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## DETERMINANTS OF PAP SCREENING AMONG SUB-SAHARAN AFRICAN IMMIGRANT WOMEN

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Digital Object Identifier: <https://doi.org/10.13023/ETD.2017.287>

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Dr. Susan Frazier, Director of Graduate Studies

DETERMINANTS OF PAP SCREENING AMONG SUB-SAHARAN  
AFRICAN IMMIGRANT WOMEN

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DISSERTATION

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

By  
Adebola Olamide Adegboyega

Lexington, Kentucky

Director: Jennifer Hatcher, PhD, Associate Professor of  
Nursing

Lexington, Kentucky

2017

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## ABSTRACT OF DISSERTATION

### DETERMINANTS OF PAP SCREENING AMONG SUB-SAHARAN AFRICAN IMMIGRANT WOMEN

The purpose of this dissertation was to explore the determinants of Pap screening completion among sub-Saharan African immigrant women. Cervical cancer is a public health problem globally. The risk of invasive cervical cancer remains high among sub-Saharan African immigrant women in the US despite being a preventable cancer. Early detection through Pap screening is crucial for prevention, treatment and prognosis. The specific aims of this dissertation were to 1) examine Pap screening practices among African immigrant women and to identify gaps to guide future research; 2) explore barriers and motivators that influence Pap screening decisions among African immigrant women; and 3) explore African immigrant men's knowledge of Pap screening and attitudes about supporting their wives/female partners to utilize Pap screening, and 4) explore predictors of Pap screening use among sub-Saharan African immigrant women,

Specific aim one was addressed by a review and synthesis of literature focused on Pap screening among African immigrant women. Common factors influencing Pap screening completion included immigration status, health care interactions, knowledge deficiency, religiosity, and certain personal characteristics. Specific aim two was addressed by the conduct of a qualitative descriptive study of barriers and motivators contributing to Pap screening decisions in 22 African immigrant women. Women experienced different barriers including low knowledge of screening, cultural beliefs, fear and communication issues. Addressing knowledge gaps and other barriers related to Pap screening may improve Pap screening participation in this group. Specific aim three was addressed by a qualitative descriptive study of men's attitudes and beliefs regarding Pap screening and support for their wives for Pap screening participation. African immigrant men demonstrated suboptimal knowledge and awareness of cervical cancer screening. Most men had a lack of knowledge regarding HPV and its link with cervical cancer. Despite knowledge deficiency men showed significant interest in supporting their wife/female partners. Specific aim four was addressed by conducting an analysis of cross sectional data collected from 108 sub-Saharan African women. Predictors of Pap screening completion was determined using logistic regression while controlling for age and education. Pap screening awareness and provider's recommendations were independent predictors of Pap screening.

Given the unequitable burden of cervical cancer experienced by this population, the findings from this dissertation point to the need for a multilevel targeted health interventions directed toward African immigrant population are needed to increase the rates of Pap screening among African immigrant women. Prevention efforts should focus on individual level factors and develop culturally relevant strategies that will effectively provide educational outreach interventions and alleviate barriers to Pap screening. Engaging spousal support and addressing social norms related to spouses/partners' roles that may influence partaking in cervical cancer screening is important among African immigrant women. Cervical cancer is preventable; Pap screening will lead to early detection of cervical cancer in female African immigrants.

**KEYWORDS:** Pap screening, cervical cancer, African immigrants, sub-Saharan African immigrants.

*Adebola Olamide Adegboyega*

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*June 5, 2017*

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Date

DETERMINANTS OF PAP SCREENING AMONG SUB-SAHARAN  
AFRICAN IMMIGRANT WOMEN

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## ACKNOWLEDGEMENTS

First and foremost, I would like to thank the Almighty God for his faithfulness and for helping me thus far. The Lord has been my help in ages past and he is my hope for years to come. He brought me from a lowly estate and established my feet on the solid rock to stand.

I would like to thank Dr. Jennifer Hatcher for serving as the chair of my dissertation committee and for being my mentor. Dr. Hatcher provided me with innumerable opportunities to develop my scholarly abilities. Dr. Hatcher has supported me throughout my doctoral studies by providing invaluable insight and constructive criticisms and feedback. She provided a nurturing and conducive atmosphere for me to grow and fine tune my research ideas. I am eternally grateful for your kindness, patience and your encouragements. I want to thank Dr. Gia Mudd- Martin for serving on my committee and for her selfless contributions to the successful completion of this dissertation. I am also grateful to Dr. Ana Maria Linares for providing invaluable feedback throughout my dissertation research. Finally, I would like to express my deepest gratitude to Dr. Mark Dignan for serving as the outside member of my dissertation committee and for his mentorship. I am grateful for the guidance, research funding support, and the opportunities for career development you provided me and for sharing your wealth of experience to improve my dissertation.

I am indebted to my parents, who have supported me through all my educational endeavors and do not cease to encourage me to be the best that I can be. I appreciate my parents in love, for their words of encouragements and support throughout my education in the US. God will bless you all. My sincere appreciation goes to the love of my life, Dr.

Olubunmi Adegboyega and my children, Ayo and Fisayo, for their unflinching support throughout all my educational pursuit. I am grateful for all the sacrifice you made to make this journey a success. Thank you for your love, patience and understanding. I love you more than words can express.

I would like to thank all the people, too numerous to mention who have contributed to my success and have supported me along this journey. The completion of my graduate education would not have been possible without the assistance from colleagues, encouragements from family and friends. My sincere appreciation goes to my siblings, classmates, co-workers, colleagues, friends, College of Nursing staff, and all faculty who have supported and assisted me in various ways during my sojourn in graduate school and completion of this dissertation. Worthy of mention are Dr. and Dr. Mrs Adedoyin, Jung Hee Kang, Adaeze Aroh, Kathy Collins, Mark Cromo, DREAM team, Dr. Amanda Wiggins, Dr. Terry Lennie, Dr. Zim Okoli, Dr. Yvonne Commodore Mensah, Kathy Bengley, Pastor James Adekunle, and Adefemi Ajayi.

Finally, I would like to thank all sub-Saharan African immigrant men and women who volunteered to participate in this study for their insight and time. I would like to acknowledge Geographical Management of Cancer Health Disparities Program (GMaP) region 1North (National Cancer Institute Grant # 3P30CA177558-04S3) and Disparities Researchers Equalizing Access for Minorities (DREAM) center, College of Nursing, University of Kentucky for providing research funding for completion of this dissertation.



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## CHAPTER ONE: Introduction

### 1. Cervical cancer and risk factors

Cervical cancer is a major global health concern. The International agency on Cancer Research and World Health Organization estimate that 530,000 women were diagnosed with cervical cancer in 2012 and there were approximately 275,000 deaths worldwide in 2012.<sup>1</sup> Cervical cancer is the fourth most common cancer among women worldwide and the leading cause of cancer-related deaths among women in developing countries.<sup>1</sup> The incidence and mortality of cervical cancer has declined in high income countries largely due to the wider use of primary or secondary prevention but almost nine out of ten (87%) cervical cancer deaths occur in the less developed regions where effective cervical cancer screening and treatment services have been difficult to implement.<sup>1</sup>

Cervical cancer deaths in the United States (US) have decreased dramatically since the implementation of widespread cervical cancer screening. The incidence of cervical cancer in the U.S has decreased more than 50% in the past 30 years because of widespread screening with cervical cytology.<sup>2</sup> In 1975, the rate was 14.8 per 100,000 women. By 2008, it had been reduced to 6.6 per 100,000 women. Mortality from the disease has undergone a similar decrease from 5.55 per 100,000 women in 1975 to 2.38 per 100,000 women in 2008.<sup>2</sup> The rates for new cervix uteri cancer cases in the U.S. have been falling on average 1.2% each year over the last 10 years. Death rates have been falling on average 1.3% each year from 2002 to 2011.<sup>3</sup> The aim of screening for cervical cancer is to identify and treat preinvasive lesions, thus preventing the progression to

invasive cancer. Almost all cases of cervical cancer occur in women who have not been appropriately screened.<sup>4</sup>

Cervical cancer is a slow-growing cancer that develops in the tissues of the uterine cervix. The cervix is the lower, narrow end of the uterus. The cervix leads from the uterus to the vagina (birth canal).<sup>5</sup> Cervical cancer screening tests that are widely used include tests for human papillomavirus (HPV) and cytology (Papanicolaou [Pap] test). Pap screening is recommended every 3 years for women 21-65 years of age with a cervix, for women aged 30 to 65 years co-testing with cytology, and HPV testing every 5 years is preferred; screening with cytology alone every 3 years is acceptable.<sup>2</sup> Liquid-based and conventional methods of cervical cytology collection are acceptable for screening. Screening by any modality should be discontinued after age 65 years in women with evidence of adequate negative prior screening test results. Screening decreases cervical cancer incidence and mortality by at least 80%.<sup>6</sup> The reduction of mortality and morbidity associated with the introduction of cytology-based screening is consistent and equally dramatic across populations. Correlational studies of cervical cancer trends in countries in North America and Europe demonstrate dramatic reductions in incidence of invasive cervical cancer.<sup>7</sup> Strategies that aim to ensure that all women are screened at the appropriate interval and receive adequate follow-up are most likely to be successful in further reducing cervical cancer incidence and mortality in the U.S.<sup>7</sup>

Despite the encouraging trends of decreasing morbidity and mortality from cervical cancer, the burden of this disease is not shared equally among women of all races and ethnicities.<sup>8</sup> About 85% of the global burden occurs in the less developed regions, where it accounts for almost 12% of all female cancers. The highest incidence rates in the

world were reported in eastern, western and southern Africa.<sup>1</sup> The prevalence and case-fatality from cervical cancer remains high in many African countries as a result of the inadequate use of primary and secondary prevention methods. Most women in these countries do not seek treatment until the terminal stages of the disease, while primary and secondary prevention methods remain poorly integrated into Africa's health care system.<sup>9, 10</sup> Similarly, the overall 5-year relative survival rate for cervical cancer among black women in the U.S is 58%, compared with 69% among white women partly because black women are more likely than white women to be diagnosed with regional stage or distant-stage disease. Racial differences in stage at diagnosis may be related to differences in the quality of screening and follow-up after abnormal results.<sup>11, 12</sup> Lower socioeconomic status is also associated with lower screening rates, later stage at diagnosis, and poorer survival.<sup>13, 14</sup>

Persistent infection with oncogenic Human papillomavirus (HPV) is the major causative agent of cervical cancer.<sup>15</sup> There are more than 120 HPV different types that may infect human skin and mucosa. Only 13–15 of these are found in cervical cancers and other malignancies and are called 'high risk' HPV (HPV-HR). HPV 16 is the most important HPV-HR-type; it is linked to approximately 50 % of cervical cancers worldwide. HPV 18 ranks second, HPV 16 and 18 are associated with two thirds of all cervical cancers.<sup>16</sup> HPV infections are very common below the age of 30 years and most of these infections are self-limiting but only a minority will persist for many years and decades.<sup>16</sup> The US Food and Drug Administration has approved and recommended three vaccines for the prevention of the most common HPV genotypes. Two of the vaccines provide protection against HPV types causing approximately 70% of cervical cancers,



while the third provides protection against HPV types associated with approximately 90% of invasive cervical cancers.<sup>17</sup> Women vaccinated for HPV need to continue to receive recommended cervical cancer screening, because these vaccines only target the most common strains of HPV, and they also do not provide protection for those women who are already infected with HPV.<sup>18</sup> HPV infection prevalence (all types) and cervical cancer risk in Africa is 24% and 3.4% respectively compared to 5% and 0.5% in Northern America.<sup>1, 19</sup>

With a growing number of African immigrants to the US, there is potential for many of the disease characteristics affecting them in Africa to impact their health as they live in the US.<sup>20</sup> A 10-20 year lag between pre-cancer and cancer offers ample opportunity to screen, detect and treat pre-cancer to stop its progression to cancer.<sup>21</sup> However, these opportunities for early detection are missed in women who do not screen according to recommended guidelines.

## **2. Cervical cancer screening program in the US**

Cancer screening in the U.S. is predominantly opportunistic, except for a few organized programs within certain health care plans.<sup>22</sup> Opportunistic screening depends on individual members of the public to request screening or on their health care providers to recommend screening, because most individuals are not part of an organized program. Unlike in organized systems, a significant percentage of the adult population has no access to screening at all because there is no central coordination of screening.<sup>22</sup> If all eligible adults are included in a centralized call-recall system, timely reminders to the target population tailored to individual risk can be issued based on recommended guidelines, independent of encounters with health care providers.<sup>23</sup> However, immigrants

who do not have access to regular care may be missed by opportunistic screening because of absence of health care encounters and missed opportunities during health care interactions to ascertain whether patient had been screened or at risk for cervical cancer. The likelihood of undergoing cancer screening is associated with having a regular place of care, a regular physician, more visits, and among these, more visits for preventive care (checkups), and a recommendation for cancer screening from a clinician.<sup>24</sup> Through the National Breast and Cervical Cancer Early Detection Program (NBCCEDP), Center for Disease Control and Prevention (CDC) provides low-income, uninsured, and underserved women access to timely breast and cervical cancer screening and diagnostic services. Uninsured and underinsured women ages 21 to 64 years at or below 250% of federal poverty level are eligible for NBCCEDP cervical cancer screening.<sup>25</sup>

### **3. African immigrants in the United States and cervical cancer screening**

The sub-Saharan African immigrant group is a rapidly growing new population in the U.S.<sup>26</sup> The sub-Saharan African diaspora population in the U.S is comprised of approximately 3 million individuals who were either born in or reported ancestry from sub-Saharan African countries.<sup>27</sup> The term sub-Saharan African immigrants refer to immigrants of sub-Saharan African ancestral origins who self-identify or are identified by others as sub-Saharan African immigrant but exclude immigrants from North African. In 2013, 78 percent of sub-Saharan Africans came from Eastern and Western Africa, with Nigeria, Ethiopia, Ghana, Kenya, and South Africa representing the top sending countries. Together, these five origin countries accounted for more than 52 percent of all sub-Saharan Africans in the United States.<sup>27</sup> Sub-Saharan African immigrants have diverse modes of entrance into the US and various status once they get to the U.S.<sup>26</sup> Sub-

Saharan African immigrants were much more likely to have been admitted as refugees (21 percent) or through the Diversity Visa Lottery (17 percent) than immigrants from most other world regions.<sup>27</sup>

Despite the growing presence of sub-Saharan African immigrants, this group is underrepresented in research and is usually lumped with African Americans or African Caribbean,<sup>28</sup> making it difficult to elucidate health characteristics or behaviors specific to this population. Sub-Saharan African immigrant women continue to lag behind native born blacks with suboptimal Pap screening rates despite the importance of cervical cancer screening. Using data from National Health Interview Survey (2008-2010), after controlling for demographic variables, being an African born woman was the strongest predictor of current Pap screening status. A comparison of African immigrants and African American women showed that African Americans have three times the odds of reporting current pap screening.<sup>20</sup>

In the United States, African Americans bear a disproportionate share of the cancer burden, having the highest death rate and shortest survival of any racial or ethnic group for most cancers.<sup>18</sup> The causes of these inequalities are complex and reflect social and economic disparities more than biological differences.<sup>18</sup> Data from persons of African descent who reside in the US including African Americans, African Caribbean, and African immigrants, all of whom may share the “Africa” designation, should be disaggregated due to differences in culture, migration histories, and genetic admixtures, which are important determinants of health.<sup>29</sup> While the factors that influence Pap screening have been well examined among other minority and immigrant groups in the U.S including African Americans, Hmong Americans, Asian Americans, Koreans

Americans and Native American, there is limited information on the specific factors that influence Pap screening among sub-Saharan African immigrants. Sparse studies specific to African immigrants have been conducted and researchers attributed screening disparity to low knowledge, language difficulties, distrust of interpreters, negative past experience, fear of tests, and cultural barriers such as fatalistic beliefs and modesty.<sup>30-33</sup> Other influential factors are nativity, length of residence in the United States, ethnicity, and greater utilization of the health care system.<sup>34-36</sup>

#### **4. Theoretical Framework**

Theories can be used to explain the structural and psychological determinants of behavior and guide the development and refinement of health promotion and education.<sup>37</sup> Health behavior theories focus on multiple determinants of behavior at the individual, interpersonal, group, organizational, and/or community levels.<sup>38</sup> A range of beliefs, attitudes and sociodemographic factors influence health behaviors such as Pap screening. This dissertation was guided by two theoretical frameworks (the Health Belief Model and the Revised Behavioral Model for Vulnerable Populations) that best suited the purpose of this research, which is to determine factors influencing Pap screening among African immigrant women. The Health Belief Model (HBM) was used because, based on attitudes and beliefs, it predicts the tendency to utilize health care services such as Pap screening and the Revised Behavioral Model for Vulnerable Population considers factors that may lead to vulnerability and incorporates both individual and contextual determinants of health services use.<sup>38-40</sup>

The HBM has been used in research to determine relationships between health beliefs and health behaviors, as well as to inform interventions.<sup>38</sup> The HBM is a major

organizing framework for explaining and predicting acceptance of health and medical care recommendations.<sup>41</sup> The HBM postulates that if individuals regard themselves as susceptible to a condition, believe that condition would have potentially serious consequences, believe that a course of action available to them would be beneficial in reducing either their susceptibility to or severity of the condition and believe the anticipated benefits of taking action outweigh the barriers to (or costs of) action, they are likely to take action that they believe will reduce their risks.<sup>38</sup> This model includes constructs of perceived susceptibility (belief about likelihood of getting a disease or condition), perceived severity (belief about how serious a condition and its sequelae are), perceived benefits (belief in efficacy of the advised action to reduce risk of disease), perceived barriers (belief about the tangible and psychological costs of the advised action), self-efficacy (confidence in one's ability to take action, and cues to action (strategies to activate readiness)).<sup>38</sup> (See fig.1.1)

The HBM was used to guide the study reported in chapter three, a qualitative descriptive study describing barriers and motivators contributing to Pap screening decisions among African immigrant women. The Health Belief Model guided the construction of the semi structured interview questions and data analysis.

The other framework utilized in this dissertation is the Revised Behavioral Model for Vulnerable Populations (see fig 1.2). Individuals with high risk statuses (e.g. sub-Saharan African immigrants in the current study) are in a highly vulnerable health position.<sup>42</sup> The Revised Behavioral Model for Vulnerable Populations model assists in identifying the determinants that lead an individual to use health care services. The three components of the model are (1) Predisposing characteristics that exist before an onset of

illness (e.g., sociodemographic variables, health beliefs, and values); (2) Enabling factors that affect an individual's ability to secure health services in the community (e.g., personal, family, and community resources); and (3) Need for care characteristics including the actual health problems of the populations. <sup>43, 44</sup>

The Revised Behavioral Model for Vulnerable Populations is a multilevel model that incorporates both individual and contextual determinants of health services use. In this dissertation study, the model guided study reported in chapter five; a cross sectional quantitative study to determine independent predictors of Pap screening. Individual-level predisposing, enabling, and need for care factors were examined as potential predictors of Pap screening status. The Revised Behavioral Model for Vulnerable populations provides a theoretical basis from which to understand health care services and health outcomes such as Pap screening. The model shows hypothesized relationships between the different components and the ultimate health outcomes. Theoretically, each of the components of the predisposing, enabling, and need for care factors will contribute to explaining Pap screening among African immigrant women. Factors predisposing individuals use of Pap screening include variables: age, marital status, education, awareness, knowledge and acculturation. Enabling factors considered to predict Pap screening are variables: income, health insurance, spousal support, having primary care provider and routine provider visit. Need for care factors were measured with perceived health status and provider's recommendation.

## **5. Purpose of Dissertation**

The purpose of this dissertation was to examine factors influencing cervical cancer screening among African immigrants. In each of the four studies, a different facet

of cervical cancer screening was examined. First, a literature review related to cervical cancer screening among African immigrants in developed countries was conducted. Second, a qualitative descriptive study was conducted to examine perceptions contributing to cervical cancer decisions among African-Born women. Third, a qualitative descriptive study was conducted to explore African immigrant men's knowledge and attitudes to supporting their wives or partners in obtaining cervical cancer screening. Finally, a cross sectional study was conducted to explore predictors of cervical cancer screening in sub-Saharan African immigrant women. The Health Belief Model and the Revised Behavioral Model for Vulnerable Populations were used to guide the study designs, data collection, data analysis and the interpretation of the results reported in this dissertation.

## **6. Summary of Subsequent Chapters**

Chapter Two is a report of literature review of studies based on cervical cancer screening among African immigrants. The study is titled "examining cervical cancer screening utilization among African immigrant women: A literature review".<sup>46</sup> This systematic review evaluates cervical cancer screening research in African immigrants and identified the gaps. Despite the growing number of African immigrants to developed countries, there is limited cancer research specific to this population, many studies include a small number of Africa immigrants or combine data for all persons of African descent. To address this gap, published research from 2005 to 2015 specific to cervical cancer screening use among African immigrants was reviewed to identify screening adherence rates and factors influencing Pap screening use among African immigrants.

Chapter three is a report of a qualitative descriptive study designed to describe the barriers and motivators contributing to cervical cancer screening decisions among a purposive sample of sub-Saharan African immigrant women. The study is titled “factors influencing Pap screening use among African immigrant women”.<sup>47</sup> Women were eligible if they were (a) self-identified as African born, (b) have lived in the US for at least 1 year, (c) can speak and read English language. Twenty-Two African immigrant women aged 24 to 65 years who have lived in the US for at least 1 year were recruited and interviewed. Participants took part in one of five focus groups with four or five participants in each group. Interview sessions were digitally recorded and transcribed verbatim. Content analysis was used for data analysis. Barriers to screening included low knowledge of screening, cost, cultural beliefs, fear, and communication issues. Motivators to improve Pap screening use include provider’s recommendation, health insurance coverage, enlightenment, and family support.

Chapter four is a report of a qualitative descriptive study to explore African immigrant men’s knowledge, attitudes, and spousal support for their partners’ completion of Pap screening. To date, many studies exploring factors influencing Pap screening have been limited to women but did not include men’s perspectives on Pap screening use. Understanding male’s perspective is important because in the African cultural context, men have a dominant role in the family and males’ involvement is an integral part of women’s health promotion. To address this gap, a maximum variation purposeful sample consisting of approximately 21 African immigrant men were recruited. Data were obtained by in-depth individual interviews and audio recorded. Content analysis was used for data analysis. African immigrant men demonstrated some knowledge of cervical



cancer in general but limited knowledge and awareness of cervical cancer screening. Despite knowledge deficiency men showed significant interest in supporting their wife/female partners.

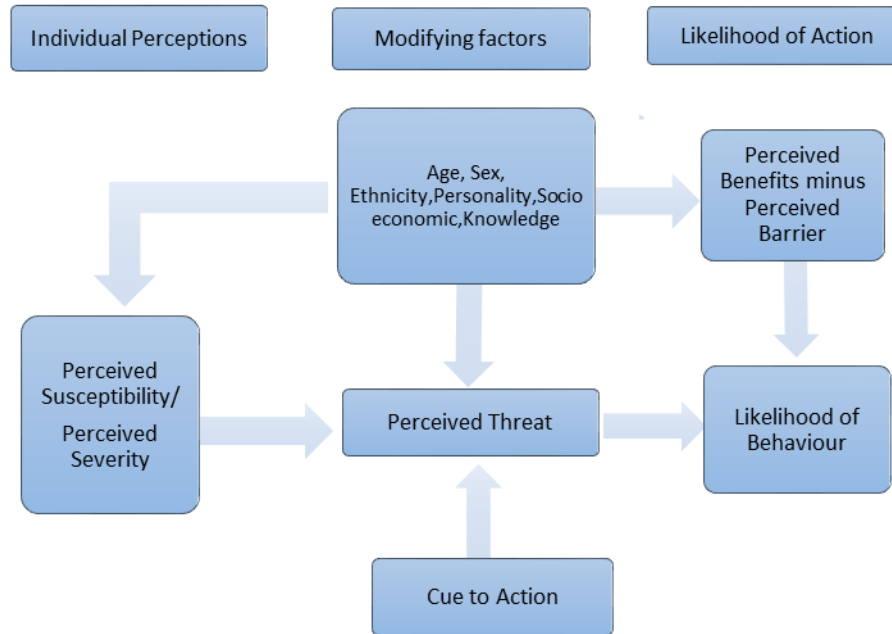
Chapter five is a report of a cross-sectional study to determine determinants of Pap screening among African immigrant women. In this chapter, predisposing factors, enabling factors and need for care factors were assessed to determine if they were predictive of having ever had a Pap screening among sub-Saharan African immigrant women. Data were obtained from 109 women. Women were eligible if they were a) able to speak English, b) self-identify as a sub-Saharan African woman, c) being age 21 or above. Self-administered questionnaires were used to collect data on demographics, Pap screening status, acculturation, knowledge, awareness, spousal support and social support. Logistic binary regressions were conducted to determine predictors of Pap screenings. Findings from this study led to exploratory study to determine men's knowledge and attitudes toward Pap screening for their wives/female partners.

Chapter six is a discussion of Pap screening patterns among African immigrant women that synthesizes data from the studies in this dissertation to address gaps in the literature, implication for practice and future research directions to improve Pap screening among sub-Saharan African immigrants. Findings from the studies form the foundation for further research and inform development of a culturally tailored intervention to promote the use of Pap screening among African immigrant women. Given the unequitable burden of cervical cancer experienced by this population, the findings from this dissertation indicate that a multilevel targeted health intervention may be effective to increase the rates of Pap screening among African immigrant women.

Such interventions combining factors identified in this study have the potential to reduce the cervical cancer disparity experienced by the African immigrant population.

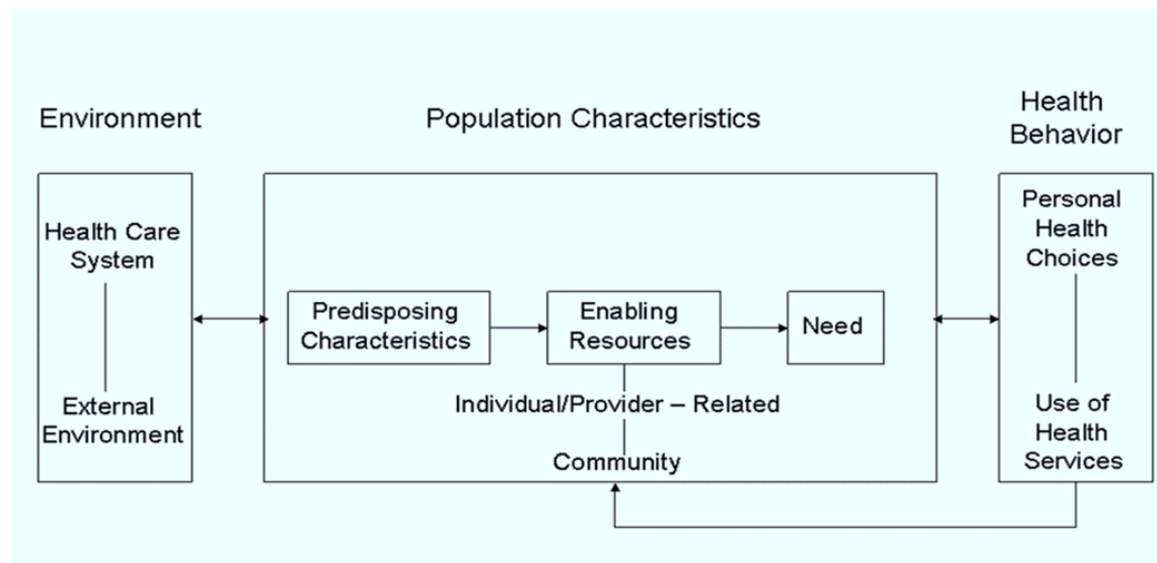
**Figure 1.1: Health Belief Model**

Adapted from Health Behavior and Health education: Theory, Research and Practice. <sup>38</sup>



**Figure 1.2: The Behavioral Model for Vulnerable Populations**

Adapted from “revisiting the behavioral model and access to medical care: does it matter”? <sup>45</sup>



## CHAPTER TWO: Examining Cervical Cancer Screening Utilization Among African Immigrant Women: A Literature Review

Adegboyega A, Aleshire M, Linares AM (2017). Examining Cervical Cancer Screening Utilization Among African Immigrant Women: A Literature Review. *International Journal of Women's Health Wellness* 3:046. 10.23937/2474-1353/1510046.

### 1. Introduction

Every year 530,000 women worldwide are diagnosed with cervical cancer, and approximately 275,000 die from the disease.<sup>1</sup> Cervical cancer is the second most common cancer among women worldwide<sup>1,2</sup>, is the most common cause of cancer in Africa<sup>3</sup>, and is the leading cause of cancer-related deaths among women in developing countries.<sup>1,4</sup> Cervical cancer incidence rates are highest in sub-Saharan Africa, Latin America, Melanesia, and the Caribbean and are lowest in Western Asia, Australia, New Zealand, and North America. There is significant variation in cervical cancer rates by geographical region, which reflects differences in the availability and utilization of cervical cancer screening based upon geographical area.<sup>2</sup> Cervical cancer screening has successfully decreased cervical cancer incidence and mortality<sup>5</sup> in developed countries.

However, screening in most African countries remains inaccessible and underutilized by African women.<sup>6</sup> In many sub-Saharan African countries, cervical cancer screening programs have not been effective due to multifactorial barriers that are client-based, provider-based, and system-based.<sup>7</sup>

Human papillomavirus (HPV) infection is the primary cause of cervical cancer and HPV prevalence in women without cervical abnormalities is 24% in sub-Saharan Africa compared to a prevalence of 5% in North America.<sup>2,8</sup> Western and Eastern Africa are high risk areas for cervical cancer with women having a 3.4% cumulative risk of

developing cervical cancer during their lifetime compared to a 0.5% lifetime risk of cervical cancer for women in North America risk of. <sup>9</sup> Decreases in HPV prevalence in North America have been linked to HPV vaccination; <sup>10</sup> however, the high cost of HPV vaccine may make it unaffordable or unavailable in many African countries.<sup>4</sup> The high HPV prevalence in African women translates to a high burden of cervical cancer in African women as well as an increased risk of cervical cancer for African women who immigrate to the United States (U.S.). <sup>11</sup>

Receiving Papanicolaou smear (Pap) screening according to recommended guidelines significantly reduces cervical cancer morbidity and mortality and is the most commonly used prevention strategy for cervical cancer worldwide.<sup>12</sup> Pap screening can find precancerous cervical abnormalities as well as detect cervical cancer at early and at treatable stages. Cervical cancer is rare in women less than 21 years of age, and screening in adolescent females has been shown to increase cost and anxiety without decreasing incidence of cervical cancer.<sup>13</sup> Hence, cervical cancer screening is not recommended for adolescent females.<sup>14</sup> The American Cancer Society, American Society of Colposcopy and Cervical Pathology, American Congress of Obstetricians and Gynecologists, and U.S. Preventive Services Task Force (2012) recommend Pap screening begin at age 21 years and be completed every 3 years until women are over 65 years. Women ages 30-65 years may alternatively choose co-testing with HPV and Pap screening every 5 years. Co-testing for HPV in combination with Pap screening can help to assess cervical cancer risk.<sup>15</sup> If there is no history of cervical cancer or precancerous abnormalities, women who have had a hysterectomy that includes removal of the cervix and women over age 65 do not need cervical cancer screening.<sup>15</sup> These recommendations are for women at average

risk and do not apply to women at increased risk for cervical cancer such as women who have a history of cervical dysplasia or cervical cancer; women who have been exposed in utero to diethylstilbestrol, or women who are immunocompromised.<sup>12</sup> Recommended screening practices should not change based on HPV vaccination status.<sup>16</sup>

Women receiving Pap screening based on guideline recommendations and intervals is critical to reducing cervical cancer related morbidity, mortality, and economic burden.<sup>17</sup> In the U.S mortality reduction would be 86%-93%, and lifetime cost would be approximately \$1200-\$1500, and 24 quality-adjusted life-years would be gained.<sup>10, 18</sup> To improve the health and economic burden of cervical cancer, the Pap screening patterns of ethnic minorities and underserved populations must be understood since these populations are disproportionately affected by cervical cancer. Currently, there exists a limited understanding of the factors influencing cervical cancer screening among African immigrants (AIs) to the U.S.

Sub-Saharan Africa is historically a region of intense migration and population movement prompted by demographic, economic, ecological and political factors.<sup>19</sup> Hence, the African immigrant (AI) group is a rapidly growing population in the U.S.<sup>20</sup> From 1980 to 2013, the African population in the U.S. increased from 130,000 to 1.5 million.<sup>21</sup> AIs differ by country of origin, reasons for migration, primary languages spoken, health practices and beliefs, human capital, education status, and cultural background.<sup>22</sup> Immigrants bring with them their health profiles and health-related knowledge, values, beliefs, and perceptions reflecting their cultural background.<sup>23</sup> Cervical cancer screening services have been poorly implemented in many developing countries because of the high cost of health services, poor health infrastructures,

insufficient numbers of pathologists and technicians, lack of resources, and accessibility particularly by people living in the rural areas since many of the available services are based in secondary and tertiary health care facilities located in urban areas.<sup>4, 24</sup> The awareness and utilization of Pap screening is increasing in Sub-Saharan Africa. However, the unavailability and inaccessibility of cervical cancer screening services continue to lead to only a small percentage of women being screened in sub-Saharan Africa.<sup>4</sup> Insufficient awareness of cervical cancer screening recommendations may deter AI women from completing Pap screening<sup>7</sup> after they migrate to the U.S. AIs may not have had any Pap screening prior to coming to the U.S. Consequently, cervical cancer screening appears to be underutilized among AI populations whose screening rates are much lower than the proposed Healthy People 2020 objective of 93% of women age 21 to 65 receiving screening based upon current guidelines.<sup>25</sup>

AI women in the U.S. may be disproportionately affected by cervical cancer due to health care factors, culturally determined beliefs and attitudes, and cervical cancer screening barriers.<sup>26-28</sup> In the only identified systematic review of cancer control research focused on U.S. AIs, Hurtado-de Mendoz and colleagues (2014)<sup>29</sup> examined cancer related studies that included African-born immigrants to the U.S. This review was conducted in May 2013 and was not specific to cervical cancer screening. To date, scant research has examined the current state of cervical cancer screening in AIs or identified research gaps to inform future research and interventions. Therefore, the purpose of this review is to examine cervical cancer screening practices among AI women and to identify gaps in the literature to guide future research.

## 2. Methods

### 2.1. Search Method

The literature review combined electronic searches from PubMed, Web of Science, Google Scholar, Ovid Medline and CINHAL and followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.<sup>30</sup> Search terms included a combination of key words such as “cervical cancer screening”, “African immigrants”, “cervical neoplasm screening”, “Pap test”, “African refugees”, and “immigrants”. First, abstracts and titles were screened for relevance. Subsequently, full text articles were evaluated to determine adherence to the predetermined inclusion criteria. The article selection was based on the following inclusion criteria: (a) studies were published in English between 2005 and 2015, (b) studies reported on cervical cancer screening in an AI population, (c) articles were peer reviewed, (d) and the article was either a qualitative or quantitative research study, (e) studies done in Europe, Australia, or North America. Studies reported only in abstracts without full manuscripts, conference abstracts, review papers, dissertations, and epidemiological studies were excluded from the review.



## Sample search terms used in PubMed

(africa\*) OR "Africa"[Mesh])) AND (((("Emigrants and Immigrants"[Mesh])) OR immigrant\*)) AND "last 10 years"[PDat] AND Humans[Mesh] AND English[lang])) AND (((cancer screen\* AND "last 10 years"[PDat] AND Humans[Mesh] AND English[lang])) OR ("Early Detection of Cancer"[Mesh] AND "last 10 years"[PDat] AND Humans[Mesh] AND English[lang])) AND "last 10 years"[PDat] AND Humans[Mesh] AND English[lang])) AND "last 10 years"[PDat] AND Humans[Mesh] AND English[lang])) AND (((("Uterine Cervical Neoplasms"[Mesh] AND "last 10 years"[PDat] AND Humans[Mesh] AND English[lang])) OR (cervi\* AND "last 10 years"[PDat] AND Humans[Mesh] AND English[lang])) AND "last 10 years"[PDat] AND Humans[Mesh] AND English[lang])

## 2.2. Search Outcome

Figure 2.1 summarizes the article selection process. From the initial electronic database search, 31 articles were identified. The abstracts were appraised and the references were reviewed to identify relevant studies from the reference lists that might have been missed in the initial search. After deleting duplicates, the remaining 24 full-text articles were screened for eligibility. A total of 16 studies met inclusion criteria.

## 2.3. Quality Appraisal

Due to the limited number of studies meeting inclusion criteria, all research methodologies were included in this review. A categorical quality appraisal of the studies was not undertaken due to the significant heterogeneity among studies and is a limitation of this review, however the quality of studies was appraised via identifying designs, measures, strengths and weaknesses.

## **2.4. Data Extraction and Analysis**

The abstract, manuscript, and the main findings of the studies meeting inclusion criteria were critically reviewed and synthesized. The authors used a data extraction sheet to examine study characteristics including subject characteristics, sampling methods, study location, and research design. Due to the changes in cervical cancer screening guidelines between 2005 and 2015, the authors referred to contemporary guidelines from the time the studies were conducted to ascertain if study participants met cervical cancer screening recommendations. The primary outcome variable of interest was if AIs had ever received Pap screening. Data also appraised and synthesized included cervical cancer screening adherence, and facilitators and/or barriers affecting cervical cancer screening practices. Given the heterogeneity of the included studies, meta-analysis or other statistical analysis could not be performed; therefore, data was summarized using qualitative synthesis. Extracted data was organized, integrated, and analyzed using qualitative content analysis methods.<sup>31</sup> Extracted data with common characteristics were then synthesized and grouped into major themes.

## **3. Results**

### **3.1. Characteristics of Selected Studies**

The selected articles were published between 2005 and 2015. The study characteristics are outlined in Table 2.1. The study designs included six qualitative,<sup>32-35</sup> seven quantitative,<sup>11, 36-41</sup> and one mixed methods (using both qualitative and quantitative) approach.<sup>42</sup> The reviewed articles included only two intervention studies.<sup>43</sup> <sup>44</sup> Of the selected studies, 11 were studies specific for cervical cancer while the remaining studies also included other types of cancer.

### 3.2. Subject Characteristics

The sample sizes and sampling methods varied among the studies. Convenience sampling was used most frequently (25%, 4 articles). Three articles (18.8%) used stratified sampling, two articles (12.5%) used randomized sampling and purposeful sampling methods, one article (6.3%) used clustered sampling, and four articles (25%) did not specify the sampling method. All studies' participants were ages 18 and above. Seven articles examined AIs exclusively while 9 studies included other populations. Somalia was the most common country of migration in all reviewed studies which may be related to large Somalian immigrant populations in the areas where most studies on AIs have been conducted. Somalia was the top country of origin of African-born refugees and asylees (11.6%) admitted to the US in 2007.<sup>45</sup> Ten studies were conducted in the United States, two in United Kingdom, and one study each was conducted in Canada and Australia.

### 3.3. Cervical Cancer Screening Adherence

The cervical cancer screening adherence outcome for the purpose of this review was defined as the proportion of AI women, 21 years and older who had ever had a Pap screening. Women who had not received screening for 5 years after co-testing with HPV and Pap screening, women who had not received Pap screening within the past three years or had never had a Pap screening were categorized as overdue for screening. Pap screening rates among AIs were reported in five studies. According to Morrison and colleagues (2013),<sup>40</sup> 51% of the 310 women in their study had at least one cervical cancer screening within the past three years. In a sample of AIs in Minnesota, Harcourt and colleagues (2013)<sup>38</sup> found a 52% screening adherent rate. Somali women often

completed cervical cancer screening at lower rates when compared to other AI women (37% versus 63%).<sup>38</sup> Forney-Gorman and Kozhimannil (2015)<sup>11</sup> reported 26.4% of AI women were current on cervical cancer screening. Sewali and colleagues (2015)<sup>43</sup> reported a 19.4% and 65.9% completion rate for Pap screening and HPV home based kit, respectively, at 3-month follow-up. Lofters and colleagues (2010) reported that 49.2% of sub-Saharan African immigrants in their sample had not been screened for cervical cancer.<sup>46</sup> Ekechi and colleagues (2014)<sup>41</sup> reported that 26% (n = 216) of the AIs in their study were overdue for cervical cancer screening compared to 18% of Caribbean immigrant women. Piwowarczyk and colleagues (2013) reported among a group of Somali and Congolese women living in greater Boston area, 75% (n = 120) had ever completed a Pap screening. African American women were more than 3 times more likely to have reported having a Pap screening (OR=3.37, 95% CI=1.89, 5.96) compared to AI females.<sup>11</sup>

### **3.4. Factors Influencing Cervical Cancer Screening**

#### **3.4.1. Immigration status**

Four studies<sup>37, 38, 41, 43</sup> demonstrated that length of stay in country of immigration may improve cervical cancer screening, with a longer period of stay being associated with likelihood of having completed cervical cancer screening. Harcourt and colleagues (2013) found that established (greater than 5 years) are more likely to be screened for cervical cancer compared immigrants to recent immigrants ( $p < 0.001$ , OR= 0.40, CI 0.24-0.65). However, Samuel and colleagues (2009)<sup>42</sup> did not observe a correlation between time living in the U.S. and odds of being screened for cervical cancer. In a Canadian study, Lofters and colleagues (2010)<sup>46</sup> found immigrant class (economic,

family, and refugee class) to be a significant predictor of cervical cancer screening in sub-Saharan African and Western European women. In this study, refugees were less likely to have completed cervical cancer screening, even though length of stay in Canada was not consistently associated with lack of screening,

### **3.4.2. Health care interactions**

The frequency of health care system interaction may increase screening. Emergency department visits were associated with an increased likelihood of cervical cancer screening completion.<sup>39, 40</sup> Morrison and colleagues (2012, 2013)<sup>39, 40</sup> reported that there was a significant positive association between the duration of established health care ( $p = 0.001$ ), number of health care encounters ( $p = 0.001$ ), and cervical cancer screening adherence. Three studies<sup>35, 40, 47</sup> reported that post-natal or obstetrics/gynecological visits increased the odds of cervical cancer screening completion. Ogunsiji and colleagues (2013)<sup>47</sup> found a majority of women who had Pap screening participated after their first pregnancy and continued to receive follow-ups and reminders from their providers. In addition, health care provider recommendations,<sup>35, 48</sup> patient- health care provider relationship,<sup>48</sup> and trained medical interpreter use<sup>39</sup> all were found to improve rates of cervical cancer screening.

A health care provider's gender may influence cervical cancer screening completion.<sup>32, 35, 40, 42</sup> Morrison and colleagues (2012)<sup>40</sup> reported that patient-provider gender concordance may improve screening adherence among Somali women. Cervical cancer screening was significantly more likely to occur during a visit with a female health care provider compared to a male provider (6.9% versus 1.2%). Having a male health care provider perform Pap screening may be uncomfortable<sup>42</sup> and for Muslim Somali

women this may be a barrier to screening completion.<sup>35</sup> Redwood-Campbell (2011)<sup>32</sup> found in their study of cervical cancer screening barriers and facilitators, that participants preferred female clinicians, and that the health care provider be female gender was most important to Muslim women.<sup>32</sup>

Other personal level factors related to health care interaction such as cost,<sup>33, 48</sup> communication,<sup>32, 35</sup> pain,<sup>34</sup> embarrassment,<sup>32, 34, 35</sup> fear,<sup>33, 34, 41, 48</sup> and accessibility difficulties are barriers to Pap screening among AI women. Fear of the Pap screening included fear of the procedure and fear of the result. Certain women perceived the process of undergoing pelvic examination as invasive. Some women believed that the use of speculum would damage reproductive organs or impact future pregnancies.<sup>34</sup> Some women considered the speculum a painful instrument and did not trust the instruments' sterilization.<sup>35</sup> Fear of receiving a cervical cancer diagnosis prevented women from undergoing Pap screening due to the belief that a cancer diagnosis would result in death.<sup>33</sup> Ghebre and colleagues (2014)<sup>34</sup> reported that some AI women would rather die rather than know that they have cancer. Accessibility challenges affecting cervical cancer screening included lack of childcare, inconvenient appointment times, and transportation issues.<sup>33, 35</sup>

Some women anticipated embarrassment associated with reaction from health care providers based on having undergone female circumcision.<sup>35</sup> Also, women perceived undergoing Pap screening as a sign of problem or an indication that a woman is experiencing an infection. Other women were concerned regarding how their community might interpret undergoing a gynecologic exam.<sup>34</sup> Younger women expressed that due to

the close knit nature of the AI community in the area, they had concerns related to privacy and confidentiality.<sup>33</sup>

Another barrier affecting cervical cancer screening was communication and language difficulties experienced during health care interactions.<sup>34, 35</sup> English is a second language for many AI women and the inability to communicate effectively may be a barrier to cervical cancer screening. Communication issues may influence forming a trusting relationship with providers. Language difficulties can affect women's understanding of the cervical cancer screening and the perceived need for screening. Even though interpreter services were available, some women expressed dissatisfaction with the quality of interpreters provided, distrust of the interpreters provided, and embarrassment about disclosing private issues to interpreters.<sup>35</sup>

Lack of trust in healthcare system,<sup>34</sup> negative past experiences,<sup>35</sup> and lack of health insurance<sup>11, 48</sup> are system level barriers affecting cervical cancer screening. Cost of screening may affect cervical cancer screening for women without health insurance or underinsured. Lack of health insurance was associated with lower odds of Pap screening completion.<sup>11</sup> Lack of trust in the health care system and in health care providers was also identified by AI women as a health care system barrier to cervical cancer screening. Many women questioned recommendations by physicians and perceived that health care system or providers may not be focused upon the patient's best interest.<sup>34</sup> Furthermore, certain women delayed Pap screening due to their own past negative experience or other's reports of poor experiences related to Pap testing.<sup>35</sup>

### 3.4.3. Knowledge of cervical cancer screening

Several studies reported that cervical cancer screening knowledge is low among AI women. <sup>32-35, 47, 48</sup> The women endorsed the need for more information on the necessity of cervical cancer screening, steps involved in procedure, and the implications of test results. <sup>32</sup> Because women's health issues were often not discussed openly in sub-Saharan African countries, it was difficult for AI women to initiate discussions on sexuality, cancer screening, or reproductive health. <sup>47</sup> In a multiethnic study by Brown and colleagues (2011) <sup>48</sup>, AI women knew the least among all the ethnic groups and commonly believed that cervical cancer was caused by having too many children. The women did not identify HPV as the cause of cervical cancer and were not aware HPV is a sexually transmitted infection. <sup>48</sup> Ndukwe and colleagues (2013) <sup>33</sup> discussed that AI women often assume symptoms of cervical cancer are menstrual symptoms. Ghebre and colleagues (2014) <sup>34</sup> found some Somali women might not know if they have undergone a cervical cancer screening because they did not know if they had undergone cervical cancer screening or another gynecological exam.

### 3.4.4. Religiosity, beliefs and attitudes

Certain religion and cultural belief can be barriers to cervical cancer screening completion. Ekechi and colleagues (2014) <sup>41</sup> found that women who attended religious services at least once a week were more likely to be overdue for screening than those who rarely or never attended (27% vs. 17%,  $p = 0.02$ ). Also, a common Muslim Somali belief is that everything that happens is 'under God's will' <sup>34, 35</sup> and prevention has 'no impact on God's plan' for one's health. <sup>34</sup> Other beliefs that impact pap screening include that personal faith will serve as protection from cancer, that cancer is a curse, <sup>33</sup> or that cancer



is a form of punishment from God inflicted on an individual.<sup>34</sup> Some AI women have fatalistic beliefs; the women reported that prevention has no impact because if God plans for someone to get sick, they will despite screening. Individuals will die the day they were supposed to die and participating in health prevention would not change the outcome was another sentiment shared by AI women. <sup>34</sup>

There is conflicting evidence about AIs attitudes related to cervical cancer screening. Ogunsiyi and colleagues (2013) <sup>47</sup> reported the majority of West African immigrant women in their study had a negative attitude toward Pap screening due to unfamiliarity with the test. Conversely, Redwood-Campbell and colleagues (2011) <sup>32</sup> reported a positive attitude among female immigrant being proactive in managing their health by obtaining cervical cancer screening.

#### **3.4.5. Demographic characteristics**

Among the studies that assessed correlation between age and cervical cancer screening, one study reported no association between AIs age and cervical cancer screening completion <sup>38</sup> while another study reported that women 25-44 years old were less likely to be screened than women 45-64 years old. <sup>41</sup> Two studies indicated that single African women were less likely to be screened compared to married women. <sup>11, 41</sup> Harcourt and colleagues (2013) <sup>38</sup> reported that there was no association between AIs' level of education and cervical cancer screening while Forney-Gorman and colleagues (2015) <sup>11</sup> found an association between higher level of education and screening but it did not reach statistical significance.

#### 4. Discussion

This literature review describes the state of cervical cancer screening evidence related to AIs and highlights a paucity of research specific to AI women and cervical cancer screening despite growing numbers of this immigrant group in developed countries. The review included 16 articles published between 2005 and 2015. Through synthesis of the articles, the authors identified thematic factors influencing Pap screening among AIs. Factors influencing Pap screening were identified as immigration status; health care interactions; knowledge related to cervical cancer screening; religiosity, beliefs, and attitudes; and demographic characteristics.

Cervical cancer screening is underutilized in the AI population with screening rates lower than other U.S. women and well below the Healthy People 2020 goal of 93% of women ages 21 to 65 receiving screening.<sup>25</sup> The differing cervical cancer screening guidelines in place during 2005 to 2015 review period make direct comparisons of Pap screening adherence across studies difficult. Available national data do not reflect screening rates among AI due to data aggregation in which AI females are reported as part of African American female statistics. The 2010 National Health Interview Survey showed that the overall cervical cancer screening receipt in the U.S. within the past three years was 83.0%. African American women have a cervical cancer screening rate of 85%, and rates were significantly lower among Asians at 75.4%.<sup>49</sup> Lack of disaggregation of data makes it difficult to identify sub group differences between native-born blacks and foreign-born blacks. There is limited data about Pap screening among a nationally representative sample of AI. In this review, reported cervical cancer screening rates among AI varied greatly from 19.4% to 75%. Notably, even a cervical cancer

screening rate of 75% is below the reported screening rates among other minorities indicating further intervention is still needed to increase cervical cancer screening rates and achieve the Healthy People 2020 goals in this population.

Knowledge deficits related to cervical cancer risk factors and screening procedures influence cervical cancer screening among AIs. Limited knowledge in the AI population may be related to lack of cervical cancer screening emphasis or utilization prior to migration. Numerous studies conducted in Africa have shown that there is poor knowledge related to HPV, cervical cancer, and cervical cancer screening among African women. In a study conducted among women in Burkina Faso, the researchers reported low biomedical knowledge about cervical cancer.<sup>50</sup> In an integrated review of barriers to cervical cancer screening in sub-Saharan Africa, McFarland and colleagues (2016)<sup>7</sup> cited lack of knowledge and awareness of cervical screening as the most common client-based barrier. Lack of information about cervical cancer screening programs and illiteracy likely are components affecting this knowledge gap. Similarly, research among other immigrant population in the U.S. have found knowledge of cervical cancer causes and prevention to be lower as compared to the general U.S. population. For example, Corcoran and colleagues (2014) reported that Latina women have inaccurate and inadequate knowledge of cervical cancer and its prevention.<sup>51</sup>

The knowledge gaps related to cervical cancer which exist in the burgeoning AI population must be addressed. Limited knowledge related to cervical cancer can fuel misconceptions about cervical cancer and cervical cancer screening. Alarming, more than half of cervical cancer deaths in the U.S. are among immigrant women,<sup>37</sup> and AI women also suffer a disproportionate cervical cancer burden. Screening campaigns must

target AIs and emphasize the causative role of HPV in cervical cancer and cervical cancer risk factors. Such campaigns will help eliminate anecdotal beliefs and combined with targeted cervical cancer screening programs can reduce the risk of cervical cancer. Regular cervical cancer screening based upon current guidelines is highly effective in identifying cervical cancer precursors and interrupting progression to invasive disease.<sup>52</sup>

In this review, health care interactions also influenced cervical cancer screening among AI. In this review, AI women at post-natal or obstetrics/gynecological visits were screened as part of their visit; however, depending solely on this service may preclude women above childbearing ages. In native African women, screening for cervical cancer is similarly opportunistic and is more often completed by women who attend antenatal and family planning clinics. However, women who use these services are generally young and from a relatively low-risk group. This type of service does not reach women many at higher risk such as those aged 35–60 years and those who live in rural areas.<sup>4</sup> Morrison and colleagues (2012) noted that more frequent exposure to the health care system may increase comfort with the system and procedures, enhancing opportunities for preventive health services.<sup>40</sup> However, women who anticipate or experience unpleasant health care interactions may have fewer encounters with the health care system decreasing the likelihood of preventive care including cervical cancer screening.

In addition, certain health care interaction factors affecting Pap screening that are reported by U.S. ethnic minorities include embarrassment, fear of pain, fear of diagnosis, and trust in provider.<sup>51, 53</sup> In a systematic review of barriers to cervical cancer utilization in sub-Saharan Africa, Lim and Ojo (2016) reported similar barriers among Sub-Saharan Africans.<sup>54</sup> Nigerian women indicated that fear of a positive result, modesty concerns,

gender of health care providers, and beliefs that it is better to be ignorant of disease than to go in search of it were factors affecting cervical cancer screening practices, but these factors were not uniform across religions and geographical regions.<sup>55</sup> Furthermore, anticipated embarrassment related to health care providers unfamiliar with female circumcision practices have been reported among AIs.<sup>29</sup> Health care providers that encounter immigrant women should be aware that AIs may have specific needs related to female circumcision, which is practiced in more than 28 countries in Africa.<sup>56</sup>

Religiosity has been shown to predict engagement in preventive services.<sup>57</sup> Generally, individuals who attend religious services are more likely to report the use of female preventive services compared to those who never attend.<sup>57</sup> However, in this review, we found that AI women who attended religious services were not up to date on screening. Religiosity may influence perceptions about cervical cancer causes and outcome. Some AI women endorse fatalistic beliefs about cancer that may be intertwined with religious beliefs. The belief that a higher power controls health is a component of fatalism.<sup>58</sup> Studies conducted among native African women have reported fatalistic views of cervical cancer screening, viewing positive results as a death sentence negating the need for screening. Other African women have reported solace in ignorance about their cervical cancer status.<sup>54</sup>

Based on the heterogeneity and cultural diversity among Africans, factors related to cervical cancer screening uptake may vary among different ethnicities, within countries, and across the continent. In this review, most of the factors identified as influencing cervical cancer screening among AIs are similar to those identified among native Africans. However, some factors influencing cervical cancer screening differ

between native Africans and AIs. For instance, immigration status is an important determinant of cervical cancer screening uptake among immigrants with recent immigrants at greater risk for non-compliance with screening recommendations. In addition, immigrants may be disproportionately affected by unique factors that may deter from cervical cancer screening. For example, undocumented immigrants cannot receive health insurance via the Patient Protection and Affordable Care Act (ACA) and legal immigrants who have been in the country less than five years are also excluded from participation in the Medicaid expansion program. Therefore, undocumented immigrants and recent immigrants are less likely to receive cervical cancer screening, and more likely to delay seeking necessary care.<sup>59</sup> U.S. immigrants consistently have lower rates of health insurance coverage than native U.S. populations, yet there are differences among immigrants based on immigration status, time in the U.S., and country of origin.<sup>60</sup> Having health insurance and cost likely play a significant role in access to preventive services such as Pap screening for AIs.

Despite migration to developed countries where organized cancer screening services and programs are normalized, there remains low cervical cancer screening rates among AIs. In part, this may be associated with lack of successful integration into the health care system of the host country. As acculturation and assimilation occur for AIs over time, this may lead to changes in beliefs or norms related to health practices such as cervical cancer screening.<sup>61</sup> Culturally congruent care may facilitate awareness of and access to health care services, including cervical cancer screening.

This review underscores the need for culturally-appropriate, targeted prevention efforts aimed at recent immigrants to improve their cervical cancer-screening uptake. In

an intervention study identified in this review, Piwowarczyk and colleagues (2013) <sup>44</sup> found that a culturally and linguistically tailored DVD intervention increased knowledge and intention to screen among women. The intervention was a series of one-session group workshops with Congolese and Somali in the US built around a DVD using AI women's stories which provided basic information about mammography, pap smears and mental health services for trauma.

Connecting recent immigrant with community resources, local advocacy, and resettlement organizations may help link and integrate them into the health care system in their host countries and reduce the cervical cancer screening and cervical cancer disease disparities experienced by this group.

Although, considerable progress is being made toward understanding the facilitators and barriers to cervical cancer screening among AIs, this review highlights the need for culturally-targeted and linguistically appropriate interventions to address knowledge gaps, health promotion, all levels of prevention, and culturally sensitive health care interactions.

This review indicates that health care providers influence cervical cancer screening utilization via their recommendations, patient-provider relationships, and communication. Hence, interventions and educational initiatives should address health care providers' cultural sensitivity and cultural congruence and facilitate incorporation of these concepts into patient-centered care to enhance health care interactions and improve health care barriers for AIs.

Self-Pap screening and HPV testing may play a vital role in the future in increasing the number of women globally who are able to receive cervical cancer

screening.<sup>62</sup> Sewali and colleagues (2015) study<sup>43</sup> among Somali immigrants demonstrated the potential for using self-sampling home-based kits to increase cervical cancer screening in AIs. Community health workers (CHWs) might serve as patient navigators to participants with positive cervical cancer or HPV self-screening results to ensure timely follow-up.<sup>62</sup> As frontline lay public health workers, CHWs serve as a bridge between communities and health care providers.<sup>63</sup> CHWs address the challenge of delivering health care services to underserved populations through education, outreach, and counseling.<sup>64, 65</sup> CHWs have been successfully used in cancer screening promotions among underserved populations and thus should be considered as a component of intervention strategies aimed at increasing cervical cancer screening in AI women.<sup>65</sup>

#### **4.1. Limitations**

There are several limitations of this review including the number and types of studies that were reviewed and the time span of publication. Although 16 studies were identified, the study designs and samples varied greatly and studies utilized unique research purposes and questions, different types of research participants, dissimilar research measures, multiple variables, and widely varied immigrant population foci. Although the authors sought to identify all AI cervical cancer screening studies meeting inclusion criteria, the search methodology employed for the literature review may have limited the number of studies identified for inclusion. Searches of additional databases, grey literature, abstract-only writings, and unpublished data may have led to the identification of additional research studies. The limitation of using keywords and Mesh terms may have impacted the search results; however, in an effort to minimize this effect multiple databases were searched. The diversity of the articles reviewed and AIs as a



population, limits the ability to generalize the review findings. The results should be interpreted with caution due to the numerical variation of AI study participants. Also, study participants included AI women born in various countries across the African continent which are likely influenced by factors such as geographical region, religion, legislation, socio-political factors, sociocultural norms, and a myriad of other factors. Data classification and thematic identification and classification were based on subjective inferences; consequently, this is a limitation that may affect the results.

## **5. Conclusions**

The findings from the review highlight gaps in research among AI population related to cervical cancer screening. The need for more research to test interventions among this growing population cannot be overemphasized. Such research studies should target AIs within their socioeconomic cultural context to identify effective interventions to improve cervical cancer screening participation in this group. Such investigation should also evaluate the cost effectiveness and feasibility of such interventions for dissemination to a larger AI audience.

In addition, much of the research done in this group has not been among national representative samples of AI and has been conducted with broad classification of immigrants with small representation of AIs; thus limiting the interpretation and generalization of such research to larger AI populations. Future AI research should consider the heterogeneity of the AI population and identify and study population subgroups and subcultures to determine the similarities and differences in cervical cancer screening influences and practices. AI groups such as uninsured, recently-arrived, and non-English speakers may be best reached through community-based participatory

research with community-based organizations.<sup>29</sup> Engagement with community-based organizations that serve these communities provide a platform for exploring meaningful health promotion interventions in this underrepresented population.<sup>66</sup> Achieving inclusive, meaningful research in this population may best be accomplished through multi-institutional collaborations to ensure diversity among African-born populations while further stratification may delineate risks, behaviors, and associations unique to specific subgroups within these populations.<sup>66</sup>

**Table 2.1: Summary of cervical cancer related studies that include African immigrants (AIs)**

<b>Author/year</b>	<b>Study design and population</b>	<b>Sample</b>	<b>Outcome</b>	<b>Pap screening time frame</b>	<b>Key findings</b>
Abdullahi, et al. 2009 <sup>35</sup>	Qualitative: Somali immigrants in Camden, London	AI N= 50	Cervical cancer screening	Ever had Pap screening	Barriers to cervical cancer screening included limited knowledge, language difficulties, fatalistic attitudes, and embarrassment.
Brown, et al. 2011 <sup>48</sup>	Qualitative: focus group/ ethnically diverse women (Haitian, African, Caribbean, and African American)	N = 54 AI N= 5 (9.2%)	Facilitators and barriers related to cervical cancer screening	N/A	Patient-doctor relationship was the most important facilitator for cervical cancer screening. Barriers to screening included cost, busy work schedule, fear of the unknown, lack of insurance, being unemployed, and fear of disclosing immigration status.
Ekechi, et al. 2014 <sup>41</sup>	Quantitative: African or Caribbean women in London	N = 876 AI N = 218 (24.7%)	Knowledge of cervical cancer screening and screening attendance	Pap screening $\leq$ 3 years or Pap screening within 3-5 years	Being younger, single, African, and attending religious services, were more frequently associated with being overdue for cervical cancer screening.

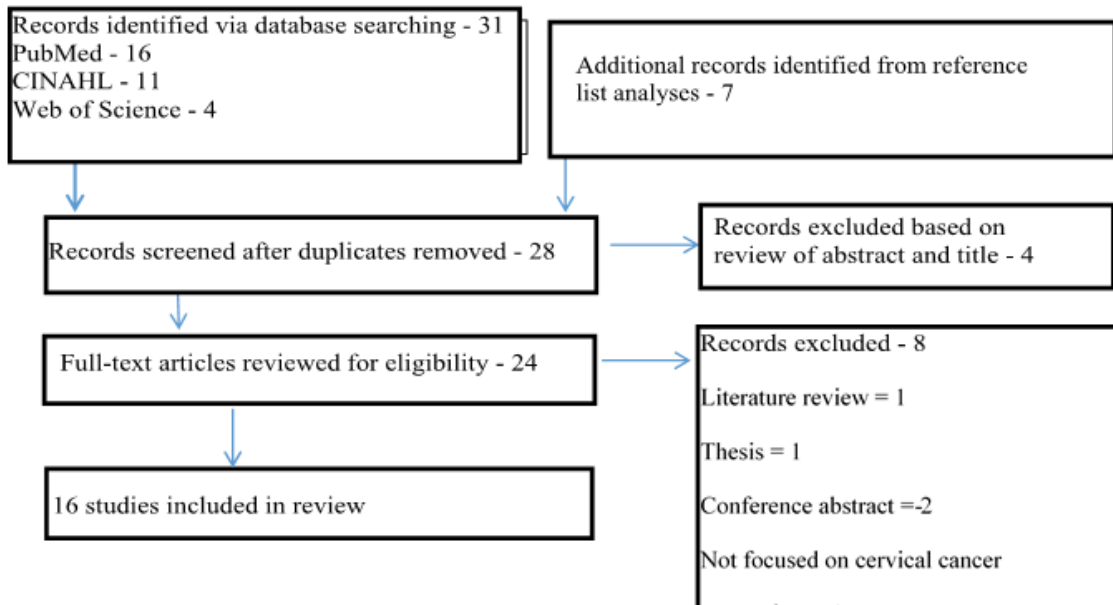
**Table 2.1 (Continued): Summary of cervical cancer related studies that include African immigrants (AIs)**

Author/year	Study design and population	Sample	Outcome	Pap screening time frame	Key findings
Forney- Gorman & Kozhimannil, 2015 <sup>11</sup>	Quantitative: secondary analysis of integrated health interview data/ African Americans and AIs	N =656 AI N = 36 (18%)	Distinguish between African Americans and AI cervical cancer screening patterns	Pap screening within the past 3 years	African Americans were over 3 times more likely to have reported Pap smear compared to AIs (OR-3.37, 95% CI-1.89-5.96). Higher education level is associated with higher odds of current Pap test. Every 1-unit increase in income category was associated with increased likelihood of having current Pap screening.
Ghebre, et al. 2014 <sup>34</sup>	Qualitative: informant interviews/ Somali immigrants	AI N = 23	Barriers and facilitators to cervical cancer screening	N/A	Barriers to screening include lack of knowledge, religious beliefs, fatalism, fear, embarrassment, and lack of trust in interpreters. Other barriers are language and trust in health care.
Harcourt, et al. 2013 <sup>38</sup>	Quantitative: cross-sectional design/ AIs in Minnesota	AI N = 421	Factors associated with cervical cancer screening and screening rates	Ever had a Pap screening	52% have ever had Pap screening. Recent immigrants ( $\leq 5$ years stay) were less likely to be screened. Somali immigrants have higher odds of being screened than other AIs.

**Table 2.1 (Continued): Summary of cervical cancer related studies that include African immigrants (AIs)**

Author/year	Study design and population	Sample	Outcome	Pap screening time frame	Key findings
Lofters, et al. 2011 <sup>36</sup>	Quantitative: immigrant women living in Ontario's urban centers	N =455,864 AI N = 26,125 (5.7%)	Cervical cancer screening adherence and predictors	Pap screening within the past 3 years	49.2% of Sub-Saharan African immigrants have completed Pap screening. Refugee sub-Saharan African and Western European immigrants were less likely to have completed Pap screening.
Morrison, et al. 2012 <sup>39</sup>	Quantitative: medical records data/ Somali immigrants	N=91,557 AI N = 810 (0.9%)	Factors associated with preventive services use	Pap screening completion within the past 3 years	Somali patients had lower Pap screening rates (48.8%) compared to non-Somali patients (69.1 %.) Pap smear completion was positively associated with the number of primary care (67%, $p = 0.01$ ) and emergency room visits (51 %, $p = 0.005$ ).

**Figure 2.1: Summary of literature search and review**



## CHAPTER THREE: Factors Influencing Pap Screening Use Among African Immigrant Women

Adegboyega, A., & Hatcher, J. (2016). Factors Influencing Pap Screening Use Among African Immigrant Women. *Journal of Transcultural Nursing*, 1043659616661612.

### 1. Introduction

Cervical cancer is a major global health concern with approximately 530,000 women diagnosed with cervical cancer and approximately 275,000 deaths from the disease each year.<sup>1</sup> It is the second most common cancer among women worldwide, and the leading cause of cancer-related deaths among women in developing countries.<sup>1</sup> Screening decreases cervical cancer incidence and mortality by at least 80%.<sup>2</sup> The rates for new cervix uteri cancer cases in the United States [U.S.] have fallen on average 1.2% each year over the last 10 years and death rates have fallen on average 1.3% each year over 2002-2011.<sup>3</sup>

Unfortunately, the burden of cervical cancer is not shared equally among women of all races and ethnicities.<sup>4</sup> Foreign-born women who reside in the U.S. are likely to suffer disparities in both mortality and screening related to cervical cancer. When compared to foreign-born women, U.S. native-born women are three times more likely to have participated in cervical cancer screening. (Five percent of U.S. native-born women have never participated in cervical cancer screening compared to 18% of foreign-born women.<sup>5</sup> The disparity in cervical cancer mortality is closely tied to a suboptimal use of cervical cancer screening (Papanicolaou [Pap] screening).

One group affected by this disparity is the African immigrants. African immigrants are a rapidly rising new population in the U.S.<sup>6</sup> From 1980 to 2013, the sub-Saharan

African immigrant population in the U.S. increased from 130,000 to 1.5 million .<sup>7</sup> The sub-Saharan African immigrant population consists of diverse ethnic groups, cultures, and countries. <sup>7</sup> Sub-Saharan African immigrants have lower screening rates compared to non-immigrant groups in the U.S. <sup>8-11</sup> In a comparison study, about 26.4% of eligible African immigrant women compared to 55.4% African American women reported a Pap screening consistent with screening recommendations. Also, Harcourt et al. (2013)<sup>9</sup> reported that only 52% of the age-eligible immigrant women (n= 421) had ever been screened for cervical cancer. Because of these suboptimal screening rates, cervical cancers among African immigrants may be discovered at later stages resulting in lower chances of survival when compared to other ethnic groups.

There are many barriers to routine screening of women who migrate from other countries to the U.S. Screening practices in many countries are different than those in the U.S. In particular, screening programs in Africa are often rudimentary or nonexistent.<sup>12</sup> There is a lack of basic infrastructure for diagnosis, treatment, and prevention of cancer. The majority of African countries have not traditionally considered cancer a high priority in their health planning especially when compared to other competing health demands such as malaria and AIDS.<sup>13</sup>

Many women who migrate from African countries to developed countries such as the U.S. may have no knowledge of cervical cancer screening prior to migration and only become aware of the associated risks of cancer upon migration to Western countries.<sup>14</sup> Several authors have reported that cervical cancer screening knowledge is low among sub-Saharan African immigrant women.<sup>10, 14-18</sup> Ghebre and colleagues (2015)<sup>18</sup> found that due to knowledge limitations, some African women don't know if they have undergone a



cervical cancer screening because they cannot distinguish between a standard gynecological cancer screening and other gynecological exams.

Previous studies have shown that immigrant women may believe that screening is painful and a diagnosis of cancer will result in death.<sup>10</sup> Some may view screening as physically and emotionally intrusive.<sup>17, 18</sup> Younger immigrant women may perceive Pap screening as a threat to virginity;<sup>19</sup> and some experience embarrassment associated with having been circumcised<sup>17, 19, 20</sup>

Other barriers to screening include religion,<sup>17, 18</sup> fatalistic beliefs,<sup>21</sup> and cultural beliefs.<sup>17, 22</sup> Other barriers include, language difficulties, distrust in the healthcare system,<sup>18</sup> and practical difficulties such as scheduling appointment times and arranging childcare.<sup>17</sup> In addition, there may be a cultural preference for same sex providers as reported among Somali women who show preference for female providers.<sup>23</sup>

Some researchers have reported that length of stay in the country of immigration may improve cervical cancer screening use.<sup>9, 21, 22, 24</sup> Tsui and colleagues (2007)<sup>24</sup> found that, after adjusting for demographic characteristics and indicators for access to healthcare and health status, significant differences exist in rates of cervical cancer screening between foreign-born groups by birthplace and by duration of stay in the U.S. A higher percentage of recent immigrants who had spent less than 25% of their lifetime in the U.S. had never received a Pap screening (19%) compared to (10%) of established immigrants who had spent more than 25% of their lifetime in the U.S. and to (6%) U.S. born women. Specifically, 8.4% of African who have spent more than 25% of their lifetime in the U.S. compared to 18.0% of African who have spent less than 25% of their lifetime in the U.S. had never been screened.

Despite the handful of studies that have described Pap screening use among African immigrants, there remains a fundamental lack of understanding of the barriers and motivators that underlie Pap screening decisions among this group. It is important to understand sub-Saharan African immigrants' barriers and motivators to the adoption of preventive cancer screening, specifically Pap screening, in order to meet their health needs and prioritize cancer prevention in this population. This study will build on previous works to form a foundation for interventions that might improve screening rates in this underserved population, thereby decreasing their mortality related to cancer. The purpose of this study is to describe the barriers and motivators contributing to cervical cancer screening decisions among a purposive sample of sub-Saharan African immigrant women in Lexington, Kentucky. The research questions addressed by this research study were: 1) what are the barriers that may influence Pap screening decisions among sub-Saharan African immigrant women? and 2) what are the motivators that may contribute to Pap screening decisions among sub-Saharan African immigrant women?

## **2. Methods**

### **2.1. Theoretical Framework**

The health belief model (HBM) was used as the conceptual underpinning for this study. The HBM is a conceptual framework used to predict why individuals will take action to prevent, screen for, or control illness.<sup>25</sup> Since the development of the Health Belief Model by a group of social psychologists in the 1950s, the Health Belief Model has served as one of the most widely used frameworks for examination and explanation of health-related behavior.<sup>26</sup> The health belief model posits that to perform healthy behaviors, one should initially perceive the risk of contracting the health condition of

concern (perceived susceptibility). Also, one should understand the seriousness and severity of the consequences, and complications derived from such a condition with physical, psychological, social and economic dimensions (perceived severity). When one receives positive cues in the form of incentives from external or internal environments (cues to action), one finally takes action after believing in the suitability and applicability of such action.<sup>27</sup>

Developers of the HBM suggested that despite perceptions of susceptibility and severity, an individual may delay a health behavior until an instigating event sets the process in motion. Cues to action are those factors that served to stimulate or prompt health-related behaviors.<sup>26</sup> Two other concepts, health motivation and self-efficacy, were later added to the original HBM. Health motivation refers to the beliefs and behaviors related to the state of general concern about health. Perceived self-efficacy (confidence) is defined as the belief that one can successfully execute a behavior that will ultimately lead to a desirable outcome.<sup>28</sup>

## **2.2. Study Design**

This is a qualitative descriptive study designed to explore the barriers and motivators contributing to cervical cancer screening practices among sub-Saharan African immigrant women in Lexington, Kentucky. The study utilized a qualitative descriptive method, which provides a rich understanding of the issue in question through data collection in a natural setting and focuses on participants' perspectives. Using this method, researchers focus on learning individual's common or shared experience of a phenomenon.<sup>29</sup> Purposive sampling was used to identify participants who had the best knowledge concerning the research topic and were most capable of providing rich data.

Sub-Saharan African immigrant women are in the best position to share knowledge about their barriers and motivators towards screening which enabled the researchers to learn the participants' unique perspectives.

### **2.3. Participants and Recruitment**

After receiving approval from the university's Institutional Review Board, the principal investigator (PI) recruited participants through African religious organizations, African communities, and by word of mouth. The PI contacted African religious organizations and community leaders in Lexington, Kentucky to describe the study and gain access to the community. Engaging a community through religious leaders in the African immigrant recruitment process is an important strategy to improve participation due to the inherent distrust reported by many ethnic minorities.<sup>30</sup> Following permission from organizational or religious leaders, participants were approached and provided with a verbal description of the study. Eligible and interested participants were enrolled and focus group sessions were scheduled based on the participants' availability. Study participants were a purposive sample of 22 sub-Saharan African-born females, who were English speaking, aged 21 years and above, and have resided in the U.S. for more than one year.

### **2.4. Data Collection**

Data for this study were collected using focus group interview sessions and a socio-demographic questionnaire. The focus groups provided an interactive avenue to explore common views and shared experiences among the women. Twenty-two women took part in one of five focus groups with four or five participants in each group. Upon arrival, the investigator thanked the women and developed rapport with the participants

to make them feel comfortable. Informed consent was obtained prior to the start of the focus group interview. The investigator provided a brief overview of the focus group process. The discussions lasted approximately 105 minutes, ranging from 90-120 minutes. A semi-structured interview protocol with open-ended questions and probes to elicit discussion was used as a guide during focus groups (appendix A). Probes are follow-up questions that elicit specific, detailed descriptions of participants' experiences and clarify information. Probes were used to clarify participants' responses and elicit rich data. Examples of the open-ended questions included: "Can you talk about what has helped you to get Pap smear screening in the past?" "Can you discuss why it was difficult to get your screening in the past?" and "Can you discuss how you learned about Pap screening?" The focus group sessions were digitally recorded with the consent of the participants using a password protected recording device to ensure confidentiality. At the end of the session participants were compensated with twenty dollars.

## **2.5. Data Analysis**

The digital recordings from the interviews were transcribed verbatim. Accuracy of the transcription was enhanced by rereading the transcripts while listening to the recordings. Qualitative content analysis was used to analyze data and interpret its meaning.<sup>31</sup> This included using line by line coding to identify core categories of emerging findings. Coding involved aggregating the data text into small categories of information and assigning a label to the code.<sup>29</sup> The line-by-line coding enabled the researchers to develop themes rather than using themes based on pre-established template of the conceptual framework. The data was coded by identifying main themes and assigning descriptive words. Phrases used by women during discussion were categorized

into different emergent themes and subthemes. For example, a phrase like “I think that they talk differently to me because I have an accent... they think I have no clue...” was identified as a communication problem and grouped with other themes as a barrier to cervical cancer screening use. These themes were used to develop a codebook.

No qualitative data software was used for analysis; however, the investigators took several steps to insure the rigor and trustworthiness of the study. First, transcripts were read several times to get a complete sense of the data and allow immersion in the details. Second, an audit trail was created to provide the details of data analysis and show evidence of the decisions that led to the study findings. During focus groups, field notes were taken to describe behaviors, non-verbal expressions, physical settings, and other observations that would not be captured by voice recordings. Finally, member checking was used to verify the accuracy and credibility of the interpretation of the data that were provided.<sup>29</sup> Two members from each focus group were contacted and provided with a summary of preliminary findings. The members provided their views on data interpretation and agreed that the findings were reflective of the focus group discussions.

### **3. Results**

The demographic characteristics of participants are shown in Table 3.1. The participants were between 24 and 65 years [mean:  $35 \pm 11$  years]. The duration of stay in the U.S. ranged from 2 to 26 years [ $5.22 \pm 5.19$ ], about two thirds of the women had resided in the U.S. for less than 5 years [64%]. Only two women had been screened for cervical cancer prior to migration. Sixty-six percent of the women were from Nigeria and Cameroon, 82% had a college degree or higher, 55% were employed and 68% had health insurance.

## **Themes**

### **3.1. Barriers to cervical cancer screening**

This theme grouped the various barriers that prevent women from receiving cervical cancer screening. These barriers included lack of knowledge, religious and cultural beliefs, fear, communication problems, and cost.

#### **3.1.1. Lack of knowledge**

In all of the focus group sessions, women cited lack of knowledge as a major reason for not receiving cervical cancer screening. Participants described the low knowledge of cervical cancer screening among African immigrant women with one woman stating that, "...ignorance is the biggest thing that our people [Africans] have when they get into the country [U.S.]" (30 years old, 9- year immigrant). A participant from another focus group commented, "It is difficult for women to get a Pap smear because of lack of knowledge about the test" (33 years old, 2- year immigrant). The participants indicated that low knowledge was related to a lack of emphasis on preventive services, such as Pap screening, in their various home countries. It is not common practice to go for routine screening in their home countries; most women seek medical help after exhausting self-medication options without success. One woman stated, "I go for checkup when I am sick, when I am not sick I don't believe that I have to see a doctor" (26 years old, 4-year immigrant). Another woman commented, "Preventive services are not very efficient in my country, there are no personnel" (44 years old, 3-year immigrant).

### 3.1.2. Religious and cultural beliefs

The participants identified personal religious practices and cultural beliefs as a barrier to Pap screening usage. The women noted that some religious practices might hinder them from seeking health services, like Pap screening, because of the physical exposure involved. Additionally, the women believed that their religious beliefs served as a protective measure from diseases. A woman commented, “Before I heard about all these cancers, who was taking care of me? It was God and he is still living. I believe God is still taking care of me” (31 years old, 4-year immigrant).

Also, many of the participants discussed how their cultural background acted as a major barrier to cervical cancer screening. In many of the cultures represented, female reproductive and sexual issues were not discussed publicly and attending cervical cancer screening might be a source of embarrassment. Furthermore, privacy was another common issue that emerged as women discussed their culture and engagement in Pap screening; some of the women thought that it was not appropriate to discuss subjects considered personal and private such as screening related to private parts. One participant stated, “If you say that you are going to see a doctor for screening, the people feel that you are promiscuous or have done something wrong, you don’t want to be stigmatized or to be considered as a wayward person” (30 years old, 9-year immigrant). Privacy issues were evident as circumcision was discussed in relation to Pap screening. Despite female circumcision being a common practice in Africa, most women were not open to a discussion about whether or not they had been circumcised. Participants made general statements about whether circumcision was a practice in their tribe but there were few personal disclosures. Some participants mentioned that female circumcision may affect



cervical cancer screening utilization because female circumcision may play a role in how women perceive their sexuality. One woman stated, “I never had a circumcision, but I can understand how some may feel less like a woman when somebody else looks at them oddly when undergoing a procedure, they don’t want to be laughed at or talked about as being different” (33 years old, 3-year immigrant). Another woman stated, “I think I was circumcised, in my culture, circumcision is done on babies, in some cases it may cause one to be a bit more cautious” (65 years old, 5-year immigrant).

### **3.1.3. Fear**

Participants noted fear as a barrier to screening. Participants discussed the fear of discomfort that they perceive is associated with the procedure; one participant stated that “The test is uncomfortable, you are exposed, you spread your leg, oh my God, I didn’t like it” (31 years old, 4-year immigrant). The participants detailed how the perceptions of fear of Pap screening results affected their screening use; one participant stated, “It is just like hearing about HIV because you don’t want to hear that you have it” (34 years old, 2-year immigrant).

### **3.1.4. Communication issues**

The women that had been involved in the healthcare system identified communication with providers as a major barrier to screening. These women believed that preconceived notions regarding African immigrants’ lack of English proficiency often interfered with interactions with health care providers. One woman stated, “...in the clinic they always assume that I don’t speak English” (34 years old, 2-year immigrant). Another woman commented, “I think that they talk differently to me,

because I have an accent...they think because I have an accent that I don't have a clue. They think that I don't know what I am talking about" (28 years old, 7-year immigrant). Difficulty scheduling appointments over the phone due to communication issues was also identified as a major barrier. Participants noted that phone scheduling is often frustrating and cumbersome. One woman stated, "I prefer to schedule my appointment face to face because I feel I am always repeating myself on the phone. It is so frustrating because I have to spell everything out for them since they tend not to understand or pretend not to understand" (29 years old, 10-year immigrant).

### **3.1.5. Cost**

The issue of cost of screening was also a major barrier to attending cervical cancer screening. Screening was not high on the women's priority list due to financial constraints; the money for the test may be needed for other more pressing demands. Many women expressed that as immigrants, they have other competing demands such as getting good jobs, paying bills, and family sustenance. One woman commented, "First things first, eating and paying bills, then I can decide if I have money to get screening" (31 years old, 4-year immigrant). Along similar lines, the women expressed that their financial capabilities are limited. One woman commented, "...we don't have required papers to get good jobs, we are trying to survive." (39 years old, 2-year immigrant). Another woman said, "when you are not working, you don't have health insurance, the bills are always too high, I can't afford the bills" (24 years old, 3 year-immigrant).

### **3.2. Motivations for Pap screening use**

Participants in the focus groups identified several factors that might motivate them to get cervical cancer screening.

### **3.2.1. Benefits of Pap screening**

Since migration to the United States, participants felt that they had become more aware of cervical cancer screening and its benefits. One participant stated, “I pick up brochures and pamphlets at the clinic that help increase my knowledge” (29 years old, 2-year immigrant). Another woman stated, “the screening helps to detect the cancer early so that it can be taken care of before it spreads; since there is no symptom that is the importance of screening (52 years old, 26-year immigrant). Another participant stated, “I know the risk of not knowing, just knowing that I am in good health gives a lot of satisfaction.” (34 years old, 4-year immigrant).

### **3.2.2. Providers’ recommendations**

One of the foremost motivational cues was providers’ recommendations. Participants wanted reminders from their providers regarding annual gynecological checkups. One participant stated, “Some Africans are not aware of various services, until they go to the doctor where they will introduce it to you. If you have not been sick and have to go to the doctor, then you are not aware” (24 years old, 2-year immigrant). Another participant stated that, “recommendation from doctor is good, we respect the doctors and we do what they want us to do. People like you [nurses] and others should cover our demographic area to provide education about what we need to do” (52 years old, 26-year immigrant).

### **3.2.3. Family support and community enlightenment**

Discussions during the focus groups highlighted that family support and community enlightenment programs targeted at the African community are crucial motivators that might improve screening in this population. The participants described

how they would be more motivated to screen if their family members or friends encouraged them. One participant stated, “if our brothers, our husbands and fathers understand the importance, then there might be a little more support for the women” (35 years old, 6-year immigrant). The women suggested that community enlightenment through health providers that are members of African communities, churches, and different African community meetings might also be helpful. One participant stated that “the best way to spread information to Africans is during the meeting that the different communities have. I believe that Africans are more comfortable talking to one of their own.” (35 years old, 6-year immigrant). Another participant stated, “gathering and meeting to reach the women during get together is better, people usually lose pamphlets or they may not read them” (52 years old, 26-year immigrant).

#### **3.2.4. Health insurance**

Women who had health insurance discussed that coverage may serve as a motivation to get preventive services such as cervical cancer screening. Seven of the participants did not have health insurance at the time of the interviews. Those with health insurance coverage commented that coverage would encourage them to get Pap tests because they would not have to worry about the cost. A participant stated, “I have health insurance, if I don’t use it, then it can go to waste” (34 years old, 4-year immigrant). Another participant stated, “I don’t go when my insurance lapse but now that I have insurance, I can go if I need to.” One participant without health insurance stated, “I didn’t take health insurance at work because I know that I don’t need it, I don’t get sick” (43 years old, 2-year immigrant).

#### 4. Discussion

In this study, we explored the barriers and motivators regarding cervical cancer screening among sub-Saharan African women who immigrated to the U.S. This study provides important insight into the challenges sub-Saharan African immigrant women face as they assimilate into the U.S. and adopt the use of preventive services, specifically Pap screening. Perhaps more importantly, the study reveals important motivational cues and strategies that might help increase screening use among this vulnerable group of women.

One of the major findings from this study was that African immigrant women had low awareness of cervical cancer screening tests. Only two of the women in the recommended age range were tested prior to migrating to the U.S. Two other women knew about cervical cancer screening from health education classes prior to migration, but they were not screened. The majority of the women admitted having little knowledge about Pap screening and testing guidelines. This is consistent with reports that African women have low awareness and understanding of Pap screening.<sup>9, 10, 17, 32</sup>

The knowledge deficit with regard to Pap screening is not surprising given the lack of large scale screening programs in many African countries.<sup>33</sup> To combat this discrepancy in screening practices for sub-Saharan African immigrant women, it is important that providers become aware of the knowledge deficit. Providers should not assume that all women are aware of the importance of cervical cancer screening and current screening guidelines. Increasing knowledge of the risk of cancer and of screening guidelines as a strategy to reduce risk is necessary, although it is not a sufficient precursor to screening participation.<sup>34</sup> It is essential to educate all women about

preventive services such as cervical cancer screening; individuals with higher knowledge of cancer and screening have higher utilization.<sup>22, 35</sup>

The cost of screening services was found to be a barrier to screening completion. While the majority of women interviewed in this study had some form of health insurance, which they identified as a motivating factor to seek health services, they noted that healthcare costs in the U.S. are very high and may be a major deterrent for recent immigrants who have yet to secure a job that provides health insurance coverage and financial stability. Other investigators.<sup>10, 36, 37</sup> have also reported cost as a barrier for seeking care among immigrant population. The implementation of the Patient Protection and Affordable Care Act of 2010 (ACA) should increase insurance coverage for U.S. citizens and access to cervical cancer screening through insurance expansions and regulatory changes.<sup>38</sup> However, the impact is yet to be determined among sub-Saharan African immigrants, some of whom may not qualify for coverage based on immigration status. In Kentucky, free and low-cost screening is available to all women through the Kentucky Women's Cancer Screening program, funded by the Centers for Disease Control and Prevention's Breast and Cervical Cancer Early Detection Program.<sup>39</sup> Underinsured sub-Saharan African immigrant women may benefit from low cost screening programs such as these as well as navigation assistance to connect them with the appropriate programs.

In addition, one of the main barriers to screening for this population and other immigrant groups is communication. Although all the participants in this study were well educated and proficient in English as a first or second language, they expressed that they have faced challenges and frustrations during healthcare interactions. Our findings are

consistent with that of other investigators<sup>36, 40-42</sup> who reported language and communication problems as barriers to the utilization of healthcare among African immigrants. Providers should evaluate patients' language needs on a case by case basis rather than making assumptions about English proficiency. While immigrant's language problems may impact provider's effective communication of the importance of pap screening and recommendations, it is critical that this is established rather than assumed to avoid perceptions of discrimination.

Cultural competence should also include knowledge of certain cultural practices that might impact cervical cancer screening, such as female circumcision. Circumcision is a deeply rooted practice in many African countries and has been reported as a major health issue for African immigrant women.<sup>43-45</sup> Due to the sensitivity of this issue, many women are not open to talking about it. The women in this study expressed concern about how circumcision may affect a woman's self-esteem. Women may not feel comfortable during the gynecological examination due to thoughts that they might be perceived as different. Cervical cancer screening may be associated with the invasiveness and pain experienced during circumcision, hence an underutilization of screening among African migrant women. Providers who provide services to African immigrants should be educated on female circumcision and how its aftermath may affect women seeking tests and procedures related to reproductive health.<sup>14</sup>

Provider recommendation is one of the most important keys to screening utilization.<sup>46-48</sup> Women in this study expressed that providers play an influential role in healthcare decisions. For example, in a study of West African immigrants in Australia, the majority of the women learned about the need for Pap screening during a healthcare

encounter and after recommendations from their providers upon migration to Australia.<sup>14</sup> A key component to providing effective screening recommendations and education for this group would involve a certain level of cultural competence. It is critical that providers be culturally competent to earn the trust of patients and develop deliberate attitudes to be more accepting of patients from other cultures.

In addition to providers' recommendations, participants in this study identified community enlightenment as a possible motivation for screening awareness. Community programs that focus on prevention and services might be helpful in providing the needed motivation and awareness to prompt screening in this vulnerable group. The use of peer educators, women who have successfully navigated the barriers identified in this study, might be a key strategy to increase cervical cancer screening utilization. Increasing cervical cancer prevention awareness with a focus on benefits and importance of screening may influence the prioritization of cervical cancer screening among sub-Saharan African immigrant women.

Participants also emphasized the role that family support plays in cancer screening adoption. Since Africans belong to a collectivist society, where the focus is on the well-being of the group or family,<sup>49</sup> involving the family in Pap screening interventions may improve screening use. In a study of Nigerian women, support from husbands and community leaders were important factors in a woman's decision to utilize cervical cancer screening services.<sup>50</sup> The World Health Organization recommends involving men in the prevention of cervical cancer as with other aspects of women's reproductive health. African men are often the "gatekeepers" of access to services for



their wives and daughters, so their support (or, in extreme cases, their permission) may be needed if women are to obtain screening.<sup>51</sup>

#### **4.1. Limitations**

Despite significant contributions from this study, it has two main limitations. First, the findings are not generalizable to all sub-Saharan African immigrant women due to the small sample size usually employed in qualitative inquiry. Second, the lack of diversity of country of origin in the study participants limits generalizability to the entire population of African immigrants. Africans are a diverse group; hence future studies should study migrant women from specific African regions to explore variations that might be present and generate diverse viewpoints.

#### **5. Conclusions**

Although many of the barriers identified by this study are similar to those experienced by other minority groups, barriers such as cultural background, beliefs, and role of female circumcision may be unique to sub-Saharan African immigrants. Interventions tailored to address the barriers specific to this population may help alleviate the challenges to Pap screening and improve Pap screening rates in this population. Understanding cultural differences may foster effective communication about Pap screening and its importance. Health care providers should take special care to show understanding and patience to understand cultural differences.<sup>19</sup> Implementing programs that incorporate the motivators of Pap screening may improve screening uptake among this population. African immigrant families should be targeted for cancer screening awareness and education programs. Educating recent immigrants about U.S. healthcare services through more established community members and healthcare navigators may

assist in achieving improved access and utilization rates for services.<sup>52</sup> Further research is needed to elucidate potential intervention approaches to increase cervical cancer knowledge and screening uptake.

**Table 3.1: Demographic characteristics of participants (N=22)**

Variables	Mean (SD) or n (%)
Age (years)	35 ± 11
Country of origin	
Nigeria	8 (34%)
Cameroon	7 (32%)
Congo	4 (18%)
Niger	1 (5%)
Kenya	2 (9%)
Educational attainment	
<high school	4 (18%)
High school	0
College degree or higher	18 (82%)
Annual household income	
Below 24,999	14 (64%)
25,000-49,999	7 (32%)
50,000-74,999	0
>75,000	1 (5 %)
Insurance status	
Insured	15(68%)
Uninsured	7 (32%)
Employment status	
Employed	12 (55%)
Unemployed	10 (45%)
Duration of residence in the US	
< 5 years	14 (64%)
>5 Years	8 (36%)
Screened prior to migration	2 (9.1%)

## **CHAPTER FOUR: African Immigrant Male's Knowledge and Support Related to Cervical Cancer Screening**

### **1. Introduction**

Cervical cancer is largely preventable by completion of cervical cancer screening at regular intervals. Healthy People 2020 sets a goal of 93% goal cervical cancer screening for women age 21 to 65 years every three years.<sup>1</sup> Despite the success of cervical cancer screening in the United States (U.S) and other developed countries, the American Cancer Society estimates that there will be 12,820 new cases of cervical cancer and 4,210 deaths from this disease in 2017 among women in the U.S.<sup>2</sup>

Previous research has shown disparities in cervical cancer screening rates among sub-Saharan African immigrant populations when compared to women born in the U.S.,<sup>3-5</sup> with African immigrant women being significantly less likely to screen. Numerous studies among sub Saharan African immigrant women in the U.S. have reported low cervical cancer screening uptake among this population,<sup>5,6,7</sup> with rates ranging between 19.4% to 75%.<sup>8</sup> African American women are over 3 times more likely to report a current Pap screening than African immigrant women.<sup>5</sup> African American women are also screened less than the overall U.S populations (75.3 % versus 82.6%)<sup>9</sup> and despite opportunities for access to an advanced health care system when immigrants migrate to the U.S., they encounter the same health-care inequalities based on race and social class that are faced by the native-born population.<sup>10</sup> To reduce these disparities, cervical cancer screening access and utilization must be improved in the U.S for the African immigrant (AI) population.<sup>10</sup>

These low screening rates are attributable to a variety of factors. Researchers have associated low screening rates among AI women with factors such as low screening

awareness,<sup>6, 11</sup> shorter residency in the U.S.,<sup>7, 12</sup> lack of health care providers' recommendation,<sup>13</sup> and varied cultural beliefs.<sup>14, 15</sup> Sub-Saharan African immigrants have reported individual, societal, and structural barriers to cervical cancer screening such as language difficulties, distrust of interpreters, fear of cervical cancer screening, negative past experiences, and competing priorities.<sup>3, 14</sup>

Given the collective nature of African society, one additional factor contributing to the lack of adequate screening for AI women may be limited involvement of African males in the screening process. The World Health Organization (WHO) recommends involving men in the prevention of cervical cancer as with other aspects of women's reproductive health. African men are often the "gatekeepers" of access to health care services for their wives and daughters, so their support (or, in extreme cases, their permission) may be needed if AI women are to obtain screening.<sup>16</sup> Patriarchal practice is embedded in the African culture.<sup>17, 18</sup> This factor is financially and culturally related. In most African community, the man is the head of the family and important decision regarding the family is made solely by him.<sup>19</sup> While a number of studies on improving Pap screening have focused on women, data are sparse regarding men's knowledge, and support related to Pap screening completion. This data gap extends to AIs in the U.S. and little is known about AI men's knowledge and attitudes related to cervical cancer screening. AI males support related to Pap screening completion is important to improve Pap screening use among AI women. The purpose of this study is to explore AI men's knowledge, and support for their partners to complete Pap screening.

## 1.1 The role of spousal support in Pap screening

Social support is one essential function that social networks including marital relationships provide and may be an integral component of improving cervical cancer screening rates among AI women.<sup>20</sup> Social support can be provided by many types of people, both in one's informal network (e.g. spouse, family, friend) and in formal networks (e.g. health care providers).<sup>20</sup> The focus of this study is limited to social support provided by spouses or partners of African immigrant women and is referred to as spousal support for the purpose of this paper. The presence of strong social networks often facilitates the acquisition of health care<sup>21</sup> and aids in undertaking healthy behaviors.

Africans belong to a collectivist society where the focus is on the well-being of the group or family.<sup>22</sup> Collectivism is associated with interdependent self-construal; that is, people identify themselves as embedded in groups and relationships rather than as separate from others.<sup>23</sup> Hence, women with collectivism values may want to promote their health to ensure they can fulfill their responsibility of caring for their husband and children. Also, these women may have higher tendency to screen when the family unit plays a central role in the coping, healing, and health-related decisions among members of collectivistic societies.<sup>24</sup>

In addition, African society is patriarchal in nature;<sup>19</sup> therefore, male partners often dominate decision-making and have significant influence on the health-seeking behavior of family members. This culture and social organization may influence use of gynecological services including Pap screening; thus, involving AI men in cervical cancer prevention activities is essential.

Empirical evidence supports positive effects of spousal support on Pap screening practices of populations with Pap screening disparities. A study among Mexican immigrants indicated that men have a role in effective screening programs for cervical cancer<sup>25</sup> since understanding the risk factors related to cervical cancer and the benefits of screening motivates them to be supportive of screening for the women in their lives. Similarly, a study of Nigerian women found that support from husbands and community leaders was an important factor in a woman's decision to utilize cervical cancer screening services.<sup>26</sup> Another key factor in a woman's decision to participate in cervical cancer prevention services can be her husband's emotional and financial support.<sup>27</sup> A study among Nigerian women found that most participants indicated that they would need spousal financial and emotional support before completing screening services.<sup>28</sup> Lyimo and Beran (2012)<sup>29</sup> found that husbands' approval of Pap screening was strongly associated with Tanzanian participants' Pap screening status.

In cultures where men have a dominant role over their wife's health-seeking decisions, husbands' approval becomes an integral and often necessary part of women's health promotion.<sup>29</sup> Support from husbands or partners is likely an essential component of Pap screening uptake for AI women. When African husbands or partners approved of screening, women were likely to obtain the screening. This social structure with emphasis on male leadership could be leveraged in health promotion interventions designed to improve cervical cancer screening rates of AI women.

## **1.2 The role of spousal/partners' awareness and knowledge in Pap screening**

Although cervical cancer is exclusively a female disease, men can play a key role in cervical cancer prevention and treatment if men have knowledge of the risk factors and

prevention. Human papillomavirus (HPV) is a sexually transmitted infection that is the primary cause of cervical cancer and men can contribute to preventing HPV via HPV vaccination and safe sexual practices,<sup>16</sup> hence, reduce the risk of cervical cancer for the female partners.

Studies related to cervical cancer screening indicate African men have low awareness and inaccurate knowledge related to cervical cancer and its prevention.<sup>30,31</sup> Additionally, men who are aware of cervical cancer and have higher cervical cancer knowledge levels are more likely to encourage their female partners to reduce their personal cervical cancer risks. Men's cervical cancer awareness and knowledge likely influences their support of Pap screening for their female partners. Knowledge of cervical cancer and Pap screening influences beliefs about cervical cancer seriousness and susceptibility and the benefits of cervical cancer screening, and limited cervical cancer knowledge can lead to inaccurate beliefs and misconceptions.<sup>32</sup>

Currently, a gap exists in our understanding of AI men's Pap screening knowledge and spousal support of Pap screening and the roles that these factors may play in cervical cancer prevention. To address this gap and have a better understanding of this phenomenon, a qualitative descriptive study was conducted among AI men. The purpose of this study was to assess the Pap screening knowledge and support for Pap screening among sub-Saharan African immigrant men. This exploratory study focused on the following research questions: (1) What are AI men's knowledge and awareness related to Pap screening? and (2) What are AI men's attitudes toward supporting wives/female partners to utilize Pap screening?



## **2. Methods**

### **2.1 Study Design**

A qualitative descriptive design was used to enhance understanding of AI men's knowledge related to Pap screening. Qualitative research not only achieves description of a phenomenon, but it also helps move inquiry toward more meaningful explanations.<sup>33</sup> A qualitative descriptive study is most appropriate when a complex, detailed understanding of a phenomena is warranted.<sup>34</sup> This methodology allows the researcher to explore participants' attitudes and experiences while allowing for the emergence of previously overlooked nuances of the phenomenon being studied. Qualitative descriptive studies collect data in a natural setting and focus on participants' perspectives, meaning, and diverse viewpoints.<sup>34</sup>

### **2.2 Sampling Method**

A purposeful sampling method was used for selecting participants. Purposeful sampling is also known as non-probability sampling. In a non-probability sample, units are deliberately selected to reflect features of groups within the sampled population, and the sample is not intended to be statistically representative. The chances of selection for each element are unknown; but, instead, the characteristics of the population are used as the basis of selection.<sup>35</sup> Participants in purposeful sampling are selected based on features that can best help the researcher to understand the phenomenon to be studied.<sup>34</sup> The sample units are chosen because they have characteristics which will enable detailed exploration and understanding of the central phenomena being studied; such characteristics may be socio-demographic or may relate to specific experiences, behaviors, and roles.<sup>35</sup>

Based on the study's aims, we used a maximum variation sampling method described by Patton<sup>36</sup> where there is a deliberate strategy to include phenomena which vary widely from each other. The aim is to identify central themes which cut across the variety of the sample to achieve diversity or heterogeneity in the study sample.<sup>35,36</sup> To maximize variation in this sample, male participants were recruited with attention to diversity of age, length of stay in the U.S., and marital status.

Snowball sampling was also utilized to recruit participants. Snowball sampling involves identifying information-rich participants, engaging them in the project, and then asking for their aid in identifying additional participants that can be approached next. In this way, a sample accrues via a chain of referrals within a network of information-rich participants. To recruit male participants, an AI male (interviewer) who had undergone training in human subject protection began recruitment of eligible males at an African local church. Male participants who expressed interest in the study, introduced the interviewer and study to other eligible men.

### **2.3 Participants**

Twenty-one males were identified for study participation via purposive sampling. Eligibility criteria for the study included: 1) male gender 2)  $\geq 21$  years of age 3) able to speak and understand English; 4) African-born, and 5) able to provide written or verbal consent to participate in the project. Participants were recruited primarily through word of mouth from within the AI community. An African immigrant male (AI) community member was hired to recruit participants and assist with data collection. The AI male completed the web based Collaborative IRB Training Initiative (CITI). The man was trained on all study procedures including obtaining informed consent and research

compliance. Men who were recruited initially into the study were asked for additional referrals to recruit other men who might meet inclusion criteria and participate.

Institutional Review Board (IRB)-approved advertisement flyers were given to men to share with other men in the AI community (**Appendix B**). Men meeting eligibility criteria were invited to participate in the study and a mutually agreeable time and venue (usually participant's home) was chosen for the interview to enable the participant to share important information.<sup>37</sup>

## **2.4 Sample size**

Rather than sampling a specific number of individuals to gain significance based on statistical manipulation, qualitative research looks for repetition and confirmation of previously collected data.<sup>37</sup> Qualitative samples are usually small but provide data that is rich in details as there are many hundreds of pieces of information from each unit of data collection, hence sample size needs to be kept small. If the data are properly analyzed, there will come a point where very little new evidence is obtained from each additional fieldwork unit.<sup>35</sup> Interviews were conducted until saturation was reached<sup>34</sup> which occurred after 21 interviews.

## **2.5 Protection of Research Participants**

All study procedures were approved by the IRB prior to commencement of the study. Confidentiality of records and personal information was maintained. All electronic information, including taped interviews and field notes were kept in a password protected and encrypted file. Data analysis was performed on a password protected laptop computer designated solely for this purpose. Stored data did not contain any identifying information as the participants were assigned a participant's study number.

The interviewer explained the project and the interview began with the interviewer reading the informed consent and allowing the participant to ask questions. All participants signed informed consent prior to the interviews; one signed consent form was given to the participants and one kept for our records.

## **2.6 In-depth interview**

An AI male community member who was hired as the recruiter was trained by the primary investigator (PI) to serve as the interviewer. The interviewer was trained in ethical conduct in research including maintaining confidentiality through the recruitment process and completion of informed consent. After training, the interviewer conducted three practice interview sessions. The PI reviewed the recorded interview sessions and provided feedback. The PI continued to supervise the interviewer and address any challenges that arose throughout the recruitment and data collection process. Data were obtained using a socio-demographic questionnaire and a semi-structured interview guide (**Appendix C**) during one-on-one interviews. The interview guide contained a list of questions and topics that need to be covered during the conversation in a predetermined order. The interviewer followed the guide, but was able to follow topical trajectories in the conversation that strayed from the guide when appropriate.<sup>38</sup>

The interview guide was developed by the PI based upon an exhaustive literature review and using the Revised Behavioral Model for Vulnerable Populations as a framework.<sup>39</sup> The Revised Behavioral Model for Vulnerable Populations has been found useful for understanding health promotion and preventive service use among minority populations. Its semi structured design allows the participants to freely discuss the topic using their own terms. The interview guide included questions addressing knowledge

about cervical cancer screening, knowledge of cervical cancer, decisions about cervical cancer screening, and support for spouse/partner to obtain cervical screening.

Papanicolaou screening is the recommended screening test for cervical cancer<sup>40</sup> and in the U.S., this is often more commonly called a Pap test, Pap smear, or Pap screening; thus, the term Pap screening was used in the interviews as a term that was more likely to be familiar to study participants. Examples of questions included “Can you discuss what comes to mind when you hear about cervical cancer and Pap screening?” and “Can you discuss what you know about human papillomavirus (HPV) and its role in cervical cancer in women?” After the questions about cervical cancer, Pap screening, and HPV knowledge; men were provided with basic information about cervical cancer, cervical cancer screening, and HPV to provide them with accurate, contemporary, and evidence-based information on these topics. After being provided this information, the participants were asked questions focused on spousal/partner support and decision-making related to Pap screening.

The interviews were conducted in a quiet, private environment that was mutually agreed on by the participant and the male interviewer. The average interview was 45-60 minutes in length. Participants were given opportunities to ask any questions and provide general feedback about the interview. At the end of the interview, the interviewer thanked participants and provided them with a thirty dollar honorarium. All one-on-one interview sessions were audio-recorded.

## **2.7 Data Management**

All 21 digitally recorded interview audio files were professionally transcribed for subsequent analysis. No identifying information was included in the audio files. The files

were labelled as M701, M702, etc. The PI listened to the digital audio files twice while following each transcription to verify transcription accuracy. Transcripts were corrected as needed when any transcription error was detected.

### **2.7:1 Data Analysis**

Qualitative content analysis was used to analyze data and interpret its meaning. In this research method, data is subjectively interpreted through the systematic classification process of coding and identifying themes or patterns.<sup>41</sup> Line-by-line coding was used to identify core categories of emerging findings. This coding involved aggregating the data text into small categories of information and assigning a label to the code.<sup>34</sup>

Data analysis started with reading all data repeatedly by the PI to achieve immersion and obtain a sense of the whole dataset. Then, data were read word by word to derive codes by highlighting the exact words from the text that appear to capture key thoughts or concepts.<sup>41</sup> Next, the PI made notes of first impression, thoughts, and initial analysis. As this process continued, labels for codes emerged that are reflective of more than one key thought. The PI developed labels for codes based on the interview guide, previous literature, and an initial review of the transcripts. Examples of individual codes included the following: inaccurate knowledge of Pap screening, agreement to screen, woman's health is paramount, support enthusiasm, and individualized preference. The codes came directly from the text and then became the initial coding scheme. Codes then were sorted into categories based on how the different codes were related and linked. These categories that emerged were used to organize and group the identified codes into meaningful data clusters.<sup>41</sup> There were no pre-defined categories for grouping responses, but an inductive process allowed themes to emerge from the data.

## **2.8 Scientific Rigor**

Several strategies were used to ensure scientific rigor. First, prior to the study initiation, the PI explored and captured in writing identified assumptions, prejudices, preconceived notions, and biases and referred to these throughout the study process to ensure they were not affecting data analysis and interpretation. Rigor and trustworthiness of the research were further ensured through credibility and confirmability.<sup>37</sup> To establish credibility, member checking was used to verify the accuracy and the interpretation of the data that were provided.<sup>34</sup> Four study participants were contacted and provided with a summary of the preliminary findings and specific descriptions of the themes to determine whether the participants felt that they were accurate. Confirmability was established by using an audit trail to record activities over time in a systematic way. This process illustrates clearly the possible evidence and thought processes that led to the study's findings and conclusions.<sup>37</sup>

## **3. Results**

### **3.1. Demographic characteristics**

Interviews were conducted with 21 AI men. Demographic characteristics are summarized in Table 4.1. The mean age of the participants was 36.2 years (SD= 9.0). Men were primarily from West Africa, but there were participants from other parts of sub-Saharan Africa. More than half of the men were currently married (62%), 14% were separated, widowed or divorced and 24% were single (never married) but were in committed relationships. Non-married men in committed relationships were included in the study to garner diverse opinions about spousal support and to determine if there are differences of opinions as related to Pap screening among married and unmarried men

involved in committed relationships. The majority (88%) of participants reported college or post-graduate education as their highest education level. Fifty three percent of the men have resided in the US for more than 5 years. Eighty-one percent of the study participants worked full time, and 86% reported having health insurance. Ninety-one percent of respondents reported that their income was enough to make ends meet and 43% had an annual income greater than \$50,000. The demographics of participants in this study mirrors the overall demographics of AI in the US. According to U.S census, immigrants from Western Africa (36%) are the largest African population in the U.S. Compared with the overall foreign born population, AI had higher levels of educational attainment. Forty-one percent of AI population had a bachelor's degree or higher in 2008–2012, compared with 28 percent of the overall foreign born.<sup>42</sup> High levels of educational attainment among the AI are in part due to the emigration of large number of educated Africans and coming to the US for academic pursuit.<sup>43</sup> Many AI with the exceptions of refugees though highly educated are underemployed in professional settings due to obstacles related to obtaining licenses required to work in their professions.<sup>44</sup>

The in-depth interviews lasted, on average 52 minutes, with a range from 45 to 60 minutes. Four primary themes were derived from the analysis of these individual interview discussions: (1) inadequate knowledge and awareness of cervical cancer, Pap screening and HPV; (2) men involvement/spousal support; (3) preventive health-related decision making; and (4) preference regarding health care providers' gender. Each theme is described below and representative quotes are provided.



### 3.2. Inadequate knowledge and awareness of cervical cancer

AI men displayed some knowledge of cervical cancer in general. Many men were aware of the female cervix as a part of female anatomy and hence could identify cervical cancer as being a female cancer of the cervix. One participant stated: *“I do not really know anything about cervical cancer; maybe it is the cancer of the cervix.”* (28 years old, single male)

However, some participants had limited knowledge and awareness of Pap screening. Many AI men were unfamiliar with Pap screening, simply indicating that they had no knowledge when asked about Pap screening. When queried about cervical cancer and Pap screening, one man stated, *“I believe is that kind of cancer that is peculiar to women. It is usually found in their private part. I am not very familiar with Pap screening.”* (36 years old, divorced male) A few of the participants revealed that their female partners had talked about Pap screening, but the men were unsure about its purpose and role in cervical cancer detection.

When asked about the role of HPV as a risk factor for cervical cancer. Participants demonstrated little or no knowledge of HPV. The majority of the AI men had never heard of HPV or had not paid attention when they heard about it. Consequently, participants were unable to identify HPV as the primary risk factor for cervical cancer.<sup>45</sup> One man stated: *“I don't know much about the HPV and I can't say anything about it.”* (32 years old, single male) Another participant said, *“I have heard about HPV, not really sure what it is and how it relates to cervical cancer, but I think it requires our attention.”* (41 years old, married male)

According to most participants, lack of knowledge related to HPV is pervasive among AI men; with some suggesting that they are sure most men do not have knowledge about HPV. Some men indicated that because they do not know specific information about Pap screening or HPV, they would defer decisions related to HPV and Pap screening to their partners since these issues are related to women's health. Overall knowledge of risk factors for cervical cancer was low. The most common risk factors identified during interviews were multiple sex partners and smoking. Some participants demonstrated a lack of knowledge related to cervical cancer risk factors. Inaccurate risk factors identified by AI study participants included unhygienic practices and improper cleaning during and after menstruation. One man stated: *"I know women when they have their monthly period it depends on how you take care of yourself. I can imagine if you don't clean up or disinfect yourself properly, it may degenerate into things like that. I know infection could come from it. If infection could come from it, definitely it might go as bad as being cancerous."* (48 years old, married man)

Overall AI men's knowledge of cervical cancer risk factors, HPV, and Pap screening were low among participants. Two participants with a history of medical training were the exceptions and these respondents demonstrated knowledge related to HPV, HPV vaccination, and the role of HPV in cervical cancer.

### **3.3. Men involvement/Spousal support**

Men were enthusiastic about supporting their wives/female partners to complete Pap screening based upon evidence-based recommendations. Many of the men noted that they will support their wives/female partners to improve their health or to prevent their partners from illness. Participants emphasized that preservation of their wife's health is

paramount to the welfare of the family because of the indispensable role the woman plays in the home.

Participants expressed concern about their lack of knowledge related to cervical cancer and cervical cancer screening based upon recommended guidelines. Men attributed their lack of knowledge regarding cervical cancer and cervical cancer screening to the fact that cervical cancer only affects females and to a lack of emphasis on cancer screenings in the countries they migrated from. Many AI men acknowledged their disadvantaged position due to low awareness related to cervical cancer and cervical cancer screening and opined that to be supportive of their partners they will need to update their knowledge about cervical cancer and cervical cancer screening. One man stated: *“African men need to be more understanding, we need to do more research, we have to know more about the things that can affect our wives in terms of their health.”* (47 years old, married man)

AI men indicated that they will initiate discussions about Pap screening with their wives/partners. Participants suggested that their wives/partners are more knowledgeable and proactive when it comes to health issues, but they indicated their partners are too busy with other things to prioritize Pap screening. Men revealed that they are willing to encourage their partners by scheduling Pap screening appointments, keeping appointment reminders, and accompanying their partner to the appointment to show their support. One man mentioned, *“I will make sure she sees the doctor, know when the next appointment is, we keep it on the fridge, we make sure we don't forget, put the alarm on the phone and make sure that whenever that date is near you know we will be telling each other how to work things out and make sure she has free time to go and do what is necessary because*

*health is very important, people die a lot from not knowing what is supposed to be.”* (41 years old, married man)

Men with health insurance coverage were optimistic that their insurance should cover Pap screening cost with no co-pay. In the event Pap screening is not covered by health insurance, financial constraints would not deter most men from supporting their partners' screening. One participant stated: *“I will help her to keep dates of her appointments and support her financially and mentally. For instance, if the process is painful, I will encourage her and stand by her through the pain.”* (34 years old, married man) Many of the men indicated that spending money on health is more like an investment that pays off. However, some men stated that cost might present a challenge; but indicated they are willing to support in other ways.

Overall AI men showed promising attitudes toward supporting their female partners' Pap screening. Most men discussed that they will provide emotional, mental, and moral support as needed to their partners as related to Pap screening completion. One participant stated: *“Support from the husband is important.... If that support is there, if there are other barriers, the fact that you have a good support system might make it easier.”* (26 years old, single man) Another man mentioned that *“Continuing discussion with women about the importance (of cervical cancer screening) and making them feel comfortable about testing and supporting them in any way possible, morally, financially will be important to get this done.”* (48 years old, married man)

In general, all the participants showed the desire to encourage their partners or significant others to engage in Pap screening. There was no difference between married and non-married men in the desire to offer spousal support. Most AI men emphasized the

importance of traditional gender roles and the need for men to be role models of health in their homes. AI men wanted to take charge of the family's health and know how to handle female-related health needs. To effectively fulfill this role, participants discussed the need for men to be equipped with information regarding cervical cancer and Pap screening. One of the interviewees stated: *"We need to involve men; we don't need to talk only to the woman that they have to do it. They need their partners. We need to make sure men are educated. Lack of education on their part prevents them from supporting their woman."* (50 years old married man).

### **3.4. Preventive Health Care Decisions**

Two themes emerged related to decision-making regarding preventive screenings such as Pap screening. These themes were family-oriented decision-making and autonomous female decision-making. Several participants discussed that when making decisions about preventive screenings, the approach is a collaborative one including the AI man and his female partner and that health-related decisions are based upon the best interest of the family. However, the men indicated that female partners do not need to seek approval or permission to complete Pap screening or other preventive services. One man stated: *"I mean, me and my wife would decide things as a family, I will support her."* (47 years old married male) Another man opined: *"It is your husband, it is not a permission to ask, it is something you need to tell your husband, I know it may be hard on the woman but your husband has the right to know just in case there is a problem, he needs to know about it. It is something you need to sit down and talk to him about it."* (35 years old married man)

A smaller number of AI men suggested that their female partners should be proactive about their health by making autonomous decisions related to completing preventive screenings. The women should have the final say when it comes to issues related to women's health was the perspective shared by these men. One man stated: *"It is not for the man to decide because if something happens to woman, God forbids that she dies, the man will get someone else. It is her life; she has to take care of herself."* (47 years old, married male) Several men indicated that they will respect their partner's decisions and be involved. Men shared that they would like their partners to inform them and carry them along when making Pap screening decisions, but that the onus lies on the woman to decide if she will share this information. Other AI men wanted to be informed about their partner's Pap screening results. One man indicated that *"you should be smart enough to decide your own health for yourself, then carry your partner along."* (41 years old, married man). It seems like all the participants irrespective of marital status want to be informed and involved in the decision-making process in some way, even if they don't get the final say on Pap screening decision.

### **3.5. Provider's Gender Preference**

Many of the AI men considered Pap screening as an examination that invades women's privacy. The men noted that to maintain women's privacy and modesty, women should be given the choice to have a female health care provider complete cervical cancer screening for them. One man stated: *"as a man, I prefer a female provider to take the sample from my wife. I won't want another man to take the sample. Once, you find out that it is a man taking the sample, you move on to the next one. It shouldn't be a barrier*

*at all that, there is a way around it. I know some African men may not allow it.”* (56 years old, married man)

Narratives related to AI men’s preferences regarding the gender of a health care provider performing a Pap screening for their partners varied among men interviewed. Most men showed no preference one way or the other, while eight participants preferred that female health care providers perform their partners’ Pap screening. AI men who preferred that their partners’ Pap screening be performed by female health care providers indicated their preference was primarily related to privacy and modesty. These men believed that it is inappropriate for male health care providers to perform cervical cancer screening for the AI men’s female partners or to see their partners partially unclothed. For example, one man noted: *“you don't necessarily have to have a male go down there to check, you can have a female. You have that option to choose who you want to go down there. I didn't know that before so I was a little bit reluctant but now I know women have that option.”* (30 years old, married male)

AI men who showed no preference related to the gender of the health care provider completing their partner’s Pap screening noted that the choice should be the woman’s. One participant stated: *“as long as the woman is more comfortable with that situation that is more important than what I as a man feel. Even If I as a man I am uncomfortable with it, I must think about her health. It should be whoever the woman is comfortable with, she is the one undergoing the test and her opinion should matter most.”* (48 years old, married male) One man shared his opinion, *“whatever makes women comfortable, it depends on the individual, if a female wants a male that is fine but not my wife. My wife will not be comfortable with a male doctor, she actually told me, and she*

*can request to have a female do it and I am very glad about that.”* (33 years old, married male) Men with no preference related to the gender of the health care provider completing their partner’s Pap screening emphasized that the skills of the health care provider should be more relevant than the provider’s gender. One participant explained *“I think it’s just comfortability but I don’t think it should matter because my doctor is a woman and I am a man, I mean I really don’t care and I don’t think that it should matter because it’s their profession so its the knowledge of what they are doing that is most important.”* (34 years old, married man)

#### **4. Discussion**

This qualitative study explored AI men’s knowledge of cervical cancer, Pap screening, and attitudes towards supporting their wives/female partners’ Pap screening use. From this study, several themes emerged regarding AI men’s knowledge and attitudes related to Pap screening for their female partners. AI men, in this study were willing to support their female partners’ participation in cervical cancer screening. This finding is consistent with results from a study among urban men in Ghana in which African men expressed willingness to provide spousal support for cervical cancer screening if they had more information about cervical cancer and the screening methods.<sup>31</sup> Similarly, a study among Hispanic men found that men are willing to learn more about cervical cancer to support their partner's health care seeking efforts.<sup>46</sup> The AI men in this study discussed three different dimensions of support which include emotional support (provision of empathy, love, trust, and caring), instrumental support (provision of tangible assistance that directly helps a person), and informational support (provision of advice, suggestions, and information that a person can use to address



problems).<sup>20</sup> AI men wanted to provide emotional support to help their partners cope with possible discomfort from Pap screening and wanted to accompany their partners to Pap screening appointments. Some participants mentioned financial provision for Pap screening indicating willingness to provide instrumental support to their partners. Pain and financial constraints are commonly identified barriers to cervical cancer screening;<sup>6, 11, 14</sup> therefore, support to alleviate or reduce these barriers may improve cervical cancer screening uptake. Given AI men's enthusiasm to support their partners for Pap screening, future interventions should leverage this support. Programs to increase health education and awareness of women's health needs should include and engage men to reinforce male partners' roles in cervical cancer screening uptake and cervical cancer prevention.

Most men displayed some knowledge and awareness of cervical cancer; however, specific knowledge about Pap screening was lacking among the majority of participants. A few of the men in this study were introduced to the term "Pap screening/Pap test" for the first time during the interview. Our findings showed that AI men frequently held some inaccurate beliefs about cervical cancer's etiology and risk factors. These findings are consistent with previous studies among immigrant populations that suggest knowledge deficits related to cervical cancer risk factors and cervical cancer screening and males related to female cancers.<sup>6, 25, 47-49</sup>

One possible reason for the limited knowledge about Pap screening and cervical risk factors among AI men may be because most information and campaigns about cervical cancer have been aimed primarily at women and have not emphasized that men may play a role in improving Pap screening. However, studies among AI women have demonstrated equally low knowledge and awareness.<sup>6, 7, 50</sup> Because women's health

issues were often not discussed openly in sub-Saharan African countries, it was difficult for AI women to initiate discussions on sexuality, cancer screening, or reproductive health.<sup>51</sup> This may have contributed to the knowledge deficit among AI men. AI knowledge deficits related to cervical cancer may be in part related to the anatomical location of the cervix and the presumed intimate nature and vulnerability associated with Pap screening<sup>28, 52</sup> Low levels of HPV knowledge and its link with cervical cancer has been reported in studies among Africans.<sup>53, 54 55</sup> It is plausible that this knowledge gap may be related to low publicity of the role of HPV in cervical cancer etiology. In addition, low knowledge may be related to lack of screening emphasis in most sub-Saharan African countries. Until recently, little attention was given to cervical cancer screening program in Sub Saharan Africa;<sup>19</sup> despite being the most common female cancer in Sub-Saharan Africa, cervical cancer has not been prioritized by the health system and advocacy programs have not focused on cervical cancer.<sup>56</sup>

Extant literature indicates that in many cultures husbands serve as the gatekeeper of their wives' health.<sup>16</sup> When this is the case, a lack of knowledge about cervical cancer risk factors and cervical cancer prevention may impede men from supporting and encouraging their female partners' decisions to complete cervical cancer screening. Limited knowledge among AI men may pose a significant barrier to becoming positively involved and supportive of their female partners' cervical cancer screening. A study among Nigerian husbands reported a linear relationship between practices encouraging wives to obtain screening and the husbands' cervical cancer related knowledge.<sup>57</sup> This underscores the importance of relevant and comprehensive cervical cancer knowledge and awareness.<sup>57</sup> In light of these findings, careful consideration to increase knowledge

and awareness of the importance of Pap screening is warranted. Programs using multiple approaches to disseminate Pap screening related messages including interpersonal communication, educational initiatives, and public health awareness campaigns would benefit this population. Pap screening related messages should include information about cervical cancer risk factors, screening guidelines, and importance of male support in cancer screening to broaden men's knowledge and awareness. Such campaigns can help eliminate anecdotal beliefs, inform Pap screening support, and emphasize the significant role that men play in cervical cancer prevention.

The results of this study suggest that AI men may play a pivotal role in their female partners' Pap screening. This is similar to findings in a study among AI women, participants emphasized that family support is a crucial motivator that might encourage AI women to participate in Pap screening.<sup>11</sup> Patriarchal attitudes and deep-rooted stereotypes regarding the roles and responsibilities of women and men in the family can limit women's control over their sexual and reproductive health.<sup>58</sup> The priority of maintaining their female partner's health is a motivation for AI men to support their partner's cervical cancer screening. Similar findings occurred as a result of a study among Mexican immigrant males, which suggested that a main motivation for cancer screening spousal support was to prevent women from being sick for a prolonged time and ensure the women can continue in their role as the primary childcare provider.<sup>25</sup> This central role in the decision making and screening patterns of AI women is an important finding that may play an important part in improving Pap screening use..

AI men play a salient role in preventive health care decisions in their families. Decision-making autonomy is an important determinant in the uptake of women's health

services such as Pap screening. Unfortunately, power imbalances within these relationships can interfere with women's ability to access health services.<sup>59</sup> Women's lack of decision-making power can limit their access to health care and negatively affect maternal health outcomes.<sup>58</sup> Many societies still have sociocultural structures that rigidly define the roles of men and women. Such gender roles and structures are usually encoded in religious, tribal, and social traditions. Worldwide, often the sociocultural status of women based upon their gender limits their autonomy and ability to make decisions about many aspects of their own lives including their own health.<sup>60</sup>

It is encouraging that AI men in this study refuted the notion that their partners need to seek their permission for Pap screening. Some men noted that they encourage joint decision-making and collaborative decision-making for preventive health care services such as Pap screening while others preferred their partners make such decisions autonomously. Previous studies have shown that joint decision-making between husband and wives may yield better health outcomes than men making decisions alone or women making decisions without spousal input or agreement.<sup>61, 62</sup> Joint decision-making is associated with greater male involvement in health behavior and it improves couple's communication and negotiation strategies to improve health practices.<sup>63</sup> Joint decision-making allows the husband and wife to share the responsibility of the decision, especially in cases where there may be abnormal screening results.<sup>64</sup>

AI participants in this study discussed that gender of the health care provider was important in facilitating access to cervical cancer screening for their wives/female partners. Some men showed preference for female health providers while some had no provider gender preference. Some men were optimistic that their partners could have

access to female health care providers if desired. The literature is limited on men's perspectives about the gender of the healthcare provider performing their partner's Pap screening. Drawing from studies conducted among women, most studies have reported that women show preference for female health care providers to perform a Pap screening but would accept care from male health providers.<sup>28, 65, 66</sup> A study among different ethnolinguistic groups in Canada found that all the women in the study preferred female health care providers for screening, but some women were willing to have male health care providers provide their Pap screening. The gender of the health care provider was most important to Muslim women.<sup>65</sup> Similarly, a study among Nigerian women found that women will accept health care from a male provider if necessary if a female chaperone is present.<sup>28</sup>

The findings of this study should prompt researchers to consider male involvement as an integral part of family based culturally tailored interventions to improve Pap screening among AI population. Such intervention should include navigation assistance for AI families to explore barriers to Pap screening, engage with women to gain spousal support and connect women with preferred provider offering Pap screening services. In addition, health promotion intervention should focus on increasing cervical cancer and its risk factors knowledge and awareness for both men and women. At the health care system level, it is imperative to increase the number of trained female health care providers offering Pap screening to accommodate the need of AI families peculiar about provider's gender concordance.

#### **4.1 Limitations**

This study provides important information to fill an existing knowledge gap regarding AI men's knowledge and attitudes related to supporting their female partners' cervical cancer screening. Despite significant contributions to the literature, findings from this study should be interpreted taking the research limitations into consideration. First, the findings are not generalizable to all sub-Saharan AI men due to the study design and use of purposeful sampling methodology. Data collection was stopped when saturation was achieved i.e. when no new themes emerged and data were repetitive.<sup>37</sup> Lastly, it is plausible that social desirability might have played a role in the responses from the men interviewed.<sup>67</sup> However the significant findings from this study outweigh the limitations, the findings can provide important information regarding development of future interventions to increase Pap screening among AI women based on spousal support.

#### **5. Conclusions**

This is one of the few studies among AI men focusing on their knowledge and attitudes towards cervical cancer screening. Previous studies on cervical cancer screening in AI populations have focused nearly exclusively on AI women. Findings suggest that AI men have a salient role to play in their female partners' decisions to complete Pap screening. Gaining men's support through education about importance of preventive cervical cancer screening, advocacy and involvement in screening decision-making within their socio-cultural norms would enable men to make informed decision related to supporting their partners to get screened. Cervical cancer enlightenment programs for AI population should emphasize the link between HPV and cervical cancer with a focus on prevention and early detection. Complementary efforts at the health care system level

such as improving health care access and availability of female health providers to perform Pap screening would facilitate Pap screening use for AI women.

Within the health care system, person centered care approaches are warranted to facilitate access to cultural sensitive care; person centeredness implies recognition of each individual patient as bearers of unique requirements and needs, thus calling for a holistic approach that is successful with open patient–provider communication.<sup>68</sup>

### **5.1. Implication for public health and practice**

The number of sub-Saharan AIs in the U.S. is expected to increase; therefore, understanding the preventive health care needs of this group is critical to meeting the unique health challenges and barriers experienced by this population. Community outreach programs should target this burgeoning population to increase awareness about available free cervical cancer screening services and deliver information in a culturally sensitive and competent manner. Information on available screening centers may improve screening use and decrease the screening disparity experienced by AI population.

Given that AI men are eager to support their female partners' cervical cancer screening, our findings have implications for health care providers caring for AI women and families. While interventions are needed to enhance men's knowledge and awareness regarding cervical cancer screening, a multifaceted approach is essential to address Pap screening barriers encountered by the AI population. Based on the collectivist culture of Africans, family-focused interventions will benefit this group and provide AI men information on how to better support their female partners' cervical cancer screening and health promotion and maintenance. Provision of gender-concordant health care services may be an important strategy to encourage AI women to obtain cervical cancer screening.

Further research is needed to explore barriers that AI men may face in providing Pap screening support for their female partners. Additional research to understand AI women perceived partner support for Pap screening and the perspectives of health care provider's caring for AI populations is warranted to develop and implement strategies to improve cervical cancer screening uptake in AI women. Previous studies among AI women have emphasized the importance of family support; to my knowledge, till date existing intervention to improve cervical cancer screening are limited to women. Findings highlight potential areas to engage men in improving Pap screening use among AI women. For intervention development, researchers should consider multiple influences and socio cultural norms related to spousal support or lack thereof that may influence preventive health care behavior.

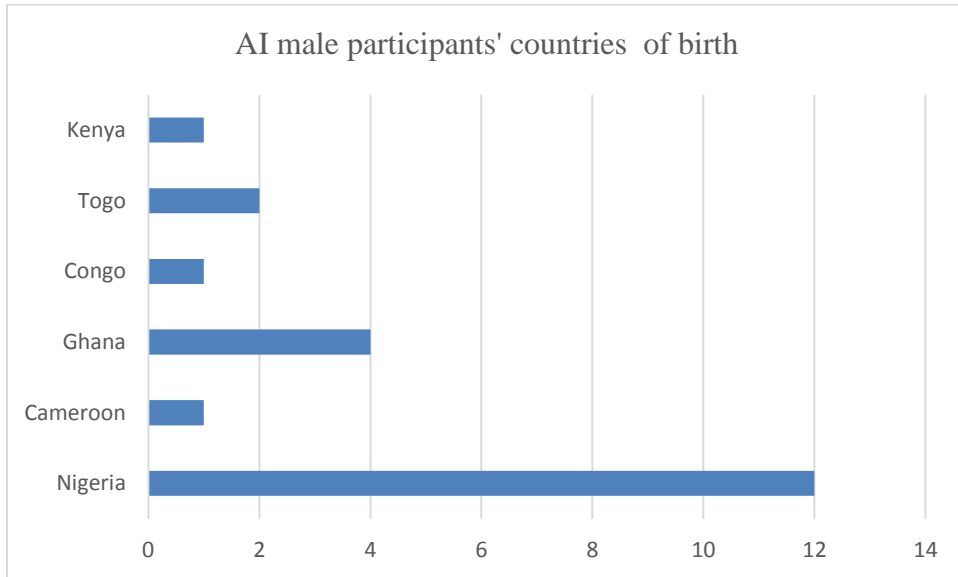


**Table 4.1: Demographics characteristics of participants (N =21)**

Variable	Mean (SD) or N (%)*
Age (years)	36.2 (9.0)
Year in the US	
≤ 5years	10 (47%)
>5years	11 (53%)
Country of origin	
West African countries (Nigeria, Togo, Ghana)	18 (86%)
Others (Cameroon, Congo, Kenya)	3 (14%)
Marital status	
Currently married/unmarried living together	13 (62%)
Single (never married)	5 (24%)
Divorced/separated/widowed	3 (14%)
Education	
High school completed	2 (10%)
College degree	10 (48%)
Post graduate degree	9 (43%)
Health insurance	
Yes	18 (86%)
No	3 (14%)
Enough income to make ends meet	
Yes	19 (91%)
No	2 (10%)
Income	
≤ \$24,999	5(24%)
\$25,000-34,999	3 (14%)
\$35,000-49,999	3 (14%)
>\$50,000	9 (43%)

\*Percentages may not add up to 100 due to rounding up to whole numbers

**Figure 4.1: AI male participants' countries of birth**



## CHAPTER FIVE: Determinants of Pap Screening Among Sub-Saharan African Women

### 1. Introduction

Cervical cancer is the second most common cancer among women worldwide, and the leading cause of cancer-related deaths among women in developing countries.<sup>1</sup> The introduction of the Papanicolaou (Pap) test in the 1940s brought about a marked decrease in the incidence of and mortality from cervical cancer, especially among U.S. born women.<sup>2</sup> Assuming widespread implementation of Pap screening, human papillomavirus (HPV) testing and the HPV vaccine, the incidence of cervical cancer will likely continue to decline both in the United States and other areas with well-developed health care delivery systems.<sup>2</sup> Despite, the decline in cervical cancer incidence and mortality rates among United States (US) born women, certain subpopulations in the US remain at higher risk than others, including low-income, immigrant, and minority women<sup>3</sup>

Most cervical cancers develop from persistent infection with high-risk oncogenic human papillomavirus (hrHPV).<sup>4</sup> Following persistent infection with hrHPV, the process of carcinogenesis progresses with disruption of the normal maturation of the transformation zone epithelium of the uterine cervix. These abnormal changes lead to pre-invasive lesions (dysplasia) that are often asymptomatic and discovered only by cytological examination during Pap smear screening.<sup>5</sup> If these low and high grade lesions are left untreated they may grow and eventually cross the epithelium to connective tissue border formed by the basement membrane to become invasive. But until invasion occurs, the entire stepwise precancerous lesion process is reversible if

caught early through appropriate screening, prompt detection, and treatment <sup>5</sup>

Even though many HPV infections are self-limiting, a small proportion of cases will persist for many years and decades and may lead to cervical cancer.<sup>6</sup> Migration and population mixing has been shown to increase the risk of sexual transmitted diseases including HPV infection in many regions of the world.<sup>7</sup> HPV infection prevalence and cervical cancer risk in Africa is 24% and 3.4% respectively compared to 5% and 0.5% in North America;<sup>1, 8</sup> a high burden of cervical cancer in Africa due to increased cervical cancer risk and HPV prevalence translates into increased risk among Africans who migrate to the US.<sup>9</sup> Currently primary prevention involves education about safe sexual practices and HPV vaccination.<sup>10</sup> Vaccination against carcinogenic strains of HPV is commercially available, but vaccine expense and limited health care delivery systems in developing countries have hampered its use and uptake has been slow in some developed countries. Even if universal female HPV vaccination could be provided on a consistent basis, there would still be several generations of at-risk, HPV-infected women who would not benefit from and would unlikely be targeted for HPV vaccination. Thus, secondary prevention by cervical cancer screening will be needed for the foreseeable future. <sup>11</sup>

Foreign-born population from Africa has grown rapidly in the United States during the last 40 years, with a near doubling of its population size between 2000 and 2012 to approximately 1.6 million people according to the U.S. Census Bureau.<sup>12</sup> African foreign-born population accounts for 4 percent of the total U.S. foreign-born population and about 36 percent of the black immigrant population, their numbers are expected to grow. The number of African immigrants living in two metropolitan cities

(Louisville and Lexington) in Kentucky is estimated at about 7,500.<sup>12</sup> Recent data estimated that 11,514 African immigrants live in Kentucky in 2013, a 220% increase from 2000.<sup>13</sup>

Research has shown cancer-related disparities across the cancer control continuum among African immigrants.<sup>14</sup> Data about African immigrant's health and Pap screening practices is critical to help define the problem of cervical cancer and serve as a baseline data for future research among this burgeoning group. Although the opportunity exists for access to an advanced health-care system, as immigrants migrate to the U.S., they encounter the same health-care inequalities that are faced by the native-born population based on race and socioeconomic status.<sup>15</sup>

There is established literature on access factors influencing Pap screening utilization. Certain sociodemographic factors such as age,<sup>16-19</sup> higher income and affordability of care,<sup>17, 18</sup> marital status,<sup>20</sup> and higher education<sup>20</sup> predict Pap screening. In a study among Asian American women, older women aged 30 to 39 years and 40 to 49 years were significantly more likely to have Pap tests compared with those aged 21 to 29 years for all Asian American ethnic groups except Korean women.<sup>19</sup> Among immigrants other factors predictive of Pap screening use include health insurance,<sup>9, 18</sup> having a usual source of care,<sup>17, 18, 21</sup> continuity of care,<sup>17, 21</sup> having a female provider,<sup>17, 21</sup> and physician's recommendation.<sup>22, 23</sup>

Despite the available literature regarding predictors of screening, paucity of research still exists for sub-Saharan African immigrants, who are a unique and vulnerable group. This emerging population is one of the most underrepresented groups in health-care research, especially research focused on gynecologic and breast

malignancies.<sup>15</sup> This study was designed to : (1) evaluate Pap screening use of Sub-Saharan African immigrant women; (2) assess the relationship between predisposing, enabling, and need for care factors and Pap screening; and (3) explore predictors of Pap screening use.

## **2. Theoretical Framework**

This study was theoretically grounded by the Revised Behavioral Model for Vulnerable Populations (figure 5.1),<sup>24, 25</sup> useful for understanding health promotion and preventive service use among minority populations. A vulnerable population is defined as a group at increased risk for poor physical, psychological, and social health outcomes and inadequate health care, which may apply to all immigrants, regardless of immigration status.<sup>15, 26</sup> The African immigrant population is one such vulnerable population. The Revised Behavioral Model for Vulnerable population was originally created in the 1960's to explain and predict why families and individuals use health care services, to inform policy, and to increase access to health care equitably.<sup>24</sup> The framework has undergone iterations with revisions, expansions and updates to include health status outcome, elaboration of health services, patient satisfaction and compliance. The framework proposes factors to consider when studying the use of health services and health outcomes for vulnerable populations. The original framework, developed by Andersen and colleagues, has been widely adapted for investigating screening and other preventive care utilization among minority and underserved populations.<sup>18, 20, 25,</sup>

27-29

Applying models of health services utilization to vulnerable groups can be especially helpful in identifying the challenges each faces in obtaining needed services

and may provide insights into maintaining or improving their health status. The Behavioral Model for Vulnerable populations posits that health promoting behavior such as Pap screening is a function of predisposing, enabling, and need for care factors. These factors either facilitate or impede the use of Pap screening.<sup>20</sup>

This study focused on population characteristics (predisposing, enabling, and need for care). Predisposing factors are characteristics that influence an individual to seek health services. These factors include characteristics such as demographic characteristics like age, gender, and marital status, social structural characteristics such as ethnicity, education, employment, family size, acculturation, immigration status, literacy, childhood characteristics, living conditions, psychological resources, and health beliefs. Predisposing factors found to impede various types of screening include demographic characteristics (e.g., older age, low educational attainment), knowledge deficits, and negative attitudes.<sup>24, 30</sup>

Enabling factors are factors that would enhance or impede an individual's ability to use healthcare services, should the need arise. The enabling factors include having a regular source of care, insurance status, affordability of medical care, spousal support, competing needs, availability and use of information sources, and community resources.<sup>24, 29</sup>

Need for care characteristics are the most immediate cause of the utilization of health services. They involve both perceived (self-perception) and evaluated health status. Need for care factors include those perceived by the individual or identified by a healthcare professional.<sup>29</sup> A provider's evaluation of patients may be affected by the patients' vulnerable status. Similarly, patients' perceptions of their health may be related to

their vulnerable status.<sup>24</sup> Measures of perceived illness may include the symptoms that individuals experience, self-reported health status, and side effects or complications of medical conditions/procedures. Evaluated health measures are actual health problems that the individual is experiencing and those that have been clinically identified or judged by health practitioners.<sup>18</sup> The outcome domain includes perceived and evaluated health status and satisfaction with care.

This framework is useful in identifying predictors and developing interventions that include key elements for Pap screening promotion among African immigrants because it allows for the influence of individual and system level variables that may affect screening. Understanding predictors of Pap screening could be leveraged to improve screening among sub-Saharan African women in the U.S.

### **3. Methods**

#### **3.1 Design and Participants**

This cross-sectional, descriptive study included 108 adults. Purposive and snowball sampling were used to select one hundred and eight participants for this study. Inclusion criteria included the ability to speak English, self-identification as a sub-Saharan African woman, being age 21 or above (Pap screening is recommended every three years for women aged 21 and older).<sup>31, 32</sup>

Participants were recruited from Lexington, Frankfort, and Richmond, Kentucky through a snowballing sampling method between October 2016 and January 2017. Project staff visited places of worship and organization meetings to distribute study flyers (appendix B) and describe the study to potential participants. The lead investigator, a Nigerian American, approached members of the African community through religious



organizations and social organizations to seek out individuals who met the eligibility criteria. Individuals who expressed interest in the study were approached and recruited into the study. They were also asked for their help in identifying additional participants to be approached to take part in the study. These women were then invited to participate. After eligibility was determined, a convenient date and time for a face-to-face meeting was scheduled. During that meeting, informed consent was obtained and the participant completed the study survey on a pass word protected iPad or computer using Qualtrics. Participants were also given the option to complete the survey on paper. All participants were offered \$30 for their participation.

### **3.2 Ethical considerations and procedures**

All research procedures were approved by the University of Kentucky Institutional Review Board prior to research commencement. The PI obtained consent by reading the informed consent form aloud to the participant. Once the participant obtained clarifications about any concerns and gave consent to participate in the study, the informed consent form was signed and completed. Participants were given the option to stop participating in the study at any time without penalty.

### **3.3 Measures**

#### **3.3.1. Survey instrument**

The survey instrument (**appendix D**) was a self-administered questionnaire. The survey questionnaire included 72 items/measures that have been previously used among immigrant populations or native Africans. The survey took an average of 15-20 minutes to complete. Some of the items were adapted from the National Cancer Institute, Health Information National Trends Survey (HINTS) 2014 cycle.<sup>33</sup> HINTS consists of items to

assess cancer screening behaviors, perceived health status and use of cancer-related information. The questionnaire was pretested with three African immigrant women for feedback on readability, clarity, and acceptability of questions and responses. The questionnaire was revised as needed following feedback from the pretest. All participants completed standard sociodemographic questionnaire used to gather data on age, country of origin, household income, insurance status, education, and employment status. In addition to demographics, participants were asked if they had ever had a Pap screening. Pap screening receipt was assessed by the question, have you ever had a pap test? (yes, no).<sup>33</sup> If yes, the women were asked the following questions: “How long has it been since you had your last Pap test?, with options, within the past year (anytime less than 12 months ago), within the past 2 years (1 year but less than 2 years ago), within the past 3 years (2 years but less than 3 years ago), within the past 5 years (3 years but less than 5 years ago), and 5 or more years.

### **3.3.2. Predisposing characteristics**

There were six predisposing characteristics measured: age, marital status, education status, knowledge, awareness, and acculturation. Age, marital status, employment status and education level were collected as part of sociodemographic information.

Awareness and knowledge of Pap screening: The awareness of Pap screening was measured with five yes/no/ don't know response” questions asking participants if they had ever heard of cervical cancer, human papillomavirus (HPV), know someone with cervical cancer, Pap screening, and HPV vaccine.<sup>34</sup> This scale has an acceptable level of internal consistency in this sample (Cronbach's alpha  $\alpha$  - 0.83).

The knowledge of Pap screening was measured with fourteen questions consisting of true/false/ don't know statements that included both facts and common myths about cervical cancer and HPV. <sup>34</sup> A Knowledge Score was generated, with one point given for each correct answer and no points given for incorrect answers and don't know responses. This scale has an acceptable level of internal consistency in this sample (Cronbach's alpha  $\alpha$  - 0.91).

**Acculturation:** Acculturation was assessed using length of residence in the United States as a proxy. Length of residence has been used as a proxy measure to determine acculturation level in immigrants.<sup>28,35</sup> To determine length of residence in the United States for this study, participants were asked to indicate the year they moved to the United States. The length of residence was calculated as the current year (2017) minus the year of migration to the US. The variable was dichotomized into the  $\leq 5$  years and  $\geq 5$  years in the US.

### **3.3.3. Enabling characteristics**

There were six enabling characteristics measured: income, health insurance coverage, perceived spousal support, social support, and primary source of care and routine health care visit.

Participants were asked to provide yearly household income estimate and about their access to care including health care coverage, routine health care visit, and whether they have a primary source of care.

*Perceived spousal/partner support:* Perceived spousal/partner was assessed by asking women to rate; “my husband or partner would support me to have pap screening” on a five point Likert scale, with response categories from strongly disagree to strongly

agree. Higher ratings indicated higher perceived spousal support towards pap screening.

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*Social support:* The Medical Outcomes Study Social Support Survey (MOS-SS) is a 19-item, self-administered social support survey developed for patients in the Medical Outcomes Study (MOS).<sup>37</sup> The 19 items cover four domains (emotional/informational support, tangible [also called instrumental] support, positive social interaction, and affection) recommend for both combined and individual use.<sup>37</sup> Response options are in Likert format, ranging from 1 = none of the time to 5= all the time. The scores are summed, rescaled on a 100-pont scale, and then averaged to determine a total score for social support. Higher scores on the MOS Social Support Survey indicate a greater perception of social support. This scale has an acceptable level of internal consistency in this sample (Cronbach's alpha  $\alpha$  - 0.93).

### **3.3.4. Need for care characteristics**

*Perceived health status:* Perceived health status was measured by asking participants whether they are in excellent, very good, good, fair, or poor health, with response options of “excellent” = 1 to “poor” =5.

Health care provider's recommendation: Health care provider recommendation was assessed by asking “have you ever been told you needed a Pap test” with yes or no response. Table 5.1 shows a summary of the variables and measures included in the study questionnaire.

## **3.4 Data Analysis**

Data were exported from Qualtrics into SPSS version 22 for analyses. An alpha level of 0.05 was used to determine statistical significance for all analyses. Descriptive

analysis including means and SD or frequency distributions, was used to summarize the study variables used to characterize participants. To address specific aim 1, which was to determine use of Pap screening among Sub-Saharan African immigrant women, frequency and percentages were calculated to determine Pap screening use among participants. Participants who reported that they had never screened or who do not know if they had ever screened were grouped together as never screened for other analysis.

To address specific aim 2, assess the relationship between predisposing, enabling, and need for care factors and Pap screening, women who had ever received Pap screening were compared to those who had never been screened on each of these factors using t tests and Chi square test of association.

To address specific aim 3, to explore predictors of Pap screening use, logistic regression modeling was used to determine independent predictors of having had Pap screening. To enhance model parsimony, income was not included in the logistic regression model because 21% of participants did not report income, thus, the use of income as a covariate would have resulted in a substantial loss of participants. The Hosmer-Lemeshow test was used to determine goodness-of-fit and variance inflation factors were used to assess whether multicollinearity was present in the regression.

Four models were constructed to examine predisposing characteristics, enabling characteristics, need for care characteristics and the 4th model included all significant variables from the prior three models while controlling for age and education. All predictors were entered simultaneously. Odds ratio and confidence intervals (95.0% CI for EXP (B) are presented and the Nagelkerke R square are reported as an indication of the amount of variation.

## 4. Results

### 4.1 Characteristics of Participants

Characteristics of participant by Pap screening status are shown in **table 5. 2**. Of the women included in the analysis in the study (n= 108), 65.7% reported ever having had Pap screening, 29.6% reported never having been screened and 4.6% reported that they did not know whether they had ever been screened. Of the screened women, 64.7% had screened within the past year, 32.4% within the past three years and 2.8% had been screened more than 3 years. For further analysis, women who don't remember if they had been screened were grouped with never screened women. Majority of the women reported Nigeria and Cameroon as their country of birth (59%) (**figure 5.2**). The mean age of the participants was 34.5 years (SD= 9.5). More than half were married (52%) and majority reported college and post graduate education as their highest education (83%). Thirty-seven percent did not have health insurance coverage, 41% reported having no primary care provider and 62% had not had a provider's recommendation for Pap screening.

### 4.2 Comparison of screened and never screened women

As shown in **table 5.2**, there were no significant differences in the predisposing factors age, education level, or marital status between those who had been screened and those who had not been screened. There were significant differences between the groups on the predisposing factors acculturation (length of stay), knowledge, and awareness. Length of stay was significantly different; 26 (36.6%) of the screened participants have lived in the US for less than 5 years, whereas only 24% (64.9%) of the never screened participants have lived in the US for less than 5 years (P = 0.01). There was significant

difference in knowledge scores for screened (Mean=8.75, Standard Deviation= 3.08) and never screened (M=5.86, Standard Deviation = 3.70),  $p = < 0.001$ . There was significant difference in awareness scores for screened (Mean = 4.20, Standard Deviation= 1.38) and never screened (Mean = 2.30, Standard Deviation = 1.71),  $p = < 0.001$ .

Regarding enabling factors, there were no differences in yearly household income and having primary care provider between women who had been screened and those who had not been screened. There were significant differences between the groups on the enabling factors healthcare insurance, routine visit/check, and spousal support. Health insurance coverage was significantly different; 52 (73.2%) of the screened participants have health insurance, whereas 16 (43.2%) of the never screened participants have health insurance coverage. ( $P = 0.004$ ). Having a routine health visit within the past two years was significantly different; 60 (84.5%) of the screened participants had a routine visit within the past two years compared with 24 (64.9%) of the never screened participants. ( $P = 0.032$ ). Having spousal support was significantly different between screened and never screened participants; 47 (66.2%) of the screened participants agreed that they have spousal support, whereas 18 (48.6%) of the never screened participants did not have spousal support. ( $P = 0.04$ )

Regarding need for care factors, there was no difference in perceived health status for women who had screened and women who had not screened. There was significant difference between the groups on provider's recommendation. Receiving provider's recommendation for Pap screening was significantly different between screened and never screened participants; 37 (52.12%) of the screened participants have received

provider's recommendation compared to 4 (10.8%) who have never screened ( $P = < 0.001$ )

#### 4.3. Predictors of Pap screening

Three preliminary logistic regression were conducted to determine if predisposing, enabling, and need for care factors were independent predictors of Pap screening. Using Variance Inflation Factors (VIFs), there was no multicollinearity among variables. The variables had acceptable range (1.055-1.564). The odds ratios and the 95% confidence intervals (CI) from the logistic regression model for predisposing factors are shown in **table 5.3**. In model 1 predisposing factors (awareness, knowledge, length of stay, age, and education) were considered based on factors identified as predictive from literature. The full model containing predisposing factors was statistically significant,  $X^2(6, N=108) = 38.15, P < 0.001$ , indicating that the model was able to distinguish between individuals who reported having been screened and those who reported not been screened. The model explained 41.1% (Nagelkerke R squared) of the variance in Pap screening status and correctly classified 73.1% of cases. In model 1, when all the predisposing factors (awareness, knowledge, length of stay, age, marital status and education) were entered only awareness was significantly associated with having Pap screening ( $p < 0.001$ ). Every one-unit increase in Pap screening awareness scores, increase the odds of having a Pap screening by 2 times (95% CI: 1.41-2.86)

In model 2, we entered enabling factors (spousal support, health care insurance, having a primary provider and emotional/informational support, and routine visit/check, the full model of enabling factors was statistically significant. **Table 5.4** summarizes the odds ratio and 95% confidence interval (CI) for enabling factors.  $X^2(7, N=108) = 20.72$ ,



$p = 0.004$ ) indicating that the model could distinguish between individuals who reported being screened and those who reported that they had not been screened. The model explained 24.1% (Nagelkerke R squared) of the variance in Pap screening status and correctly classified 74.1% of cases. In this model, having health insurance status was significantly associated with Pap screening use. Women who reported insurance coverage were 4.4 times (95% CI: 1.57-12.56,  $p = 0.01$ ) more likely to report having had a Pap screening compared to those without health insurance. All other variables were not statistically predictive of Pap screening adherence.

**Table 5. 5** summarizes the odds ratio and 95% confidence interval (CI) for need for care factors. Need for care variables (provider's recommendation and self-perception of health) were included in model 3. The model was statistically significant.  $X^2$  (2,  $N=108$ ) = 20.17,  $p < 0.01$ ) explaining 23.5% (Nagelkerke R squared) of the variance in Pap screening status and correctly classified 67.6% of cases. Provider's recommendation for Pap screening was significantly related to obtaining a Pap screening. Women who reported that a provider had recommended Pap screening for them have 9 times (95% CI: 2.89- 28.10,  $p < 0.001$ ) the odd of receiving a Pap screening compared to women who had not received a provider's recommendation.

Lastly, controlling for age and educational level, all significant variables from predisposing, enabling and need for care factors (awareness, health insurance, and provider's recommendation) predetermined from previous models were simultaneously added into model 4. Odds ratio and 95% confidence intervals are presented in **table 5. 6**. In the overall predictor model, provider's recommendation and Pap screening awareness remained significant predictors of receiving Pap screening. Women who reported having

had provider's recommendation for Pap screening were 6.2 times (95% CI: 1.72 – 24.65),  $p = 0.004$  more likely to report Pap screening compared to women who did not receive Pap screening recommendation. Also, for every 1-unit increase in pap screening awareness scores, the odds of receiving Pap screening increased by 1.9 times (95% CI: 1.34 – 2.67),  $p < 0.001$  among women. The model was statistically significant ( $X^2 (6, N=108) = 44.32, p < 0.001$ ). The model explained 46.5% (Nagelkerke R squared) of the variance in Pap screening status and correctly classified 76.9 % of cases.

## 5. Discussion

The purpose of this project was to explore characteristics that predict sub-Saharan African women having Pap screening. Among the 108 study participants 65.7% reported ever having had a Pap screening. There is a screening disparity evident among participants in this study. Pap screening rates among this group is lower than the national Pap screening rates of 80.7 % of all women having a Pap screening within the past three years in 2013<sup>38</sup> and screening rates of 75.3% reported among African Americans nationwide.<sup>32</sup> Similarly, screening rates among women in this study are below the *Healthy People 2020* target of 93.0%.<sup>39</sup> Consistent with prior studies, findings from this study confirm that sub-Saharan immigrant women have low rates of cervical cancer screening<sup>3, 9, 14</sup>

The most important finding from this study is that African Immigrant women may not be getting adequate cervical cancer screening. This study is among the first to establish a baseline screening pattern for this vulnerable group. Women who do not screen according to recommended guidelines may miss opportunities for early detection and may be at risk for developing invasive cervical cancer.<sup>40</sup> In a systematic review and meta-

analysis, Spence and colleagues found that poor Pap screening frequency was the primary factor attributable to development of invasive cervical cancer. On average, 53.8% (95% confidence interval: 43.6 – 66.3) of women with invasive cervical cancer had inadequate screening histories and 41.5% (95% confidence interval: 35.4 – 48.7) were never screened.<sup>41</sup> This means that African immigrants are likely at high risk for development of invasive cervical cancer, posing a public health risk to this burgeoning population.

Invasive cervical cancer is the second leading cause of cancer related deaths in women and this highly preventable disease poses a threat to AI women due to their inadequate screening rates. Identification of this screening issue provides an opportunity for intervention among this population. Early detection and treatment will prevent unnecessary mortality. This study provides important information on the predictors of screening, allowing researchers to design appropriate interventions to address this problem.

One of the factors identified in this study as influencing pap screening was acculturation (length of stay in the US). Acculturation was significantly different among screened and never screened women although it was not a significant predictor in logistic regression analysis. The effect of acculturation, measured by length of stay in this study has been examined in previous studies. Findings from this study agree with previous studies showing that higher acculturation is associated with the likelihood of receiving a Pap screening.<sup>28, 42</sup> African immigrant women who have resided in the U.S. for less than 5 years were less likely to have had a Pap screening (OR=0.40, 95% CI= 0.24, 0.65,  $0 < 0.001$ ) as compared to women who have resided in the U.S for more than 5 years.<sup>28</sup> Using various measures of acculturation, Lee and colleagues found that acculturation was

positively associated with the odds of having all cancer screenings among Asian Americans. Individuals who have lived in the U.S for more than 20 years were about 1.79 times (95% CI= 1.07, 3.01) more likely to have a Pap screening than those who have lived for less than 10 years.<sup>43</sup>

Several possible explanations have been provided for the association between acculturation and health behavior adoption. Acculturation is said to increase English proficiency and being acquainted with better skills to navigate the seemingly complex U.S health system<sup>28</sup> which may influence screening uptake among immigrants. In the presence of socioeconomic and health inequalities faced by immigrants, acculturation may lead to improved health behaviour. Moving from one's own country to another can bring substantial benefits to individuals and their families in terms of better access to effective medical care. Moreover, access to care inequalities which immigrants face may lessen with increasing length of time the respective group has been established in the host country.<sup>44</sup>

The association between acculturation and screening points to the need for special attention for recently immigrated women by the health care system. Women who have been in the U.S. less than 5 years appear to be at a higher risk to not screen and therefore at a higher risk for development of invasive cervical cancer. Practitioners and Researchers should address acculturation issues while developing interventions or providing health promotion messages.

There was a significant association between Pap screening and knowledge of cervical cancer and Pap screening. Women who had never been screened scored below the average score on the questions assessing knowledge of cervical cancer and Pap

screening. Inadequate knowledge of cervical cancer may contribute to low screening rates. Despite the knowledge of cervical cancer and screening among the participants, it is troubling that only 60% of respondents correctly identified that screening can decrease the risk of developing invasive cervical cancer. Women who do not know that screening is beneficial or that cancer and its precursors can be detected through screening may decide not to screen, which may place them at greater risk for advanced stage cervical cancer diagnosis.

Similar to reports from Brown and colleagues<sup>45</sup> many participants had deficient knowledge and awareness of HPV and its transmission and did not correctly identify HPV infection as a major risk factor for cervical cancer. Awareness scores varied significantly among women who reported that they had screened compared to unscreened women. Despite high educational attainment reported by many respondents, awareness score was low. It is expected that people with high educational qualification have better access to obtaining more and effective information from various sources. Inadequate knowledge and awareness of preventive screening could be related to lack of information, health literacy, and/or recommendations from health care providers. Deficient knowledge and awareness on the connection between HPV, mode of transmission and cervical cancer may put women at risk for HPV infection acquisition. Future research should further explore the association between educational attainment and cervical cancer knowledge, HPV knowledge, and awareness among sub-Saharan African immigrant population.

In line with the findings in this study, low knowledge and awareness of Pap screening, HPV and cervical cancer had been reported among sub-Saharan African

women in their native countries and among immigrant women to developed country.<sup>2, 46-</sup>

<sup>50</sup> The importance of educational outreach about cervical cancer prevention and early detection cannot be over-emphasized in this population. Educational interventions must target immigrant women with focus on explaining risk factors and the importance of screening per recommended guideline. Piwowarczyk and colleagues<sup>51</sup> found a significant increase in knowledge and intention to use preventive services following health promotion workshops for Congolese and Somalis in the U.S.

The association between knowledge and screening suggests that knowledge deficiency may deter African immigrant women from Pap screening. Grass root enlightenment and educational outreach with emphasis on preventive care and screening guidelines are essential to improve knowledge among this population.

Enabling factors associated with Pap screening use include, health insurance, routine visit to provider within past year, spousal/partner support, and emotional/informational support while income and having a primary care provider were not significantly associated with screening.

In line with evidence in the extant literature, health insurance and routine visit to a provider were associated with Pap screening use in this study.<sup>9, 43</sup> Having health insurance increases consistency in medical visits, which may often serve as reminders or cues for individuals to adopt healthy behavior as well as avoid risky ones based on health provider's recommendation.<sup>52</sup> Patient navigator programs connecting underinsured and uninsured African immigrants with health care resources such as a federally qualified health center could increase routine health care visits and Pap screening among this underserved population. Federally qualified health centers (FQHCs) provide preventive

and primary care to underserved populations regardless of ability to pay, positioning them to improve cancer screening rates.<sup>53</sup> Health care policies such as the Affordable care act (ACA) has improved health care access by providing coverage to between 7.0 million to 16.4 million Americans especially young adults, Hispanics, blacks, and those with low incomes.<sup>54</sup> Despite the gains made through the ACA, its future is unclear and a cloud of uncertainty remains on questions of health care access and health coverage for individuals who have gained coverage through this health insurance reform. This has implications for African immigrants who gained insurance through the ACA, it is unclear what the new policy restrictions and eligibility would be for immigrants.

Social and spousal support was an important predictor of screening among the African immigrant women in this sample. The perceived receipt of social support is a motivator for multiethnic women to get routine cancer screenings. Evidence of positive associations between subjective perceptions of support for cervical cancer screening and actual screening behavior have been reported among African American women.<sup>55</sup> Social support is one essential function that social networks including marital relationships provide.<sup>56</sup> Social network is partly responsible for determining individual attitudes and behaviors through access to resources and opportunities, and stimuli to perform certain behavior.<sup>57, 58</sup> Spousal/partner support plays an influential role in decision making, men are encouraged to carry some responsibility to ensure the continued wellbeing of their spouses.<sup>59</sup> African immigrant women with limited social ties and lack of spousal support may be at increased risk for developing invasive cervical cancer. Health care providers should evaluate support sources available to African immigrants and foster ways to connect women with support resources within their community. Sub-Saharan African

women will benefit from dyadic informational sessions tailored towards spouses and partners to gain support for cervical cancer screening. Future studies are warranted to evaluate the type of social support more influential among this population.

Findings from the overall logistic model indicated that awareness and health care provider recommendation are the most important predictors of cervical cancer screening participation among this group. Women with higher cervical cancer and screening awareness reported ever having had Pap screening, perhaps because they leverage their exposure to cervical cancer information and translate it to preventative behavior.

Awareness and knowledge of screening may prompt individuals to seek services and initiate discussions about screening with their providers. Sub-Saharan African immigrant women may be faced with limited information on how to successfully navigate the U.S healthcare system. Insufficient awareness or inaccurate knowledge may impair sub-Saharan African immigrant women's understanding of their risk for cervical cancer and affect their use of Pap screening. Awareness screening may affect women's access to health services and ultimately their wellbeing. Health care providers have unique opportunities to initiate discussions that would increase Pap screening related awareness and knowledge among African immigrant patients. Discussions should incorporate information on access to screening services and recommendations.

The healthcare system is not limited to facilities, but includes personal interaction with healthcare providers. Health care provider's recommendations influence their patients' compliance with observing health recommendation or adopting health behaviors. In this study, women who received Pap screening recommendation were more likely to have had a Pap screening. Providers' recommendation is an important tool to



enlighten women about screening guidelines, benefits, risks, and screening options for cervical cancer. Healthy women appear to be favorable to taking control of their health by actively engaging in the decision making when options and consequence of their decision are clear.<sup>60</sup>

There is an integral connection between awareness and provider recommendations for African immigrant women. Provider--patient communication is more nuanced than just a simple recommendation, the quality and content of the discussion surrounding the recommendation may have an additional and important bearing on a patient's decision to get screened.<sup>61</sup> Screening participation may be influenced by terminology commonly used during provider/patient communication. Persons with limited English language proficiency may have communication issues during health care interactions. Health care providers should evaluate patient's language needs on a case by case basis<sup>62</sup> and address such need to enhance effective communication with this population. Cancer screening information may be ineffective with individuals that have limited knowledge of cancer control and its accompanying vocabulary. Hence providers must provide explanations in simple lay man terms to ensure that patients understand screening concepts and early detection.<sup>63</sup> Healthcare providers must create a non-judgmental environment allowing ample time for patients to ask questions and provide patient centered care in culturally competent fashion.<sup>64</sup> In general, most patients consider their health care providers as the preferred source for health information.<sup>65</sup> Some patients put all of their control into the provider's hands and assume that the provider would tell them if they needed an exam<sup>66</sup> such as Pap screening. Health care providers should have basic skills in cultural competency

including knowledge of certain cultural practices such as female circumcision that might affect cervical cancer screening.<sup>62</sup> Health care providers must openly discuss patients' personal risks for cancer and the effectiveness of preventive measures in order to stimulate knowledge and the motivation towards screening.<sup>66</sup>

Based on this finding, intervention programs designed to improve healthcare provider-patient discussion and providers-patient relationships are invaluable for this population. Health care providers should be targeted for future interventions to increase Pap screening recommendation for sub-Saharan women. Culturally tailored interventions targeted towards less acculturated sub-Saharan African immigrants may improve Pap screening participation.

### **5.1. Limitations**

Despite significant contributions from this study, this study is not without limitation and it is important to take the limitations into consideration for interpretation of the results. The sample population was limited to sub-Saharan African women in Kentucky who could complete surveys in English. This inclusion criterion may limit the representation of sub-Saharan African immigrant women who do not speak English in this study. Women were asked responses describing previous use of health services and may have been subject to recall biases and social desirability.<sup>67</sup> Selection bias may also be present, as women who participated in the study may be different from others who did not participate. These factors limit the generalizability of findings to the sample population and not the larger population of sub-Saharan African immigrant women in the United States.

## 6. Conclusions

There is need for education and communication regarding importance of cervical cancer early detection, risk factors, and preventive measures in the sub-Saharan African immigrant community. It is understood that knowledge is necessary but not sufficient for continued health behavior engagement. As such, it is important that auxiliary efforts which provide access to screening services and address barriers of screening engagement accompany educational efforts.<sup>68</sup> Healthcare providers and educators serving immigrant populations have a pivotal role to play in reaching this population. Intervention approaches should target social networks of immigrant women especially spouses to increase awareness about screening services.

**Table 5.1: Summary of variables and how they were measured**

Variables	Measures
<b>Outcome variable</b>	
Pap screening	Have you ever had a pap test? (yes, no). How long has it been since you had your last Pap test?
<b>Predisposing factors</b>	
Age, marital status, education	Socio-demographic questionnaire
Awareness <sup>34</sup>	The awareness of Pap screening was measured with five yes/no/ don't know response questions asking participants if they had ever heard of cervical cancer, human papillomavirus (HPV), know someone with cervical cancer, Pap screening, and HPV vaccine. Cronbach alpha = 0.83
Knowledge <sup>34</sup>	Fifteen true/false/ don't know statements that included both facts and common myths about cervical cancer and HPV, e.g HPV is an infection that can cause cervical cancer, nothing can prevent cervical cancer because it is fate or the will of God. – Cronbach alpha = 0.91
Acculturation <sup>28, 35</sup>	Acculturation was assessed using length of residence in the United States as a proxy. What year did you move to the United States?
<b>Enabling factors</b>	
Income, health insurance	Socio-demographic questionnaire
Perceived spousal support <sup>36</sup>	My husband or partner would support me to have pap screening” on a five point Likert scale, with response categories from strongly disagree to strongly agree
Social support <sup>37</sup>	MOS-Social support scale- 19 items. Cronbach's alpha= 0.93).
Primary health care	Do you have a primary care provider (yes, no)

**Table 5.2: Sample characteristics and comparison of predisposing, enabling, need for care factors, by Pap screening status**

Variable	Total (n=108) Mean (SD) or N (%)	Screened (71) Mean (SD) or N (%)	Never screened (37) Mean (SD) or N (%)	P value
<b>Predisposing factors</b>				
Age (years)	34.51 (9.5)	34.82 (8.50)	33.92 (11.20)	0.67
Education				0.36
Less than high school	19 (17.6%)	10 (14.1%)	9 (24.3%)	
College	60 (55.6%)	40 (56.3%)	20 (54.1%)	
Post graduate	29 (26.9%)	21 (29.6%)	8 (21.6%)	
Marital Status				0.28
Currently married	56 (51.9%)	40 (56.3%)	16 (43.2%)	
Not married	52 (48.1%)	31 (59.6%)	21 (40.4%)	
Acculturation (Length of Stay)				<b>0.01</b>
≤ 5 years	50 (46.3%)	26 (36.6%)	24 (64.9%)	
≥5 years	58 (53.7%)	45 (63.4%)	13 (35.1%)	
Knowledge score	7.76 (3.56)	8.75 (3.08)	5.86 (3.70)	<b>&lt; 0.001</b>
Awareness score	3.55 (1.75)	4.20 (1.38)	2.30 (1.71)	<b>&lt; 0.001</b>
<b>Enabling Factors</b>				
Income				0.33
≤ \$35,000	57 (52.8%)	34 (47.9%)	23 (62.2%)	
> \$35,000	28 (25.9%)	21 (29.6%)	7 (18.9%)	
Don't know	23 (21.3%)	16 (22.5%)	7 (18.9%)	
Healthcare insurance coverage	68 (63%)	52 (73.2%)	16 (43.2%)	<b>0.004</b>
Primary care provider	64 (59.3%)	45 (63.4%)	19 (51.4%)	0.32

**Table 5.2 (Continued): Sample characteristics and comparison of predisposing, enabling, need for care factors, by Pap screening status**

Variable	Total (n=108) Mean (SD) or N (%)	Screened (71) Mean (SD) or N (%)	Never screened (37) Mean (SD) or N (%)	P value
Routine visit/check				<b>0.032</b>
Within the past 2 years	84 (77.8%)	60 (84.5%)	24 (64.9%)	
Within the past 5 years	8 (7.4%)	5 (7%)	3 (8.1%)	
Never/don't know	16 (14.8%)	6 (8.5%)	10 (27.0%)	
Spousal/Partner support				<b>0.04</b>
Disagree	13 (12%)	10 (14.1%)	3 (8.1%)	
Neutral	30 (27.8%)	14 (19.7%)	16 (43.2%)	
Agree	65 (60.2%)	47 (66.2%)	18 (48.6%)	
Emotional/Informational support scores	3.85 (0.78)	3.96 (0.72)	3.64 (0.86)	<b>0.05</b>
Tangible Support scores	3.79 (0.82)	3.87 (0.80)	3.64 (0.87)	0.18
Affectionate support scores	4.01 (0.70)	4.09 (0.71)	3.87 (0.66)	0.13
Positive social interaction scores	4.33 (0.66)	4.18 (0.63)	3.94 (0.68)	0.06
<b>Need for care factors</b>				
Provider's recommendation				<b>&lt; 0.001</b>
Yes	41 (38%)	37 (52.1%)	4 (10.8%)	
No	67 (62%)	33 (47.9%)	34 (89.2%)	
Perceived health status				0.490
Excellent/very good	83 (76.9%)	56 (78.9%)	27 (73%)	
Good/fair	25 (23.1%)	15 (21.1%)	10 (27%)	

Bold p values < 0.05, an a priori value of 0.05 was used to determine significance

Chi square test used to determine differences between categorical variables and t test used to determine differences between continues variables.

**Table 5.3: Logistic regression analysis for predisposing factors (n=108)**

<b>Predisposing</b>	<b>Odds ratio (OR)</b>	<b>95% CI for OR</b>	<b>P value</b>
Age	1.022	0.97-1.08	0.43
Knowledge	1.090	0.93-1.28	0.30
Length of stay ≤ 5 years ≥ 5 years (Reference group)	0.381	0.14-1.08	0.07
Awareness	2.004	1.41-2.86	<b>&lt; 0.001</b>
Education ≤ High school College Post-graduate (Reference group)	1.131 0.850	0.26-4.94 0.27-2.72	0.87 0.78

Bold p values < 0.05, an a priori value of 0.05 was used to determine significance  
Predisposing: Model Chi-square =38.15, df = 6, p < 0.001. Nagelkerke R square= 0.411

**Table 5.4: Logistic regression analysis for enabling factors (n=108)**

<b>Enabling</b>	<b>Odds ratio (OR)</b>	<b>95% CI for OR</b>	<b>P value</b>
Spousal support Neutral Disagree Agree (Reference group)	0.400 1.752	0.14-1.11 0.39-7.87	0.08 0.47
Routine visit Within past 2 years Within past 5 year or more Never (Reference group)	2.64 1.79	0.74-9.43 0.25-12.62	0.14 0.56
Health insurance (yes) (Reference group)	4.436	1.57-12.56	<b>0.01</b>
Primary care (yes) (Reference group)	0.639	0.22-1.90	0.42
Emotional & information support	1.332	0.73-2.43	0.35

Bold p values < 0.05, an a priori value of 0.05 was used to determine significance  
Enabling: Model Chi-square =20.72, df =7, p = 0.004. Nagelkerke R square= 0.241

**Table 5.5: Logistic regression analysis for need for care factors (n=108)**

Need for care	Odds ratio (OR)	95% CI for OR	p
Perceived health status Good/fair Excellent/very good (Reference group)	1.399	0.51-3.86	0.52
Provider's recommendation (Yes) (Reference group)	8.993	2.88-28.10	< <b>0.001</b>

Bold p values < 0.05, an a priori value of 0.05 was used to determine significance  
Model Chi-square =20.17, df =2, p < 0.001. Nagelkerke R square= 0.235

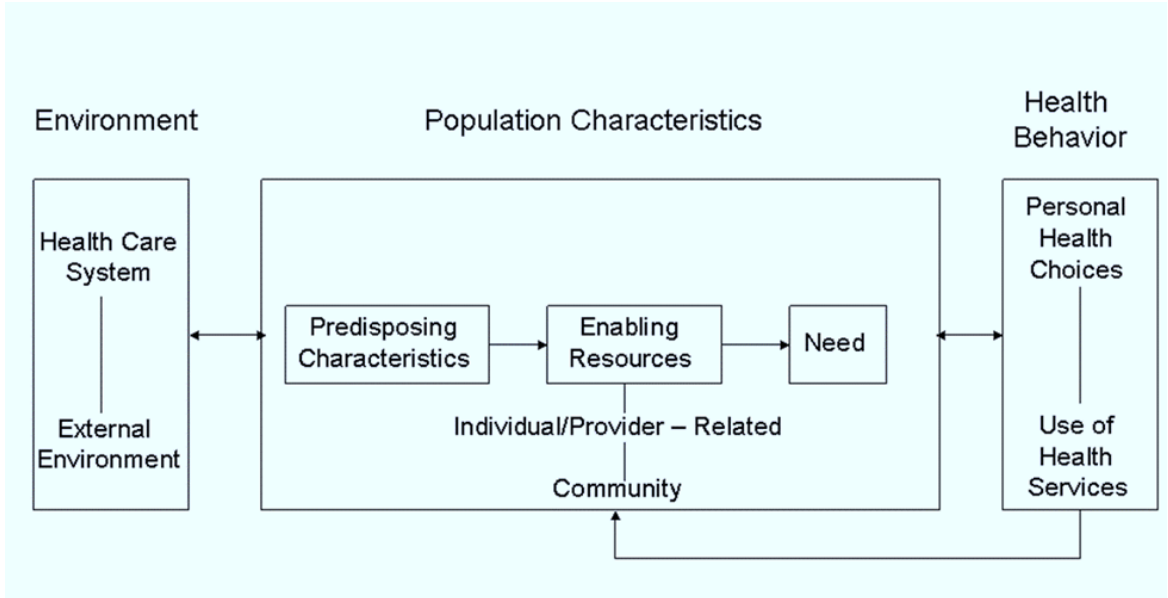
**Table 5.6: Logistic regression for prediction of Pap screening (n-108)**

Variable	Odds ratio	95% CI	P value
Provider's recommendation (yes) (Reference group)	6.185	1.72-24.65	<b>0.004</b>
Awareness	1.824	1.34- 2.67	< <b>0.001</b>
Health insurance (yes) (reference group)	2.391	0.89- 6.60	0.09
Age	1.021	0.97-1.08	0.47
Education ≤ High school (Reference group)	1.586	0.317-7.926	0.574
College	1.501	0.447- 5.041	0.512
Post-graduate			

Bold p values < 0.05, an a priori value of 0.05 was used to determine significance  
Model Chi-square =44.32, df =6, p < 0.001, Nagelkerke R square= 0.465

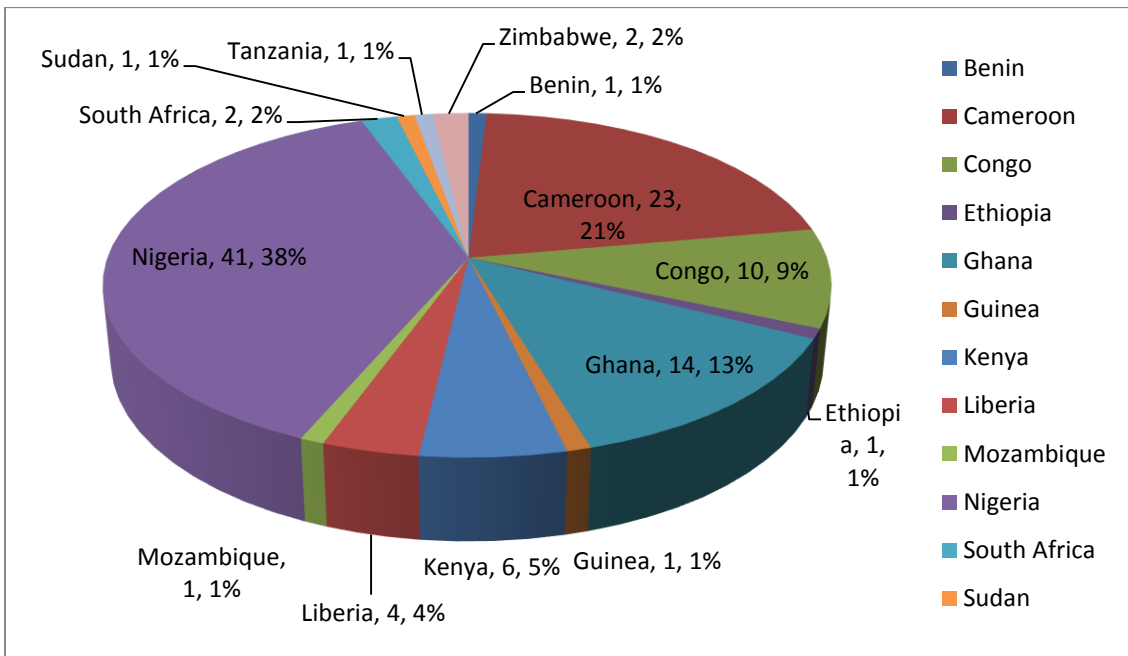


**Figure 5.1: Behavioral Model for Vulnerable Populations**



Adapted from “revisiting the behavioral model and access to medical care: does it matter”<sup>25</sup>

**Figure 5.2: Pie chart showing countries of origin of women surveyed (n=108)**



## CHAPTER SIX: Summary of Findings

### 1. Background and Purpose

The purpose of this dissertation was to examine factors influencing cervical cancer screening among African immigrant women. Cervical cancer incidence and mortality have decreased in the US over the past couple of decades, however, sub-Saharan African immigrant women have a disparate screening rate compared to native born African Americans and others in the U.S.<sup>1, 2</sup> Four manuscripts were included in this dissertation: 1) a literature review evaluating the state of cervical cancer screening research in African immigrant women and identified current gaps, 2) a qualitative descriptive study to examine factors influencing Pap screening among African immigrant women, 3) a qualitative descriptive study to examine men's knowledge and support for Pap screening for their wives and female partners, and 4) a cross-sectional study to determine Pap screening predictors among sub-Saharan immigrant women. These four manuscripts present a full picture of the state of science in regards to the screening patterns and predictors of screening of African immigrant women.

The primary goal of cervical screening is to decrease the incidence of and subsequent mortality from invasive cervical cancer.<sup>3</sup> Evidence shows that screening offers protective benefits.<sup>3</sup> However, African immigrant women do not utilize Pap screening at optimal rates, for a variety of reasons that have been explored and reported in this dissertation. The purpose of this chapter is to synthesize findings from the studies conducted and discuss how these findings advances the state of the science for cervical cancer screening among African immigrants. Recommendations for future research and implications for clinical care are also discussed.

## 2. Summary of Findings

Chapter two was the report of a systematic literature review in which the state of cervical cancer screening research in African immigrants were evaluated and current gaps were identified.<sup>4</sup> Sixteen studies published between 2005 and 2015 were evaluated. This review showed a low screening rate among African immigrant women. The Pap screening rate reported by studies reviewed varied from 19.4% to 75%. Notably a screening rate of 75% is below the overall Pap screening rate of 80.7% in the US.<sup>5</sup> This rate is also below the cervical cancer screening Healthy 2020 target goal of 93% among women 21 to 65 years.<sup>6</sup> According to the American Cancer Society,<sup>7</sup> inadequate level of screening places women at high risk for developing invasive cervical cancer. Screening according to guidelines offers the best chance for cervical cancer to be found early when successful treatment is likely. The reviewed articles included only two intervention studies.<sup>8,9</sup> Common factors influencing Pap screening among this group were immigration status, health care interactions, knowledge of cervical cancer screening, religiosity, and demographic characteristics such as age, marital status, and education level.<sup>4</sup> Research is needed to target African immigrant women within their socioeconomic cultural context to identify effective interventions to improve cervical cancer screening participation in this group.

The findings from this study show a knowledge gap related to cervical cancer and Pap screening among African immigrants.<sup>4</sup> This knowledge gap speaks to the need for specific population targeted public health campaigns emphasizing cervical cancer risk factors, HPV causative role in cervical cancer etiology and screening. Such campaigns

can eliminate anecdotal beliefs and cultural perceptions of cervical cancer, reduce cervical cancer risks and promote engagement in Pap screening.

Another intriguing finding from this review was the importance of healthcare interactions and its role in Pap screening. Health care utilization is the point in health systems where patients' needs meet the professional system.<sup>10</sup> Patients' perception of such health care interactions, patient-provider communication and provider's recommendation may preclude women from Pap screening use. Feeding into an opportunistic screening system may be challenging for persons who do not perceive a cordial environment during health care interaction.

The major gap identified in this review is that the research related to cervical cancer screening among African immigrants has not shifted from descriptive to intervention level. With only two intervention studies identified, much work remains to be done by cancer control researchers to move the science forward. In addition, this review shows the need for consistency in the definition of the Pap screening adherence and time frame for ease of comparison across studies. This inconsistency is very important to consider in the overall interpretation of the findings.

Chapter three was a qualitative descriptive study that explored factors influencing Pap screening among African immigrant women.<sup>11</sup> Twenty-two women were interviewed during focus group sessions and transcripts were analyzed for themes. Based on the HBM barriers and motivators of pap screening were elucidated. Women discussed multiple barriers and motivators to Pap screening. Barriers included low knowledge of screening, cost, cultural beliefs, fear and communication issues. Women emphasized the importance of provider's recommendations, enlightenment, health care insurance, and family support

in improving their Pap screening use. Sub-Saharan African immigrant women have unique barriers related to cultural background and beliefs such as the role of female circumcision in Pap screening and concerns with privacy. Such culturally mediated issues can be addressed with provider's demonstrating skills in cultural competency and sensitivity.

One of the major barriers to Pap screening identified from this study was communication. Participants in this study expressed that they have faced communication challenges during health care interactions. Language and communication barriers adversely affect patients in their access to health services; comprehension and adherence; quality of care; and patient and provider satisfaction.<sup>12</sup> Hence, future interventions should incorporate high-quality interpreter services where language-concordant providers are not available.<sup>13</sup> to alleviate communication concerns. Findings from this study identified need to engage health care providers in future efforts to improve Pap screening in this population. Such interventions should include educational initiatives and trainings focused on enhancing health care interactions, patient- provider relations, cultural sensitivity and competence among health care providers.

Given evidence that provider's recommendations, enlightenment, health care insurance coverage, and family support are motivators for Pap screening, cancer control researchers should take these factors into account in the design and actual implementation of their cancer control programs.

Building on findings from study reported in chapter three, given that participants expressed that family support was a key motivator for Pap screening, chapter four was conducted to explore this phenomenon. Chapter four was the report of a qualitative

descriptive study to determine African immigrant men's (partners of African immigrant women) knowledge and spousal support for Pap screening. Twenty-one men took part in one on one individual interviews. All interviews were recorded and transcribed and data were analyzed using content analysis. Men demonstrated some knowledge about Pap screening and cervical cancer but had limited knowledge of HPV and its role in the etiology of cervical cancer. Men in this study showed desire to support their wives and or female partners for Pap screening. However, some men showed preference for female providers for their wives/female partners and there were divergent opinions on Pap screening related decision making.

Considering the results of chapters three and four, which indicated that provider's recommendation and spousal support played a role in motivating women, a study was undertaken to determine independent determinants of Pap screening among sub-Saharan immigrant women. Chapter five was the report of a cross-sectional quantitative study in which determinants of Pap screening completion were determined among 108 sub-Saharan African women. The study was theoretically guided by the Behavioral Model for Vulnerable Populations. The model has three components; predisposing, enabling, and need for care factors.<sup>10</sup> T-test and Chi square analysis were used to compare bivariate associations between predisposing, enabling, and need for care factors. Binary logistic regression was used to determine predictors of Pap screening among sub-Saharan women. Results from t test and Chi analysis shows that for predisposing factors, there were significant difference in length of stay (proxy for acculturation), knowledge and awareness between those who have been screened and those who have never had a Pap screening. Insurance status, routine visits, spousal support, and emotional/informational

support were enabling factors that were significantly different between groups of screened and never screened women. For need factors, receiving provider's recommendation was significantly different between women who had been screened and women who had never screened.

For independent predictors of Pap screening, awareness and provider's recommendation remained significant in relation to Pap screening in the final model after controlling for age and education. For every unit increase in awareness score, the odds of receiving Pap screening increased by 1.8 (95% CI 1.32 – 2.52),  $p < 0.001$ . Women who reported receiving provider's recommendation were 6.2 times (95% CI 1.78 – 21.56),  $p = 0.04$  more likely to screen compared to women who did not receive Pap screening recommendation. These findings showed that provider's recommendation and Pap screening awareness were the critical and influential predictors of ever having a Pap screening among study participants.

The findings from this dissertation suggest that numerous factors influence Pap screening use among African immigrant women. Based on opinions of African immigrant men and women verified by a cross sectional quantitative study, this dissertation identified determinants that both impede and facilitate Pap screening with common themes across all studies. In this study population, determinants that facilitate Pap screening include provider's recommendation, spousal support, male involvement in decision making, knowledge, and awareness of Pap screening. Findings also emphasize that costs, cultural background and beliefs, fear, knowledge deficit, communication issues during health care interactions may impede Pap screening. Several of these factors overlap and reinforce each other. For example, cultural background like lack of emphasis

on preventive screening in participants' native countries may lead to knowledge deficit which may fuel misconceptions about cervical cancer risks and screening importance.

### **3. Impact of Dissertation on the State of the Science**

This dissertation contributes significantly to the literature by identifying the factors that are significant in the use of Pap screening among African immigrant women. The findings expand current research about cancer screening use among African women in the U.S by providing empirical data to fill research gaps in an understudied population. In chapter two, the literature review study improved our knowledge of cervical cancer screening literature and identified gaps in the literature. To my knowledge, this is the first review of cervical cancer screening specific to African immigrant women. This review showed that African immigrant women are often underrepresented in cervical cancer studies or they are grouped with other persons of African descent which may mask distinct factors specific to the population. Aggregation of data limits the understanding of specific contributors to screening disparities. An understanding of contributors to these health inequities is necessary to positively impact the health of this population.<sup>14</sup> Grouping foreign-born blacks with American-born blacks misses important variations within these populations and ignores potential cultural differences that may have profoundly different effects on health outcomes.<sup>15</sup> Rather, comparison studies across the cancer control continuum among ethnic minority populations are valuable since such research is lacking among African immigrants. Researchers should target African immigrants for inclusion in cancer control research and separate data from other persons of African descent.



The review identified few interventions specifically designed to improve Pap screening among African immigrants. This research gap indicates that there is much work left to be done to improve Pap screening among African immigrant women. Researchers should develop and test interventions specifically targeted to African immigrants across the cancer control continuum.<sup>16</sup> Interventions designed to reduce disparities in screening related to African immigrant ethnicity should increase access to health care through awareness of free cancer related services and provision of affordable health insurance.

In chapter three, women identified barriers and motivators that influenced their use of Pap screening. The finding from this study was consistent with previous research among immigrant women. Africa is not a monolithic society; hence, further research is needed to examine subgroups of African immigrant women to determine differences in cancer screening perceptions and cultural beliefs related to screening practices. An understanding of screening perceptions and cultural beliefs could inform intervention tailored toward subtle differences among African immigrants.

The study findings provide opportunities to improve screening through multipronged approaches. Health care policy stakeholders should consider implementing an organized screening system in the US. African immigrants will benefit from an organized screening system rather than an opportunistic attendance. Several African immigrants are recent arrivals and may find it difficult to navigate the complicated US health care system. Thus, a system which reminds women who have no registered Pap screening for the past three years to make an appointment for screening would be more effective for the African immigrant population. Efforts should focus on recent African

immigrants since less acculturated women are less likely to interact with the health care system and miss opportunistic screening.

Even though the screening in the US is mainly opportunistic, health care system changes are needed to make the most of every patient encounter with the health care system. First, researchers should develop interventions that improve provider's recommendation for African immigrants. Interventions should include health care providers' trainings to increase awareness of their African immigrant patients' screening status and communication strategies. Health care providers should seize opportunities during health care encounters for discussion about screening history, screening recommendations and ordering of screening tests. Providers' reminders of clients screening history delivered as printed, electronic, chart notations or preventive checklists have been found to be effective<sup>17</sup> to prompt providers to recommend and order cancer screening. Incorporating such providers' reminders in the health care system may prompt reminders to initiate screening discussions with African immigrant women presenting at the clinic.

Findings suggest that family support is a motivator for Pap screening, future studies using reliable and validated social support scales among this population are needed to investigate the actual levels of support related to screening as opposed to perceived social support. Future studies should also investigate the different dimensions of social support such as emotional support, informational support and instrumental support to identify which can be best leveraged to encourage Pap screening.

Cost of screening appeared to be a barrier to Pap screening among participants, efforts are needed to increase awareness and access to low cost Pap screening services.

The Affordable Care Act (ACA) helps reduce financial barriers both by increasing access to insurance and by eliminating cost sharing for cancer screening services including breast, cervical, and colorectal cancer screening (among other preventive services) for many insured persons.<sup>18</sup> However, the future of the ACA is not certain. Similarly, the National Breast and Cervical Cancer Early Detection Program provide free or low-cost screening and linkages to diagnostic services for uninsured and underinsured low-income adults.<sup>19</sup>

The study reported in chapter four examined men's knowledge and perspectives on providing spousal support for Pap screening. This is one of the few studies to include male's involvement and support for Pap screening. Findings from this study bridge an important gap in cervical cancer control literature by highlighting important issues related to male's support of Pap screening in this population. In general, men in this study desire to provide spousal support to their wives or female partners to encourage Pap screening. Provider gender concordance was important for some men and there was an expectation that screening decision would be made as a family unit. These findings highlight the need to involve men as part of interventions to improve screening. Such interventions should include ways to better communication strategies among couples to foster decision making. Findings from this study provides a starting point for further studies. For example, future studies should include husband and wife dyads to determine spousal support for screening, and if support varied with years of marriage.

The study reported in chapter five examined predictors of Pap screening among sub-Saharan immigrant women. This study makes a unique contribution to the literature as one of the first studies to focus on African immigrants screening in Kentucky. The

study addressed a significant gap in literature by obtaining preliminary data among African immigrants in Kentucky and forms the foundation for future studies among this population. The results from this study points to screening disparities experienced by this group of women, this is consistent with disparities reported among other immigrant populations. Providers' recommendation and cervical cancer awareness were independent predictors of Pap screening pointing to critical intervention points for this vulnerable population. These findings should be utilized to develop interventions to reduce screening disparities and promote cervical cancer screening equity among African immigrant women. Knowledge of these predictors among could provide useful information to inform culturally tailored interventions needed to improve Pap screening among African immigrant women.

Innovative approaches are needed to engage African immigrants to increase Pap screening and decrease cancer disparities. One such approach may be to deliver health promotion and cancer screening campaigns through faith based sites of primarily African immigrant congregation. Interventions would include delivering targeted education, awareness programs on cancer screening, risk reduction efforts, and early detection behaviors through health providers who are members of the African community. In addition, printed brochures, educational materials and invitation letters for screening would be distributed to African women. This approach is promising because African immigrants may be more comfortable and relate better with other Africans who share similar cultural values. Tavasoli and colleagues found that invitation and reminder letter strategies increased cervical cancer screening participation among women who had not received a Pap screening in the previous 3 years.<sup>20</sup>

#### 4. Recommendations for Nursing Practice and Research

Nurses play a pivotal role in increasing the number of women who participate in cervical cancer screening.<sup>21</sup> Nurses at all levels of practice can reach a large and diverse populations and are ideally positioned to provide information that will increase knowledge about cervical cancer. One approach to improving the knowledge deficiencies identified in this study may be enhanced HPV knowledge and cervical cancer screening recommendations from health care providers including nurses and physicians. Nurses work in a variety of settings, such as the school system and neighborhood clinics, as well as hospitals and urgent care facilities. In these settings, they can help educate women, especially mothers with daughters, about the prevalence of HPV and methods to prevent infection. This form of education may help reduce the incidence of HPV infection and cervical cancer in the US.<sup>21</sup> Health care providers have unique opportunities to implement primary and secondary prevention programs for cervical cancer among African immigrants.

Extant literature suggests that cancer screening improves with provider's recommendation.<sup>22</sup> Discussions between health care providers and their patients regarding cancer screening options and importance of cancer screening is an important determinant of cancer screening adherence.<sup>17</sup> Increased recommendations and ordering of screening tests is an important intermediate step toward increasing actual screening rates.<sup>17</sup> However, some providers may not provide screening recommendation due to communication barriers which may impact effective communication between African immigrant client and their health care provider. Health care providers should provide recommendations based on a combination of evidence based practice and current

guidelines for cervical cancer. Research among health care providers indicate persistent barriers to adoption of clinical practice guidelines for cervical cancer screening.<sup>23</sup> It is important to increase cancer related research specifically focused on African immigrants to inform interventions. Such intervention approaches should consider salient factors specific to this population in the development of innovative culturally and linguistically tailored approaches to improve cervical cancer screening uptake.

Consistent with the Health Belief Model and the Revised Behavioral Model for Vulnerable Populations,<sup>24, 25</sup> this dissertation identified numerous factors that influence Pap screening engagement among African immigrant women. Certain factors impede and facilitate Pap screening, including sociocultural attitudes and beliefs, personal health practices, social networks, predisposing, enabling factor, and need for care factors. Based on the findings of this study, multilevel targeted health interventions directed toward African immigrant population are warranted. Prevention efforts should focus on individual level factors and develop culturally relevant strategies that will effectively provide educational outreach interventions and alleviate barriers to Pap screening. Engaging spousal support and addressing social norms related to spouses/partners' roles that may influence partaking in cervical cancer screening is important among African immigrant women. Interventions should target sociocultural norms and perceptions related to adoption of preventive health care services. Similarly, systemic factors that aid in integration of new immigrants into the community will improve access to health care use and prompt use of screening to check health. Lastly, systemic factors related to health care access navigation, and provider's recommendation should be important components of tailored interventions targeted toward African immigrant population women.

#### **4.1. Limitations**

Although this dissertation has filled several important gaps in our knowledge of Pap screening use among African immigrant women, some caveat of the studies includes the exclusion of French speaking African women and other women who may not be able to communicate effectively in English. Including a more linguistically diverse sample could have revealed additional perceptions and factors regarding cervical cancer that are unique to certain African immigrant groups. Another limitation of the studies is the potential for self-selection bias due to purposive sampling. Finally, recruitment of highly educated participants could bias study findings. Additional research is needed to determine whether similar findings are prevalent among less educated African immigrant individuals. High level of educational attainment is common among African immigrants excluding refugees.<sup>26</sup>

#### **5. Conclusion and Future Research Plans**

Our findings suggest that African immigrant women are likely to use Pap screening at suboptimal rates for a variety of reasons. Knowledge deficiency, cultural beliefs, and communication issues are barriers to Pap screening use in this population. Results from this dissertation point to several areas to improve screening use for African immigrant women. First, having provider's recommendation, spousal support and involvement in decision making, and improved awareness related to Pap screening are a priority to facilitate Pap screening use among African women. Other areas are improved access to health care, quality health care interaction, reduced cost and factors to mitigate fears and cultural issues related to Pap screening. This population will benefit from family based interventions to improve knowledge and reinforcement of spousal support.

Auxiliary efforts alleviating barriers and improving access to screening services are warranted.

Future studies need to evaluate and test interventions incorporating elements of provider's recommendation, spousal support, knowledge and awareness campaigns for African immigrants to examine their effectiveness on improved satisfaction, access, and use of preventive health care services. Future studies of male involvement in Pap screening are warranted to confirm the findings from this study, as they could further inform how to target family based interventions among African immigrants.



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## Appendices

### Appendix A: Semi-structured qualitative focus group interview guide


- Can you talk about your health in connection use of preventive services in the United States?
- Where do you get your healthcare services here? How is that working for you?
- Discuss how you learned information about Pap screening
- If you have had a pap smear in the past, can you talk about that experience
- Can you talk about what has helped you to get screened in the past?
- Can you discuss some reasons why it was difficult to get your Pap screening in the past?
- If you have not had a pap smear in the past, can you discuss some reasons why you have not?
- If you have not had pap smear can you discuss what will help you to get the Pap screening.
- What do you think will make it easiest for African women to get their Pap screening?
- How would you prefer to be given information on Pap screening?
- Discuss some reasons why African women in the US should get or not get regular Pap screening.

## Appendix B: Approved study recruitment flyer

UNIVERSITY OF KENTUCKY RESEARCH

### Are you from Africa and Living in Central Kentucky?

You are invited to participate in a research study about how to increase Pap screening among African women living in Central Kentucky.



**You may be eligible to participate if you:**

- Live in central Kentucky;
- Are an African immigrant/refugee;
- Are over the age of 21; and
- Read and speak English.

**What will you be asked to do?**

- Men will take part in a one-time interview.
- Women will fill out questionnaires.

You will receive a token as a thank you for your time.

For more information, please contact:  
Bola Adegboyega  
aoadeg2@uky.edu  
859-967-9629

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Mallory L**

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## Appendix C: Men individual interview guide

Thank you for agreeing to take part in this interview. Your responses are very important to us

1. First, I will like to find out a little about you
2. Please describe how you receive health information and preventive health recommendations such as screening?
4. What comes to mind when you hear about cervical cancer and Pap screening?
5. Please discuss what you know about Human papilloma virus (HPV) and how it contributes to cervical cancer for women
6. Pap screening (or Pap test) looks for precancers, cell changes on the cervix that might become cervical cancer if they are not treated appropriately. Pap screening is recommended for all women between the ages of 21 and 65 years old, and can be done in a health care provider's office or clinic.

What do you think of your wife/partner's participation in Pap screening?

Probes: will you encourage your wife/partner to go for Pap screening to look for abnormal cells in the cervix.

7. Who do you think should decide on whether to go for preventive screening such as Pap screening (the man, the wife or both the man and wife/partner together)
8. How will you support your wife/partner to ensure she is current on Pap screening?
9. We have found that many immigrant women do not obtain Pap screening.  
What are the things that may make it difficult for your wife/partner to obtain pap screening?

10. Please tell me how each of the following things make it hard for women to obtain Pap screening (health insurance, getting appointment, don't know she needs to get screened, no recommendation from provider
11. Can you share your thoughts about how to best provide information and improve awareness about cancer screening in your African community?
12. How can African men be encouraged to be more involved in their wife's /partner's preventive health such as pap screening.
13. I will appreciate any other valuable information you will like to share with me that may affect Africans as they seek preventive health care as we round up this interview.

I appreciate your time. Thank you

## Appendix D: African Immigrant Pap study questionnaire

Q1 Informed consent.

Do you agree to participate?

Yes

No

If No Is Selected, Then Skip To End of Survey

Q2 Participant ID

Q3 What is your age in years?

Q4 What year did you come to live in the US?

Q5 In total, how many years have you spent at school or in full time study (excluding preschool

Q6 What is the highest level of education you have completed?

- No formal schooling
- Less than primary school
- Primary school completed
- Secondary/High school completed
- College/University completed
- Post graduate degree completed

Q7 What is your country of birth?

Q8 What is your marital status?

- Never married
- Currently married
- Separated
- Divorced
- Widowed
- Unmarried couple living together

Q9 Which of the following best describes your employment (main work) status over the past 12 months

- Full time

- Part time
- Self employed
- Working without pay e.g. volunteer work or unpaid internship
- Student
- Homemaker
- Retired
- Unemployed (able to work)
- Disabled/unable to work

Q10 What is your job or profession now? Or if you're not working right now, what was your last job or profession

Q11 During the last year, did you have enough income/money to make ends meet?

- yes
- No

Q12 Can you give an estimate of the annual household income

- Less than \$15,000
- More than \$15,000- \$24,999
- More than \$25,000 -≤\$34,999
- More than \$35,000 -≤ \$49,999
- More than \$50,000
- Don't know

Q13 How many people older than 18 years, including yourself, live in your household?

Q14 How well do you speak English?

- Very well

- Well
- Not well

Q15 Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs or government plans such as Medicare/Medicaid ?

- yes
- No

Q16 People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it? Circle one number on each line.

	None of the time	A little of the time	Some of the time	Most of the time	All of the time
Emotional/informational support					
Someone you can count on to listen to you when you need to talk					
Someone to give you information to help you understand a situation					
Someone to give you good advice about a crisis					
Someone to confide in or talk to about yourself or your problems					
Someone whose advice you really want					
Someone to share your most private worries and fears with					

Someone to turn to for suggestions about how to deal with a personal problem					
Someone who understands your problems					
Tangible support					
Someone to help you if you were confined to bed					
Someone to take you to the doctor if you needed it					
Someone to prepare your meals if you were unable to do it yourself					
Someone to help with daily chores if you were sick					
Affectionate support					



Someone who shows you love and affection					
Someone to love and make you feel wanted					
Someone who hugs you					
Positive social interaction					
Someone to have a good time with					
Someone to get together with for relaxation					
Someone to do something enjoyable with					
Someone to do things with to help you get your mind off things					

Q17 Now we are going to ask you some questions related to your health. How would you rate your health in general?

- Excellent
- Very good
- Good
- Fair
- Poor

Q18 Have you ever had a Pap screening?

- Yes
- No
- Don't Know

Q19 How long has it been since you had your last Pap test?

- Within the past year (anytime less than 12 months ago)
- Within the past 2 years (1 year but less than 2 years ago)
- Within the past 3 years (2 years but less than 3 years ago)
- Within the past 5 years (3 years but less than 5 years ago)
- 5 or more years ago
- Never

Q20 Which of the following best describes how you currently receive your healthcare?

- Regular health provider, like a family health practitioner
- No regular provider, attend public clinic when necessary
- No regular provider, go to the nearest emergency department when necessary
- Other
- Decline to answer

Q21 Has a health care provider ever told you that you could choose whether or not to have the Pap screening

- Yes
- No

Q22 Have you ever been told you needed a Pap screening (vaginal examination for cervical cancer)

- Yes
- No

Q23 Overall, how difficult is it for you to get health information?

- Not difficult at all
- Somewhat difficult
- Difficult
- Very difficult
- Extremely difficult

Q24 Overall, how satisfied are you with your sources of health information?"

- Extremely satisfied
- Very satisfied
- Moderately satisfied
- Slightly satisfied
- Not at all satisfied

Q25 Do you have a primary care provider

- Yes
- No

Q26 About how long has it been since you last visited a doctor for a routine checkup? A routine checkup is a general physical exam not an exam for specific injury, illness or condition

- Within the past year (anytime less than 12 months)
- Within the past 2 years (1 year but less than 2 years ago)
- Within the past 5 years (2 year but less than 5 years ago)
- 5 or more years ago
- Don't know
- Never

Q27 Not including psychiatrists and other mental health professionals, is there a particular doctor, nurse, or other health professional that you see most often

- Yes
- No

Q28 What is your preferred language for health related issues

- English
- Not English
- Other \_\_\_\_\_

Q29 My husband or partner would support me to have pap screening

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Q30 Who do you think should make decision about whether to seek screening?

- Husband/Partner
- Wife
- Both

Q31 Do you want more information about pap screening?

- Yes
- May be
- No

Q32 What type of information will you like to learn ?

Q33 What is the best way to provide pap screening information to you?

- Books
- Brochure
- Family
- Friend/Coworker
- Health care provider (doctor, nurse, pharmacist, others)
- Internet
- Library
- Magazine
- Newspaper
- Telephone information number
- Complementary alternative or unconventional practitioner

Q34 Please provide other options not listed above to provide pap screening to you

Q35 Please answer the following questions. Choose the best option

	True	False	Dont know
Screening tests look for changes a woman's cervix that indicate the woman is at risk for cancer  Women should get screened for cervical			

<p>cancer only if they have symptoms</p> <p>If a woman has abnormal vaginal bleeding, discharge, or pain, she should see a medical provider to get screened for cervical cancer</p> <p>Cervical cancer can be prevented</p> <p>Screening tests can help prevent cervical cancer</p> <p>There is no treatment for cervical cancer</p> <p>HPV is an infection that can cause cervical cancer</p>			
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<p>HPV is spread during close contact like during sexual intercourse</p> <p>HPV infection is always symptomatic</p> <p>Cervical cancer is treatable</p> <p>No cure for cervical cancer</p> <p>Cervical cancer is expensive to treat</p> <p>Nothing can prevent cervical cancer because it is fate or the will of God</p> <p>Screening decreases risk</p>			
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Q36 Please answer the following questions

	Yes	No	Don't know
Ever heard of cervical cancer			
Ever heard of cervical cancer screening			
Ever heard of human papillomavirus (HPV)			
Ever heard of pap screening test			
Knows someone with cervical cancer			
A vaccine to prevent HPV infection is available and is called the HPV shot			

Q37 If you could get the pap screening free or at a low cost, would you get it

- yes
- Maybe
- No

## Vita

### Adebola Adegboyega

#### Education

<u>Institution</u>	<u>Degree earned</u>	<u>Date Conferred</u>	<u>Field(s) of Study</u>
Institute of Medical Laboratory Science. Nigeria	Associate of the Institute of Medical Laboratory, Nigeria	1997, May	Medical Laboratory Science
University of Ado-Ekiti, Nigeria	Post Graduate Certificate	2005, May	Microbiology
University of Kentucky, Lexington, KY	BSN	2012, December	Nursing

#### Professional Experience

<b>Dates</b>	<b>Institution and Location</b>	<b>Position</b>
2016-present	College of Nursing University of Kentucky, Lexington, KY	Predoctoral fellow TL1 CCTS, University of Kentucky
2012-2015	College of Nursing University of Kentucky, Lexington, KY	Graduate Research Assistant.
January 2013-present	University of Kentucky, Good Samaritan Hospital, Lexington, KY. 6 Main	Staff Nurse Acute care services
Summer 2012	University of Kentucky, Good Samaritan Lexington, KY. 6 Main	Summer Practicum Acute care services
Jan 1998-Jan 2006	Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria	Medical Laboratory Scientist Clinical chemistry

#### Scholastic and Professional Honors

2017	Carolyn A Williams award for research
2016	Clinical and Translational Science Program TL1 Pre-doctoral trainee supported by University of Kentucky institutional CTSA from the NIH.
2016	Travel scholarship, Geographical Management of Cancer Health Disparities
2016	Travel scholarship, 2016 National Conference on Health Disparities.
2016	Top 10 student poster. Southern Nursing Research Society, Feb 2016.
2016-2017	UK College of Nursing Millennium Fund Scholarship
2015-2016	UK College of Nursing Millennium Fund Scholarship
2014-2015	Lyman T. Johnson Fellowship, University of Kentucky
2013-2014	Dorothy Luther Fellowship, University of Kentucky, College of Nursing

2012-2012 University of Kentucky Medical Center Enhancement Scholarship  
 2010-2012 University of Kentucky, College of Nursing Dean's List  
 2002-2006 Laboratory Focal Person for Ekiti State, Nigeria  
 1997 Best Graduating Student. Medical Laboratory Science

### Professional Presentations

Date of presentation	*(if peer reviewed). Names, title of presentation, type of presentation, Program title, location of program
April, 2017	*Adegboyega, A & Hatcher, J. Repeat mammography screening among African American women: Qualitative application of the PEN-3 framework. Poster presentation. Association of Clinical Translational Science, 2017. Washington DC
March, 2017	Adegboyega A, Hatcher J. & Dignan M. Determinants of Pap screening among African immigrant women. Podium presentation. CCTS Spring conference, 2017
November, 2016	Adegboyega, A. & Hatcher J. Factors influencing cervical cancer screening decisions among African immigrant. Podium presentation.
November, 2016	Adegboyega, A & Linares, A (2016). Pap screening among African Immigrants- the State of the Science. Poster presentation. Annual Midwest Global health conference, Lexington, KY.
September, 2016	*Adegboyega, A & Hatcher, J. Repeat mammography screening among African American women: Qualitative application of the PEN-3 framework. Poster presentation. American Association of Cancer Researchers Conference. Fort-Lauderdale, Florida
September, 2016	*Hatcher, J., Aroh, A., Adegboyega, A., & Schoenberg, N. Promoting Colorectal Cancer Screening in Rural Appalachian Emergency Departments. Poster presentation. American Association of Cancer Researchers Conference. Fort-Lauderdale, Florida
April, 2016	*Adegboyega, A & Linares, A (2016). Cervical cancer screening among African Immigrants-A literature review. Poster presentation. UK Center for Clinical and Translational Science (CCTS) research day, Lexington, KY.
February, 2016	*Adegboyega, A. & Hatcher J. Factors influencing cervical cancer screening decisions among African immigrant in Kentucky. Poster presentation. Student Research Forum, National Health Disparity Conference. Washington, DC.

February, 2016	*Adegboyega, A., Chung, M., Moser, D., Lennie, T., and Mudd-Martin, G. Psychometric Testing of an Instrument to Measure Cardiovascular Disease Fatalism. Podium presentation Southern Nursing Research Society Conference, Williamsburg, VA
November, 2015	*Adegboyega A., Hatcher J., Frazier S. Predictors of Mammogram Screening in African American Women. Poster presentation. UK Healthcare Nursing Research Day, Lexington, KY.
July, 2015	*Adegboyega, A. & Hatcher J. Perceptions Contributing to Cancer Screening in African- born Immigrants. Poster presentation. Sigma Theta Tau International, San Juan, Puerto Rico.
February, 2014	*Morris, C., Adegboyega, A., Damron, K. R. & Hardin-Fanning, F. Providers' Perceptions of Meaningful Use Mandates. Poster presentation. Southern Nursing Research Society Conference, Tampa, Florida.

### Professional Publications

\***Adegboyega A**, Aleshire M, Linares AM (2017) Examining Cervical Cancer Screening Utilization Among African Immigrant Women: A Literature Review. *International Journal of Women's Health and Wellness* 3:046. 10.23937/2474-1353/1510046

\*Hardin-Fanning, F., **Adegboyega, A. O.** & Rayens, M. K. (April 2017 – in press) Youth's perceptions of a gardening activity at a juvenile justice center. *Journal of Holistic Nursing*

\***Adegboyega, A.**, & Hatcher, J. (2016). Factors influencing Pap screening use among African immigrant women. *Journal of Transcultural Nursing*. DOI:10.43659616661612

\*Culp Roche, A. & **Adegboyega, A.** (2016). Analysis of Kentucky's law protecting the rights of school children with type 1 diabetes mellitus: Application of Kingdon's policy stream model. *Policy, Politics and Nursing Practice*. DOI: 10.1177/152715441662968

\***Adegboyega, A.** & Hatcher, J. (2015) Unequal Access: African Immigrants and American Healthcare. *Kentucky Nurse*, Volume 64 (1), pp. 10-13

\*Brandford A, **Adegboyega A**, Combs B, & Hatcher J. (June 2016) Training community health workers in motivational interviewing to promote cancer screening. *Health Promotion and Practice*. Under Review