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A Qualitative Analysis of Awareness and Perceptions of African Immigrant Men Regarding HPV Vaccine Uptake in Children to Prevent Cervical Cancer

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College of Health Sciences and Public Policy

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Netsai Nancy Mariga Andere

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Walden University

2025

Abstract

A Qualitative Analysis of Awareness and Perceptions of African Immigrant Men
Regarding HPV Vaccine Uptake in Children to Prevent Cervical Cancer

by

Netsai Nancy Mariga Andere

MPH, Georgia State University, 2014

BSN, Jacksonville University, 2011

Doctoral Study Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Public Health

Walden University

February 2025

Abstract

Low Human Papillomavirus (HPV) vaccine acceptance remains one of the most crucial disparities in the US by country of origin among children. The study aims to qualitatively explore the HPV and HPV vaccine awareness and perceptions among African immigrant men to help reduce the HPV-related cervical cancer burden among African immigrants living in the US. The health belief model (HBM) was used for this basic qualitative study of self-reported awareness and perception among African immigrant men in the US with responses from 11 individual interviews. Thematic analysis was utilized to analyze the data collected from the interview responses. Six themes emerged centered on lack of HPV awareness, knowledge of cancer risk, HPV vaccine attitudes, cultural impact, source of information, and role of fathers. Most participants had no HPV awareness and had a low perception of cancer risk, they shared how cultural practices can affect the decisions for HPV vaccine uptake, and highlighted the importance of getting HPV awareness education as well as the role of fathers. Participants shared sources of information that can be instrumental in raising HPV and HPV vaccine awareness, including church gatherings, provider recommendations, or community events. Based on the identified themes, the findings of this study can bring a positive social change regarding fostering an environment that may increase HPV and HPV vaccine awareness, understanding communication methods between fathers and children, and creating avenues for trusted sources of information to disseminate HPV and HPV vaccine information effectively.

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Dedication

This capstone is dedicated to my late parents, Justus and Rumbidzai Mariga (helping to finish the fight for cancer). My parents have been the inspiration behind this research. Additionally, I would like to extend this dedication to my family and friends, who were supportive throughout my studies.

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Section 1: Foundation of the Study and Literature Review

Introduction

African immigrants residing in the United States (US) have suffered low Human Papillomavirus (HPV) vaccination rates in the efforts to prevent cervical cancer. HPV is the most common sexually transmitted disease worldwide and affects both males and females (Al Shdefat et al., 2022). This virus affects at least 42 million people in the United States, and an estimated 99% of all cervical cancers are associated with HPV infection (World Health Organization [WHO], 2021a). The infection with HPV is the leading cause of cervical cancer in women, in addition to other cancers, and the infection causes the initiation of cellular changes from low-grade to high-grade (pre-cancerous) lesions to invasive cancer (Langberg et al., 2022). Thirteen HPV types can cause cervical cancer, and at least one of these types can cause other cancers involving the genital parts and, particularly, head and neck cancers (Centers for Disease Control and Prevention [CDC], n.d.-a).

Various studies show that the HPV vaccine is highly effective in reducing the transfer of the virus and the subsequent diseases associated with the virus (Cheng et al., 2020). In fact, the HPV vaccine is essential to prevent HPV infection linked to cervical cancer and is a public health issue among African immigrants and many other populations worldwide. HPV vaccination can avert more than 90% of HPV-related cancers, and two HPV vaccines (Gardasil and Cervarix) protect against the two strains of HPV types 16 and 18 (Lakneh et al., 2022). The World Health Organization recommends primary HPV vaccination among girls aged 9-14, including secondary target populations

of females aged ≥ 15 (WHO, 2018). The global distribution of more than 100 million doses is proof that the vaccines are effective and safe, as evidenced by the significant reduction in the prevalence of pre-cancerous high-grade cervical abnormalities, genital warts, and cervical cancer incidence. (Al Alawi et al., 2023).

There is an increase in the African immigrant population in the US, and Africa is a region with a high risk of HPV-related cancers with some of the highest incidences and mortality globally (27.6 and 17.5/100,000; Cofie et al., 2022). The harsh economic conditions prevalent in most African countries have fueled a rampant migration of people to affluent nations. The primary drivers for this relocation to other countries comprise the pursuit of job opportunities to alleviate poverty and escape the hazards of violence, oppression, and war (Rami et al., 2023). Thus, there is evidence that increased HPV vaccination rates among African immigrants can help decrease the burden of cervical cancer among African immigrants, whose ethnicity status is a known predictor of late-stage cervical cancer diagnosis and mortality (Xu et al., 2023).

Though there have been consistent suggestions for HPV vaccines among US adolescents for several years, there is still low parental HPV vaccine acceptance, which may be attributed to low awareness, reduced exposure, and lack of solid provider recommendations. (Tsui et al., 2023). Research studies indicate that specific formats of health information may also affect where African immigrants get their health information, how they value the importance of the information received, and how they change their health behavior after getting the information (Cudjoe = et al., 2021). Several studies have investigated awareness and perception of the HPV vaccine among African

immigrant women. Research done includes literature on understanding cervical cancer awareness and prevention among African immigrant women (Adekunle et al., 2021), assessing attitudes towards HPV vaccine by immigrants from sub-Saharan Africa (Adegboyega et al., 2022) and HPV vaccine uptake among daughters of Latinx immigrant mother (Scarinci et al., 2020). However, little is known regarding the lack of awareness and perception among African immigrant men who are influential when health behavior decisions are made for their children and families (Netfa et al., 2020).

Problem Statement

The HPV vaccine is critical to tackling the uneven distribution of cervical cancer incidences (Illah & Olaitan, 2023). An estimated 99% of all cervical cancers are associated with HPV infection, a widespread virus transmitted by sexual contact (World Health Organization, 2021a). The highest HPV prevalence is in sub-Saharan Africa (24%), compared to Eastern Europe (21.4%), Latin America (16.1%), Northern America (4.7%), and Western Asia (1.7%). In 2019, the percentage of adolescent girls between 13 and 17 who had at least one HPV vaccine rose to 73.2% (Illah & Olaitan, 2023). However, despite this increase, the immigrant population is a disadvantaged group with generally underprivileged access to care due to socioeconomic, cultural, and language barriers (Kenny et al., 2021). There is very little literature on the perception and awareness of HPV and the HPV vaccine among African immigrant men living in the United States. Thus, the purpose of this doctoral study was to qualitatively explore the awareness and perception of the HPV and HPV vaccine among African immigrant men

living in the US regarding the acceptance of the HPV vaccine for cervical cancer prevention among their children.

Purpose of the Study

This qualitative study explored the awareness and perceptions of HPV and HPV vaccines among African immigrant men residing in the US concerning preventing cervical cancer among their children. Low HPV vaccine acceptance remains one of the most crucial disparities in the United States. Research assessing the disparities in HPV vaccine uptake by country of origin shows that children with foreign-born parents are less likely to be vaccinated than children with U.S.-born parents (Anuforo et al., 2022). Given the growing number of African immigrants in the United States, understanding the HPV and HPV vaccine awareness and perceptions among African immigrant men is crucial because it will fill the gap of increasing HPV awareness and perception to help reduce the HPV-related cervical cancer burden among African immigrants living in the US. Moreover, the study findings will assist decision makers like the Centre of Disease Control in appreciating the various causes of the low acceptance of the vaccine amongst the immigrant process and thus come up with appropriate measures to both encourage the uptake of the vaccine and the mitigation of the spread of the virus to other populations.

Research Questions

The research questions (RQ) of the study are described below.

RQ 1: What are the perceptions of risk regarding cervical cancer in their children among African immigrant men living in the US?

RQ2: What is the level of awareness of African immigrant men living in the US regarding HPV vaccine and cervical cancer prevention in their children?

RQ3: What are perceived factors of influence among African immigrant men living in the US regarding cervical cancer prevention in their children?

Theoretical Framework

The health belief model (HBM) was used for this study to explore the awareness and perception of HPV and HPV vaccines for preventing cervical cancer among African immigrant men. HBM has been widely used to help understand individuals' likelihood of participating in healthy behaviors to prevent or control diseases (Rosenstock, 2000).

HBM is frequently used in health behavior, explaining determinants such as HPV vaccine uptake (Lubeya et al., 2022). The HBM consists of six constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and cues to action (Alsulami et al., 2023).

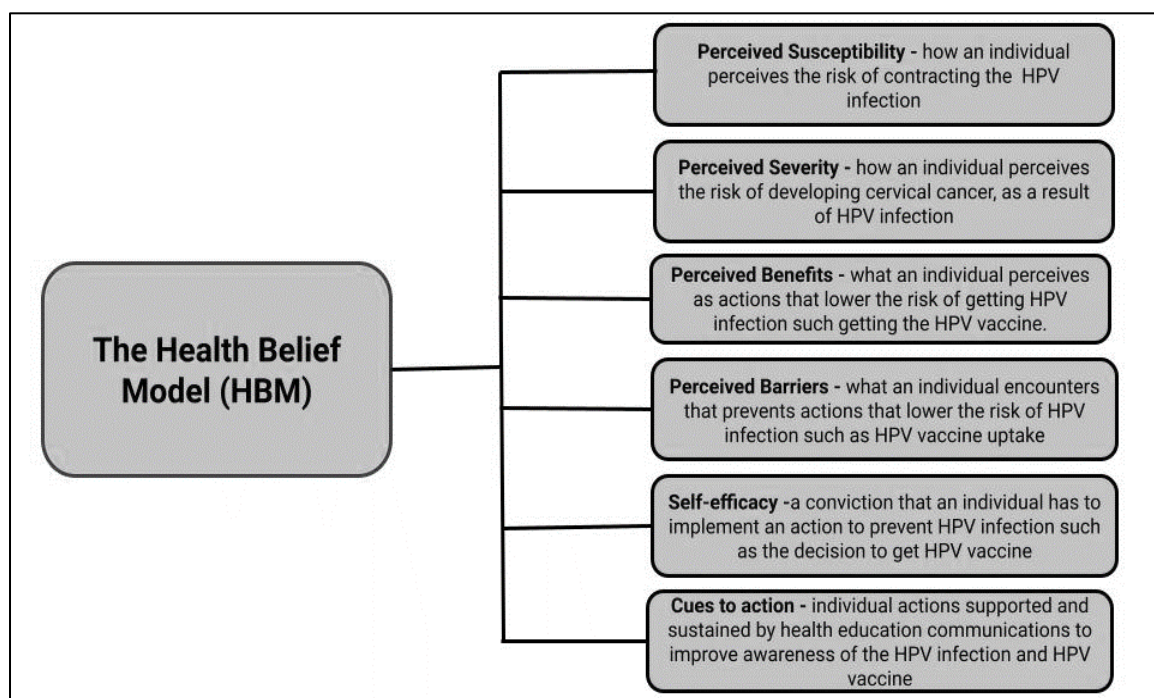
The basic principle in the HBM is that individuals will act to fend off ill-health conditions if they deem themselves susceptible to the condition (Rosenstock, 2000). On the other hand, individuals will take action if they believe a particular health behavior or action will be beneficial in decreasing either their susceptibility to a disease or the severity of the condition (Rosenstock, 2000). Using the HBM, a person determines the potential benefits of preventing cervical cancer by getting the HPV vaccine. A person may decide to get immunized or support a child's vaccination with the HPV vaccine by balancing perceived susceptibility and severity and considering perceived benefits if an action or behavior change occurs (Arwa et al., 2019).

The HBM centers on disease prevention and demonstrates the association between beliefs and behaviors with the central concept that disease-preventive behaviors are affected by the perceived variables of benefits and barriers, thereby guiding health actions (Mohammadi et al., 2023). The process of deciding to get the HPV vaccine to prevent cervical cancer for oneself or a child depends on how the person perceives how dangerous the disease is to the individual as well as the perception of how the vaccine can protect the individual from the disease (Rajeh et al., 2023).

Figure 1 below shows how the Health Belief Model was used to understand the determinants of HPV vaccine uptake.

Figure 1

The Health Belief Model



Note: Figure developed using concepts from Rajeh et al., 2023.

Perceived susceptibility is about the perception of risk or proneness of contracting a disease (Yenew et al., 2023), in this case, the HPV infection that can lead to the development of cervical cancer. Perceived susceptibility is an individual's perception of the risk of developing the disease (Rajeh et al., 2023). In this regard, the perceived severity of a disease like cervical cancer is dependent on how individuals regard the magnitude of the disease as severe (Rajeh et al., 2023). Perceived severity also includes the beliefs concerning the seriousness of catching a particular disease or condition and the consequences (Ghorbani-Dehbalaei et al., 2021). The decision to get the HPV vaccine is dependent upon how severe the individual or parent views regarding contracting the HPV virus as well as the magnitude of contracting the illness. It is crucial to understand how deeply African immigrant fathers view HPV infection as a threat to their children's health concerning the development of cervical cancer.

Research has shown that those who feel threatened or deemed to have an increased risk of contracting or developing the disease develop the need to get vaccinated (Rajeh et al., 2023). However, health literacy affects perceptions and beliefs about preventive health behaviors, including vaccination decisions and other health beliefs (Shon & Lee, 2023). Research has further shown that health literacy and beliefs, especially perceived susceptibility, correlate to preventive health behaviors (Ghorbani-Dehbalaei et al., 2021). Perceived susceptibility to HPV infection among African immigrant men is unknown, and it is vital to understand how this population perceives the risk of HPV infection among their children concerning cancer prevention.

Perceived benefits are about personal opinions on what can lower the threat of disease, yet various barriers prevent people from getting vaccinated against diseases like cervical cancer (Rajeh et al., 2023). In other words, the notion relates to the belief that an action will bring positive change by decreasing the threat that a disease like HPV infection can cause (Yenew et al., 2023). Suppose people believe there is a passable danger to life by developing a disease, the pros of engaging in the health behavior outweigh the disadvantages, and they can effectively participate in the behavior; they will be more likely to do so (Kroke & Ruthig, 2022). It is crucial to understand how African immigrant men perceive and believe in reducing the threat of HPV infection among their children concerning cervical cancer prevention.

The perceived barriers concerning HPV vaccination have to do with what people encounter to decrease the probability of acting to protect against the disease (Rajeh et al., 2023). There are multilevel barriers that affect people, prohibiting the uptake of the HPV vaccine. Individual barriers include medical mistrust, vaccine safety concerns, misinformation, no perceived need, and a lack of awareness (Jin et al., 2023). Interpersonal barriers include a lack of provider recommendations and a lack of recommendation strength. In contrast, community-level barriers include a lack of vaccine-related public education, social and religious norms, no policy requirement in schools, and issues in the healthcare system (Jin et al., 2023). People require prompts in the form of HPV vaccine information to influence the action of the HPV vaccine. Furthermore, for individuals to be able to identify and act, people also should be able to develop psychological readiness to act (Rajeh et al., 2023).

Self-efficacy is the conviction that an individual has to implement a health behavior resulting in a positive outcome (Rosenstock, 2000). Self-efficacy regarding HPV vaccination behavior refers to community-specific beliefs in the ability to act and produce desired outcomes, and higher self-efficacy is associated with greater adherence to HPV vaccine recommendations (Prior et al., 2022). It is the belief in an individual's power to accomplish a task and is linked to social norms and plans to get vaccinated with the HPV vaccine acceptability (Stout et al., 2020). Understanding African immigrant men's ability to take action to have their children get vaccinated against the HPV vaccine to prevent cervical cancer is crucial. Regarding cues to action, these actions should be supported and sustained by interventions such as health education communications or media campaigns taking into cultural considerations to improve awareness and attitudes (Maseko et al., 2021). Besides individuals being able to identify and implement cues to action, they also need to develop a mental eagerness to act on them (Rajeh et al., 2023). It is essential to understand how African immigrant men identify cues to action concerning the HPV vaccine uptake.

Nature of Study

The research questions in this study were addressed using a qualitative analysis of primary data. The research design includes a basic qualitative study of self-reported awareness and perception among African immigrant men in the US with responses from individual interviews. Data analysis followed Saldana's (2016) various coding processes, such as a priori, descriptive, affective, and pattern coding in the first cycle. Analyzing the

codes helped to identify categories that were divided into themes, phrases deducted from these categories, and the themes used for thematic analysis.

Literature Search Strategy

Various databases were used in the literature review to find published studies associated with the problem, the study's purpose, and the conceptual framework. The databases comprise various peer-reviewed journals such as Science Direct, CINAHL Plus, ProQuest, MEDLINE, Open Access Journals, and PubMed. Appropriate articles were located using the Walden University Library and Google Scholar. The keywords included *human papillomavirus (HPV)*, *HPV vaccination*, *cervical cancer prevention*, *immigrant men*, *fathers*, *parents*, *refugees*, *experiences*, *perception*, *knowledge*, *vaccination attitude*, *cervical cancer*, *United States health belief model*, and *theoretical framework*. Filters were used to limit research published within the last 5 years, but the search will be amplified to find significant research relevant to the study, including the theoretical model.

Literature Review Related to Key Concepts

Background

The disparity in HPV vaccine uptake among African immigrants in the US is a critical public health issue similar to that in other countries worldwide. HPV vaccine is widely available in the US to prevent HPV infections that cause cervical cancer as well as other cancers. Despite the access to the HPV vaccine in the US, inequalities in the incidence of cervical cancer and other HPV-related cancers continue to persist among racial/ethnic minority and immigrant populations (Anuforo et al., 2022). It is crucial to

ensure the vaccination of both sexes, as failure to do so will result in the infection of the opposite sex by the other (Brouwer et al., 2019). HPV vaccination for girls and boys 13-17 was recommended in 2011 (Anuforo et al., 2022). Two of the HPV vaccines are 6-12 months apart for females and males under 15 years old; three doses are recommended for those above 15 years by the Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices (Cofie et al., 2022). From 2012-2016, in the US, there were approximately 34,800 cancers associated with HPV infection, and almost 32,000 of these new cancers would have been prevented using the 9-valent HPV vaccine (Aragones et al., 2022).

Although HPV vaccinations have consistently been advocated for adolescents in the US for several years now, low parental HPV vaccine acceptance still persists. This can be attributed to low awareness, reduced exposure, and a lack of solid provider recommendations. (Tsui et al., 2023). However, compared to US urban populations, the rural counterparts have a higher incidence of HPV-related cancer and lower HPV vaccine uptake. This variation is mainly attributed to a lack of information and varying cultural beliefs and stigma associated with the vaccine uptake (Peterson et al., 2020). Research has shown that parental reasoning variable that consists of hesitancy, beliefs, and knowledge concerning HPV, and its vaccine can play a significant part in making decisions for HPV vaccine among their children (Jin et al., 2023). Some parents actually argue that uptake of the vaccine promotes sexual activity during adolescence (McKenzie et al., 2023). Some of the views about HPV are also influenced by interpretations of religious beliefs and expectations around sexual behavior (Pratt et al., 2019). Health

information communication directed towards parents plays a significant role in instilling awareness among parents and guardians. There is limited information on how African immigrant men learn about the HPV vaccine for use in their children to prevent cervical cancer. Research studies indicate that specific characteristics of health information may also impact where African immigrants get their health information, how they value the importance of the information received, and how they change their health behavior after getting the information (Cudjoe et al., 2021).

African Immigrants

There has been an increase in human migration over the past 50 years, with an estimated 281 million international immigrants living outside their birth country as of 2020 (Jefferis, 2020). While migrant resettlement inside the African continent has risen since 2000, the highest movement of migrants has been a movement of African immigrants from Africa to more developed countries like the US, with an estimated number of African migrants living in Europe (9 million), Asia (4 million) by 2015 (Fouche et al., 2021), and North America (over 2 million; Nkimbeng et al., 2023). There is a growing African immigrant population, with an estimated 2.1 million sub-Saharan African immigrants residing in the United States alone in 2019, which accounts for 5% of the total foreign-born population of 44.9 million (Lorenzi & Batalova, 2022).

Given that not all host countries have standard vaccination programs, there is a need to assess and characterize the vaccination rates among immigrants since the vaccination rates in their countries of origin are often low. (Rami et al., 2023). Additionally, studies usually combine the experiences of African immigrants with those

of African Americans or Afro-Caribbean descent. By assuming all Black individuals in the United States are alike, researchers overlook the significant differences in cultural backgrounds, migration experiences, and health behaviors among these distinct groups. (Malika et al., 2020). Understanding the influence on African immigrants with regard to HPV and HPV vaccines is critical to help improve the HPV vaccine uptake.

In the US, HPV vaccination rates for immigrant children are significantly lower compared to rates of HPV vaccination among US-born parents (Guo et al., 2023). Approximately 18.1 million children have at least one foreign-born parent family (Guo et al., 2023). A previous study has shown some HPV vaccine awareness among immigrant women from Cameroon (Nji, 2016). However, little is known about HPV vaccine awareness among African immigrant men. Therefore, there is a need to explore the perception and awareness of this vaccine among African immigrant men (Nji, 2016). African families regularly rely on their husbands' or fathers' support regarding health behaviors, including vaccine uptake and cervical cancer prevention (Adegboyega et al., 2019).

There is a need to understand the awareness and perception of the HPV vaccine among African immigrant men concerning preventing cervical cancer among their children. There is evidence that African male heads of households have little or no knowledge about HPV, cervical cancer screening, or the disease (Dsouza et al., 2022). HPV vaccine acceptance remains low because of inadequate HPV knowledge (Jensen et al., 2024).

Lack of awareness and perception among African immigrant men will enable critical gaps to continue in public health professional knowledge of what impacts African immigrants regarding public health policies and practices related to the health and well-being of this target population (Fouche et al., 2021). The factors influencing African immigrant men's unwillingness to vaccinate their daughters are not well-known (Guo et al., 2023).

Decision-makers in families must be aware of the HPV vaccine because misinformation and lack of awareness are among the most common causes for developing a hesitant attitude toward vaccinations (Poirier et al., 2021). Furthermore, even though vaccination is usually a requirement for immigration purposes, many immigrant populations have lower immunization rates and a higher burden of illnesses like cervical cancer that can be prevented by using vaccines compared to non-immigrant individuals (Tankwanchi et al., 2021). Additionally, a study about Somali immigrants shows that knowledge, awareness, particular religious or cultural considerations, embarrassment or modesty, fear, language barriers, inconvenient clinic hours, and childcare necessities have been classified as barriers to the HPV vaccine uptake (Allen et al., 2019).

Preventing cervical cancer among African immigrants is imperative to help reduce the disease burden among this target group. Increasing the understanding of the association between migration and health is significant progress regarding developing specific and practical approaches that address the health needs of immigrant populations that are regarded as vulnerable, including children and young people (Fouche et al.,

2021). Understanding the awareness of cervical cancer prevention among African immigrants is essential to address the barriers that the target population may be facing.

Cervical Cancer and Prevention

Cervical cancer is among the leading occurring cancers, ranking fourth among the leading cancers worldwide, with 90% of the new diagnoses and deaths arising in low- and middle-income countries (O'Neill & Dwyer, 2023). There are high cervical cancer rates among sub-Saharan women, with rates of >40 per 100000, which are three times more than the global rates of 13.1 per 10000 (Adegboyega et al., 2022). The problem of high cervical cancer rates among sub-Saharan is not just a public health issue not only globally but also in the US, where there has been an increase of 130000 to an estimated 2 million immigrants from that region between 1980 and 2018 (Echeverria-Estrada & Batalova, 2019). Black immigrant females lack the same wide-ranging national policies and strategies for the prevention of cervical cancer. That is why cervical cancer is the most frequently diagnosed cancer among African females and the leading cause of cancer death, accounting for nearly 25% of total annual new cancer cases and deaths among this population (Amuta-Jimenez et al., 2022). Given this public health issue, it is paramount that the barriers that prevent primary interventions against cervical cancer are understood.

Research about primary cervical cancer prevention, including HPV vaccination, needs to be categorized by specific cultural background to understand better the awareness and perception of target populations like African immigrants. Studies on cancer prevention among ethnic/racial minorities in many various developed countries such as the US frequently examine Black females as the same group of people even when

evidence shows that the health behaviors of these subgroups are affected by diverse cultural, organizational, and socio-demographic elements (Cudjoe et al., 2021).

Understanding the effect of the different Black female sub-groups, namely African immigrants, Afro-Caribbean, and native-born Blacks, is crucial.

There has been a rise in HPV-related cancers from 41% before 2000 to 72% in 2010 (McGuire et al., 2023), with HPV linked to over 99 % of cervical cancers (O'Neill & Dwyer, 2023). In the US, there has been a decline in overall cancer mortality rates since the 1990s; still, ethnic minorities, including African immigrants, continue to bear a higher burden of cancer incidence, morbidity, and mortality (Smith et al., 2023). Several studies have shown that immigrant women are at higher risk for underutilizing screenings for cervical cancer compared to US-born women (La Frinere-Sandoval et al., 2022).

Efforts to prevent cervical cancer among African immigrants should start at the primary prevention level by vaccinating those eligible for the HPV vaccination as recommended by the CDC (Smith et al., 2023). Effective HPV primary prevention through vaccination and secondary prevention strategies, such as screening and treating precancerous lesions, will prevent most cervical cancer cases (World Health Organization, 2021b). In 2020, WHO started a campaign to eradicate cervical cancer by preventing, screening, and treating HPV-associated cervical cancers (Poirier et al., 2021). The targets for the WHO strategy include 90% vaccination rates, 70% screening rates, and treatment for 90% of the invasive cancers for women in all countries by the year 2030 (WHO, 2021b). It is critical for public health professionals to understand the

barriers that African immigrants face to help reduce this cancer burden among African immigrants in the US.

Human Papillomavirus

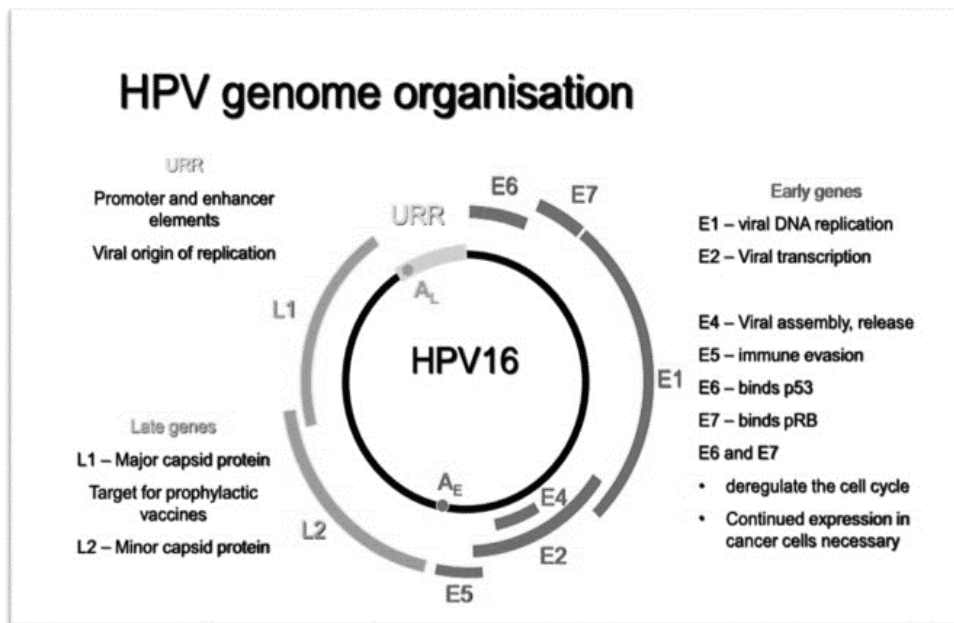
Human papillomavirus (HPV) is a group of viruses transmitted through skin-to-skin sexual contact, and it is a virus that has been associated with various cancers, including cervical cancer (Mohammadi et al., 2023). The HPV virus is an obligate intracellular parasite that gets into a human host cell via a minute cut in the epithelial layer of the skin and begins to multiply and increase in number (Alghamdi et al., 2021). HPV viruses use human cellular proteins to replicate and maintain life (Tahmasebi et al., 2023). The virus genome comprises open reading frames and long control regions to control the repetition and transcription of primary genes (Tahmasebi et al., 2023).

There are different types of HPV, which are categorized into high or low-risk carcinogenic, with cervical cancer frequently linked to high-risk carcinogenic HPV (Kutz et al., 2023). More than 220 HPVs have been discovered and organized into five categories: alpha, beta, gamma, mu, and nu, and these include 14 genotypes known to be high-risk (HR) HPVs (Mina Mobini et al., 2023). It is crucial to understand the categories of HPV viruses as they affect people differently. The viruses categorized as HR HPV are associated with the development of cervical cancer and the ones categorized as LR HPV are related to the development of skin lesions known as warts (Alghamdi et al., 2021).

Figure 2 below is an image showing the genetic make-up of the HPV virus.

Figure 2

The HPV Genome



Note: The HPV genome organization from “Understanding the public health value and defining preferred product characteristics for therapeutic human papillomavirus (HPV) vaccines: World Health Organization consultations, October 2021—March 2022,” by Prudden (2022). *Vaccine* 40(41), p.5843–5855.

<https://doi.org/10.1016/j.vaccine.2022.08.020> Copyright 2022 by Prudden: *Vaccine*.

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Understanding the genetic makeup of the HPV virus is crucial to appreciate how the HPV vaccine works against it. The HPV genome (Figure 1) can be divided into three areas, i.e., the upper regulatory region (URR), the early ϵ gene, and the late (L) genes (Prudden et al., 2022). The early region of papillomavirus genomes is over 50% of the virus genome and encodes six shared open reading structures, namely, E1, E2, E4, E5,

E6, and E7, that transform individual proteins (Zheng & Baker, 2006). The late region of all papillomavirus genomes covers about 40% of the virus genome, lies downstream of the early region, and encodes L1 and L2 ORFs for translation of a major (L1) and a minor (L2) capsid protein. The URR is the noncoding region comprising regulatory elements that control the expression of the eight viral genes that comprise the remainder of the genome (Prudden et al., 2022).

HPV replication is dependent on the replication of a human cell as they do not have their own, and the intrinsically separated latent cells must be made to replicate again, which the viruses accomplish with E6 and E7 activity (Sunyoung et al., 2023). All current highly effective prophylactic HPV vaccines target L1. The most common cause of cervical cancer and the deregulation of standard patterns of the HPV virus gene expression is the integration of the virus genome into host chromosomes (Xuerong et al., 2021). HPV genotypes 31, 33, and 58, along with HPV-45 and 52, are associated with approximately 15% of cervical cancers and 11% of HPV-related cancers that can be prevented by using a 9-valent vaccine (Mina Mobini et al., 2023).

HPV Infections

Public health leaders must increase HPV vaccinations to all target populations, especially preadolescent girls, to help prevent the risk of cervical cancer (Tobaiqy et al., 2023). Vaccines against HPV types 16 and 18 are accessible to the target populations, and research has shown that HPV vaccines can decrease the incidence of cervical and other anogenital cancers (Tobaiqy et al., 2023). Reducing the risk of infection by this virus is necessary to help prevent cervical cancer. WHO guidelines now recommend the

detection of HPV DNA as the main screening method to prevent cervical cancer (Martinelli et al., 2023). The HPV vaccine can eradicate ninety percent of all cervical cancers, particularly the bivalent and quadrivalent vaccines that target the two main high-risk genotypes 16 and 18, which are associated with an estimated 70% of cervical cancer globally (Kutz et al., 2023). In addition to HPV genotype as a predictor of cervical cancer development, the viral load has also been described as a significant predictor of cervical intraepithelial neoplasia grade 2 or more (CIN2+) as well as cervical intraepithelial neoplasia grade 3 or more (CIN3+) (Martinelli et al., 2023).

The persistent infection with HPV and the higher viral load pose the most significant risk concerning the development of cervical cancer risk (Xuerong et al., 2021). Another risk factor for HPV infection is co-infection with other diseases. HPV prevalence in sub-Saharan Africa shows that women living with HIV had a greater incidence of HPV (54%) and of co-infections with various forms of HPV (23%) compared to women without the HIV infection, respectively, 27% and 7% (Okoye et al., 2021). The simultaneous infection of HPV human immunodeficiency virus (HIV) will increase the risk of chronic HPV infections, thereby increasing the risk of developing cancers such as cervical cancer.

Previous research in high-income countries has shown that HPV tests have effects linked to getting HPV-positive outcomes (Swai et al., 2023). In fact, an HPV-positive outcome can affect sexual relationships, resulting in partners failing to disclose their status to their partners out of the fear of stigma associated with the virus (Swai et al., 2023). Public health leaders must thus increase HPV vaccinations to all target

populations, especially preadolescent girls, to help reduce such incidences and also prevent the risk of cervical cancer (Tobaiqy et al., 2023). Vaccines against HPV types 16 and 18 are accessible to the target populations, and research has shown that HPV vaccines can decrease the incidence of cervical and other anogenital cancers (Tobaiqy et al., 2023). The African immigrant population is one group growing in the US. The use of HPV vaccines can eradicate health disparities in HPV-attributable cancers in immigrant parents and their children (Kim & LeClaire, 2019).

The acceptance of the HPV vaccine among immigrants is still less than optimal (Kim & LeClaire, 2019). A study by Guo et al. (2023) showed that out of all the immigrant parents who were informed about the availability of the HPV vaccine and the vaccination procedures, 48% were not keen to vaccinate their daughters, with the highest prevalence rates of unwillingness among African immigrants' parents. African immigrants are not a similar group of people, and they come from different environments with diverse upbringings, ethnicities, cultures, diets, and reasons for relocation (Dunajcik & Cunningham, 2023). Understanding how these diverse populations understand the impact of HPV vaccinations among their children is crucial for public health professionals to prepare programs that can increase HPV vaccine uptake among African immigrants in the US.

African immigrant men may face different influences based on their country of origin. The diversity in origins for African immigrants is reflected by the variety in motivations for emigrating to the United States, with the arrival of refugees from war zone countries such as Ethiopia, Somalia, and the Democratic Republic of the Congo

(DRC), high-skilled immigrants and international students from Nigeria, Kenya, Ghana, and South Africa, Diversity Lottery visas beneficiaries from countries such as Liberia and Cameroon, and family members joining immigrants already living in the US (Echeverria-Estrada & Batalova, 2019). It is essential to understand the impact of different cultures regarding the decision of getting children to get the HPV vaccine to help protect against cervical cancer.

Risk Factors for HPV Infection

Various risk factors may contribute to getting infected with the HPV infection. Many of the modifiable factors include the age at which an individual becomes sexually active and the number of lifetime sexual partners they have (Prudden et al., 2022). It is necessary to target adolescent girls in the prevention efforts against HPV infection. In the US, the current age of consent regarding sexual intercourse varies among states, but for the majority, it is 16 years (Glosser et al., 2004). Recommending the HPV vaccination before this age can provide sufficient protection against the infection (Sunyoung et al., 2023), as there is a biological susceptibility in younger females connected with the cervical transformation zone that is undergoing active metaplastic changes (Prudden et al., 2022).

Understanding the awareness of African parents regarding their children engaging in sexual activities at an early age and also including the risk of having multiple sexual partners can help to prevent the HPV infection. Actually, for most parents, sex education and talk is a difficult conversation which is often never initiated regardless of the positive role of consistent parent–child communication for sexual health and

relationships (Mulholland, 2023). Sex education actually helps prepare youths to have responsible attitudes and behavior toward sex for a harmonious sexual life (Ademuyiwa et al., 2023). However, in Africa, it is often a taboo for parents to engage in any form of communication involving sex as the African community is conservative, and this significantly contributes to the sensitization of Africans and African migrants on HPV and the risks associated with the virus.

Research has shown that long-term repeated infection of some subtypes of HPV is a risk factor for cervical cancer development in women (Luan, 2023). Additionally, individuals who are immunocompromised, such as those living with HIV, are at risk of having persistent HPV infections, thereby increasing the chances of progression to pre-cancers and cancers than the general population (Lubeya et al., 2022). Other immunocompromised individuals are those who have had organ transplants. Females who are on immunosuppressive treatment post-organ transplantation are at an increased risk for developing cervical cancer because of their susceptibility to HPV infections, driving the process of cervical tumor development (Sunyoung et al., 2023).

Other risk factors that may contribute to the HPV infection and development of cervical cancer include exogenous behavioral elements such as tobacco smoking, having had multiple pregnancies, infection with other sexually transmitted diseases (STDs), and the individual's immune response (Yamaguchi et al., 2021). Infection by other STDs compromises the immune system and further makes one more susceptible to HPV, a virus thought to be the most prevalent sexually transmitted infection (Oyouni & Health, 2023). Smoking is also believed to either increase the risk of HPV infection or reduce the

clearance of the virus, thereby leading to an increased risk of cervical cancer (Sunyoung et al., 2023). Practicing healthy lifestyles, avoiding modifiable risk factors and getting vaccinated is crucial to prevent infections like HPV. Understanding the awareness of these risk factors among African immigrant men is important to help prevent HPV infection in their children as they grow up.

History of HPV Vaccine

Various treatment formulas for HPV are being explored, and the HPV vaccine remains the most viable method for fighting the virus (Malik et al., 2023). The development of the HPV vaccine began after German virologist Harald zur Haus discovered the presence of HPV-18 cells from the HeLa cells he biopsied HeLa from an African American woman called Henrietta Lacks, who died from cervical cancer at age 31 years (Illah & Olaitan, 2023). In 1983, a researcher named Gissman established that papillomavirus DNA related to but not identical with that of the papillomavirus responsible for genital warts could be found in a majority of tested cervical cancer specimens (Frazer, 2019). It became proven in 1999 that persistent HPV infection was a precursor for the development of most invasive cervical cancer (Illah & Olaitan, 2023).

Various research teams from the University of Rochester in New York, Georgetown University in Washington, DC, and Queensland University in Brisbane, Australia, led to the production of either the Merck or GlaxoSmithKline vaccine, and both vaccines, centered on the L1 protein of the papillomavirus assembling into virus-like particles that stimulate counteracting antibodies against HPV (Joi, 2022). Vaccines to prevent the HPV became first available in 2006. The vaccines help to prevent the

infection with the HPV strains most likely to cause genital warts or cervical cancer (Kutz et al., 2023).

Currently, there are six approved HPV vaccines namely three bivalent, two quadrivalent, and one and the WHO has prequalified four of these licensed vaccines (Kutz et al., 2023). There are two vaccines available, namely, a bivalent (HPV2) and a quadrivalent (HPV4) vaccine, and they are given as a 3-dose series as routine vaccination (Elebiyo, 2023). Vaccines have been gradually made available to countries worldwide. Various national programs have been introduced in different countries. However, research studies and international organizations have reported that both vaccine introduction and coverage achieved are still sub-optimal (Bruni et al., 2021). According to the Centers for Disease Control and Prevention (CDC, n.d.-b), only the Gardasil-9 HPV vaccine is available in the US since 2016 and protects against nine HPV types (6, 11, 16, 18, 31, 33, 45, 52, and 58).

Vaccine Hesitancy

Safe and effective vaccines are instrumental in protecting against diseases. However, vaccine hesitancy has brought challenges to successfully implementing HPV vaccine programs. Vaccine hesitancy was explained by the World Health Organization SAGE working group as a behavior influenced by the effects of confidence, complacency, and convenience (Karafillakis et al., 2019). Vaccine hesitancy is increasing and has become a public health concern worldwide. The concern deepened further during the COVID-19 pandemic particularly in diverse race/ethnic communities that are disproportionately affected by preventable conditions like HPV-related cancers (Shin et

al., 2023). HPV vaccine hesitancy has increased due to the viral spread of deceiving information on social media concerning the safety of HPV vaccination (Milondzo et al., 2022). Public health communications should address any misinformation circulating in social media to help advance the HPV vaccination efforts among African immigrants.

There are barriers and facilitators to HPV vaccine among African immigrants and Africans in general. Barriers that contribute to vaccine hesitance among this population have been linked to parental confidence in HPV vaccine safety due to various circumstances such as parental vaccination knowledge, education level, cultural beliefs, and influences from media messages (Patel & Berenson, 2013). Research has shown that many parents have faced incorrect information regarding the HPV vaccine from social and other internet platforms, thereby negatively affecting their acceptance and decision-making processes for HPV vaccination for their children (Shin et al., 2023). Furthermore, various studies have shown that parental perceptible variables that comprise beliefs, hesitancy, and awareness of HPV and its vaccine can affect the decision-making for adolescent HPV vaccination (Jin et al., 2023). African immigrant men as fathers' perception may contribute to the HPV uptake in their children.

African men, in their roles as fathers, play an important role in the HPV vaccination among their children regarding cervical cancer prevention. Therefore, to achieve the best HPV vaccination rates among African immigrants, it is crucial to understand the influences related to awareness concerning this vaccination (Gauna et al., 2023). Several factors may contribute to the lack of awareness and understanding regarding the HPV vaccine among African immigrant fathers, and it is crucial to

understand the level of awareness and perception of the HPV vaccine in this community to help address the challenges they may be facing. The understanding of HPV and HPV vaccines in fathers to prevent cervical cancer among their children is a crucial aspect of HPV vaccine uptake (Elebiyo, 2023). Research has also shown that parents who have medical mistrust are more than likely to hesitate when it comes to HPV vaccine acceptance (Tsui et al., 2023). Having medical trust is a principal element when it comes to getting vaccinated. There is limited knowledge of how medical mistrust affects African immigrant fathers concerning HPV vaccine use among their children.

African immigrants in the US may face other barriers that US-born individuals do not regularly encounter that prevent them from getting the recommended vaccines. Research has shown that political conversations have powered discrimination and segregation of immigrants as well as restrictive policies that essentially block good quality healthcare to people experiencing poverty and prohibit access to universal health coverage to immigrants, especially undocumented migrants, represent a significant barrier to immunization as vaccine hesitancy (Tankwanchi et al., 2021). Vaccine hesitancy may arise from extensive social and cognitive practices that go beyond the understanding and acceptance of scientific evidence concerning the safety and effectiveness of vaccines (Troiano & Nardi, 2022).

African immigrants in a new host country may face different challenges while blending in with US culture, which may affect their health behaviors. African immigrants arrive from different African countries with diverse languages, beliefs, values, and upbringings and struggle to select how much of their original culture to preserve and how

to adapt to the new environment (Alsulami et al., 2023). This process of blending into another country can influence the health-seeking behaviors of immigrants, and it is crucial to understand how this transformation from one environment to another affects African immigrant fathers with regard to HPV vaccine uptake decision-making for their children to prevent cervical cancer. Also, perceived risks of the vaccine include adverse effects, which frequently require skilled providers to provide information so people must rely on expert guidance concerning the prevalent risks (Wilson, 2021). It is crucial to examine how these can be a barrier to the lack of HPV awareness among African immigrant fathers that may influence the uptake of the vaccine among their children. Furthermore, unequal access to HPV vaccines to fight against HPV infection is likely to intensify cervical cancer disparities in the future (Liu et al., 2022).

Vaccination in Africa

Regardless of the introduction of HPV vaccinations to most countries, vaccination rates in most African countries have not been to par, with HPV vaccination uptake reported to be lower than the 90% required to achieve herd immunity for HPV (World Health Organization [WHO], 2020). Only 31% of African countries have rolled out the HPV vaccine campaign in their national immunization programs, compared to 77% and 85% of countries in Europe and the Americas, respectively (Ledibane et al., 2023). As of 2019, just 17 out of the 46 countries (37.0%) in sub-Saharan Africa had well-known nationwide HPV vaccination programs (Okoye et al., 2021). Furthermore, research shows that HPV vaccine coverage is more extensive in Northern Africa (35.6%) than in sub-Saharan Africa (1.2%) (Klein et al., 2020). The average vaccine uptake rate of HPV

programs in the sub-Saharan region achieved 68% for the first and 53% for the last dose of HPV (Bruni et al., 2021).

In Zimbabwe, the first campaign that began in May 2018 covered approximately 83% in one week for the first dose that targeted several primary schools in various constituents.(Garon et al., 2022). The campaign targeted all girls aged 10-14 years. The second vaccination campaign done in May 2019 achieved 67% coverage for the second dose of the multiple cohorts and 91% coverage for the first dose of the single cohort (Garon et al., 2022). HPV vaccination rate targets should align with the Immunization Agenda 2030 and the Sustainable Development Goals Agenda (goals # 3.4 and 3.b.1; WHO, 2020). Some known barriers to HPV vaccine uptake comprise of individual, structural, economic, community/social, and cultural challenges facing different African countries (Lubeya et al., 2022).

Acceptance

The low HPV vaccine uptake among African immigrants in the US is due to various reasons. One significant factor is the misunderstanding or lack of awareness regarding the HPV and HPV vaccine, even among well-informed people. Studies have shown that when the targeted population is knowledgeable about the risks and benefits of the HPV vaccine, there is the possibility of a higher uptake (Sidiropoulou et al., 2022). A study conducted by Guo et. al. showed that the number of African immigrant parents were less willing to vaccinate children who were high compared to Asian and Hispanic immigrant parents (Guo et al., 2023). There is need to address challenges specific to African Immigrant families, including the lack of awareness and the perceptions in order

to achieve a high uptake of the HPV vaccines, it is crucial for to address issues related to lack of information among African immigrant men (Shabani et al., 2019). By addressing these challenges and providing accurate and culturally sensitive information, efforts need to be made to increase awareness of HPV and the importance of HPV vaccination among African immigrants in the US.

The Role of Men as Fathers

HPV vaccination among children depends on parents or guardians' involvement as they are decision makers of their health services, including vaccinations against certain diseases such as HPV. Literature shows that fathers have less awareness and perception of HPV and its effects, including knowledge regarding the HPV vaccination and its importance (Suárez et al., 2019). There are reasons why men's awareness and perception may affect HPV vaccination uptake in their children. Some studies show that some parents believe that if children get the HPV vaccine, it will encourage early sexual activities and promote promiscuousness among their children (Suárez et al., 2019). The participation of fathers and guardians regarding the decision on the HPV vaccine uptake among their children is crucial for the acceptability and use of the vaccine (Mihretie et al., 2022).

Communication between African fathers and their children in an African family set up concerning sexual and reproductive health is very minimal or non-existent in most cases. Among East African family setups and people, discussions between parents and children about HPV vaccination are sensitive because the subject matter incorporates information on sexual health, which is stigmatized in these communities (Celentano et

al., 2021). Therefore, historical host countries' healthcare processes and dissemination of the vaccination information may also affect the lack of awareness among African immigrant men concerning the use of the HPV vaccine among their children to prevent cervical cancer.

Research has shown that fathers' involvement in the family decision-making regarding the vaccination of their children is significantly associated with the vaccination of daughters (Egawa-Takata et al., 2020). In addition, when fathers have a positive attitude concerning the HPV vaccine, the relationship between the father's involvement in vaccination decision-making increases HPV uptake (Egawa-Takata et al., 2020). Hence, investigating the awareness of HPV and HPV vaccination among African immigrant fathers is fundamental to help address any barriers to increasing the HPV vaccine uptake among African immigrants in the US.

Home Country Knowledge and Barriers

Individuals moving to the US often move with underlying factors prohibiting or facilitating HPV uptake among their children. Various influences affecting African immigrants can range from a lack of knowledge and awareness about the HPV vaccine and cervical cancer to language and cultural barriers, religious beliefs, and health insurance (Allen et al., 2019). African immigrant families and individuals are affected by different factors depending on the country of origin. Having HPV and HPV vaccination awareness is required to fight against the HPV to prevent cervical cancer. Understanding the cross-sectional knowledge, attitude, and perception investigations among target

populations helps understand enablers and difficulties affecting HPV vaccination acceptance (Xie et al., 2023).

There are debates regarding the HPV vaccines. These social debates about vaccines also mirror questions of morality. Debates around vaccination also reflect questions of morality, critical activities with local and national political governments, and particular interactions between populations and establishments of the state, science, and the media (Wilson, 2021). Individual factors that can affect the willingness and intention to vaccinate one's child have to do with the knowledge regarding the HPV vaccine and how it is associated with getting cervical cancer as perceived negative behavioral significance (Peterson et al., 2020). Exploring HPV awareness and perception among African immigrant men is crucial to help address barriers inhibiting HPV vaccine uptake among African immigrants. Institutional and healthcare procedures in host countries may be facilitators or barriers concerning the HPV vaccine uptake (Peterson et al., 2020).

Source of Information

The sources from which people get information about the HPV vaccine are crucial in shaping their knowledge and decision-making. A study in India showed that gynecologist, the Internet, and family disseminated most of the communication regarding HPV vaccine, and these sources were the most trusted (Sidiropoulou et al., 2022). Insufficient dissemination of the HPV vaccine information has been a challenge among various nations. Studies done in Kenya have shown that limited knowledge about the HPV vaccine was the most crucial possible barrier to effectively introducing HPV programs country wide (Wilson, 2021). In South Africa, a study showed that the level of

education among the target populations was linked to the increased HPV knowledge and awareness, not considering the area of residence (Shabani et al., 2019). In the United States, research showed that provider influence and communication and caregiver and peer influence, including social support for caregivers, influence the HPV vaccine uptake (Peterson et al., 2020). Similarly, a research done in the Netherlands revealed that it was challenging to find unbiased HPV vaccine information and regarded HPV as a complicated subject making it difficult for parents to make vaccination decisions for their children (Wilson, 2021).

The source of information plays a critical role in understanding the risks and benefits associated with HPV and HPV vaccines. A study by Liebermann et al. (2020) revealed that healthcare providers specializing in women's or children's health are considered a trusted source of information. The researchers also highlighted that HPV vaccine programs that are school based and do not have a direct relationship with healthcare providers make it difficult for parents and guardians to trust this route of health information dissemination (Liebermann et al., 2020). The source of HPV vaccine information is important as it may affect the acceptance of HPV vaccine use among the target population. It is imperative to understand that, more than likely, social media and the Internet are used as everyday sources of information on vaccines. However, studies indicate that this source of information is often associated with incorrect or misleading knowledge (Troiano & Nardi, 2022).

Provider Communications

The relationship between the patient and the doctor is crucial in determining vaccine recommendations. Healthcare providers play an important role regarding HPV vaccine information, vaccine timing, and vaccination completion (Xu et al., 2023). Research has shown that healthcare providers' advice to get vaccinated is one of the most influencing factors in determining the uptake of HPV vaccine acceptability for their children (Lama et al., 2022). In fact, HPV vaccine uptake was 24% for patients without and 60% for patients with a health provider recommendation (Oh et al., 2021). However, minorities consistently report lower HPV vaccine rates when compared to their white counterparts (Xu et al., 2023). Also, besides the critical function that health care providers have in the HPV vaccine recommendation, personal perceptions also affect the decision of parents (Rajeh et al., 2023). Healthcare providers should have well-developed scripts targeted at different populations to enable a pathway for a strong, concise, and convincing recommendation that will lead most parents to vaccinate their children (Coyne-Beasley & Ortiz, 2023). Considering that the HPV vaccine is associated with the prevention of a potentially sexually transmitted disease, there is an existing stigma about the uptake of the vaccine as both parents and sexual partners argue that it promotes adolescent and promiscuous sexual activity, which constitute a notable barrier to vaccine uptake (McKenzie et al., 2023). Thus, there is a need for health providers to clearly communicate the obvious advantages of the vaccine and the various methods of transmission of the virus, including the non-sexual transmission routes. It is not known

whether health provider advice to African immigrant fathers is effective in getting their child vaccinated against the HPV infection to prevent cervical cancer.

Definitions

African immigrant men: Men who move from various African countries to live in the United States

Cervical cancer: A malignancy that begins with the cells lining the cervix, the lower part of the uterus, that grows uncontrollably (American Cancer Society, 2020).

Disparities: Variances in how healthcare is provided between racial, ethnic, or other population groups that are not directly attributable to differences in clinical needs or patient choices continue despite adjustment for socioeconomic influences (Saeed & Masters, 2021).

Human papilloma virus: Also interchanged with HPV are a group of viruses where some cause non-cancerous papilloma (warts), but others are known to cause cancers (American Cancer Society, 2023).

HPV vaccine: A medicinal product that can train an individual's immune system to generate HPV antibodies, as it does when it's exposed to the HPV infection (World Health Organization, 2021b).

HPV vaccination: The act of an individual getting the HPV vaccine to prevent HPV and HPV related cancers (Galvin et al., 2023).

Assumptions

I made several assumptions regarding the primary data collected from the 11 individual interviews in this doctoral study. Interview questions were explained to the

study participants to assure the correctness of data collection and that the participants respond honestly to the interview questions. Firstly, I assumed that the study participants comprehended each survey question and provide an authentic response. Secondly, I assumed that the study sample was large enough to be representative of the diverse African immigrant men living in the US less than 5 years. Thirdly, I also assumed that the study participants had different cultural beliefs and norms that may influence HPV and HPV vaccine awareness and perception among the study population.

Scope and Delimitations

This study focused on the HPV and HPV vaccine awareness and perception of African immigrant men with children living in the US. The study aimed to explore the awareness and perceptions of HPV vaccination among African immigrant men residing in the US concerning preventing cervical cancer among their children. I recruited married and unmarried African immigrant men with children living in the U.S. via WhatsApp social media platforms through snowball sampling techniques for individual interviews. The interviews were semi-structured with open-ended questions adapted from Nji's (2016) study that investigated perceptions of Cameroonian women regarding cervical cancer prevention, considering parental attitudes, their knowledge, and their beliefs about the acceptance and usage of the HPV vaccines and other screening services.

There were some limitations in this study. Some challenges that may occur when conducting interviews include unnecessary fatigue, and the participants may experience what they may consider upsetting or distressing questioning due to the sensitive nature of the topic (Szulc & King, 2022). As the researcher, I incorporated breaks during the

interviews to prevent unnecessary exhaustion. Additionally, I monitored the participants for emotional distress to ensure they were not upset during the interview. Another limitation that was of concern is the potential for the researcher to over identify with study participants, which could affect the analysis of the study outcomes (Schonfeld & Mazzola, 2013). As the researcher, I used an interview guide to ensure a more systematic approach. This guide helps to structure the interviews and ensure that the researcher stays on track and addresses relevant topics only (Brayda & Boyce, 2014). Generalization of study findings is another limitation to note. The study findings may not be possible to transfer to other populations as the sample size in qualitative studies is too small to permit that, considering that this study had 11 participants (Ganesh, 2020). However, attaining saturation in this basic qualitative study was important because it helped make data collection strong and acceptable (Hennink & Kaiser, 2022).

Significance

This study is significant in that it will fill a gap in understanding African immigrant men's level of awareness and perception regarding the HPV vaccine use among their children to prevent cervical cancer. Low HPV vaccination uptake is a public health concern. The research study may provide a better and new understanding of African immigrant men's influence on their children regarding HPV vaccine acceptance. The study findings helped better understand the HPV vaccine awareness and perception among African immigrant men to help reduce the HPV-related cervical cancer burden among African immigrants living in the US. The findings from the study can help

healthcare providers better understand HPV communication needs with various African immigrant parents in the efforts of HPV vaccine uptake recommendations.

Findings from the study can also guide how information regarding HPV and HPV vaccines can be disseminated among African immigrant men and their families to increase awareness if needed. In addition, the findings can also help to understand better communication methods between fathers and children regarding HPV and HPV vaccines as well as sexual health to help prevent diseases like HPV infection that can lead to cervical cancer. Public health professionals can also benefit from the study findings by understanding the challenges faced by this community regarding HPV vaccine acceptance as recommended. Health policymakers can also gain an understanding of HPV and HPV vaccine awareness and perception among African immigrants to help create policies that can meet the needs of this community. The implication of this basic qualitative study's social change is to understand African immigrant men's awareness and perception concerning HPV and HPV vaccines to improve HPV vaccine uptake among their children to prevent cervical cancer.

Summary and Conclusions

HPV vaccination is important to tackle the HPV infection linked to cervical cancer and is a public health issue among African immigrants and many other populations worldwide. Low HPV vaccination acceptance remains one of the most crucial disparities in the US. Research studying the disparities in HPV vaccine uptake by country of origin shows that children with foreign-born parents are less likely to be vaccinated than children with U.S.-born parents (Anuforo et al., 2022). There is a

growing number of African immigrants in the US, and there is a lack of the HPV vaccine among African immigrant men living in the US. The HPV vaccine is critical to tackling the uneven distribution of cervical cancer incidences (Illah & Olaitan, 2023). An estimated 99% of all cervical cancers are associated with HPV infection (World Health Organization, 2021a). Several studies have investigated awareness and perception of the HPV vaccine among African immigrant women. However, there is little knowledge regarding HPV awareness and perception among African immigrant men who are influential in health behavior decisions made for their children and families. Understanding the awareness and perceptions of African immigrant men is crucial as it will help design appropriate interventions to improve HPV vaccination rates among the children of African immigrants about cervical cancer prevention.

Section 2: Research and Data Collection

Introduction

This basic qualitative study explored the awareness and perceptions of HPV vaccination among African immigrant men residing in the US concerning preventing cervical cancer among their children. Low HPV vaccination acceptance remains one of the most crucial disparities in the United States. Research assessing the disparities in HPV vaccine uptake by country of origin shows that children with foreign-born parents are less likely to be vaccinated than children with US-born parents (Anuforo et al., 2022). Given the growing number of African immigrants in the United States, understanding the awareness and perceptions of African immigrant men is crucial as it may help in the design of strategies that could increase HPV vaccination rates among the children of African immigrants about cervical cancer prevention.

Research Design and Rationale

The purpose of this basic qualitative study was to understand the extent of awareness and perceptions of risk among African immigrant men living in the USA regarding the acceptance of the HPV vaccine for cervical cancer prevention among their children. I conducted individual interviews via the Zoom platform to collect the data. I used the basic qualitative approach and HBM to develop an interview process and create the interview questions to reflect some of the model's constructs. The interview questions were semistructured with open-ended questions adapted from Nji's (2016) study that investigated perceptions of Cameroonian women regarding cervical cancer prevention, considering parental attitudes, their knowledge, and their beliefs about the acceptance and

usage of the HPV vaccines and other screening services. Interview protocols were developed to address the problem and purpose of the study.

The rationale for using this design is that qualitative approaches help explore issues where little is known or understood regarding complicated settings, building themes, and gaining new understanding concerning a subject matter (Richards & Morse, 2013). Using a basic qualitative allowed the researcher to understand how people interpret experiences, construct ways of living, and interpret meanings attributed to lived experiences. The main goal of a basic qualitative study is to unravel and translate how people make sense of their lives (Merriam & Tisdell, 2015). The importance of this study is that it examined the awareness and perception of African immigrant men with regard to cervical cancer prevention among their children to help address barriers and challenges that prohibit the uptake of HPV vaccination among African immigrants.

Role of Researcher

My role as the qualitative researcher was to develop a questionnaire with semi-open-ended questions, recruit study participants to answer questions, collect data from interview responses, perform data analysis, and interpret the data while considering the information reviewed in the literature. I did not include my assumptions when analyzing the data. I also did not disclose my assumptions to the study participants throughout the research. As a researcher, I assumed the role of primary researcher through data collection and creating professional relationships with participants. As an African immigrant, I acknowledged my beliefs and employed deep considerations throughout the

study. I disengaged myself from my feelings to allow the data collection and analysis process to be completed without bias.

Methodology

Population

The target population was adult African immigrant men, married and unmarried, who have children and have lived in the US for less than 5 years. The reason for focusing on this population is that there is little known about this group of African immigrants concerning the awareness and perception of HPV and HPV vaccines in the efforts to prevent cervical cancer in their children. It is a challenge to recruit and enroll study participants in cancer prevention and health promotion, particularly when target populations are of low income, racial/ethnic minorities, and those who are immigrants (Cudjoe et al., 2019). Exploring awareness and perception of HPV and HPV vaccination among African immigrant men helped better understand African immigrant men's awareness and perception to serve this community better and achieve optimal HPV vaccination rates among their children to prevent cervical cancer.

Sampling Strategy and Criteria

I recruited participants from a WhatsApp group with predominantly African immigrant men for this basic qualitative study using snowball sampling. With the snowballing sampling method, the study's participants recommend inviting others to participate (Richards & Morse, 2013). Snowballing sampling begins with one or a few appropriate and information-rich respondents, then requests the participants for additional relevant contacts who can offer a different or confirming perspective (Patton, 2015).

African immigrants are a unique group of people that may be hard to reach, and using the snowballing technique will minimize problems such as non-response (Beauchemin & González-Ferrer, 2011). The data for this study only included responses to interview questions from African immigrant men living in the United States.

I recruited 11 African immigrant men via WhatsApp, a social media platform I knew had predominantly African immigrants, through snowball sampling until saturation was reached. Snowball sampling is an effective and efficient technique to produce a sample through the internet or social media platforms (Patton, 2015). Saturation is reached when continued analysis yields no new information (Burkholder et al., 2020). Saturation indicates the comprehensiveness of the code set and coding tree structure and is greatly affected by the target population and the type of people whose views are studied (Buckley, 2022). In qualitative studies, saturation is when data collection produces no new information and when repetition of data begins, signifying that a sufficient sample size is reached (Hennink & Kaiser, 2022).

Instrumentation

The instrument for this basic qualitative study was individual interviews. The interviews were confidential. The interview comprised 15 questions aligned with the six HBM constructs. To minimize bias, the questions were all in English, which characterizes the African immigrant population. All participants spoke English, and there was no need for translations. Every study participant answered the same questions presented to them. The interviews were conducted confidentially without prejudice or burden to respond in a certain way. Semi-structured with open-ended questions were used

for the individual interviews. Using semistructured interviews with open-ended questions is appropriate when the researcher knows enough about the study topic to frame the required discussion without structuring the data collection, which will limit the discovery of significant aspects not previously discovered (Richards & Morse, 2013). Additionally, a semistructured interview offers the researcher the organization and comfort of preplanning the questions and confidence that the information to be collected will be reliably retained by all study participants on the questions (Richards & Morse, 2013).

While conducting semistructured interviews, as a researcher, I could ask the participants follow-up questions. The interview questions were semi-structured with open-ended questions adapted from Nji's (2016) study that investigated perceptions of Cameroonian women regarding cervical cancer prevention, taking into consideration parental attitudes, their knowledge, and their beliefs about the acceptance and usage of the HPV vaccines and other screening services. Interview protocols were developed to address the problem and purpose of the study. The findings of this basic qualitative study came straight from the study participant's answers to the individual interviews. No influence was exerted on the participants when asked to respond to the interview questions. Interview questions are listed in Appendix B.

Procedures for Recruitment, Participation, and Data Collection

Through snowball sampling, I recruited 11 African immigrant men via WhatsApp, a social media platform I knew had predominantly African immigrants, until saturation was reached. Saturation is reached when continued analysis yields no new information (Burkholder et al., 2020). The inclusion criteria were married and unmarried

African immigrant men with children who had lived in the US for less than 5 years. I assessed each participant's eagerness to participate in this qualitative study throughout the recruitment process. I collected demographic information from the study participants, including age, number of children, years of residence in the US, and country of origin. I also asked the participants about their cultural background.

Data collection included responses to interview questions from study participants. The interviews were semistructured with open-ended questions adapted from Nji's (2016) study that investigated perceptions of Cameroonian women regarding cervical cancer prevention, taking into consideration parental attitudes, their knowledge, and their beliefs about the acceptance and usage of the HPV vaccines and other screening services. Interview protocols were developed to address the problem and purpose of the study.

Data Analysis Plan

Qualitative data analysis involves descriptive and thematic interpretations (Leila, 2020). For this qualitative study, data analysis followed Saldana's (2016) various coding processes, such as a priori, descriptive, affective, and pattern coding in the first cycle. Analyzing the codes allowed the identification of keywords to explore the topic. The keywords were categorized into consolidated meanings. The categories were divided into themes, or phrases deducted from the categories, and the themes were used for thematic analysis. Thematic analysis was utilized to analyze the data collected from the interview responses.

Thematic analysis is a process where themes emerge logically from the collected data and allow the researcher to develop and make sense of shared meanings and

experiences (Braun & Clarke, 2023). Thematic analysis is helpful for this basic qualitative study because of its ability to explore and deduce patterned meaning from the collected data (Braun & Clarke, 2023). A six-step process guided the thematic analysis of the data collected. It first involved familiarizing with the data, generating initial codes, scanning for themes, reviewing the themes, defining and naming the themes, and producing the findings (Kiger & Varpio, 2020).

Issues of Trustworthiness

The credibility of the outcomes and interpretations in any qualitative study depends upon ascertaining trustworthiness (Patton, 2015). Trustworthiness in qualitative research pertains to the degree to which a researcher has confidence in the sources used and the approaches used to collect the sources (Burkholder et al., 2020). The issue of trustworthiness is fundamental in measuring qualitative research, and in addition to that, it is also the most significant quality when it comes to transparency (Adler, 2022). Outlying the procedures taken during the qualitative study and justifying the reason the procedures used in the study is important to examine the study's trustworthiness (Adler, 2022).

I took steps to ensure the study's trustworthiness, including flexibility and ensuring the data collected would be available to study participants. Reflecting and sharing my position on the subject matter without bias, as a researcher, is fundamental to evaluating trustworthiness in qualitative research (Adler, 2022). Data analysis and interpretation in qualitative research require that researchers employ self-reflection to identify assumptions and develop awareness regarding the effects of examining the data

from a more comprehensive outlook than the self (Snyder & Turesky, 2023). Therefore, as a researcher, I ensured that measures were implemented to ascertain trustworthiness throughout the research study.

Limitations

Some limitations were anticipated while conducting this basic qualitative study. During the qualitative interviews, the researcher may feel unnecessary fatigue, and participants may experience upsetting or distressing questioning (Silverio et al., 2022). U took breaks during the interviews to avoid unnecessary fatigue and monitor participants for emotional distress to avoid upsetting them. Another limitation of concern was the potential for the researcher to over-identify with study participants, which could affect the analysis of the study outcomes (Schonfeld & Mazzola, 2013). Moreover, considering that I am fluent in English, the respondents' selection may have been biased towards English speakers. All study participants were English speakers, and there was no need for translation services. An interview guide was also utilized to make the interviewing more systematic and comprehensive by restricting the information to the issues being explored (Brayda & Boyce, 2014). Despite these anticipated limitations, the importance of this study among African immigrant men is a strong feature as it provided an understanding of their HPV and HPV vaccination awareness and perception with regards to preventing cervical cancer among their children.

Internal and External Validity

Validity in qualitative studies concerns research that is trustworthy, plausible, credible, and defensible (Rose & Johnson, 2020). The necessary steps are needed to

ensure validity during the research process. Validity can be supported by having the researcher verify the accuracy of each respondent's understanding of the interview questions and paraphrasing their responses to clarify responses and allow respondents to confirm their words (Coleman, 2021). When some responses contradict an established theory, the data must be incorporated when analyzing to equalize any possible bias (Tebogo Thandie, 2019). Internal validity concerns the level to which the researcher collects data and analyzes what is supposed to be measured (Leila, 2020). I expected that responses to reach saturation while collecting and analyzing data from the interview. I anticipated that all participants in this qualitative research study identified themselves as African immigrant males with children. I anticipated that the African immigrant males lived in different parts of the US but had a shared background of migrating from a Sub-Saharan African country.

External validity refers to the generalization, that is, whether the findings from the study are transferable to other population groups (Lakshmi & Mohideem, 2013). It is crucial to ensure that studies have the potential to be applicable and generalizable to other communities and population groups (Leila, 2020). I guaranteed reliability by ensuring that the interview questions and analysis were completed while minimizing errors that compromised the process and findings of the study. All reliable external validity interpretations should be justified for various measurements, whether they refer to generalizability or transportability (Findley et al., 2021).

Ethical Procedures

Ethical considerations for this study were outlined. Participation in the study was voluntary and study participants were recruited from African immigrant males living in the US. Informed consent was provided to all study participants. Informed consent is the constant process of sharing information between myself, as the researcher, and the study participant and is based on the view that it is based on the participant's right to make an informed and voluntary choice to participate in the study (Burkholder et al., 2020). All study participants were informed on the nature of the study, the goals, and the potential social change it can bring to African immigrants in the US. All participants were assured that responses to the interview questions were voluntary and would be kept confidential to comply with ethical considerations. The participants were advised that they were free to withdraw from the study at any given time. Walden University IRB approval process for ethical procedures was sought for this study. All data were secured, and no personal identification information was linked to the interview question responses. Participants were also notified that the decision to stop participating in the study would be honored.

Summary

Section 2 shows the research design and rationale, research methodology, instrument used, and sampling strategy, which are described in detail. Recruitment procedures, participation and data collection were also described in detail. The purpose of the study was restated. Also discussed in this section are the issues of trustworthiness and ethical issues taken into consideration while recruiting study participants, and collecting

data. Procedures to ensure confidentiality during the research are also highlighted in this section to safeguard the privacy of study participants.

Section 3: Presentation of the Results and Findings

Introduction

The purpose of this study was to qualitatively explore the awareness and perception of the HPV and HPV vaccine among African immigrant men living in the US regarding the acceptance of the HPV vaccine for cervical cancer prevention among their children. Understanding the awareness and perception of HPV and HPV vaccine among African immigrants is vital to fill the gap of increasing HPV awareness and perception to help reduce the HPV-related cervical cancer burden among African immigrants living in the US. This study utilized the HBM as a theoretical framework to understand health behavior and explain the determinants of HPV vaccine uptake (Lubeya et al., 2022).

This section presents the findings of interviews conducted among 11 African immigrant men living in the US with children. Before the interviews were conducted, ethical approval was obtained from Walden University IRB (04-04-24-105955). The interview process allowed the participants to share their perceptions and awareness of the HPV and HPV vaccines and the use of the HPV vaccine among their children. This section comprises the description and discussion of the study, demographic data, data collection, and data analysis using Fireflies.AI transcribing software. Themes and trustworthiness of this research are included with the summary of findings.

Setting and Demographics

The study was conducted from April 12th to June 1st, 2024. 11 participants were recruited from three WhatsApp groups with African immigrant men. The participants responded to the research flyer, which included my email address and phone number. I

sent the consent form to the email addresses provided by the participants. After receiving the consent form, the participants showed their consent by replying “Yes” to the email, and I saved the emails on a locked computer. All the participants met the inclusion criteria and confirmed the interview date and time via email or phone. The introduction to participants was conducted via an initial phone call, explaining the purpose and significance of the study and answering any questions or concerns that the participants may have. The interviews were conducted virtually using the Zoom platform. I reiterated that the participants had the right to withdraw at any time without any consequences. Participants were also reminded that interviews will be audio-recorded via the Zoom platform. Interviews were conducted privately for each participant without any other people around.

The study participants’ identities were protected by assigning a numerical code to the data collected. The interviews were conducted confidentially without prejudice or burden to respond in a certain way. Documents with participant names were stored on a laptop protected by a password, and no other person could access them. The participants provided their age, African country of origin, years living in the US, and number and gender of children (see Table 1). The participant’s ages in this study were from 32-67, and their years living in the US ranged from 0.8 to 5 years. All participants had children ranging from one to six in number. Study participants immigrated from five African countries: four from Zimbabwe, three from Kenya, and one from the Democratic Republic of Congo (DRC), Sierra Leone, South Africa, and Zambia.

Table 1*Study Participant Demographics (N=11)*

Participant	Age	African Country of Origin	Number of years living in the U.S.	Number of Children	Gender of Children
P1	42	Zambia	3	2	1 boy, 1 girl
P2	37	Zimbabwe	0.8	2	1 boy, 1 girl
P3	36	Zimbabwe	0.9	1	1 boy
P4	36	Zimbabwe	5	2	2 boys
P5	40	Kenya	4	3	1 boy, 2 girls
P6	67	Sierra Leone	5	6	0 boy, 6 girls
P7	46	Kenya	5	4	2 boys, 2 girls
P8	43	Kenya	4.5	4	2 boys, 2 girls
P9	42	DRC	4	1	1 boy
P10	48	Zimbabwe	2	4	1 boy, 3 girls
P11	32	South Africa	1	2	1 boy, 1 girl

Data Collection

The data were collected from responses to 11 individual interviews conducted in English. The interviews ranged from 20 to 40 minutes each to complete using semistructured, open-ended questions. The interview consisted of 15 questions, some followed by probing questions, and the time allowed the participants to express their awareness and perception of HPV and HPV vaccine use among children. The Zoom platform was used to audio record the interviews after obtaining verbal consent to audio-record before the interview started. Participants were allowed to ask questions or voice any concerns they may have had. After each interview, the audio-recorded files were uploaded to a password-protected personal laptop, and the data were transcribed using Fireflies.AI transcribing software. Each study participant was given a \$20 gift electronically as a thank-you gift for volunteering. After each interview, participants were thanked for their time and for providing their valuable awareness and perceptions of the study subject. Participants were also notified that the study findings would be shared via

email, using email addresses provided at the time of consent, after the research. The audio recordings were listened to, and transcribed data were checked for accuracy.

Data saturation was reached when no new information was gained from the interviews collected. Saturation in qualitative research is defined as the point upon which no other new information is retrieved from the interviews, enabling the researcher to develop new categories (Guest et al., 2020). Saturation attainment in qualitative research is critical as it helps strengthen and validate data collection (Hennink & Kaiser, 2022). Open-ended questions were asked to allow the study participants to freely express their opinions and perceptions of the subject matter and help to reach saturation. Ample time was allocated for each study participant to allow them to express themselves fully. In addition, at the end of each interview, participants were asked to add any additional thoughts or opinions regarding HPV and HPV vaccine use among children.

Data Analysis

Audio recordings of the individual interviews were carefully listened to and transcribed using Fireflies AI. The accuracy was checked by listening to each interview recording three times and reviewing the transcript. The Fireflies AI is a computer software that can convert speech into written transcripts (Olu-Steven, 2023). The software generated each transcript summary. Data were manually categorized into codes and categories using the thematic analysis process, which I used to draw the themes based on the categories. Thematic analysis is one of the approaches used to analyze qualitative data by detecting and reporting patterns from data that can be interpreted into integral themes (Naeem et al., 2023). During the initial analysis of coding, codes such as

“little HPV knowledge,” “open to children getting the vaccine,” and “prefer herbal medicine” were selected. These codes were then organized into categories and used to form themes. Table 2 below shows the themes that were developed to answer the research questions.

Table 2

Correlation between the Themes and Questions

Research Questions	Themes
RQ1. What are the perceptions of risk regarding cervical cancer prevention in their children among African immigrant men living in the US?	<ul style="list-style-type: none"> • Cultural Impact • Knowledge of cervical cancer risk
RQ2. What is the level of awareness of African immigrant men living in the USA regarding the HPV vaccine and cervical cancer prevention in their children?	<ul style="list-style-type: none"> • Lack of HPV awareness • Vaccine Attitudes
RQ3. What are perceived factors of influence among African immigrant men living in the USA regarding cervical cancer prevention in their children?	<ul style="list-style-type: none"> • Role of Fathers • Sources of Information

Overall, six themes emerged from the participants’ responses. Table 3 presents the developed codes, categories, and themes, including the excerpts supporting the findings. The five emerging themes are: (a) knowledge of cancer risk, (b) lack of HPV awareness, (c) vaccine awareness and safety, (d) cultural impact, (e) source of information, and (f) role of fathers.

Table 3*Codes, Categories, and Themes*

Themes	Categories	Initial codes	Participants	Excerpts
Knowledge of Cancer Risk	Limited knowledge of cervical cancer risk.	Cervical cancer is serious	P1	“It’s very bad cancer. It’s a form of cancer that is probably killing a lot of women.”
			P4	“From my understanding, cervical cancer is, like, how men and women sexual activities can also lead to cervical cancer.”
		Sexual activities lead to cervical cancer	P5	“In terms of cervical cancer, and I know there are different kinds of cancers, but this particular one, there is something you can vaccinate against to reduce the risk of it.”
		Cancer is difficult to cure	P6	“I don’t know much about cervical cancer; it has not affected any of my person. Cancer is difficult to cure.”
		Not much into it	P7	“Well, I think HPV is linked to cervical cancer, if I’m not really wrong. I have read something like that, but I have not been so keen or so much into it, wanting to know more about it. It is for women.”
	Cervical cancer is a serious disease	There is a vaccine against it	P8	“To my understanding, it’s hereditary, it can be found in family lineage, and sometimes it can also be sexually transmitted.”
		Reduce cervical cancer risk with vaccine	P9	“It affects women, and I think there is a vaccine.”
			P11	“I have heard about cervical cancer from the streets, it affects women. People say it’s caused by uncircumcised men. I don’t have much knowledge.”
			P11	“This is the first time I’m hearing of what is called human papilloma virus.”
			P10	“I don’t know much about it.”
Lack of HPV information	Understanding of HPV	Never heard much	P8	“I’ve heard about it before, but, you know, I’ve never heard much, you know, like having too much interest on it.”
		Don’t know much	P7	“I’m not very much educated about that, so I know little to nothing about HPV.”
	Little or no HPV knowledge	Little HPV information	P6	“I really don’t know anything about it”
			P3	“I have limited knowledge of it.”
			P1	“Honestly not much.”

(table continues)

Table 3 cont.*Codes, Categories, and Themes*

Themes	Categories	Initial codes	Participants	Excerpts	
Vaccine attitudes	Attitudes towards vaccines in general	Vaccine benefits	P11	"I think the benefits outweighs the risk."	
			P10	"Biggest concern is the cost of health system here."	
	Reaction about use of HPV vaccines	Vaccine worries		P8	"If it's something approved by the CDC, I'm okay with it."
				P5	"I don't have worries about its safety"
		Cost of vaccine	P4	"It seems to be a positive vaccine that has little harm to the people that are taking the vaccine."	
			P3	"I think it's best to have the vaccine so that you avoid catching the disease in the future."	
			P1	"Vaccine of this kind may alter reproductive health."	
Cultural Impact	Folk medicine practices	Healing practices	P11	"Our culture doesn't allow us to do certain things, especially when it comes to vaccinations."	
			P10	"We sometimes think there are some diseases that do not affect us in one or the other."	
	Reliance on traditional medicine	Traditional herbs	P9	"Where I came from, when a child is born, they used to wash to give them the first bath with bones from skeleton."	
			P8	"They don't believe in, you know medication, they believe in traditional herbs."	
		Traditional taboos hindering open sexual health discussions	Rituals protecting illnesses	P3	"First of all, the practice, out tradition, we do not openly talk about these sexual issues with family members as well as with kids."
			Sexual health discussion not the norm		
Source of Information	Broadcasting of HPV information	Family education	P10	"Again, these churches, they need to find a way to convey the message about the vaccine, because I've seen a lot of negativities when it comes to the religious side."	
			P7	"They should get that information and probably maybe in religious settings like the church."	
	Pediatrician to educate and recommend HPV vaccine	Media information dissemination	P5	"I would say the biggest source of information and what needs to be done is the pediatrician."	
			P2	"Educating children while at primary level, I sort of don't agree, because the moment we have our children knowing so much about this at this tender age, is the moment they might try to experiment while it's at a tender age."	
		Safe sex practices education	HPV education at church events	P3	"The use of media, it can help people get the information."
	HPV information from doctors				

(table continues)

Table 3 cont.*Codes, Categories, and Themes*

Themes	Categories	Initial codes	Participants	Excerpts
Role of Fathers	Participate in health informal discussions with children	Educate children	P10	“I think I should be in a position to guide them, encourage them about, just to say, if they get access to this, it will be a positive move to them.”
		Guide children	P8 P3	“My role is let them get good knowledge.” “My role is research further, get to understand the nitty gritty, and encourage my, as well as my wife, to be educated about this topic. I will also encourage the child to go and get the vaccine.”
	Making HPV vaccine decisions based on knowledge and research	Ensure doctor visits	P4	“It’s a huge role to make sure that they are safe health wise, and also to make sure that they have the knowledge of, you know, the things that they are doing and what the impact is on their lives, on all their health.”
		Do research about HPV and sexual health	P1	“I think I’ll definitely go ahead and do more research about this and see what’s available out there in terms of, you know, locations where I can get the vaccine from and maybe even reach out to the primary care doctor and see if I can get that taken care of.”
		Check information about the safety of HPV vaccine		

Evidence of Trustworthiness

In this study, steps were taken to ensure the study’s trustworthiness. It was fundamental to apply and ensure all components of credibility, dependability, transferability, and confirmability throughout the data collection process to safeguard the quality of the study. Before each interview started, participants were informed of audio recordings to capture their thoughts on the study subject. I ensured credibility was established by clarifying any participant’s responses. I also presented the transcripts to the participants to ensure the accuracy of what they said. Confirmability was established by immediately transcribing and analyzing the data. Confirmability ensures the researcher’s impartiality when analyzing and interpreting the results (Nyirenda et al., 2020). I prioritized participants’ experiences and thoughts. I acknowledged and

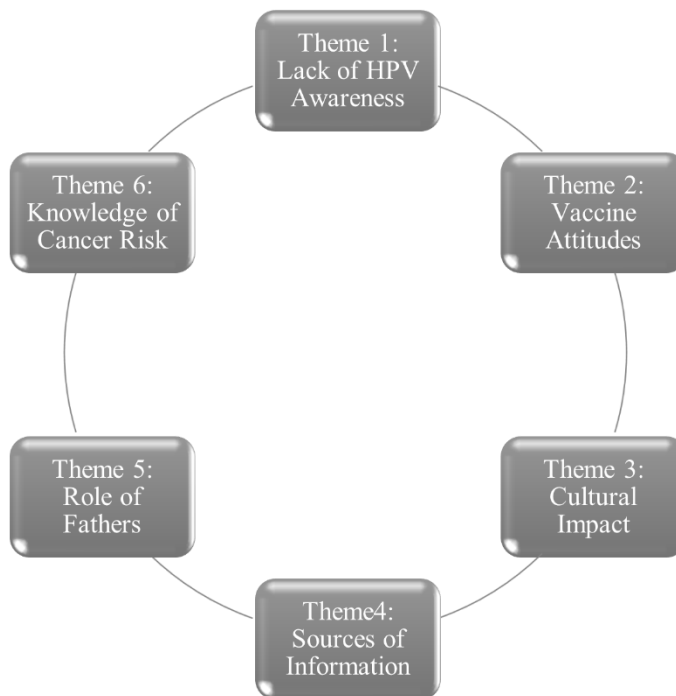
recognized my own assumptions by using open-ended questions, allowing participants to elaborate on their opinions without interruptions and while listening attentively. I also ensured that each participant answered the same questions.

As the researcher, I ensured dependability by detailing every step taken during the research process to help with the replication of the study. Dependability is how consistently a study can be replicated (Nyirenda et al., 2020). To demonstrate the transferability of a study, I provided the research background and explained the interview process. To demonstrate the transferability of the study, a researcher should ensure that the research question is answered correctly (Stanley & Robertson, 2024). Therefore, as a researcher, I ensured that measures were implemented to ascertain trustworthiness throughout the research study.

Emerging Themes

Six themes emerged after analyzing participants' interview transcripts transcribed by Fireflies software. Six core themes developed from the participants' individual interview responses: (a) knowledge of cancer risk, (b) lack of HPV awareness, (c) vaccine attitudes, (d) cultural impact, (e) source of information, and (f) role of fathers.

Figure 3 below shows the six themes as part of a continuing sequence:

Figure 3*Awareness/Perceptions about African Immigrant Men & HPV/HPV Vaccine*

The majority of the participants expressed their lack of HPV and HPV vaccine awareness, HPV vaccine attitudes, shared cultural impact, lack of trusted sources of information, knowledge of cervical cancer risk, and the role of fathers in a family setting regarding HPV and HPV vaccine use among their children. RQ1 involved the perceptions of risk regarding cervical cancer prevention in their children among African immigrant men living in the US. Two themes emerged from the findings regarding this research question: (a) knowledge of cervical cancer risk and (b) cultural impact. RQ2 involved the level of awareness of African immigrant men living in the US regarding the HPV vaccine and cervical cancer prevention in their children. Two themes emerged from the findings regarding this question: (a) lack of hpv awareness and (b) vaccine attitudes. RQ3

involved the perceived factors of influence among African immigrant men living in the US regarding cervical cancer prevention in their children. Two themes emerged regarding this question: (a) role of fathers and (b) source of information.

These themes aligned with the interview questions and addressed the research study's aim to qualitatively explore the awareness and perception of the HPV and HPV vaccine among African immigrant men living in the US regarding the acceptance of the HPV vaccine for cervical cancer prevention among their children. The interview questions addressed the awareness and perception of the HPV and HPV vaccine among African immigrant men living in the US regarding the acceptance of the HPV vaccine for cervical cancer prevention among their children.

Theme 1: Lack of HPV Awareness

The first theme examined the lack of HPV awareness at the time of the study which is one of the barriers to HPV vaccine uptake among African immigrant children in the US. This theme emerged, supporting the RQ2 that was intended to explore the level of awareness of African immigrant men living in the USA regarding HPV vaccine and cervical cancer prevention in their children. Different open-ended questions were presented to the participants to describe what they know regarding HPV and the impact of persistent HPV infections. The participants expressed what they know regarding HPV infections and the perception impact of HPV vaccine use.

Most of the participants indicated that they were not aware of HPV and how it can impact those infected with the infection. Participant 2 knew the acronym HPV as seen "on flyers and some Ads on TV," as well as its transmission from person to person. The

majority of the participants had little or no HPV awareness. Participant 11 mentioned, “This is the first time I’ve heard of what is called human papillomavirus,” when asked to describe what he knew about HPV. Participant 8 indicated he heard about it but did not know much about it due to lack of interest. He said, “I’ve heard about it before, but, you know, I’ve never had much, you know, like having too much interest in it.”

Similar sentiments were shared by Participant 7, who stated, “I’m not very much educated about that, so I know little to nothing about HPV.” Participant 6 stated, “I really don’t know anything about it,” Participant 1 shared the same view when he stated, “Honestly, not much.” Some participants acknowledged limited awareness of HPV, with Participant 3 stating that “I have limited knowledge of it” and Participant 10 stating “All I can say is it’s a virus, right, and then it is affecting mainly some, some foreign people, I think, who are living in the United States.”

Participant 5 indicated some knowledge of HPV and its impact on people’s health that he gained from reading articles. He mentioned,

Well, I’ve read some articles that it’s something that causes service for cancer, I think. And there is a vaccine for it, stuff like that; yeah, to be honest, I just read it out of curiosity. I just read about it in passing and, and also, I understood that I need to have my kids vaccinated against it. So, it’s just something that I do to protect my kids.”

Participant 4 shared similar views that he was knowledgeable about HPV and its impact. He stated, “I know that it’s one of the things that cause different types of cancers. I know

it's a virus or a combination of different viruses. And then I know that it causes different types of cancers.”

Theme 2: Vaccine Attitudes

Vaccine awareness and safety was the second theme that emerged from the individual responses, highlighting the lack of HPV vaccine knowledge; however, the willingness for HPV vaccination for children to prevent HPV. Participant 1 mentioned that he once heard about the vaccine via a poster. He said,

I've heard a bit about it. I think I've seen something to that effect. When I visited, I think when during the COVID pandemic I saw some, you know, poster at hospitals about HPV, but I really didn't pay much attention to it because it's not so much publicized, you know.

Sharing similar sentiments regarding lack of HPV vaccine awareness, Participant 7 said, “No, I've not been exposed to that kind of vaccine, especially after Covid, I know a little bit about how vaccines work.”

Participant 11 thinks the vaccine is suitable to use as an HPV infection-preventative method, and he stated, “I think the benefits outweigh the risks.” Participant 4 indicated that he had no problem with the use of the HPV on his children when he said, “It seems to be a positive vaccine that has little harm to the people that are taking the vaccine.” Similar sentiments were expressed by Participant 5 who stated, “I don't have worries about its safety.” However, not all participants shared the same views. Other participants had some concerns regarding the vaccine. Participant 10 was concerned about the cost when he stated, “The biggest concern is the cost of the health system here.”

Participant 3 was concerned about the possible adverse effects of the vaccine when he said “A vaccine of this kind may alter reproductive health.”

Theme 3: Cultural Impact

The third theme focused on the cultural influence on HPV vaccine use among children of African immigrants living in the U.S. Some participants shared how cultural practices can affect the decision to have children get the HPV vaccine. Participant 3 said, “First of all, the practice, our tradition, we do not openly talk about these sexual issues with family members as well as with kids.” Participant 11 shared how culture dictated some practices when he said, “Our culture doesn’t allow us to do certain things, especially regarding vaccinations.” Some participants highlighted some cultural practices that are done to protect against illnesses instead of vaccines. Participant 9 said,

Where I came from, when a child is born, they used to wash to give them the first bath with bones from skeleton. So, they took a bone from a dead monkey and put it in water to wash the kids with the water. It means that your kids are going to be kept safe against any illness or any infectious disease.

Participant 5 shared that cultural practices determine how a father can help decide whether or not children should get the HPV vaccine. He said,

First, the primary caretaker for kids is their mother, so that’s a big thing. So, you likely find that many fathers would support it. They would be like a secondary caregiver regarding decisions, healthcare decisions, and probably some do not. They are not required to do that because their mother is the one who cares for them.

Participant 8 shared his sentiments regarding cultural practices as challenging: “They don’t believe in, you know medication; they believe in traditional herbs.” Participant 10 also shared his view of cultural practice as a barrier by saying, “We sometimes think there are some diseases that do not affect us in one or the other.” Participant 3 stated a cultural challenge when he said, “First of all, the practice, out tradition, we do not openly talk about these sexual issues with family members as well as with kids.”

Participants migrated from different African countries and shared their different cultural impacts as a barrier. Some believe in traditional herbal treatments, while others perform traditional rituals that are supposed to be a source of protection for children against diseases. Some participants mentioned that fathers are not supposed to discuss sexual health with children, and one participant stated that culture does not allow people to do certain things, especially when it comes to vaccinations in general.

Theme 4: Source of Information

The fourth theme revealed the need for good sources of HPV and HPV vaccine information to African immigrants living in the U.S. Most participants expressed different sources of information that can help increase awareness of HPV and HPV vaccine among the target group. Participant 7 said, “They should get that information, and it may be in religious settings like the church.” Participant 10 shared a similar view when he said, “Again, these churches need to find a way to convey the message about the vaccine, because I’ve seen a lot of negativities when it comes to the religious side.” Participant 5 said, “I would say the pediatrician is the biggest source of information and what needs to be done.” Participant 3 also expressed his view regarding lack of HPV

information and said, “The use of media can help people get the information.” Participant 2 expressed his view and said,

Educating children while at primary level, I sort of don’t agree, because the moment we have our children knowing so much about this at this tender age, is the moment they might try to experiment while it’s at a tender age.

Participant 8 expressed the importance of children getting educated at early age by saying,

We are living in a society whereby even if don’t educate them, they still have to know especially with their peer friends in school. They know what is going on with the social media that these kids are using, with their computer, with their tablets. Sometimes they ask you for phones. So, it is good just to explain to them and let them know about the sex education, especially as they grow. Let them know. And I am very much okay on that side of educating them about sex education.

Participant 1 said media should be used as a means to disseminate HPV information when he said, “Awareness can be created in the form of advertising on the TV, on the radio. I think even the workplace, the way you know, certain holidays and other events are advertised at the workplace or in communities where we live, that can be effective.”

Overall, most participants did not have problems with children getting educated on recommended HPV prevention methods such as the HPV vaccine, safe sex practices, and sex education offered in schools. Some participants recommended other forms as sources

of HPV and HPV vaccine information dissemination, such as church gatherings, community events, or direct messages from healthcare providers.

Theme 5: Role of Fathers

Theme 5 examined the role of fathers when it comes to getting children of African immigrants vaccinated with the HPV vaccine. Most participants shared the importance of the father's influence in ensuring children get the HPV vaccine as primary prevention against HPV infections. Participant 4 said, "It's a huge role to make sure that they are safe health wise, and also to make sure that they have the knowledge of, you know, the things that they are doing and what the impact is on their lives, on all their health." Participant 3 shared a similar view by saying, "My role is to research further, get to understand the nitty gritty, and encourage my, as well as my wife, to be educated about this topic. I will also encourage the child to go and get the vaccine."

Participant 1 also expressed the need for fathers to first get HPV education in order to encourage their children to get the vaccine. He said,

I think I'll definitely go ahead and do more research about this and see what's available out there in terms of, you know, locations where I can get the vaccine from and maybe even reach out to the primary care doctor and see if I can get that taken care of.

Participant 8 also shared similar view by saying, "My role is to let them get good knowledge." Participant 10 voiced a similar viewpoint by expressing the need to support children to get them vaccinated by saying, "I think I should be in a position to guide

them, encourage them about, just to say, if they get access to this, it will be a positive move to them.” Participant 5 also expressed a similar opinion and said,

Well, for the most part, is just to make sure, the basics. Make sure they follow, they go to their appointment and they are up to date with everything, like vaccinations and all that, just for their well-being, making sure that is done. And obviously giving me information as regard to what is safe to do and what’s not.

Theme 6: Knowledge of Cancer Risk

Theme 6 examined the perception of risk regarding cervical cancer. Most participants acknowledged limited knowledge of cervical cancer. Some participants were aware that it was a serious disease, and others believed there was a vaccine to reduce the risk of cervical cancer. Participant 1 said, “It’s very bad cancer. It’s a form of cancer that is probably killing a lot of women.” Participant 6 shared a similar view by saying, “I don’t know much about cervical cancer; it has not affected any of my people. Cancer is difficult to cure.” Participant 4 shared that cervical cancer is linked to sexual activities. He said, “From my understanding, cervical cancer is, like, how men’s and women’s sexual activities can also lead to cervical cancer.” Participant 11 explained that the information he knows about cervical cancer is what he hears from the streets. He said, “I have heard about cervical cancer from the streets, it affects women. People say it’s caused by uncircumcised men. I don’t have much knowledge.”

Participant 8 shared he knew about cervical cancer by saying, “To my understanding, it’s hereditary; it can be found in the family lineage, and sometimes it can

also be sexually transmitted.” Participant 7 expressed that he believes cervical cancer is linked to HPV but has no interest in knowing more about it. He said,

Well, I think HPV is linked to cervical cancer, if I’m not really wrong. I have read something like that, but have not been so keen or so much into it, wanting to know more about it. It is for women.

Participant 5 believed that there is a vaccine to reduce cervical cancer risk. He said, “In terms of cervical cancer, and I know there are different kinds of cancers, but this particular one, there is something you can vaccinate against to reduce the risk of it.”

Participant 9 also shared similar views by saying, “It affects women, and I think there is a vaccine.”

Summary

The 11 study participants in this research focused on African immigrant men living in the US, exploring the awareness and perception of the HPV and HPV vaccine regarding the acceptance of the HPV vaccine for cervical cancer prevention among their children. The participants’ responses showed their lack of HPV and HPV vaccine awareness. However, they were willing to get the information. Six themes were developed from the individual interview responses: knowledge of cancer risk, lack of HPV awareness, vaccine awareness and safety, cultural impact, source of information, and role of fathers. Study participants expressed what they know regarding HPV and the HPV vaccine, sharing their HPV vaccine awareness, safety concerns, cervical cancer risk, and cultural influences based on their upbringing. In general, participants indicated a lack

of HPV awareness and its impact on health, including the development of severe diseases like cervical cancer.

All participants highlighted the importance of getting HPV awareness education and many shared sources of information that can be instrumental in raising HPV and HPV vaccine awareness among African immigrant men living in the US. Most participants did not have problems with children getting educated on recommended HPV prevention methods such as the HPV vaccine, safe sex practices, and sex education offered in schools. Some participants recommended other forms as sources of HPV and HPV vaccine information dissemination, such as church gatherings, community events, or direct messages from healthcare providers.

Section 4 will explore the six themes developed through data collection and its analysis. The section will connect the themes identified and the theoretical framework. The section will consist of the interpretation of study findings, limitations, implications of social change, and recommendations for future research studies.

Section 4: Application to Professional Practice and Implications for Social Change

Introduction

The purpose of this study was to qualitatively explore the awareness and perception of the HPV and HPV vaccine among African immigrant men living in the US regarding the acceptance of the HPV vaccine for cervical cancer prevention among their children. The study results are essential to fill the gap in understanding the HPV vaccine awareness and perception among African immigrant men to help reduce the HPV-related cervical cancer burden among African immigrants living in the US. Little is known regarding the lack of awareness and perception among African immigrant men, who are influential when health behavior decisions are made for their children and families (Netfa et al., 2020). Findings from the data analysis revealed six themes that are (a) knowledge of cervical cancer risk, (b) lack of HPV awareness, (c) vaccine attitudes, (d) cultural impact, (e) source of information, and (f) role of fathers. Findings from this study will help healthcare providers better understand HPV communication needs with various African immigrant parents and understand better communication methods between fathers and children regarding sexual health. Public health professionals can also understand the challenges faced by this community, and health policymakers can create policies that can meet the needs of this community. The implication of this essential qualitative study's social change is to understand African immigrant men's awareness and perception concerning HPV and HPV vaccines to improve HPV vaccine uptake among their children to prevent the development of diseases like cervical cancer.

Key Findings

The study involved 11 African immigrant men living in the US who shared their awareness and perception of HPV and HPV vaccine use among their children. Study participants shared their knowledge and perceptions regarding the acceptance of the HPV vaccine for their children. They explored the different cultural practices that impact their attitude toward HPV and HPV vaccines. Nine out of the 11 participants indicated that they had no awareness of HPV and HPV vaccines, including the impact it has on people's health and the development of cervical cancer. All African immigrant men interviewed deliberated on the need for better HPV and HPV vaccine information dissemination ways that can help increase awareness among this population. Two of the 11 mentioned the need to involve church and community events as a good source of information, while most participants do not object to sex education in schools. Two participants had concerns about the possible consequences of children getting sex education at an early age in fear of the children becoming sexually active at an early age.

Most of the participants (80%) expressed the impact of their different cultural practices that shape the way they perceive the use of the HPV vaccine among their children, including the practice of bathing babies in water soaked in monkey bones as a form of protection against diseases. One participant shared how cultural tradition does not allow him to discuss sexual issues with children, and another highlighted the practice that does not allow vaccination among children. Most participants voiced that the role of a father in a family setting is essential in supporting HPV vaccine intake among their children in different ways. 80% of the participants expressed the need to increase HPV

awareness to enable themselves to guide their children regarding getting the HPV vaccine, including understanding the subject matter to pave the way for HPV vaccine access to their children. One participant also mentioned the need for fathers to support wives in making HPV vaccine decisions for their children. All participants do not have problems with their children getting the HPV vaccine.

The themes that emerged from the study developed with the use of the health belief model that explored different influences that shape the health behaviors of African immigrants living in the US when it comes to HPV and HPV vaccine acceptance. Six themes emerged from the study findings. The key findings resulted in these themes, namely, (a) knowledge of cancer risk, (b) lack of HPV awareness, (c) vaccine attitudes, (d) cultural impact, (e) source of information, and (f) role of fathers.

Sample Population

The 11 study participants were comprised of African immigrant men who had lived in the US for 5 years or less. The participants originally immigrated from Kenya, Zimbabwe, South Africa, the Democratic Republic of Congo (DRC), Zambia, and Sierra Leone. Sub-Saharan Africa has a high prevalence of risk factors for cervical cancer and high rates of HPV infection, coupled with low HPV vaccine acceptance rates (Adegboyega, Aroh et al., 2022). There is an increase in the African immigrant population in the US, and Africa is a region with a high risk of HPV-related cancers, with some of the highest incidences and mortality globally (27.6 and 17.5/100,000; Cofie et al., 2022). It is essential to understand the awareness and perception of HPV and HPV vaccines among African immigrant men, who are influential when health behavior

decisions are made for their children and families (Netfa et al., 2020). All study participants had children at the time of study.

Interpretations of Findings

The following research questions directed this study:

RQ1: What are the perceptions of risk regarding cervical cancer prevention in their children among African immigrant men living in the US?

RQ2: What is the level of awareness of African immigrant men living in the US regarding HPV vaccine and cervical cancer prevention in their children?

RQ3: What are perceived factors of influence among African immigrant men living in the US regarding cervical cancer prevention in their children?

Lack of HPV Awareness

HPV awareness is critical when it comes to HPV vaccine acceptance to help prevent the development of diseases like cervical cancer. Lack of knowledge of complications and risks associated with vaccine-preventable diseases causes poor vaccine uptake (Getova-Kolarova et al., 2024). It is crucial to have an understanding of the HPV infection complications. Nine out of the 11 participants indicated that they had no awareness of HPV and HPV vaccines, including the impact it has on people's health and the development of cervical cancer. Some participants indicated having heard about HPV but had no more profound understanding of the infection and potential complications. This finding is similar to Noor Syazana et al. (2023), who stated that, generally, HPV and HPV vaccination knowledge in men is poor. A recent study by Quist et al. (2024) also showed that several men are not aware of the HPV vaccine, and this makes it unlikely for them to ask their healthcare providers about it. Awareness of both cervical cancer and

HPV preventative measures is crucial in increasing the uptake of the HPV vaccine (Fahrni et al., 2022).

Another study by Katsiroumpa et al. (2023) that assessed the level of knowledge and attitudes regarding HPV vaccination among men in Greece showed that inadequate HPV information and vaccination cost concerns contribute to low levels of HPV vaccine uptake (2023). Increased HPV and HPV vaccine awareness among African immigrant men will help the HPV vaccine uptake among their children to help prevent cervical cancer. To effectively increase HPV vaccine coverage, evaluating the current public knowledge and attitudes regarding HPV infections and vaccination is crucial to encourage HPV vaccine uptake and decrease cervical cancer prevalence (Al Alawi et al., 2023). It is vital to assess the level of HPV and HPV vaccine awareness among African immigrant men to increase the use of the HPV vaccine among their children to help decrease the development of diseases like cervical cancer.

Vaccine Attitudes

Research by Strbac et al., who studied factors influencing the acceptance of the HPV vaccine by parents of eligible children, found that parents' attitudes toward HPV vaccination could be a critical factor in children's vaccine uptake (2023). African immigrant fathers' view on the HPV vaccine plays a role in determining whether their children getting the HPV vaccine. In this study, most participants had no problem getting their children vaccinated despite the lack of HPV vaccine. A study by Getova-Kolarova et al. that explored trust, information source, and intention of vaccination showed that general hesitations concerning HPV vaccines, besides safety, consist of how long the

vaccine works, lack of knowledge regarding how HPV infection is transmitted, and considering the age of children at the time the vaccine is recommended (2024). One participant was concerned with the cost of the service. The other participant was concerned with the children getting involved in sexual activities at a premature age. One participant thought the vaccine was suitable for use as a preventative method for HPV infection, and another participant had no concerns over safety as long as medical governing bodies approved the vaccine. These findings are in line with what is in the literature, where a child's age, concerns about vaccine side effects, and worries about sexual activity initiation at an early age are barriers for parents getting their children to get the HPV vaccine (Al Alawi et al., 2023). Fathers need to have HPV vaccine awareness in order to help make decisions for their children to get the HPV vaccine to prevent HPV infection complications and the development of diseases like cervical cancer. Literature shows that parents' HPV vaccine awareness, safety, effectiveness, and concerns about unplanned sexual activities after getting the HPV vaccine impact the decisions to get their children to get the vaccine to prevent HPV infections and its complications (Çitak Bilgin et al., 2022).

Cultural Impact

Cultural practices affect opinions, language, and health-seeking behaviors and are vital groundwork for addressing health practices and research (Frietze et al., 2023). In this study, participants shared how traditional cultural practices can affect the decision to have children get the HPV vaccine. Participants discussed different cultural expectations from the various African countries they originate from that affect making decisions for

their children to get vaccinated against HPV infection. One participant mentioned that it is not customary for fathers to discuss sexual health with children or other family members. Other participants expressed how culture dictates some practices where certain things are unacceptable. In contrast, other traditional practices are done to protect against illness rather than getting vaccines such as the HPV vaccine.

These findings are similar to those previously studied, which show that attitudes and beliefs influenced by culture determine HPV vaccine acceptance (Galbraith-Gyan et al., 2019). Public health specialists must develop culturally sensitive interventions to increase HPV vaccine uptake in this population. Modifying health communication to meet the environment's and culture's needs is critical to increasing the acceptance of health messages (Xu et al., 2023). Understanding HPV awareness and perception among African immigrant men and knowing particular cultural influences can aid in the development of interventions that can increase HPV vaccination among this population to help decrease HPV infection and the development of diseases such as cervical cancer.

Source of Information

HPV and HPV vaccine information dissemination is an important aspect when it comes to increasing awareness among African immigrant men. The source of information is crucial when delivering reliable and authentic HPV and HPV vaccine information (Getova-Kolarova et al., 2024). In this study, some participants mentioned church gatherings, community events, or direct messages from healthcare providers as preferred sources of HPV and HPV vaccine information dissemination. Results are similar to findings from a study by Lindsay et al. that sought to understand the awareness,

knowledge, and acceptability of the HPV vaccine among Latinx fathers, which found out that HPV vaccine recommendation from a doctor or healthcare provider has an impact on parent's decisions to have children get the HPV vaccine (2022). One participant mentioned the use of media as a preferred source of information. Similarly, a study in China showed that media is vital in influencing a person's perceptions, attitudes, and behaviors regarding health, and it works as an essential source of information that helps increase understanding of a subject matter and impacts decision-making (Zhou et al., 2024). Another study by Frietze et al. showed that it is important to explore different sources of HPV and HPV vaccine information to find the most effective and trusted sources for recommending the HPV vaccine (2023). Having HPV information from a reliable source is critical concerning the decision to get HPV vaccination among racial and ethnic minorities in the US, and trusted sources differ among different communities (Vu et al., 2023). Using HPV information to make HPV prevention-informed decisions requires finding the ideal HPV information and utilizing that evidence to make the right choice for one's health (Sledge et al., 2019). African immigrants need to get HPV and HPV vaccine information and guidelines from sources considered reliable in their communities.

Role of Fathers

Fathers play a vital role in their children getting the HPV vaccine. Children's parents play a vital role in shaping their healthy lifestyle behaviors, coupled with a good family setting as a primary link to their growth and development (Kim et al., 2024). In this study, most participants expressed the importance of the father's influence in

ensuring children get the HPV vaccine as a primary prevention against HPV infections. One participant shared that the father's role is to ensure that children are healthy and make good health decisions. Another participant expressed the need for fathers to support spouses regarding HPV education and encourage children to get the HPV vaccine. This finding is similar to de Fouw et al. (2023), which indicated that men recognized that they did not have cervical cancer and its prevention efforts, including the HPV vaccine, and asked for better awareness in the community to enable them to support their families effectively as fathers. Egawa-Takata et al. (2020) conducted a survey that indicated that mothers typically refer to their husbands concerning children's health issues, and the fathers get involved in decision-making (2020).

Studies have shown that education given to parents regarding the HPV vaccine helps increase awareness about the vaccine, positive perceptions, vaccine acceptability, and vaccine uptake in a program conducted in Hong Kong and Indonesia (Çitak Bilgin et al., 2022). A father's participation in the decision-making process of getting a child vaccinated with the HPV vaccine depends on the father's level of awareness and knowledge regarding the vaccine and prevention of cervical cancer (Egawa-Takata et al., 2020). This study's findings show that African immigrant fathers require increased HPV and HPV vaccine awareness to enable them to make decisions to have their children get the vaccine to protect against the development of other diseases like cervical cancer.

Knowledge of Cervical Cancer Risk

Being aware of cervical cancer risks is crucial when it comes to increasing HPV vaccine uptake among African immigrants. Information regarding the risk of cervical

cancer is generally associated with the uptake of prevention measures (Yimer et al., 2021). In this study, findings showed limited knowledge regarding the risks of cervical cancer but acknowledged that cervical cancer is a serious disease. These findings are similar to a study by de Fouw et al. in Uganda, where men recognized their lack of knowledge on cervical and its risks (de Fouw et al., 2023). In another study by Okedo-Alex et al., results inferred inadequate knowledge of cervical cancer risks, symptoms, and prevention interventions (2020). Men must understand that cervical cancer is not a disease affecting women only, but men need to take safety measures against HPV infection in order to protect women (Nakisige et al., 2024).

This study's findings showed that some participants regard cervical cancer as a result of sexual practices with uncircumcised men but believe there is a vaccine to prevent the disease. Lack of knowledge regarding cervical cancer risks can result in poor support for spouses and children when it comes to prevention efforts, such as the uptake of the HPV vaccine (Okedo-Alex et al., 2020). It is vital to increase the awareness of cervical cancer risks among African immigrant men to help support their children in the efforts to get the HPV vaccine, thus reducing the possibility of developing cervical cancers among this population.

Findings Related to Theoretical Framework

HBM has been widely used to help understand individuals' likelihood of participating in healthy behaviors to prevent or control diseases (Rosenstock, 2000). The model comprises six constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and cues to action (Alsulami et al., 2023). The

African immigrant men shared their awareness and perception of HPV and HPV vaccine use among their children. Figure 4 shows study findings in relation to the awareness and perceptions of African Immigrant men about HPV and HPV vaccines.

Figure 4

Application of Four Health Belief Model Constructs

Perceived susceptibility	Perceived Benefits	Perceived Barriers	Cues to Action
<ul style="list-style-type: none"> • Does not affect Africans • Cultural practices protect children against diseases • No awareness of development of cancers from HPV infection 	<ul style="list-style-type: none"> • Sex education in schools • community events as source of information • Have children follow appointments for vaccines • Believes HPV vaccine is beneficial 	<ul style="list-style-type: none"> • No HPV and HPV vaccine awareness • Lack of trusted sources of information • High cost of health services • Culture does not allow sex health discussions with family 	<ul style="list-style-type: none"> • Support wives and children • Contact healthcare provider • Getting doctor's recommendation • Educate children and encourage HPV vaccine uptake

Perceived susceptibility is an individual's perception of the risk of developing the disease (Rajeh et al., 2023). Study findings showed a lack of HPV awareness, which is consistent with low perceived susceptibility to contracting the HPV infection, which can lead to the development of severe diseases like cervical cancer. A person may decide to get immunized or support a child's vaccination with the HPV vaccine by balancing perceived susceptibility and severity and considering perceived benefits if an action or behavior change occurs (Arwa et al., 2019). Study participants stated different perceptions regarding HPV infection, which included cultural practices that protect

children against diseases, beliefs that HPV does not affect Africans, and a lack of awareness of the possibility of the development of cancers from HPV.

The perceived barriers concerning HPV vaccination have to do with what people encounter to decrease the probability of acting to protect against the disease (Rajeh et al., 2023). Study findings showed some barriers among the participants, including the lack of HPV awareness, lack of trusted sources of information, high cost of healthcare in the US, and cultural traditions that do not permit sexual health discussions between a father and child. People require prompts in the form of HPV vaccine information, access to health, and good family communications to influence the action of the HPV vaccine.

Perceived benefits are about personal opinions on what can lower the threat of disease, yet various barriers prevent people from getting vaccinated against diseases like cervical cancer (Rajeh et al., 2023). In this study, findings showed that children getting sex in education in schools is beneficial, as well as children attending healthcare provider appointments to get the HPV vaccine and information dissemination at community events. Understanding how African immigrant men perceive and believe in reducing the threat of HPV infection among their children concerning cervical cancer prevention is crucial when it comes to increasing HPV vaccine uptake in this community.

Cues to action and support are sustained by interventions such as health education communications or media campaigns taking into cultural considerations to improve awareness and attitudes (Maseko et al., 2021). In this study, participants intended to make doctor's appointments for their children and speak with providers so that their children could get the HPV vaccine. Study findings also show that African immigrant men doing

research and learning more about HPV and HPV will help increase HPV vaccine uptake among the target population. In addition to that, African immigrant men supporting their wives, communicating with healthcare providers, and educating their children regarding HPV and HPV vaccines will help get their children to get the HPV vaccine.

Study Limitations

This study was aimed at African immigrant men with children living in the US for five years or less. I used the Zoom platform for audio recording and could not catch non-verbal cues. Participants were limited to three WhatsApp groups, primarily African immigrant men living in the US. The sample participants were from only five African countries. Study findings cannot be applied to all Sub-Saharan African immigrant populations because the sample did not represent all Sub-Saharan African immigrant populations. I was the only researcher in this study who conducted the interviews and analyzed data. Therefore, the interpretations may have included only some of what the participants shared.

Recommendations

The study explored the awareness and perception of the HPV and HPV vaccine among African immigrant men living in the US regarding the acceptance of the HPV vaccine for cervical cancer prevention among their children. The extensive insight into personal opinions and perceptions of HPV and HPV vaccines among African immigrant men demonstrates the strength of this study. Even though not all African immigrant men were represented in this study, HPV and HPV vaccine awareness and perception findings can be generalized to the target population. Due to varied African cultures, a future study

with a larger sample size, incorporating other immigrant men from additional African countries, is recommended to capture more opinions, experiences, and perceptions to improve the generalizability of the findings. Future studies using different data collection methods, such as focus groups, may help collect more profound perceptions of HPV and HPV vaccine information among the target group to help determine if different African cultural backgrounds affect health behaviors similarly. It can also help create targeted interventions that can help increase HPV vaccine uptake among the target group.

Implications for Professional Practice and Social Change

The implication of this primary qualitative study's social change is to understand African immigrant men's awareness and perception concerning HPV and HPV vaccines to improve HPV vaccine uptake among their children to prevent cervical cancer. Little is known regarding the lack of awareness and perception among African immigrant men, who are influential when health behavior decisions are made for their children and families (Netfa et al., 2020). Study findings add to the body of existing literature concerning the awareness and perception of HPV and HPV vaccines among the target population.

This study used the HBM as the theoretical framework to help develop culturally sensitive interventions to increase HPV vaccine uptake in African immigrant communities. Using the HBM as the theoretical framework helped to understand health behavior influences among different African immigrants concerning HPV and HPV vaccine use among their children. Findings from the study can create avenues for trusted sources of information to effectively disseminate HPV and HPV vaccine information

among African immigrant men and their families to help increase HPV vaccine uptake. Cultural practices emerged as one of the critical factors in HPV and HPV vaccine communications in African immigrant families. The findings can also help to understand better communication methods between fathers and children regarding HPV and HPV vaccines as well as sexual health to help prevent diseases like HPV infection that can lead to cervical cancer. Public health professionals can also benefit from the study findings by understanding the challenges faced by this community regarding HPV vaccine acceptance as recommended. Health policymakers can also gain an understanding of HPV and HPV vaccine awareness and perception among African immigrants to help create policies that can meet the needs of this community.

Conclusion

This study qualitatively explored the awareness and perception of the HPV and HPV vaccine among African immigrant men living in the US regarding the acceptance of the HPV vaccine for cervical cancer prevention among their children. Data were collected from the participants using an open-ended individual interview protocol. Data were used to qualitatively explore the awareness and perception of the HPV and HPV vaccine among African immigrant men living in the US regarding the acceptance of the HPV vaccine for cervical cancer prevention among their children.

The interviews were conducted from April 12th to June 1st, 2024. 11 participants were recruited from three WhatsApp groups with African immigrant men. Fireflies.AI was used to transcribe and summarize the data, and the thematic analysis process was used manually to analyze it. Study results showed a lack of HPV and HPV vaccine

awareness, but participants were willing to learn about the subject matter to be able to guide their children to get the HPV vaccine when recommended. African immigrant men voiced the influence of various cultural practices that shape their health behavior regarding HPV and HPV vaccines. Most participants did not have a problem with children getting sex education in schools. However, two had concerns about their children indulging in sexual activities early in life. Most participants highlighted the importance of getting HPV awareness education, and many shared trusted sources of information that can be instrumental in raising HPV and HPV vaccine awareness among African immigrant men living in the US. The study findings show the gaps in the healthcare system regarding raising HPV and HPV vaccine awareness among African immigrants living in the U.S. Hence, it is crucial to develop an approach to disseminate information on HPV and HPV to help increase the HPV vaccine uptake among African immigrants to reduce HPV infections and the development of severe diseases like cervical cancer.

References

- Adegboyega, A., Aleshire, M., Dignan, M., & Hatcher, J. (2019). Spousal support and knowledge related to cervical cancer screening: Are Sub-Saharan African immigrant men interested? *Health Care for Women International*, *40*(6), 665-681. <https://doi.org/10.1080/07399332.2019.1615914>.
- Adegboyega, A., Aroh, A., Williams, L. B., & Mudd-Martin, G. (2022). Social support and cervical cancer screening among sub-Saharan African immigrant (SAI) women. *Cancer Causes & Control: CCC*, *33*(6), 823-830. <https://doi.org/10.1007/s10552-022-01577-8>.
- Adegboyega, A., Desmennu, A. T., & Dignan, M. (2022). Qualitative assessment of attitudes toward cervical cancer (CC) screening and HPV self-sampling among African American (AA) and Sub Saharan African Immigrant (SAI) women. *Ethnicity & Health*, *27*(8), 1769-1786. <https://doi.org/10.1080/13557858.2021.1980771>
- Adekunle, T. E., Ahmed, M., & Afifi, R. (2021). A qualitative study to understand cervical cancer awareness and prevention among African immigrant women (AIW) in Iowa City, Iowa. *International Journal of Women's Health and Wellness*, *7*(1). <https://doi.org/10.23937/2474-1353/1510117>
- Ademuyiwa, I., Ayamolowo, S., Oshinyemi, T., & Oyeku, K. J. D. i. H. (2023). Knowledge and attitude of sex education among secondary school students in South-Western Nigeria: A cross-sectional study. *Dialogues in Health*, *2*. <https://doi.org/10.1016/j.dialog.2022.100085>.

- Adler, R. H. (2022). Trustworthiness in qualitative research. *Journal of Human Lactation*, 38(4), 598-602. <https://doi.org/10.1177/08903344221116620>
- Al Alawi, S., Al Zaabi, O., Heffernan, M. E., Arulappan, J., Al Hasani, N., Al Baluchi, M., Al Mamari, A., & Al Saadi, A. (2023). Knowledge, attitudes and acceptance toward Human Papillomavirus (HPV) vaccination: Perspectives of Muslim women and men. *Vaccine*, 41(13), 2224-2233. <https://doi.org/10.1016/j.vaccine.2023.02.063>
- Alghamdi, M. A., Al-Eitan, L. N., Tarkhan, A. H., & Al-Qarqaz, F. A. (2021). Global gene methylation profiling of common warts caused by human papillomaviruses infection. *Saudi Journal of Biological Sciences*, 28(1), 612-622. <https://doi.org/10.1016/j.sjbs.2020.10.050>
- Allen, E. M., Lee, H. Y., Pratt, R., Vang, H., Desai, J. R., Dube, A., & Lightfoot, E. (2019). Facilitators and barriers of cervical cancer screening and human papilloma virus vaccination among Somali refugee women in the United States: A qualitative analysis. *Journal of Transcultural Nursing*, 30(1), 55-63. <https://doi.org/10.1177/1043659618796909>
- Al Shdefat, S., Al Awar, S., Osman, N., Khair, H., Sallam, G., & Elbiss, H. (2022). Health care system view of Human Papilloma Virus (HPV) vaccine acceptability by Emirati men. *Computational & Mathematical Methods in Medicine*, 1-11. <https://doi.org/10.1155/2022/8294058>
- Alsulami, F. T., Sanchez, J., Rabionet, S. E., Popovici, I., & Baraka, M. A. (2023). Predictor of HPV vaccination uptake among foreign-born college students in the

U.S.: an exploration of the role of acculturation and the health belief model.

Vaccines, 11(2). <https://doi.org/10.3390/vaccines11020422>

American Cancer Society. (2020). *What Is Cervical Cancer?*

<https://www.cancer.org/content/dam/CRC/PDF/Public/8599.00.pdf>

American Cancer Society. (2023). *HPV and HPV testing.*

<https://www.cancer.org/cancer/risk-prevention/hpv/hpv-and-hpv-testing.html>

Amuta-Jimenez, A. O., Smith, G. P. A., & Brown, K. K. (2022). Patterns and correlates

of cervical cancer prevention among black immigrant and African American

women in the USA: The role of ethnicity and culture. *Journal of Cancer*

Education: The Official Journal of the American Association for Cancer

Education, 37(3), 798-805. <https://doi.org/10.1007/s13187-020-01884-1>

Anuforo, B., McGee-Avila, J. K., Toler, L., Xu, B., Kohler, R. E., Manne, S., & Tsui, J.

(2022). Disparities in HPV vaccine knowledge and adolescent HPV vaccine

uptake by parental nativity among diverse multiethnic parents in New Jersey.

BMC Public Health, 22(1), 195. <https://doi.org/10.1186/s12889-022-12573-7>

Aragones, A., Gany, F., Kaplan, A., & Bruno, D. (2022). An opportunity to increase

human papillomavirus vaccination rates: Change the guidelines. *Human Vaccines*

& Immunotherapeutics, 18(6). <https://doi.org/10.1080/21645515.2022.213644>

Arwa, I., Aldohaian, A., Sulaiman, A., & Arafah, D. M. (2019). Using the health belief

model to assess beliefs and behaviors regarding cervical cancer screening among

Saudi women: a cross-sectional observational study. *BMC Women's Health*, 19(1),

1-12. <https://doi.org/10.1186/s12905-018-0701-2>

- Beauchemin, C., & González-Ferrer, A. (2011). Sampling international migrants with origin-based snowballing method:: New evidence on biases and limitations. *Demographic Research*, 25, 3-3. <https://doi.org/10.4054/DemRes.2011.25.3>
- Braun, V., & Clarke, V. (2023). Is thematic analysis used well in health psychology? A critical review of published research, with recommendations for quality practice and reporting. *Health Psychology Review*, 17(4), 695-718. <https://doi.org/10.1080/17437199.2022.2161594>.
- Brayda, W. C., & Boyce, T. D. (2014). So you really want to interview me?: navigating “sensitive” qualitative research interviewing. *International Journal of Qualitative Methods*, 13(1), 318-334. <https://doi.org/10.1177/160940691401300115>
- Brouwer, A. F., Delinger, R. L., Eisenberg, M. C., Campredon, L. P., Walline, H. M., Carey, T. E., & Meza, R. (2019). HPV vaccination has not increased sexual activity or accelerated sexual debut in a college-aged cohort of men and women. *BMC Public Health*, 19(1), 1-8. <https://doi.org/10.1186/s12889-019-7134-1>
- Bruni, L., Saura-Lázaro, A., Montoliu, A., Brotons, M., Alemany, L., Diallo, M. S., Afsar, O. Z., LaMontagne, D. S., Mosina, L., Contreras, M., Velandia-González, M., Pastore, R., Gacic-Dobo, M., & Bloem, P. (2021). HPV vaccination introduction worldwide and WHO and UNICEF estimates of national HPV immunization coverage 2010–2019. *Preventive Medicine*, 144. <https://doi.org/10.1016/j.ypmed.2020.106399>
- Buckley, R. (2022). Ten steps for specifying saturation in qualitative research. *Social Science & Medicine*, 309. <https://doi.org/10.1016/j.socscimed.2022.115217>

- Burkholder, G. J., Cox, K. A., Crawford, L. M., & Hitchcock, J. H. (2020). *Research design and methods: An applied guide for the scholar-practitioner*. SAGE.
- Celentano, I., Winer, R. L., Jang, S. H., Ibrahim, A., Mohamed, F. B., Lin, J., Amsalu, F., Ali, A. A., Taylor, V. M., & Ko, L. K. (2021). Development of a theory-based HPV vaccine promotion comic book for East African adolescents in the US. *BMC public health*, *21*(1), 1137. <https://doi.org/10.1186/s12889-021-11005-2>
- Centers for Disease Control and Prevention. (n.d.a). *HPV and Cancer*.
https://www.cdc.gov/cancer/hpv/basic_info/index.htm
- Centers for Disease Control and Prevention. (n.d.b). *Vaccines and preventable diseases*.
[https://www.cdc.gov/vaccines/vpd/hpv/public/index.html#:~:text=they%20are%20better.,What%20Types%20of%20HPV%20Vaccines%20Are%20There%3F,and%20Drug%20Administration%20\(FDA\)](https://www.cdc.gov/vaccines/vpd/hpv/public/index.html#:~:text=they%20are%20better.,What%20Types%20of%20HPV%20Vaccines%20Are%20There%3F,and%20Drug%20Administration%20(FDA))
- Cheng, L., Wang, Y., & Du, J. (2020). Human papillomavirus vaccines: An updated review. *Vaccines*, *8*(3). <https://doi.org/10.3390/vaccines8030391>
- Çitak Bilgin, N., Coşkuner Potur, D., & Yildirim, G. (2022). Does group education affect mothers' knowledge and attitudes towards the HPV vaccine? *Health Care for Women International*, *43*(6), 686-704.
<https://doi.org/10.1080/07399332.2021.1982945>
- Cofie, L. E., Tailor, H. D., Lee, M. H., & Xu, L. (2022). HPV vaccination uptake among foreign-born blacks in the US: insights from the national health interview survey 2013–2017. *Cancer Causes & Control*, *33*(4), 583-591.
<https://doi.org/10.1007/s10552-021-01550-x>

- Coleman, P. (2021). Validity and reliability within qualitative research in the caring sciences. *International Journal of Caring Sciences*, 14(3), 2041-2045.
<https://doi.org/10.1136/eb-2015-102054>
- Coyne-Beasley, T., & Ortiz, R. R. (2023). Recommending HPV vaccination at age 9 to reduce health disparities: Communication challenges and opportunities. *Human Vaccines & Immunotherapeutics*, 19(1).
<https://doi.org/10.1080/21645515.2023.2178219>
- Cudjoe, J., Gallo, J. J., Sharps, P., Budhathoki, C., Roter, D., & Han, H.-R. (2021). The Role of sources and types of health information in shaping health literacy in cervical cancer screening among African immigrant women: a mixed-methods study. *Health Literacy Research and Practice*, 5(2), e96-e108.
<https://doi.org/10.3928/24748307-20210322-01>
- Cudjoe, J., Nkimbeng, M., Turkson-Ocran, R.-A., Commodore-Mensah, Y., & Han, H.-R. (2021). Understanding the pap testing behaviors of African immigrant women in developed countries: a systematic review. *Journal of Immigrant and Minority Health*, 23(4), 840-856. <https://doi.org/10.1007/s10903-020-01119-x>
- Cudjoe, J., Turkson-Ocran, R.-A., Ezeigwe, A. K., Commodore-Mensah, Y., Nkimbeng, M., & Han, H.-R. (2019). Recruiting African immigrant women for community-based cancer prevention studies: Lessons learned from the AfroPap study. *Journal of Community Health*, 44(5), 1019-1026. <https://doi.org/10.1007/s10900-019-00677-y>
- de Fouw, M., Stroeken, Y., Niwagaba, B., Musheshe, M., Tusiime, J., Sadayo, I., Reis,

R., Peters, A. A. W., & Beltman, J. J. (2023). Involving men in cervical cancer prevention; a qualitative enquiry into male perspectives on screening and HPV vaccination in Mid-Western Uganda. *PloS One*, *18*(1).

<https://doi.org/10.1371/journal.pone.0280052>

Dsouza, J. P., Van den Broucke, S., Pattanshetty, S., & Dhoore, W. (2022). Factors explaining men's intentions to support their partner's participation in cervical cancer screening. *BMC Women's Health*, *22*(1), 443.

<https://doi.org/10.1186/s12905-022-02019-y>

Dunajcik, A., & Cunningham, S. A. (2023). On the basis of visa type: Insights into incorporation and health among foreign-born people in the United States. *Journal of Migration and Health*, *7*, <https://doi.org/10.1016/j.jmh.2022.100146>

Echeverria-Estrada, C., & Batalova, J. (2019). Sub-Saharan African immigrants in the United States. *Migration Policy Institute*.

<https://www.migrationpolicy.org/article/sub-saharan-african-immigrants-united-states-2018>.

Egawa-Takata, T., Nakae, R., Shindo, M., Miyoshi, A., Takiuchi, T., Miyatake, T., & Kimura, T. (2020). Fathers' participation in the HPV vaccination decision-making process doesn't increase parents' intention to make daughters get the vaccine. *Human Vaccines & Immunotherapeutics*, *16*(7), 1653-1658.

<https://doi.org/10.1080/21645515.2019.1697107>

Elebiyo, O. T. (2023). Knowledge, attitude, and uptake of Human Papilloma Virus (HPV) vaccine among parents of adolescents attending outpatient clinic at the

- University of Benin teaching hospital, Nigeria. *African Journal of Reproductive Health*, 27(3), 108-117. <https://doi.org/10.29063/ajrh2023/v27i3.12>
- Fahrni, M. L., Azni, M. Z., Rusdi, N. S. M., Choo, C.-Y., Isa, K. A. M., & Babar, Z.-U.-D. (2022). Impact of university students' awareness and attitudes on vaccination practices for human papillomavirus, and perception on self-sampling for cervical cancer screening. *Journal of Pharmaceutical Policy & Practice*, 15(1), 1-10. <https://doi.org/10.1186/s40545-022-00471-7>
- Findley, M. G., Kikuta, K., & Denly, M. (2021). External validity. *Annual Review of Political Science*, 24(1), 365-393. <https://www.annualreviews.org/doi/10.1146/annurev-polisci-041719-102556>
- Fouche, C., Richter, S., Vallianatos, H., Mason, A., Fernández-Sánchez, H., Mazzucato, V., Kariwo, M., & Salami, B. (2021). African immigrant child health: a scoping review. *Journal of Migration and Health*, 4. <https://doi.org/10.1016/j.jmh.2021.100054>
- Frazer, I. H. (2019). The HPV vaccine story. *ACS Pharmacology & Translational Science*, 2(3), 210-212. <https://doi.org/10.1021/acsptsci.9b00032>
- Frietze, G., Padilla, M., Cordero, J., Gosselink, K., & Moya, E. (2023). Human Papillomavirus Vaccine Acceptance (HPV-VA) and Vaccine Uptake (HPV-VU): assessing the impact of theory, culture, and trusted sources of information in a Hispanic community. *BMC Public Health*, 23(1), 1-17. <https://doi.org/10.1186/s12889-023-16628-1>
- Galbraith-Gyan, K. V., Lechuga, J., Jenerette, C. M., Palmer, M. H., Moore, A. D., &

- Hamilton, J. B. (2019). HPV vaccine acceptance among African-American mothers and their daughters: an inquiry grounded in culture. *Ethnicity & Health, 24*(3), 323-340. <https://doi.org/10.1080/13557858.2017.1332758>
- Galvin, A. M., Garg, A., Griner, S. B., Moore, J. D., & Thompson, E. L. (2023). Health literacy correlates to HPV vaccination among US adults ages 27-45. *Journal of Cancer Education: The Official Journal of the American Association for Cancer Education, 38*(1), 349-356. <https://doi.org/10.1007/s13187-021-02123-x>
- Ganesh, N. P. (2020). Teaching the scope and limits of generalizability in qualitative research. *New Trends in Qualitative Research, 1*, 186-192. <https://doi.org/10.36367/ntqr.1.2020.186-192>
- Garon, J. R., Brennan, T., Mukavhi, A., Rupfutse, M., Bright, S., An, Q., Loharikar, A., & Manangazira, P. (2022). Multiple cohort HPV vaccination in Zimbabwe: 2018–2019 program feasibility, awareness, and acceptability among health, education, and community stakeholders. *Vaccine, 40*, A30-A37. <https://doi.org/10.1016/j.vaccine.2021.05.074>
- Gauna, F., Verger, P., Fressard, L., Jardin, M., Ward, J. K., & Peretti-Watel, P. (2023). Vaccine hesitancy about the HPV vaccine among French young women and their parents: a telephone survey. *BMC Public Health, 23*(1), 1-10. <https://doi.org/10.1186/s12889-023-15334-2>
- Getova-Kolarova, V., Zlatareva, A., & Kumanov, I. (2024). Exploring the nexus of trust, information sources, and vaccination intent: a study of HPV awareness and general practitioner influence. *Pharmacia, 71*, 1-6.

<https://doi.org/10.3897/pharmacia.71.e122666>

- Ghorbani-Dehbalaei, M., Loripoor, M., & Nasirzadeh, M. (2021). The role of health beliefs and health literacy in women's health promoting behaviors based on the health belief model: a descriptive study. *BMC Women's Health*, 21(1), 1-9.
<https://doi.org/10.1186/s12905-021-01564-2>
- Glosser, A., Gardiner, K. N., & Fishman, M. (2004). *Statutory rape: A guide to state laws and reporting requirements*. Washington, DC: Department of Health and Human Services. <https://aspe.hhs.gov/reports/statutory-rape-guide-state-laws-reporting-requirements-1>
- Guest, G., Namey, E., & Chen, M. (2020). A simple method to assess and report thematic saturation in qualitative research. *PLoS One*, 15(5), 1-17.
<https://doi.org/10.1371/journal.pone.0232076>
- Guo, Y., Sims, O. T., Li, Q., & Yang, F. (2023). Factors associated with first-generation immigrant parents' unwillingness to vaccinate their daughters for HPV. *Journal of Migration and Health*, 7. <https://doi.org/10.1016/j.jmh.2023.100161>
- Hennink, M., & Kaiser, B. N. (2022). Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Social Science & Medicine*, 292, N.PAG.
<https://doi.org/10.1016/j.socscimed.2021.114523>
- Illah, O., & Olaitan, A. (2023). Updates on HPV vaccination. *Diagnostics*, 13(2), 243.
<https://doi.org/10.3390/diagnostics13020243>
- Jefferis, D. C. (2020). Constitutionally unaccountable: Privatized immigration detention. *Indiana Law Journal*, 95(1), 145-182.

<https://search.ebscohost.com/login.aspx?direct=true&AuthType=shib&db=a9h&AN=141623137&site=ehost-live&scope=site&custid=s6527200>

- Jensen, J. E., Becker, G. L., Jackson, J. B., & Rysavy, M. B. (2024). Human Papillomavirus and Associated Cancers: A Review. *Viruses (1999-4915)*, *16*(5), 680. <https://doi.org/10.3390/v16050680>
- Jin, S. W., Lee, Y., & Brandt, H. M. (2023). Human Papillomavirus (HPV) vaccination knowledge, beliefs, and hesitancy associated with stages of parental readiness for adolescent HPV vaccination: implications for HPV vaccination promotion. *Tropical Medicine and Infectious Disease*, *8*(5), 251. <https://doi.org/10.3390/tropicalmed8050251>
- Joi, P. (2022). Routine vaccines, extraordinary impact: HPV. *Vaccines Work*. <https://www.gavi.org/vaccineswork/routine-vaccines/extraordinary-impact-hpv>
- Karafillakis, E., Simas, C., Jarrett, C., Verger, P., Peretti-Watel, P., Dib, F., De Angelis, S., Takacs, J., Ali, K. A., Pastore Celentano, L., & Larson, H. (2019). HPV vaccination in a context of public mistrust and uncertainty: a systematic literature review of determinants of HPV vaccine hesitancy in Europe. *Human Vaccines & Immunotherapeutics*, *15*(7-8), 1615-1627. <https://doi.org/10.1080/21645515.2018.1564436>
- Katsiroumpa, A., Skourli, I., Kalioras, E., Moisoglou, I., Tsiachri, M., Gkegkes, I. D., Stamatiadis, A. P., & Galanis, P. (2023). Determinants of HPV-Positive Male's Knowledge and Attitudes Towards HPV Vaccination. *International Journal of Caring Sciences*, *16*(3), 1292-1298.

- Kenny, D. X., Hsueh, K., Walters, R. W., & Coté, J. J. (2021). Human papillomavirus vaccination and pap smear rates among Burmese refugee girls in a healthcare system in Omaha, Nebraska. *Journal of Community Health, 46*(6), 1170-1176. <https://doi.org/10.1007/s10900-021-01003-1>
- Kiger, M. E., & Varpio, L. (2020). Thematic analysis of qualitative data: AMEE Guide No. 131. *Medical Teacher, 42*(8), 846-854. <https://doi.org/10.1080/0142159X.2020.1755030>
- Kim, E. S., Adriko, M., Oseku, K. C., Lokure, D., Webb, E. L., & Sabapathy, K. (2024). Factors associated with hookworm and *Schistosoma Mansoni* infections among school-aged children in Mayuge district, Uganda. *BMC Public Health, 24*(1), 1-14. <https://doi.org/10.1186/s12889-024-19092-7>
- Kim, K., & LeClaire, A.-R. (2019). A systematic review of factors influencing human papillomavirus vaccination among immigrant parents in the United States. *Health Care for Women International, 40*(6), 696-718. <https://doi.org/10.1080/07399332.2017.1404064>
- Klein, C., Kahesa, C., Mwaiselage, J., West, J. T., Wood, C., & Angeletti, P. C. (2020). How the Cervical Microbiota Contributes to Cervical Cancer Risk in Sub-Saharan Africa. *Frontiers in cellular and infection microbiology, 10*, 23. <https://doi.org/10.3389/fcimb.2020.00023>
- Kroke, A. M., & Ruthig, J. C. (2022). Conspiracy beliefs and the impact on health behaviors [Article]. *Applied Psychology: Health & Well-Being, 14*(1), 311-328. <https://doi.org/10.1111/aphw.12304>

- Kutz, J.-M., Rausche, P., Gheit, T., Puradiredja, D. I., & Fusco, D. (2023). Barriers and facilitators of HPV vaccination in Sub-Saharan Africa: A systematic review. *BMC Public Health*, 23(1), 1-13. <https://doi.org/10.1186/s12889-023-15842-1>
- La Frinere-Sandoval, Q. N. N. B., Cubbin, C., & DiNitto, D. M. (2022). Perceived neighborhood social cohesion and cervical and breast cancer screening utilization among U.S.-born and immigrant women. *AIMS Public Health*, 9(3), 559–573. <https://doi.org/10.3934/publichealth.2022039?viewType=HTML>
- Lakneh, E. A., Mersha, E. A., Asresie, M. B., & Belay, H. G. (2022). Knowledge, attitude, and uptake of human papilloma virus vaccine and associated factors among female preparatory school students in Bahir Dar City, Amhara Region, Ethiopia. *PLoS One*, 17(11). <https://doi.org/10.1371/journal.pone.0276465>
- Lakshmi, S., & Mohideem, M. A. (2013). Issues in reliability and validity of research. *International Journal of Management Research and Review*. 3(4), 2752
- Lama, Y., Qin, Y., Nan, X., Knott, C., Adebamowo, C., Ntiri, S. O., & Wang, M. Q. (2022). Human papillomavirus vaccine acceptability and campaign message preferences among African American parents: a qualitative study. *Journal of cancer Education: The Official Journal of the American Association for Cancer Education*, 37(6), 1691-1701. <https://doi.org/10.1007/s13187-021-02014-1>
- Langberg, G. S. R. E., Stapnes, M., Nygård, J. F., Nygård, M., Grasmair, M., & Naumova, V. (2022). Matrix factorization for the reconstruction of cervical cancer screening histories and prediction of future screening results. *BMC Bioinformatics*, 23(Suppl 12), 484. <https://doi.org/10.1186/s12859-022-04949-8>

- Ledibane, T. D., Ledibane, N. R., & Matlala, M. (2023). Performance of the school-based human papillomavirus vaccine uptake in Tshwane, South Africa. *Southern African Journal of Infectious Diseases*, 38(1), 1-6.
<https://doi.org/10.4102/sajid.v38i1.492>
- Leila, D. (2020). The process of enhancing validity, reliability, and ethics in research. *Iranian Journal of Applied Language Studies*, 12(2), 59-88.
<https://doi.org/10.22111/ijals.2020.5978>
- Liebermann, E., Devanter, N. V., Frías Gúzman, N., Ompad, D., Shirazian, T., & Heaton, C. (2020). Parent-level barriers and facilitators to HPV vaccine implementation in Santo Domingo, Dominican Republic. *Journal of Community Health*, 45(5), 1061-1066. <https://doi.org/10.1007/s10900-020-00830-y>
- Lindsay, A. C., Delgado, D., Valdez, M. J., & Granberry, P. (2022). Latinx fathers report low awareness and knowledge of the human papillomavirus vaccine, but high willingness to vaccinate their children if recommended by a healthcare provider: A qualitative study. *Global Public Health*, 17(11), 2883-2897.
<https://doi.org/10.1080/17441692.2021.1985580>
- Liu, G., Mugo, N. R., Bayer, C., Rao, D. W., Onono, M., Mgodhi, N. M., Chirenje, Z. M., Njoroge, B. W., Tan, N., Bukusi, E. A., & Barnabas, R. V. (2022). Impact of catch-up human papillomavirus vaccination on cervical cancer incidence in Kenya: A mathematical modeling evaluation of HPV vaccination strategies in the context of moderate HIV prevalence. *eClinicalMedicine*, 45.
<https://doi.org/10.1016/j.eclinm.2022.101306>

- Lorenzi, J., & Batalova, J. (2022). Sub-Saharan African immigrants in the United States. *Migration Policy Institute*. <https://www.migrationpolicy.org/article/sub-saharan-african-immigrants-united-states>
- Luan, H. (2023). Human papilloma virus infection and its associated risk for cervical lesions: a cross-sectional study in Putuo area of Shanghai, China. *BMC Women's Health*, 23(1), 1-7. <https://doi.org/10.1186/s12905-023-02166-w>
- Lubeya, M. K., Mwanahamuntu, M., Chibwesa, C., Mukosha, M., Wamunyima, M. M., & Kawonga, M. (2022). Implementation strategies to increase human papillomavirus vaccination uptake for adolescent girls in sub-Saharan Africa: A scoping review protocol. *PLoS One*, 17(8), 1-9. <https://doi.org/10.1371/journal.pone.0267617>
- Malik, S., Sah, R., Muhammad, K., & Waheed, Y. J. V. (2023). Tracking HPV infection associated cancer development, and recent treatment efforts—A comprehensive review. *Vaccines*, 11(1), 102-102. <https://doi.org/10.3390/vaccines11010102>
- Malika, N., Ogundimu, O., Roberts, L., Alemi, Q., Casiano, C., & Montgomery, S. (2020). African immigrant health: Prostate cancer attitudes, perceptions, and barriers. *American Journal of Men's Health*, 14(4). <https://doi.org/10.1177/1557988320945465>
- Martinelli, M., Giubbi, C., Saderi, L., Musumeci, R., Perdoni, F., Leone, B. E., Fruscio, R., Landoni, F., Piana, A., Sotgiu, G., & Cocuzza, C. E. (2023). Evaluation of Human papillomavirus (HPV) genotyping and viral load determination as

diagnostic biomarkers of cervical cancer risk. *International Journal of Molecular Sciences*, 24(2), 1320. <https://doi.org/10.3390/ijms24021320>

Maseko, T. N., Huang, H.-C., & Lin, K. C. (2021). Cervical cancer screening behavior of African women: The Rosenstock health belief model assessment. *Health Care for Women International*, 42(7-9), 976-991.

<https://doi.org/10.1080/07399332.2019.1677665>

McGuire, J. K., Kabagenyi, F., & Peer, S. (2023). Human Papillomavirus vaccination in Africa: An airway perspective . *International Journal of Pediatric*

Otorhinolaryngology, 165. <https://doi.org/10.1016/j.ijporl.2022.111423>

McKenzie, A. H., Shegog, R., Savas, L. S., Healy, C. M., Shay, L. A., Preston, S., Coan, S., Teague, T., Frost, E., Spinner, S. W., & Vernon, S. W. (2023). Parents' stigmatizing beliefs about the HPV vaccine and their association with information seeking behavior and vaccination communication behaviors. *Human Vaccines &*

Immunotherapeutics, 19(1). <https://doi.org/10.1080/21645515.2023.2214054>

Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation*. John Wiley & Sons.

Mihretie, G. N., Liyeh, T. M., Ayele, A. D., Belay, H. G., Yimer, T. S., & Miskr, A. D. (2022). Knowledge and willingness of parents towards child girl HPV vaccination in Debre Tabor Town, Ethiopia: a community-based cross-sectional study.

Reproductive health, 19(1), 136. <https://doi.org/10.1186/s12978-022-01444-4>

Milondzo, T., Meyer, J. C., Dochez, C., & Burnett, R. J. (2022). Human Papillomavirus Vaccine hesitancy highly evident among caregivers of girls attending South

African private schools. *Vaccines*, *10*(4),
<https://doi.org/10.3390/vaccines10040503>

Mina Mobini, K., Sara, S., Jalil, A., Maryam, E., & Hossein, K. (2023). Genetic diversity and bioinformatic analysis in the L1 gene of HPV genotypes 31, 33, and 58 circulating in women with normal cervical cytology. *Infectious Agents and Cancer*, *18*(1), 1-12. <https://doi.org/10.1186/s13027-023-00499-7>

Mohammadi, S., Rabiei, Z., Pajohideh, Z. S., Barati, Z., Talebi, S. S., & Keramat, A. (2023). Evaluating the health belief model constructs in adopting the HPV preventive behavior. *Journal of Family & Reproductive Health*, *17*(1), <https://doi.org/10.18502/jfrh.v17i1.11975>

Mulholland, M. A. J. S. (2023). Parents, whiteness and sex education: A critical race critique of parent sex education guides. *Sexualities*, *26*(1-2), 195-210. <https://doi.org/10.1177/13634607211041096>

Naeem, M., Ozuem, W., Howell, K., & Ranfagni, S. (2023). A step-by-step process of thematic analysis to develop a conceptual model in qualitative research. *International Journal of Qualitative Methods*, *22*, 1-18. <https://doi.org/10.1177/16094069231205789>

Nakisige, C., de Fouw, M., Nakalembe, M., Orem, J., Atukonyera, D., Musheshe, M., Koot, J., de Zeeuw, J., Beltman, J., & Stekelenburg, J. (2024). Baseline knowledge on risk factors, symptoms and intended behavior of women and men towards screening and treatment of cervical cancer in rural Uganda: a cross-sectional study. *BMC Cancer*, *24*(1), 1-11.

<https://doi.org/10.1186/s12885-024-12223-8>

- Netfa, F., Tashani, M., Booy, R., King, C., Rashid, H., Skinner, S. R. J. T. m., & disease, i. (2020). Knowledge, attitudes and perceptions of immigrant parents towards human papillomavirus (HPV) vaccination: A systematic review. *Tropical Medicine and Infectious Disease*, 5(2), 58.
- <https://doi.org/10.3390/tropicalmed5020058>
- Nji, A. N. (2016). *Perceptions of Cameroonian women regarding cervical cancer prevention* (Walden Dissertations and Doctoral Studies).
- Nkimbeng, M., Nmezi, N. A., Baker, Z. G., Taylor, J. L., Commodore-Mensah, Y., Shippee, T. P., Szanton, S. L., & Gaugler, J. E. (2023). Depressive symptoms in older African immigrants with mobility limitations: A descriptive study. *Clinical Gerontologist*, 46(1), 14-26. <https://doi.org/10.1080/07317115.2021.1976893>
- Noor Syazana, C. I., Leelavathi, M., & Adawiyah, J. (2023). Human Papillomavirus (HPV) infection awareness and vaccine acceptance among high-risk men in Perak, Malaysia. *Medicine & Health (Universiti Kebangsaan Malaysia)*, 18(1), 222-232. <https://doi.org/10.17576/MH.2023.1801.20>
- Nyirenda, L., Kumar, M. B., Theobald, S., Sarker, M., Simwinga, M., Kumwenda, M., Johnson, C., Hatzold, K., Corbett, E. L., Sibanda, E., & Taegtmeier, M. (2020). Using research networks to generate trustworthy qualitative public health research findings from multiple contexts. *BMC Medical Research Methodology*, 20(1), 1-10. <https://doi.org/10.1186/s12874-019-0895-5>
- Oh, N. L., Biddell, C. B., Rhodes, B. E., & Brewer, N. T. (2021). Provider

- communication and HPV vaccine uptake: A meta-analysis and systematic review. *Preventive medicine*, 148. <https://doi.org/10.1016/j.ypmed.2021.106554>
- Okedo-Alex, I. N., Uneke, C. J., Uro-Chukwu, H. C., Akamike, I. C., & Chukwu, O. E. (2020). “It is what I tell her that she will do”: a mixed methods study of married men’s knowledge and attitude towards supporting their wives’ cervical cancer screening in rural South-East Nigeria. *The Pan African medical journal*, 36, 156. <https://doi.org/10.11604/pamj.2020.36.156.21157>
- Okoye, J. O., Ofodile, C. A., Adeleke, O. K., & Obioma, O. (2021). Prevalence of high-risk HPV genotypes in sub-Saharan Africa according to HIV status: A 20-year systematic review. *Epidemiology and Health*, 43. <https://doi.org/10.4178/epih.e2021039>
- Olu-Steven, F. (2023). *Examining project managers’ productivity in an emerging virtual workplace post COVID 19* (Doctoral dissertation, Dublin, National College of Ireland).
- O’Neill, A. M., & Dwyer, R. (2023). Primary prevention of cervical cancer in women: Human papillomavirus vaccine. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 281, 29-31. <https://doi.org/10.1016/j.ejogrb.2022.12.001>
- Oyouni, A. A. A. J. J. o. I., & Health, P. (2023). Human papillomavirus in cancer: Infection, disease transmission, and progress in vaccines. *Journal of Infection and Public Health*, 16(4), 626-631. <https://doi.org/10.1016/j.jiph.2023.02.014>
- Patel, P. R., & Berenson, A. B. (2013). Sources of HPV vaccine hesitancy in parents.

Human Vaccines & Immunotherapeutics, 9(12), 2649-2653.

<https://doi.org/10.4161/hv.26224>

Patton, M. (2015). *Qualitative research and evaluation methods*. 4th Edition, Sage Publications, Thousand Oaks.

Peterson, C. E., Silva, A., Holt, H. K., Balanean, A., Goben, A. H., & Dykens, J. A.

(2020). Barriers and facilitators to HPV vaccine uptake among US rural populations: A scoping review. *Cancer Causes & Control*, 31(9), 801-814.

<https://doi.org/10.1007/s10552-020-01323-y>

Poirier, B., Sethi, S., Garvey, G., Hedges, J., Canfell, K., Smith, M., Ju, X., & Jamieson,

L. (2021). HPV vaccine: uptake and understanding among global Indigenous communities - a qualitative systematic review. *BMC Public Health*, 21(1), 2062.

<https://doi.org/10.1186/s12889-021-12147-z>

Pratt, R., Njau, S. W., Ndagire, C., Chaisson, N., Toor, S., Ahmed, N., Mohamed, S., &

Dirks, J. (2019). "We are Muslims, and these diseases don't happen to us:" A qualitative study of the views of young Somali men and women concerning HPV immunization. *Vaccine*, 37(15), 2043-2050.

<https://doi.org/10.1016/j.vaccine.2019.03>

Prior, K. N., Bond, V. E., & Bond, M. J. (2022). Does illness behavior contribute to the understanding of self-efficacy and quality of life among people with hearing loss?

A test of concept. *American Journal of Audiology*, 31(1), 211-219.

https://doi.org/10.1044/2021_AJA-21-00035

Prudden, H. J., Achilles, S. L., Schocken, C., Broutet, N., Canfell, K., Akaba, H., Basu,

- P., Bhatla, N., Chirenje, Z. M., Delany-Moretlwe, S., Denny, L., Gamage, D. G., Herrero, R., Hutubessy, R., Villa, L. L., Murillo, R., Schiller, J. T., Stanley, M., Temmerman, M., & Zhao, F. (2022). Understanding the public health value and defining preferred product characteristics for therapeutic human papillomavirus (HPV) vaccines: World Health Organization consultations, October 2021—March 2022. *Vaccine*, *40*(41), 5843-5855. <https://doi.org/10.1016/j.vaccine.2022.08.020>
- Quist, K. M., Fontenot, H. B., Zimet, G., Lim, E., Matsunaga, M., Liebermann, E., & Allen, J. D. (2024). HPV vaccine awareness, past behaviors, and future intentions among a diverse sample of fathers aged 27 to 45 years: A national survey. *American Journal of Men's Health*, *18*(3). <https://doi.org/10.1177/15579883241258823>
- Rajeh, M. T., Farsi, D. J., Farsi, N. J., Mosli, H. H., & Mosli, M. H. (2023). Are parents' willing to vaccinate their children against COVID-19? A qualitative study based on the Health Belief Model. *Human Vaccines & Immunotherapeutics*, *19*(1). <https://doi.org/10.1080/21645515.2023.2177068>
- Rami, F., Searight, H. R., Morrissey, M. B., Charvonja, A., Indart, M., & Brown, L. M. (2023). Health inequities and social determinants of health in refugee and immigrant communities. *American Psychologist*, *78*(2), 16-172. <https://doi.org/10.1037/amp0001113>
- Richards, L., & Morse, J. M. (2013). *Readme first for a user's guide to Qualitative Methods* (3. ed.). Sage Thousand Oaks, Calif.
- Rose, J., & Johnson, C. W. (2020). Contextualizing reliability and validity in qualitative

research: Toward more rigorous and trustworthy qualitative social science in leisure research. *Journal of Leisure Research*, 51(4), 432-451.

<https://doi.org/10.1080/00222216.2020.1722042>

Rosenstock, I. M. (2000). Health belief model. *Encyclopedia of Psychology*, 4.(pp. 78–80). Oxford University Press. <https://doi.org/10.1037/10519-035>

Saeed, S. A., & Masters, R. M. (2021). Disparities in Health Care and the Digital Divide. *Current psychiatry reports*, 23(9), 61. <https://doi.org/10.1007/s11920-021-01274-4>

Saldana, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). SAGE Publications.

Scarinci, I. C., Hansen, B., & Kim, Y.-i. J. V. (2020). HPV vaccine uptake among daughters of Latinx immigrant mothers: Findings from a cluster randomized controlled trial of a community-based, culturally relevant intervention. *Vaccine*, 38(25), 4125-4134. <https://doi.org/10.1016/j.vaccine.2020.03.052>

Schonfeld, I. S., & Mazzola, J. J. (2013). Strengths and limitations of qualitative approaches to research in occupational health psychology. In R. R. Sinclair, M. Wang, & L. E. Tetrack (Eds.), *Research methods in occupational health psychology: Measurement, design, and data analysis*. (pp. 268–289). Routledge/Taylor & Francis Group.

Shabani, L. W., Moodley, M., & Naidoo, T. D. (2019). Knowledge, awareness and attitude towards human papilloma virus vaccine in a resource-constrained setting: A comparison between an urban and rural population in South Africa. *Southern*

African Journal of Gynaecological Oncology, 11(1), 1-6.

<https://doi.org/10.1080/20742835.2019.1589183>

Shin, M. B., Sloan, K. E., Martinez, B., Soto, C., Baezconde-Garbanati, L., Unger, J. B., Kast, W. M., Cockburn, M., & Tsui, J. (2023). Examining multilevel influences on parental HPV vaccine hesitancy among multiethnic communities in Los Angeles: A qualitative analysis. *BMC Public Health*, 23(1), 1-11.
<https://doi.org/10.1186/s12889-023-15318-2>

Shon, E.-J., & Lee, L. (2023). Effects of vaccine literacy, health beliefs, and flu vaccination on perceived physical health status among under/graduate students. *Vaccines*, 11(4), 765. <https://doi.org/10.3390/vaccines11040765>

Sidiropoulou, M., Gerogianni, G., Kourti, F. E., Pappa, D., Zartaloudi, A., Koutelekos, I., Dousis, E., Margari, N., Mangoulia, P., Ferentinou, E., Giga, A., Zografakis-Sfakianakis, M., & Dafogianni, C. (2022). Perceptions, knowledge and attitudes among young adults about prevention of hpv infection and immunization. *Healthcare*, 10(9). <https://doi.org/10.3390/healthcare10091721>

Silverio, S. A., Sheen, K. S., Bramante, A., Knighting, K., Koops, T. U., Montgomery, E., November, L., Soulsby, L. K., Stevenson, J. H., Watkins, M., Easter, A., & Sandall, J. (2022). Sensitive, challenging, and difficult topics: Experiences and practical considerations for qualitative researchers. *International Journal of Qualitative Methods*, 21, 1-16. <https://doi.org/10.1177/16094069221124739>

Sledge, J. A., Jensen, C. E., Cibulka, N. J., & Hoffman, M. (2019). The male voice: A qualitative assessment of young men's communication preferences about HPV

and 9vHPV. *Journal of Community Health*, 44(5), 998-1008.

<https://doi.org/10.1007/s10900-019-00674-1>

Smith, J. S., Vaz, O. M., Gaber, C. E., Des Marais, A. C., Chirumamilla, B., Hendrickson, L., Barclay, L., Richman, A. R., Brooks, X., Pfaff, A., & Brewer, N. T. (2023). Recruitment strategies and HPV self-collection return rates for under-screened women for cervical cancer prevention. *PLoS One*, 17(3), 1-11.

<https://doi.org/10.1371/journal.pone.0280638>

Snyder, K. M., & Turesky, E. F. (2023). Dancing the data: A duo-ethnographic exploration toward dialogic reflexivity in qualitative data analysis. *Qualitative Inquiry*, 29(5), 558-570. <https://doi.org/10.1177/10778004221118687>

Stanley, S. D., & Robertson, W. B. (2024). Qualitative research in science education: A literature review of current publications. *European Journal of Science and Mathematics Education*, 12(1), 175-199. <https://doi.org/10.30935/scimath/14293>

Stout, M. E., Christy, S. M., Winger, J. G., Vadaparampil, S. T., & Mosher, C. E. (2020). Self-efficacy and HPV vaccine attitudes mediate the relationship between social norms and intentions to receive the hpv vaccine among college students. *Journal of Community Health*, 45(6), 1187-1195. <https://doi.org/10.1007/s10900-020-00837-5>

Štrbac, M., Vuković, V., Pustahija, T., Nikolić, N., Rajčević, S., Ilić, S., Dugandžija, T., Patić, A., Ristić, M., & Petrović, V. (2023). Motives and attitudes of parents toward HPV vaccination: Results from the initial period of HPV vaccine rollout in Serbia. *PLoS ONE*, 18(7), 1-15. <https://doi.org/10.1371/journal.pone.0287295>

- Suárez, P., Wallington, S. F., Greaney, M. L., & Lindsay, A. C. (2019). Exploring HPV Knowledge, Awareness, Beliefs, Attitudes, and Vaccine Acceptability of Latino Fathers Living in the United States: An Integrative Review. *Journal of Community Health, 44*(4), 844-856. <https://doi.org/10.1007/s10900-019-00636-7>
- Sunyoung, C., Ayden, I., George, P.-G., & Stergios, B. (2023). HPV and cervical cancer: A review of epidemiology and screening uptake in the UK. *Pathogens, 12*(298), 298-298. <https://doi.org/10.3390/pathogens12020298>
- Swai, P., Mgongo, M., Leyaro, B. J., Mwaiselage, J., McHome, B. L., Kjaer, S. K., Rasch, V., Manongi, R., & Msuya, S. E. (2023). Knowledge on human papilloma virus and experience of getting positive results: A qualitative study among women in Kilimanjaro, Tanzania. *BMC Women's Health, 23*(1), 1-8. <https://doi.org/10.1186/s12905-023-02192-8>
- Szulc, J. M., & King, N. (2022). The Practice of Dyadic Interviewing: Strengths, Limitations and Key Decisions. *Forum: Qualitative Social Research / Qualitative Sozialforschung, 23*(2), 49-68. <https://doi.org/10.17169/fqs-22.2.3776>
- Tahmasebi, E., Keshvad, A., Alam, M., Abbasi, K., Rahimi, S., Nouri, F., Yazdanian, M., Tebyaniyan, H., Heboyan, A., & Fernandes, G. V. O. (2023). Current infections of the orofacial region: Treatment, diagnosis, and epidemiology. *Life, 13*(2), 269. <https://doi.org/10.3390/life13020269>
- Tankwanchi, A. S., Bowman, B., Garrison, M., Larson, H., & Wiysonge, C. S. (2021). Vaccine hesitancy in migrant communities: A rapid review of latest evidence. *Current Opinion in Immunology, 71*, 62-68.

<https://doi.org/10.1016/j.coi.2021.05.009>

Tebogo Thandie, L. (2019). Understanding the utilization of qualitative inquiry in public health nutrition research. *World Nutrition, 10*(4).

<https://doi.org/10.26596/wn.2019104126-142>

Tobaiqy, M., Mehdar, S., Altayeb, T., Saad, T., & Alqutub, S. (2023). Parental knowledge, views, and perceptions of human papilloma virus infection and vaccination-cross-sectional descriptive study. *Journal of Family Medicine & Primary Care, 12*(3), 556-560. https://doi.org/10.4103/jfmipc.jfmipc_1673_22

Troiano, G., & Nardi, A. (2022). Instagrammers' attitude towards human papillomavirus (HPV) vaccine: A review. *Journal of Human Behavior in the Social Environment, 32*(2), 274-282. <https://doi.org/10.1080/10911359.2021.1885554>

Tsui, J., Martinez, B., Shin, M. B., Allee-Munoz, A., Rodriguez, I., Navarro, J., Thomas-Barrios, K. R., Kast, W. M., & Baezconde-Garbanati, L. (2023). Understanding medical mistrust and HPV vaccine hesitancy among multiethnic parents in Los Angeles. *Journal of Behavioral Medicine, 46*(1/2), 100-115.

<https://doi.org/10.1007/s10865-022-00283-9>

Vu, M., Berg, C. J., Pham, N. T., Tiro, J. A., Escoffery, C., Spring, B., Bednarczyk, R. A., Ta, D., & Kandula, N. R. (2023). U.S. Vietnamese parents' trusted sources of information and preferences for intervention messaging about HPV vaccination: A mixed methods study. *PEC Innovation, 3*.

<https://doi.org/10.1016/j.pecinn.2023.100189>

Wilson, R. (2021). HPV vaccine acceptance in West Africa: A systematic literature

review. *Vaccine*, 39(37), 5277-5284.

<https://doi.org/10.1016/j.vaccine.2021.06.074>

World Health Organization. (2018). *Human papillomavirus vaccines: WHO Vaccine-Preventable diseases surveillance standard*.

<https://www.who.int/publications/m/item/vaccine-preventable-diseases-surveillance-standardshpv>

World Health Organization. (2020). *Immunization agenda 2030: A global strategy to leave no one behind*. Geneva: WHO.

World Health Organization. (2021a). *Cervical Cancer*. <https://www.who.int/news-room/fact-sheets/detail/cervical-cancer>

World Health Organization. (2021b). *Vaccines and immunization: What is vaccination?* <https://www.who.int/news-room/questions-and-answers/item/vaccines-and-immunization-what-is-vaccination>

Xie, L., Ren, J., Min, S., Zhu, X., Xu, D., Qiao, K., Chen, X., Liu, M., Xiao, Z., & Tan, Y. (2023). Knowledge, attitude, and perception regarding HPV-related diseases and vaccination among the general public in Guizhou Province of China. *Vaccine*, 41(5), 1119-1131. <https://doi.org/10.1016/j.vaccine.2022.12.027>

Xu, M. A., Choi, J., Capasso, A., & DiClemente, R. (2023). Patient-provider health communication strategies: Enhancing HPV vaccine uptake among adolescents of color. *Healthcare*, 11(12). <https://doi.org/10.3390/healthcare11121702>

Xuerong, L., Tiantian, W., Youzhong, Z., & Yuzhen, L. (2021). Analysis of influencing factors of viral load in patients with high-risk human papillomavirus. *Virology*

Journal, 18(1), 1-8. <https://doi.org/10.1186/s12985-020-01474-z>

- Yamaguchi, M., Sekine, M., Hanley, S. J., Kudo, R., Hara, M., Adachi, S., Ueda, Y., Miyagi, E., & Enomoto, T. (2021). Risk factors for HPV infection and high-grade cervical disease in sexually active Japanese women. *Scientific Reports*, 11(1), 1-9. <https://doi.org/10.1038/s41598-021-82354-6>
- Yenew, C., Dessie, A. M., Gebeyehu, A. A., & Genet, A. (2023). Intention to receive COVID-19 vaccine and its health belief model (HBM)-based predictors: A systematic review and meta-analysis. *Human Vaccines & Immunotherapeutics*, 19(1). <https://doi.org/10.1080/21645515.2023.2207442>
- Yimer, N. B., Mohammed, M. A., Solomon, K., Tadese, M., Grutzmacher, S., Meikena, H. K., Alemnew, B., Sharew, N. T., & Habtewold, T. D. (2021). Cervical cancer screening uptake in Sub-Saharan Africa: a systematic review and meta-analysis. *Public Health*, 195, 105-111. <https://doi.org/10.1016/j.puhe.2021.04.014>
- Zheng, Z. M., & Baker, C. C. (2006). Papillomavirus genome structure, expression, and post-transcriptional regulation. *Frontiers in Bioscience: A Journal and Virtual Library*, 11, 2286-2302. <https://doi.org/10.2741/1971>
- Zhou, X., Whyke, T. W., & Wang, A. (2024). Cognition, willingness, and behavior towards human papillomavirus vaccination in Chinese university students: Planned behavior, health beliefs, and media influence. *Global Media and China, Preprints*. <https://doi.org/10.1177/20594364241230860>

Appendix A: Request to Participate in the Study

A Qualitative Analysis of Awareness and Perceptions of African Immigrant Men Regarding HPV Vaccine Uptake in Children to Prevent Cervical Cancer

I am conducting interviews to explore the HPV and HPV vaccine awareness and perception among African immigrant men regarding cervical cancer prevention among children. Your awareness and perception regarding the HPV and HPV vaccine is important to this study. The interview responses will be kept confidential, and should you decide to withdraw from the study, you can do so at any time. Participating in this research project is important as it will add valuable information to the literature.

If you are interested in participating in this study, please get in touch with me at

██████████ to arrange the interview date and time. My email address is

netsainancy.marigaandere@waldenu.edu

Thank you

Appendix B: Interview Protocol

Date of Interview:

Start time:

End time

Name of interviewee

Recording device

Introduction

Thank you for coming and for agreeing to talk to me today. My name is Nancy Mariga, a DrPH student at Walden University. I would like to talk to you regarding your awareness and perception about Human papillomavirus (HPV) and HPV vaccine. The interview will help gather information for a research study exploring the HPV and HPV vaccine awareness and perception among African immigrant men. The interview will take about 40-50 minutes of your time. Different men, as fathers, make various decisions about children getting the HPV vaccine based on their HPV awareness and perception. Sharing your views on HPV and HPV vaccine with me is important. All the information gathered here will be kept confidential. The information collected from the interview will be shared only with Walden University supervisors. It is important to note that all information that will identify you as a respondent will not be included in the study.

As a reminder, you do not have to share any information that you are not comfortable to talk about. Before we start, do you have any questions or concerns? Before we start the interview questions, would you give me your verbal permission to conduct and record this interview?

Interview Questions

Demographic information:

Age

African country of origin

Length of time living in the US

Number of children

Gender of your children

Interview Questions

1. Tell me what you know about Human papillomavirus (HPV).
2. Tell me what you know about the transmission of HPV and its effects on your child or children's health.
3. What do you know about cervical cancer and its prevention?
4. What do you know about the HPV vaccine?
5. What are your thoughts regarding the effectiveness of the recommended HPV prevention methods, such as the HPV vaccine, safe sex practices, and sex education offered in schools to influence your child or children's possibility of contracting HPV?
6. Tell me your thoughts about your child getting the HPV vaccine.
7. What are your thoughts regarding the HPV vaccine, such as safety and adverse effects, children's sexual activity, and availability of the vaccine?
8. What do you think is the impact on your child's health by getting the HPV vaccine?
9. Tell me about your concerns regarding the safety of the HPV vaccine.
10. What do you think are the barriers preventing you from deciding for your child to get the HPV vaccine?
11. Tell me about cultural practices that may affect your decision to get your child the HPV vaccine.

12. Tell me about religious beliefs that may affect your decision to get your child the HPV vaccine.
13. Tell me what you think can help you decide to have your child get the HPV vaccine.
14. In your opinion, what could be done to make it easier or harder for you to decide to have your child get the HPV vaccine?
15. As an immigrant father, tell me about your role in ensuring your child gets the HPV vaccine to protect against cervical cancer.

Potential Probes:

Why or why not

How did you get to know about this....

Conclusion

Thank you for taking the time to participate in this study. Your input is appreciated and valued. You will be notified when the findings of this study are available to the public.

Appendix C: Research and Interview Questions Alignment to Health Belief Model

Theory

Table C4*Interview Questions (IQ) and Health Belief Model Constructs*

HBM Constructs	Research Question (RQ)	Interview Question (IQ)
Perceived susceptibility	RQ1. What are the perceptions of risk regarding cervical cancer prevention in their children among African immigrant men living in the US?	IQ1. Tell me what you know about Human papillomavirus (HPV). IQ2. Tell me what you know about the transmission of HPV and its effects on your child or children's health.
	RQ2. What is the level of awareness of African immigrant men living in the US regarding HPV vaccine and cervical cancer prevention in their children?	IQ3. What do you understand about cervical cancer and its prevention? IQ4. What do you understand about the HPV vaccine? IQ5. What are your thoughts regarding the effectiveness of the recommended HPV prevention methods, such as the HPV vaccine, safe sex practices, and sex education offered in schools to influence your child or children's possibility of contracting HPV?
Perceived benefits vs barriers	RQ2. What is the level of awareness of African immigrant men living in the US regarding HPV vaccine and cervical cancer prevention in their children?	IQ6. Tell me your thoughts about your child getting the HPV vaccine. IQ7. What are your thoughts regarding the HPV vaccine, such as safety and adverse effects, children's sexual activity, and availability of the vaccine?
	RQ3. What are perceived factors of influence among African immigrant men living in the USA regarding cervical cancer prevention in their children?	IQ8. What do you think is the impact on your child's health by getting the HPV vaccine? IQ9. Tell me about your concerns regarding the safety of the HPV vaccine.
Cues to Action	RQ3. What are perceived factors of influence among African immigrant men living in the US regarding cervical cancer prevention in their children?	IQ10. What do you think are the barriers preventing you from deciding for your child to get the HPV vaccine? IQ11. Tell me about cultural practices that may affect your decision to get your child the HPV vaccine. IQ12. Tell me about religious beliefs that may affect your decision to get your child the HPV vaccine. IQ13. Tell me what you think can help you decide to have your child get the HPV vaccine. IQ14. In your opinion, what could be done to make it easier for you to decide to have your child get the HPV vaccine? IQ15. As an immigrant father, tell me about your role in ensuring your child gets the HPV vaccine to protect against cervical cancer.

Appendix D: Permission

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