



ORIGINAL ARTICLE

A Qualitative Study to Understand Cervical Cancer Awareness and Prevention among African Immigrant Women (AIW) in Iowa City, Iowa

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Abstract

Objective: This study aimed at assessing cervical cancer awareness and prevention among 21-65 year-old African immigrant women (AIW) in Iowa City, Iowa. Specifically, we queried about barriers and facilitators to the uptake of Papanicolaou screening, women's knowledge of the Human Papilloma Virus (HPV), and acceptance of the HPV vaccine for their children.

Study design: This was a qualitative study that included a total of 39 AIW. Twelve women were interviewed and 27 women participated in two FGDs. The FGDs included Sudanese women, and were conducted in Arabic. The interviews included women from Togo, Nigeria, Congo, Ghana, Tanzania, Botswana, and Kenya and were all conducted in English. Interviews and FGDs were recorded and transcribed/translated. We used thematic analysis - and the Socio-ecological Model as a framework - to highlight main themes.

Results: Low levels of knowledge on cervical cancer, pap smears, HPV, and HPV vaccination were found among study participants. Women described many barriers to the uptake of pap smear tests at the intrapersonal, interpersonal, organizational and community levels of the socio-ecologic model including: Language, lack of time, hardship in navigating the US health care system, cost of screening, fear of results, and lack of education regarding cervical cancer. Women were more inclined to accept the HPV vaccine for their children only after further explanation from the study facilitators.

Conclusions: Findings from this study indicate the need to increase knowledge of AIW on cervical cancer, Pap tests, HPV, and HPV vaccination; and to implement interventions to remove social and structural barriers to obtaining pap tests.

Keywords

Cervical cancer, Pap smear, African immigrant women, HPV, Iowa

Abbreviations

AIW: African Immigrant Women; FGD: Focus group discussion; HPV: Human Papilloma Virus; MA: Maysa Ahmed; NGOs: Non-governmental organizations; PI: Principal Investigator; RA: Rima Afifi; SSA: Sub-Sahara Africa; TA: Toluwani Adekunle; Pap smear/test: Papanicolaou test

Introduction

Globally, cervical cancer represents the fourth most commonly occurring cancer amongst women [1]. Yet the incidence of cervical cancer differs across the world, with higher estimates in lower resourced countries. Cervical cancer is a leading cause of cancer death for women in most of Africa, and South, East and West Africa have the highest incidence of cervical cancer worldwide [1]. Although cervical cancer rates among US females have decreased overtime [2], African-born immigrant women in the US still remain at significant risk of the disease [3].

Screening -using the Papanicolaou (Pap Smear) test- is effective in detecting cancer early and improving prognosis [4]. As a result, in the US, the current Healthy People 2020 cervical screening guidelines aims to attain cervical cancer screening frequencies of 93% of women aged 21-65 years [5]. Generally, in the United States,

immigrant populations have been found to have lower cancer screening rates as compared to their US born counterparts [6].

African Immigrant Women (AIW) are a sizable proportion of immigrants in the US [7]. Evidence indicates that, although there is a high awareness of cervical cancer in sub-Saharan African (SSA) countries, there is a low uptake of cervical cancer screening due to unavailability and inaccessibility of cervical cancer screening services [8,9]. As a result, AIW may not have had any pap screening prior to their arrival in the U.S [3], and low uptake of cervical cancer screening persists among AIW in the US [3,10-12].

Access alone is not enough to understand low screening rates: Even when free screening programs are provided in order to remove some of these structural barriers, low income women still fail to take advantage of these available services [13].

A recent literature review of cervical cancer screening among AIW found the following variables to be significant barriers: Immigrant status, lack of knowledge, religious beliefs, limited or complete lack of trust in the health care system, language difficulty, cultural and individual attitudes and stigma, cost, a lack of adequate insurance coverage, provider gender, and complexities of the health care system [3]. This review included both quantitative and qualitative studies conducted in North America, Europe or Australia. Only 6 of the 16 included studies were qualitative, and of these, 3 were conducted in the US: In Essex County, NJ; Washington DC, and in a Somali community in Minnesota. Additionally, a synthesis of qualitative evidence around cervical cancer screening identified similar factors to the above as barriers to screening, but did not include any studies from the USA [14]. This dearth of qualitative studies on determinants of pap smear among AIW in the USA is notable.

This paper aims to contribute to enhancing the in-depth understanding of the determinants of cervical cancer screening among AIW in the USA, and specifically in Iowa City, Iowa, using qualitative methods. With intent to influence prevention of cervical cancer, we further investigated AIW's attitudes towards HPV vaccination of their children. Between 2000 and 2010, the state of Iowa saw an increase of 171.3% in the settlement of African immigrants [15]. Iowa City has a burgeoning population of African immigrants, with Sudanese and Congolese making up a significant part of this population [16-18].

Methods

Study design

This qualitative study utilized a combination of interviews and focus group discussions (FGDs) to understand the determinants of the uptake of Pap smear screening and parental acceptance of the HPV vaccine among AIW

in Iowa City, Iowa. Qualitative methods can highlight socio-cultural determinants of health, as well as the lived experiences of a population [19,20]. FGDs provided an opportunity for women to exchange ideas and build on each other's contributions. However, they were also difficult to schedule given other commitments to their jobs and families. Hence, the research team made the decision to engage study participants in one-on-one interviews, at their convenience. Purposive sampling was utilized to recruit AIW in Iowa City. In addition, a snowball sampling process, through inquiry from other women enrolling into the study, was used to identify other AIW that qualified to participate in the study.

Recruitment

AIW in Iowa City were recruited via places of worship, ethnic markets/businesses, and non-governmental organizations (NGOs) that serve this population. The PI for this study (TA) sought permission from the institutions, NGOs, and businesses where participant recruitment occurred. The second author (MA) engaged in recruiting Sudanese women using snowball sampling method within her personal network, and was also the Arabic facilitator for the FGDs. The PI engaged in the recruitment and interview of other study participants that were not Sudanese. AIW were approached by the PI at these different locations, given a verbal description of the study, and recruited if they expressed interest in participating in the study. Participants were recruited based on their eligibility. The inclusion criteria for this study were AIW living in Iowa City, aged 21-65 years, who spoke English, French, or Arabic. Socio-demographic data was gathered by the PI (TA) and the Arabic research facilitator (MA) at the point of recruitment.

The Institutional Review Board of the University of Iowa approved this study.

Interview/FGD guide

The question that guided the interview and FGD were the same. Previous literature [3,8,10,14] guided the development of the questions and their probes. In total, the interview/FGD guide included 12 questions that asked about knowledge about cervical cancer and cervical cancer screening, specifically the Pap test; perceived susceptibility to cervical cancer; barriers and facilitators to the uptake of Pap test; and the health care preferences of study participants. The complete interview/guide can be found in the supplemental appendix.

Data collection

Two FGDs and 14 semi-structured interviews were held between May 2019 to August 2019 in the Iowa City/Coralville area. The 2 FGDs were held in Arabic with the help of the second author (MA) at a public library while all interviews were conducted in English by the first author (TA) at their local business, homes, or via telephone. At the start of each FGD and interview

session, the facilitator and interviewer read the IRB approved consent form and received informed consent from each participant. The FGDs lasted between 1 hr - 1 hr 30 minutes, while the interviews went for a duration of 30-45 minutes. The interview and FGD sessions were audio recorded with the consent of all participants and uploaded onto a password protected computer. Each participant received compensation in the form of a \$25 gift certificate immediately after the FGD or interview.

Data analysis

The interviews and FGDs were all transcribed and translated where necessary. Thematic analysis -a qualitative research approach to identifying the recurring themes in data and making meaning out of them [21], was conducted. All interview and FGD transcripts were uploaded to Nvivo 12. Two of the authors (TA, RA) open coded two interviews, recurring themes were identified and compared. This led to the development of a code book containing major codes and sub codes to guide analysis of the remaining interviews and transcripts.

Results

A total of 39 women participated in the study, 27 women were recruited for the FGDs and 12 women were interviewed. Most of the participants were from Northern Sudan (69%), the majority (79%) were married and had at least one child. Seventy-seven percent (77%) of participants were currently employed. All study participants had formal education, with the majority having received a college degree (64%). The mean length of stay in the United States for all participants was approximately 7 years, and the range was between 3-16 years. None of the women had been screened for cervical cancer prior to migration to the United States. Table 1 lists the characteristics of the participants.

The determinants of screening highlighted by AIW were categorized accordingly into individual, interpersonal, community, and organizational levels of the socio-ecological model. The socio-ecological model acknowledges that humans exist within a social framework with different layers that significantly impact on their health outcomes [22]. We use quotes from our participants to provide exemplars of that ecological level.

Individual level determinants of the uptake of Pap test among AIW

The individual level determinants of the uptake of the pap test among AIW in this study included knowledge, language, time, and immigration status as barriers, and perceived susceptibility to cervical cancer as a facilitator to pap test uptake.

Knowledge of cervical cancer and its determinants:

All of the study participants had heard of cervical cancer but most of them had misconceptions about its risk factors. Some of the participants rightly listed some risk factors for cervical cancer as the human papillomavirus

(HPV), lack of vaccination for the HPV, multiple sexual partners, smoking, and lack of regular check-up [23]. However, many participants -such as the one quoted below- also mentioned non-evidence based risk factors such as: Development of fibroid, prior abortion, hormonal imbalance, contact with toxic chemicals, alcohol consumption, and diet.

“Okay, first of all, I think maybe genetics could be one of them. Maybe the way you... maybe food, the way you... health, pretty much your diet. Then maybe your sexual experiences, something like that. Maybe you take a lot of birth control. Birth control will do that. A lot of, what else... maybe if you’ve lost a pregnancy before. Maybe if you’ve had a child before. Some people are just not... they don’t have their cervix, or that part of their reproduction system is not in turn to do certain things or to be a certain way. So something got affected and then they got the cervical cancer” [Kenyan woman].

Knowledge of the Pap smear as a screening test:

Many of the participants had not heard of the Pap test. Some that had heard of the test, and a few that had undergone the test, could not quite explain its purpose. One woman explained the Pap test as

Table 1: Socio-demographic characteristics of participants (n = 39).

Variables	N(%)
Age (years)*	
Age range	21-56 years
Country of origin	
Sudan	27 (69%)
Nigeria	4 (10%)
Kenya	2 (10%)
Ghana	2 (10%)
Congo	2 (10%)
Togo	1 (3%)
Botswana	1 (3%)
Insurance status	
Insured	29 (74%)
Uninsured	10 (26%)
Employment status	
Employed	30 (77%)
Unemployed	9 (23%)
Duration of residence in the United States	
< 5 years	6 (15%)
5 years and greater	33 (85%)
Pap smear prior to migration	0
Educational attainment	
< High school	0
High school or equivalent	14 (36%)
College degree or higher	25 (64%)

*except for age, all data provides numbers (and percent)

"Where you visit [the] doctor and you just, he puts stuff in your, haha, that's different from Pap smear right?" [Nigerian woman].

It was also apparent that some of the women did not know why they engaged in the test nor how often they were supposed to. One of the women mentioned that the last time she did the test was when she was pregnant.

"The last time I checked, I did [the Pap test] when I was pregnant with my kids...and you have to do it I guess" [Congolese woman].

Language: Once the test was explained, women identified barriers or potential barriers to seeking a cervical cancer screening test. Some of the women identified language as a potential barrier to seeking cervical cancer screening. One of the women expressed the impact of language on the health care seeking behaviours of AIW in the US.

"A friend of mine, she's having health issues but because of language problem ... she is also embarrassed to call somebody to take her to the hospital to hear all her health issues." [Congolese woman]

Time: Time was identified as a significant barrier in seeking cervical cancer screening. African women in the United States are burdened with other time consuming activities that they do not always have the time for seeking preventive health care.

"Because a lot of people, especially Africans here, they have kids, they're working several jobs to make ends meet, so they don't have the time or they're too busy." [Congolese woman]

Immigration status: The challenges of women with illegal immigrant status were highlighted as a barrier.

"You know ... they might not even have the legal permission to stay in the United States, which will also deny them access to health care, even if they have the money." [Nigerian woman]

Susceptibility to cervical cancer: To assess susceptibility, women were asked "do you feel that you can develop cervical cancer?" Most of the women agreed that they were susceptible to developing cervical cancer. A typical response to this question was that cancer does not discriminate.

"I fear anybody can develop it... it could happen to anybody, at any point in time." [Togolese woman]

Interpersonal level determinants of the uptake of Pap test among AIW

The only interpersonal level determinant of the uptake of the Pap test among AIW in this study included peer education, as a facilitator.

Peer education: Women showed preference for

peer education from other women within their community. When women were asked how they would prefer to receive cervical cancer information, one woman answered:

"Recruiting from within the population, I would say recruiting women who are willing to be educated, training women, women that are respected within that community to undergo trainings and then pass on the knowledge to others in the community. I think recruiting from within that population would definitely help spear-head this." [Ghanaian woman]

Organizational level determinants of the uptake of Pap test among AIW

The organizational level determinants of the uptake of Pap test among AIW in this study include cost and health insurance, health care providers, and communication difficulty as barriers, and type of health care setting as a facilitator.

Cost and health insurance coverage: Most of the women expressed that the cost of health care in the United States is either unaffordable and/or expensive. Some of the women identified a lack of insurance coverage as deterrence to the uptake of Pap test among AIW.

"Most people when they come here, they don't have health insurance and then they are afraid to go to the hospital. Then they will end up having a very big bill to pay for so many years" [Togolese woman].

One of the women highlighted that even with insurance coverage, the cost of health care is still a concern.

"I know how expensive it can be to get health care, whether it be preventive or reactive, when you don't have insurance. Because even when you do have insurance, it still can be a very hefty cost if anything, if certain things that are covered by your insurance" [Nigerian woman].

Some of the women who had insurance expressed uncertainty about the extent to which their health insurance covers a Pap test. One of the women highlighted that Pap tests for AIW may not be fully covered by their insurance policies.

"I think insurance should cover, but even with the insurance you still have to pay. You must pay a particular amount ... since the insurance is not 100%, so the little percentage might also be difficult for the ... African immigrant women because this set of people, they're still struggling to settle down to figure out what they can do with their lives" [Ghanaian woman].

Some of the women expressed unwillingness to pay out-of-pocket for a test -Pap test- that is not a regular routine of theirs. As one woman put it

"Sometimes, you just don't go that far for check-ups" [Kenyan woman].

Women also expressed their reluctance in paying for a preventative screening that may turn out negative.

"I'm not going to go take out my \$250, which is probably going to be more than that, from my savings account to go get a screen that would probably be negative. What are the chances of someone developing cervical cancer?" [Nigerian woman].

Waiting times: Women mentioned that although there were some free pap tests screening services in Iowa city, these services were usually overburdened with long waiting times.

"The free place here in Iowa City, you don't need to pay or even insurance, but you have to wait for weeks or even months before you can see a doctor." [Sudanese woman]

Health care providers: Distrust of healthcare professionals was highlighted as one of the barriers to the uptake of Pap test.

"Because the problem is that sometimes when you go to the hospital, I have the same issue when I go to the hospital and the doctor is telling me something, I feel like, well is he just trying to use me and make money? So there is this distrust of the system that some of us have so when they're like, "Can you do pap smears, it's good for you", in your head you're like, "Hm, you just want to take my money" [Nigerian woman].

Some concerns were raised by participants, regarding the gender of the health care professional executing the Pap test. As mentioned by one of the participants.

"A lot of times women end up being in the hands of a male physician, which is not as comfortable for them." [Nigerian woman]

There was also concerns about intimidation from the health care provider that is undergoing the test.

"I mean if you have someone coming into this country as an immigrant, not growing up here and knowing the value of going through health screenings, it is quite intimidating for someone to just submit themselves to a provider". [Kenyan woman]

The need for more diversity within the health care system was also one of the issues raised. Women implied that by having a more diverse health care workforce, communication may be easier.

"I think we just need other of people of color or people of African decent have to be in the health system. They are the ones who can sit down and speak a language and address their fears and talk about the questions that they might have." [Kenyan woman]

Communication difficulty: Specific distinction was made between language and communication barrier when interacting with health care providers.

"It's not even about understanding, [because] I think

I speak English relatively well. From personal experience, it's just been this wall between communicating to American healthcare providers and sometimes it's very few doctors that try to ask you about things. Sometimes you don't know what they are talking about, and they don't come down to your level...you don't want to seem stupid, so you just go along, and you don't even understand half of what they are saying." [Motswana woman]

The challenges experienced based on differences in accent, was identified by one of the participants.

"Sometimes, there might be people who respond differently, an accent or how they speak, and when you get that negative perception, automatically you shut down and you're turned off." [Kenyan woman]

As previously mentioned, language was identified as a barrier to the uptake of Pap tests. Although women acknowledged that translators can be utilized, they raised confidentiality concerns. Some women mentioned that the translators provided by the hospital could be a member of their community, creating discomfort in sharing personal health issues.

"Sometimes, you know the person doing translation and it is hard to share personal information with them. You don't want them to go out there and gossip about your private matter." [Sudanese woman]

Other issues identified included the gender of the translator and break in communication that occurs when using a translator. These concerns were well captured by the woman who described the disconnect that occurs when communicating through a translator.

"Translators will not interpret everything you feel and sometimes they bring a man, making you become shy. You might have a personality difference with the translator and they will translate things other than the ones you say. It's not like [when] you talk for yourself." [Sudanese woman]

Healthcare setting: Study participants showed more preference for smaller, more intimate health care settings. One of the reasons for this was so that the women will feel less stigmatized and overwhelmed. The concern with non-governmental organizations (NGOs) settings such as Planned Parenthood was with continuity of care. The fear was that information will not be shared across health care providers.

"The doctor would not be able to have access to this information to monitor their progress over time. So you want to do it with the primary so that at least that information is kept consistent. Somebody is monitoring their progress and seeing how things are changing" [Nigerian woman].

Participants also shared preference for private institutions due to the belief of increased chances of receiving quality health care.

“Find a private clinic where you are much likely to be attended to because if you are an African woman, it’s just the truth, your waiting is longer than a white man, no matter how much symptoms or pains” [Nigerian woman].

Provider recommendation: Many of the women showed preference for provider recommendation as a source of knowledge on cervical cancer, especially one who is culturally aware.

“A medical practitioner who is from that, who understands the culture I think, would be better. That would be the most preferred. Number one, they have to be female because being African, we are more comfortable with females, some of us” [Nigerian woman].

Community level determinants of the uptake of Pap test among AIW

The community level determinants of the uptake of the Pap test among AIW in this study included culture, superstitious beliefs, and female genital cutting.

Culture: The impact of culture on the uptake of cervical cancer screening was highlighted by many of the women. One of the women implied that the level of invasiveness that happens during the Pap test, is a stark contrast to the conservatism practiced in many African cultures.

“The African culture is very conservative I would say in terms of their body ... It’s quite invasive for someone to just go submit themselves just to a provider... and a lot of times women end up being in the hands of a male physician, which is not as comfortable for them. I mean, even in maybe the hands of a female physician I can understand why people would be hesitant” [Nigerian women].

Superstitious beliefs: Another barrier highlighted in the study was the presence of superstitious beliefs surrounding the uptake of preventive screenings.

“The perception in our concepts and culture might not give us a good reason to go for [Pap tests]. They have superstitious beliefs when it comes to cancer and other things” [Ghanaian woman].

Female genital cutting: The impact of circumcision on the uptake of Pap test was also identified. These women fear discrimination from a doctor that may never have encountered circumcised female genitalia.

“Some of them have all these concerns or fears or insecurities that they would not feel comfortable talking about unless they have somebody who they knew would understand them” [Nigerian woman].

AIW knowledge and acceptance of the HPV vaccination for their children

We also explored knowledge and attitudes of AIW towards HPV vaccination for their children.

Lack of knowledge: There was a general lack of knowledge on the Human Papilloma Virus (HPV).

For instance, one woman mentioned that

“I have heard about [HPV] before. I think it’s some kind of regular check-up or something like that. I’m not sure. I’ve never actually looked into it.” [Congolese woman]

The HPV vaccine was then described to the women and they were asked if they would allow their children -male and female- to take the vaccine. Most of the women had no problem with allowing their children to take the vaccine, however, there was a perception that withholding the vaccine from male children is justifiable since they were not susceptible to cervical cancer. One woman asked

“Will cervical cancer affect my son? If not, then I have nothing to worry about.” [Sudanese woman]

Notably, some of the women highlighted that HPV is non-discriminatory towards any gender.

“I have seen so many ads about it. You would think I would go and read more about it. What I did learn was that it apparently affected boys too.” [Nigerian woman]

Although most of the women initially had no knowledge of the HPV vaccine, after further explanation from the facilitators, they were willing to allow their children take the vaccine.

Women also expressed the need to combine HPV vaccination with adequate sexual education.

“I want my children to also know one of the risks that has been identified as a cause of cervical cancer is multiple sexual partners. I don’t want my children to feel like ‘oh because we have done this, we are now free to go ahead and do whatever we want to do” [Nigerian woman].

Some of the women shared the concern that approval of the HPV vaccine might create an assumption by the children, that they -the parent- approves of them-the child- being sexually active.

“It opens the door for discussion that we approved the ... sexual relationship for kids...but it protects from cancer and this is great” [Sudanese woman].

Discussion and Conclusion

This study explored the barriers and facilitators to the uptake of cervical cancer screening among AIW in Iowa City, Iowa. These determinants, as highlighted by the study, are embedded within the different levels of the social ecological model including the individual, interpersonal, organizational, and community levels. Most of the barriers shared by women in this study, mirror what is found in the literature regarding the target population, including low levels of knowledge, language differences, cost and health insurance coverage, communication difficulty, gender of health care provider

immigration status [3,24,25], lack of trust in the health care system and female genital cutting [26]. Barriers that were more unique to this study included the gender of the translator and fear that translator, being a member of the community, will disclose the patient's private health information.

Perception of susceptibility to cervical cancer was high among study participants but this contradicts findings from a previous study which found that perceived susceptibility to cervical cancer was low among Somali women. However, in the present study, women believed that anyone could develop cancer and it does not discriminate [26].

Some of the facilitators to the uptake of pap test highlighted in this study also confirmed previous literature including provider recommendation, use of peer educators, as well as education from friends and family [3,25]. Unique facilitators identified by study participants include the use of health care providers of African descent, who understand the culture and speak the language. An alternative to the use of health care providers from African descent, is the use of culturally aware providers.

Communication barriers were identified by women in this study, transcending language barriers alone. Study participants acknowledged the lack of understanding when communicating with US health care providers. Many of the study participants were comfortable with the English language but still complained of issues such as accent differences and the inability to 'keep-up' with US health care providers during conversations. Prior studies among AIW have shown that they often experience language and communication barriers in the uptake of Pap screenings [25,26]. US health care providers should be particularly cognizant of communication barriers when interacting with African immigrant populations. There are benefits to the provision of culturally sensitive health care services that can contribute to an increase in the uptake of cervical cancer screening among immigrant populations [27]. There has also been prior recognition for the need to provide linguistically appropriate screening services for immigrant women populations [26].

Many of the participants in the study were comfortable with receiving provider recommendation for Pap tests. The women expressed trust in the credibility of the information being received from a health professional. Many AIW also expressed that they feel more comfortable when a woman carries out their Pap test. This indicates that health care providers should be provided with cultural awareness training so that they can show sensitivity towards AIW's discomfort with the invasiveness of Pap tests and need for privacy. Strategies for the implementation of culturally sensitive health care services for culturally and linguistically diverse populations have been identified [28].

To increase the uptake of Pap test among AIW in the US, interventions should focus on raising awareness, increasing access, and addressing individual, organizational and community level barriers to receiving Pap tests. In addition to provider recommendation, knowledge of cervical cancer may be increased through community outreaches using members from within the community who are knowledgeable about the subject and can serve as health navigators/community health workers. There is increasing evidence that highlights the effectiveness of community health workers in addressing barriers to the utilization of health care services [29,30]. In addition, health care providers need to prioritize cultural humility in the provision of health care services, over cultural competency so that they can meet their patients at the point of their needs [31].

Limitations

Most of our sample (70%) consisted of women from Sudan and therefore may not be generalizable to a more diverse group of AIW. In addition, we conducted the FGDs and interviews only in English and Arabic, and therefore may have missed including women who spoke other African languages, such as French, Swahili and others. Our sample all lived in Iowa City, and therefore their experience may not represent those of AIW living in larger cities. However, the potential impact of this limitation is reduced by the similarity of our findings to others in the literature.

In conclusion, AIW from Iowa City identified barriers at the individual, interpersonal, organizational and community levels to their effective uptake of cervical cancer screening. In addition, AIW generally were unaware of the HPV vaccine but supported vaccination of their children once explained. Future research should identify successful intervention strategies for increasing the uptake of pap test among AIW populations in the US. Further research should also explore the determinants for the uptake of HPV vaccination for African immigrant populations in the United States.

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Statement of Equal Author's Contribution

TA engaged in design of study, application for IRB approval, recruitment, data collection, data analysis, and writing of manuscript. **MA** engaged in recruitment and data collection. **RA** engaged in study design, data collection, data analysis, and writing of manuscript.

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Supplemental Appendix 1

FGD Guide/Questions:

A) Knowledge about Cervical Cancer:

1. What causes cervical cancer?
2. What are the risk factors for the development of cervical cancer?

B) Knowledge about Cervical Screening:

3. What do you understand by the term “smear test”?
4. Why is the smear test done?

C) Barriers and facilitators to the uptake of pap smear test and possible solutions:

5. What are some reasons that African women in the US do not get Pap smear tests?
 - I. Probes: Language, insurance status, preference for western vs. traditional African medicine, perceived susceptibility
6. How do you think these barriers could be overcome?

D) Service Delivery:

7. In what type of health setting do you think African Women in Iowa City would prefer to get their Pap smear tests? (Hospital, Health Clinics, Planned Parenthood (NGO)).

E) Cervical Cancer Prevention:

8. What do you know about HPV?
9. Would you allow you daughter/sons to get HPV vaccines?
 - I. If yes, why?
 - II. If no, why not?

F) Cervical Cancer Intervention:

10. What would encourage you or make it easier for you to get screened for cervical cancer?
11. How would you prefer to be given information on cervical screening?
 - I. Probe: Telephone, flyer, face-to-face, language, location?
12. What type of person would you prefer provide that information?
 - I. Probe: Health providers, community members, family members?