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Acceptability and usability of self-collected sampling for HPV testing among African American women living in the Mississippi Delta

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Abstract

Background—HPV DNA testing has been shown to be an effective approach to cervical cancer screening, and self-collection sampling for HPV testing could be a potential alternative to Pap test, provided that women who tested positive by any method get timely follow-up and care. This feasibility study examined acceptability and usability of self-collected sampling for HPV testing among African American (AA) women in the Mississippi Delta in order to inform the development of interventions to promote cervical cancer screening in this population.

Methods—The study consisted of two phases. Phase I consisted of eight focus groups (N=87) with AA women to explore knowledge, attitudes, and beliefs about cervical cancer and HPV infection as well as acceptability of self-collected sampling for HPV testing. In Phase II, we examined the usability of this technology through one discussion group (N=9). The Health Belief Model guided data collection and analysis.

Results—Although participants perceived themselves as susceptible to cervical cancer and acknowledged its severity, there was a lack of knowledge of the link between HPV and cervical cancer, and they expressed a number of misconceptions. The most frequent barriers to screening included embarrassment, discomfort, and fear of the results. Women in both phases were receptive to self-collection sampling for HPV testing. All participants in the usability phase expressed that self-collection was easy and they did not experience any difficulties.

Conclusion—Self-collection for HPV testing is an acceptable and feasible method among AA women in the Mississippi Delta to complement current cytology cervical cancer screening programs.

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Keywords

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Introduction

The incidence rate of cervical cancer among African American women is 11.1 per 100,000 as compared to 7.9 per100,000 among white women, which places cervical cancer as the 7th leading type of new cancer cases among African American women (Jemal, Siegel, Xu & Ward, 2010). The excess mortality ratio associated with cervical cancer between African American and white women nationwide is 2.4 per 100,000 (4.6 vs. 2.2 respectively), which places cervical cancer among the top 10 leading causes of cancer deaths among African American women (Edwards et al., 2010). These disparities are even greater in the Delta region of Mississippi, where the incidence of cervical cancer is 13.4 per 100,000 in African American women compared to 9.1 per 100,000 in white women. The excess mortality ratio between African American and white women living in the Delta is 7.5 per 100,000 (9.7 vs. 2.2, respectively) (Cervical Cancer Incidence and Mortality, 2003–2007, n.d.) Population characteristics of women living in this region are high levels of poverty, low educational attainment, and limited access to care, all contributory factors to cervical cancer incidence and mortality (Freeman & Wingrove, 2007).

Despite the fact that cytology screening programs are widely available in the United States, some racial/ethnic minorities and women with low education and income do not fully take part in these programs due to structural and intra/interpersonal barriers, resulting in higher rates of cervical cancer in these under-screened women (Freeman & Wingrove, 2007; Centers for Disease Control and Prevention, n.d.; Scarinci et al., 2010; Brewster et al., 2005). The discovery that virtually all cervical cancer is caused by persistent cervical infections with certain carcinogenic human papillomavirus (HPV) genotypes has led to two major technologic advances: 1) prophylactic HPV vaccination for primary prevention and 2) HPV DNA testing for secondary prevention (screening).

DNA testing for HPV provides improved, more reliable identification of women with cervical precancer and cancer than Pap testing (Cuzick et al., 2006; Mayrand et al., 2007; Naculer et al., 2007; Rijkaart et al., 2012; Ronco et al., 2010; Castle et al., 2011b). The increased sensitivity of molecular HPV testing over Pap testing translates into two important healthcare benefits: 1) earlier detection of precancerous lesions that, if treated, results in a reduced incidence of cervical cancer within 4–5 years (Rijkaart et al., 2012; Ronco et al., 2010) and reduced death within 8 years (Sankaranarayanan et al., 2009) and 2) greater reassurance against cancer (lower cancer risk) following a negative result for many years (Dillner et al., 2008; Castle et al., 2012), which permits screening at an extended interval.

The added sensitivity of HPV DNA testing makes the use self-collection and HPV DNA testing for cervical cancer screening a viable option that could be used to complement current programs to reach those women not undergoing routine Pap testing. Previous studies have examined the sensitivity and predictive value of HPV detection by comparing self-collected and clinician-collected samples of HPV testing indicating HPV self collection as a feasible alternative to traditional clinician-collected sampling for cervical cancer screening (Ogilvie et al., 2007; Belinson et al., 2010; Belinson et al., 2003; Garcia et al., 2003). A recent pooled analysis of 5 studies in China showed that self-collection as at least as sensitive as Pap testing (Zhao et al., 2012). Although there is a reduced sensitivity with self-collected specimens compared to clinician-collected specimens tested for HPV DNA, women can potentially collect a cervicovaginal specimen in the privacy and convenience of

their home and mail the kit to a lab for HPV DNA testing with same cervical cancer prevention benefits as a Pap test, a standard of care. It should be noted that method of screening matters little without excellent follow-up of screen positives to ensure timely management and treatment of cervical disease.

However, the public health benefits of such technology will only be attained if the approach is accepted and adopted by at risk populations. Previous studies lacked in depth understanding of the sociocultural, structural, and intra/interpersonal factors associated with self-collection sampling for HPV testing, and most were limited to women who were recruited at clinics (Belinson et al., 2003; Balasubramanian et al., 2010; Lenselink et al., 2009; Lindau et al., 2009; Kahn et al., 2004; Palmisano et al., 2003; Harper, Noll, Belloni & Cole, 2002; Rompalo et al., 2001; Gravitt et al., 2001; Harper et al., 1999; Moscicki, 1993; Morrison, Goldberg, Hagan, Kadish & Burk, 1992).

The purpose of this feasibility study was to examine the knowledge, beliefs, and attitudes regarding cervical cancer and HPV infection as well as acceptability and usability of self-collected sampling for HPV testing among African American women recruited through public health clinics and the community in the Mississippi Delta with the ultimate goal of developing theory-based, culturally-relevant interventions to promote cervical cancer screening in this population.

Methods

Setting

This study was developed in collaboration with the Deep South Network for Cancer Control (DSNCC), a research program funded by the National Cancer Institute. The DSNCC has been in existence for more than ten years and has systematically and progressively addressed the major cancer health concerns in ten counties in the Alabama Black Belt, and nine counties in the Mississippi Delta. DSNCC utilizes a Community Health Advisor (CHA) model in its work to reduce cancer health disparity through breast and cervical cancer awareness and screening (Lisovicz et al., 2006; Lisovicz, Wynn, Fouad & Partridge, 2008; Scarinci, Johnson, Hardy, Marron & Partridge, 2009; Partridge & Fouad, 2010).

Theoretical Framework

The Health Belief Model (HBM) guided data collection and analysis. Under the HBM, individuals will change their behavior (s) to prevent a particular disease if: (a) they consider themselves as susceptible to the disease or condition [e.g., they can be exposed to HPV]; (b) if they perceive that such a disease or condition can have serious consequences [e.g., HPV can lead to cervical cancer and that can be fatal]; (c) they perceive they are threatened by the disease or condition; (d) they perceive that engagement in a particular behavior [e.g., getting screening or engaging in self-collection sampling for HPV testing] will be beneficial in reducing the susceptibility to and/or the severity of the disease; and (e) they believe that the benefits outweigh the barriers or costs (Rosenstock, 1990).

Participants

The study was conducted in two phases. DSNCC CHAs assisted in the recruitment of participants for both phases. Eight focus groups with African American women 30 years of age and older in the Mississippi Delta were conducted during the first phase. Thirty women were recruited from a public primary care clinic while attending their appointments for a routine Pap smear and 57 women were recruited from the community. The inclusion criteria were: (a) African American; (b) woman; (c) 30 years of age and older; and (d) a resident in the Mississippi Delta. Among women recruited in the community, the criterion of not having

had a Pap smear in the past three years were added since we were interested in getting the feedback of women who were getting their regular Pap smear and the ones who were not. Participants in the second phase were recruited in the community, and the frequency of screening was not an inclusion criterion. This sample consisted of nine African American women. Data collection took place between November, 2005 – January, 2006 (Phase I) and August, 2006 (Phase II).

Procedure

Prior to the study, we had discussion groups with CHAs on the best strategies to approach the community regarding self-collected sampling and HPV testing for cervical cancer screening. Their feedback was important to develop a participatory topic guide for the focus groups.

Phase 1—At the beginning of each focus group, the purpose of the study was explained and informed consent was obtained. Participants also completed a brief questionnaire including demographics (e.g., age, marital status, educational attainment, number and age of children, health insurance coverage), whether they ever heard of HPV, and when they had their last Pap smear. A question on whether participants knew where to get a Pap smear were added to the questionnaire among women recruited in the community. In the first segment of each focus group, women engaged in a discussion about knowledge, attitudes, and beliefs about cervical cancer, including perceived susceptibility, contributing factors, prevention, screening, barriers to screening, resources that support screening, and knowledge on HPV. Following a brief presentation about cervical cancer, HPV, and self-collected sampling for HPV testing, the discussion focused on willingness and barriers and benefits to engage in self-collection at home versus Pap smear. Sessions lasted approximately 1.5 hours and followed the topic guide presented in Table 1. Every session was audio taped and transcribed. Participants received $20 (cash) for their participation.

Phase 2—The results of the phase 1 were used to develop educational sessions and instructions for device usage. Two sessions were held with nine women over two days. The first session consisted of explanation of the purpose of the study, consenting procedures, and education about cervical cancer and HPV and detailed instructions about how to use the self-collection device by a female who had used the device herself. Women were given the opportunity to handle the device during the session and ask questions. Kits were distributed with a reminder card for the next group, collection device (Castle, Aftab, Saint-Jean, & Mendez et al., 2006), a vial of mouthwash as a safe transport medium for the cervicovaginal specimen (Castle et al., 2007), step-by-step written instructions on how to self-collect, and a phone number in case they had questions or experienced any problems using the device at home (Castle et al., 2006). The following day the women discussed their experience using the self-collection device in a group session (Table 2). The research protocol was reviewed and approved by the Institutional Review Board, and data collection took place in 2006.

Data Analysis

Focus group transcriptions from Phase 1 were analyzed in four stages. First, two of the investigators independently read the transcripts to identify emerging themes. Second, investigators discussed the identified themes and agreed on categories. This phase was carried out by going through the identified themes and coming to an agreement on the major themes that were identified by both investigators. Based on this discussion, a grid of agreed-upon-themes was generated. During the third phase, investigators re-read transcripts and attempted to include the previously identified themes (and other new themes) into the agreed upon categories. The fourth stage consisted of a final grouping arrangement that was agreed upon by both investigators. For Phase 2, we used the extensive notes taken during the

second discussion group where participants provided feedback on the usability of the self-collection device.

Results

Phase 1

The sample consisted of 87 African American women living in the Mississippi Delta region (Table 3). The mean age of the women recruited from the clinic was 40.9 years old (range 18–81 yrs) and recruited from the community was 43.1 years old (range 29–78 yrs). Less than half of the women recruited in both groups had heard of HPV before (40% vs. 41%). Most women (94.9%) knew where to go for a Pap smear.

The main differences between women recruited from the clinic and community was health insurance coverage (70% vs. 57%) and having a Pap smear in the past 12 months (63% vs. 29%, respectively). Almost 100% of participants recruited in the community reported knowing where to get a Pap smear (94.9%). It should be noted that although we had a strict inclusion criteria in terms of age (both groups) and not having had a Pap smear in the past three years (community group), some participants were included who did not meet the inclusion criteria. This was due to recruitment by CHAs, and, in order to maintain credibility in the community, we included them in the groups.

With regard to the qualitative findings, we have grouped them within categories that are consistent with the Health Belief Model, and they are described below. Table 4 displays representative quotes of the major identified themes. Although the obtained qualitative data among women recruited in the clinic and women recruited in the community were initially analyzed separately, there were no differences in the main themes between these two groups. Therefore, they are presented together.

Overall Knowledge and Beliefs—Most participants had heard of cervical cancer, but just one mentioned the connection between cervical cancer and HPV. We also examined their knowledge and beliefs about risk factors. The most frequent mentioned contributing factors to cervical cancer were bleeding or irregular periods, factors associated with sexual behavior/intercourse (e.g, the size of the penis, rough sex, having sexual intercourse during the menstrual period, or having multiple sexual partners, and sexually transmitted infections (especially repeated infections). Other factors were: birth control methods, smoking, alcoholic beverages, certain foods, having children, tampons, and vaginal douches. Most of the participants did not know about HPV and its link with cervical cancer, very few recognized it as a sexually transmitted infection, and some mentioned that it could cause genital warts.

Perceived Susceptibility and Perceived Seriousness of Cervical Cancer—When asked who would be more prone to have cervical cancer the most frequent answer was that African American women are more likely to get it. The reasons included were lack of knowledge, lack of financial resources, and fear. The second most common answer was sexually active women.

When asked about HPV infection, many of the participants also expressed that African American women are more likely to get HPV than white women, the reasons were: because they have more kids, and less access to health care and financial resources.

In regards to perceived susceptibility to cervical cancer there were mixed responses, some women did not feel susceptible and believed that God will protect them, and others stated

that yes, they may be susceptible. Some women talked about the severity of cervical cancer, and others talked about cancer treatments.

Perceived Benefits of Primary and Secondary Prevention—When asked how cervical cancer could be prevented, women stated: early detection through Pap smear, eating well, exercise, limiting the number of sexual partners, avoiding rough sex, and education. Women also shared their thoughts about what motivates them to get a Pap smear. Having symptoms, and the desire to know that they are well, were mentioned.

Perceived Barriers—The most frequent barriers to get cervical cancer screening were: embarrassment, the test being uncomfortable, and fear of results. Lack of financial resources or transportation was mentioned by a few. Most of the women agreed that men are not very interested in knowing about their partners getting screened.

Likelihood of taking preventive action—After the initial discussion, we provided a brief PowerPoint presentation about cervical cancer, HPV, screening, and self-collection for HPV testing. Women discussed their willingness to collect samples themselves versus Pap smear. Most women expressed that they would be willing to do their own HPV sampling at home. However, some preferred a physician to collect a sample. When participants were asked about their concerns in getting the HPV sampling at home, some of them expressed, as noted in the earlier quote, that they were afraid to do something wrong when taking the sample, they were also concerned with the cost, and the sample getting lost in the mail. Women preferring self-collected sampling at home indicated privacy and not having to wait at the clinic as the main reasons.

Phase 2

The sample consisted of nine African American women living in the Mississippi Delta region (Table 4). Their ages ranged between 25 and 51 (Mean: 39.2 ±8.8) and the mean number of years of education was 13.6 (±3.2). About 77% of the participants reported having health insurance coverage. More than half (63%) had heard about HPV before the discussion group.

Usability of self-collection sampling for HPV testing—A discussion group was held to explore the usability of self-collected sampling for the HPV testing device. All of the participants (100%) reported that it was easy to use and they did not encounter any difficulties. Only one participant experienced some discomfort. Participants expressed that the written instructions were very helpful and they referred to the brochure while inserting the device.

Participants expressed that the explanation by a female who had used the device was very helpful as well as the opportunity to “play” with it while the instructor was present. Participants suggested having a video to take home with instructions would be helpful if an “in person” instruction was not possible. However, they preferred the “in person” explanation by a woman who had used the device. Participants did have concerns about whether they used the device correctly.

Participants were divided on preference between Pap smear vs. self-collected sampling for HPV testing. Women who preferred self-collected sampling stated it was more convenient and private than going to a clinic. Some even expressed that they would do both, stating, “*the doctor’s exam is more accurate*.”

Discussion

This study examined acceptability and usability of self-collected sampling for HPV testing among African American women in the Mississippi Delta. Although several studies have examined the accuracy and success of self-collection for sexually transmitted infection testing in the United States (Belinson et al., 2010; Balasubramanian et al., 2010; Lindau et al., 2009; Kahn et al., 2004; Harper et al., 2002; Rompalo et al., 2001; Gravitt et al., 2001; Harper et al., 1999; Moscicki, 1993; Morrison et al., 1992; De Alba et al., 2008; Chernesky et al., 2005; Harper, Longacre, Noll, Belloni & Cole, 2003), few have explored acceptability of self-collected sampling for cervical cancer screening. To our knowledge this study is the first to examine acceptability of HPV self-collection in the Southern United States and specifically among African American women.

African American women in both phases of the study were demographically similar and represented women in the Mississippi Delta (U.S. Census. Factfinder Mississippi.). Women in the second phase were more likely to have heard of HPV and more likely to have health insurance coverage than women in the first phase of the study. Our study confirmed previous findings that knowledge about HPV was low among African American women, especially the link to cervical cancer (Cates, Brewer, Fazekas, Mitchell & Smith, 2009; D'Urso, Thompson-Robinson & Chandler, 2007). Participants perceived African American women to be more susceptible to cervical cancer than other racial/ethnic groups, citing the lack of knowledge, financial hardship, and having multiple children as some of the reasons. Our study confirmed that embarrassment, discomfort, and fear of results as barriers to cervical cancer screening among African American women (Burnett, Steakley & Tefft, 1995; Jennings-Dozier, 1999; Jennings, 1997; Behbakht, Lynch, Teal, Degeest & Massad, 2004; Fouad et al., 2004; Hoyo et al., 2005).

Most participants were receptive to self-collected sampling for HPV testing at home, stating that if given detailed instructions and a demonstration, they would be willing to try it. HPV DNA testing as a primary screening tool has emerged as a promising strategy in the post vaccination era. However, it excludes hard to reach women, who have higher rates of cervical cancer and are diagnosed at later stages of the disease (Subramaniam et al., 2011). Self-collected sampling for HPV testing is a possible way to reach underserved and unscreened women in the Mississippi Delta who may experience structural and/or interpersonal barriers to cervical cancer screening even if they are coming to the clinics as our findings were similar among women recruited in the community and in the clinics.

Women were divided with regard to their preference for Pap smear and self-collected sampling for HPV testing. One study (Chernesky et al., 2005) found that women preferred to collect their own vaginal swabs to diagnose sexually transmitted infections. Their findings could be extrapolated for acceptance for HPV self-collection as well, however their study focused on urban areas. A few studies (Cervix Cancer Screening, 2005; De Alba et al., 2008) focused on self-collected HPV sampling in community settings and found it to be an acceptable method for cervical cancer screening. However, future studies are needed to examine factors associated with screening preferences, especially among underserved women.

We believe this study has made three important contributions to future efforts in the prevention of cervical cancer among African American women. First, this study examined the sociocultural factors associated with cervical cancer, screening, and self-collection sampling for HPV testing among African American women in the Mississippi Delta from a theoretical perspective. Although the validity and reliability of Health Belief Model in this

type of setting and outcome need to be addressed in future studies, this study represents the first step in this direction.

Second, this study shows the importance of getting the target audience involved in the development of new technologies. Participants provided valuable information that were incorporated in a larger trial examining the perfomance of HPV DNA testing through self-collection among African American women in the Mississippi Delta (Gage et al., 2011) as well as a subsequent intervention to promote cervical cancer screening in this population (Castle et al., 2011a). Third, this study focused on an understudied population experiencing a very heavy burden in terms of cervical cancer incidence and mortality. Self-collection sampling for HPV testing represents a great alternative in cervical cancer prevention efforts among populations who are not coming in for cervical cancer screening through provider-collected cytology.

Limitations

This study has some limitations that deserve mention. Participants were a convenience sample. Our inclusion criteria was originally women over age 30, however, 3 women who participated in Phase 1 focus groups were under 30 years of age. The women in the community were recruited by CHAs and may have been more willing to participate based on their relationship with the CHA.

This is feasibility study using a qualitative methodology to inform the development of large-scale, theory-based, culturally-relevant interventions to promote cervical cancer screening among African American women in the Mississippi Delta, a group experiencing disproportionate cervical cancer burden in the U.S. Therefore, our findings should be interpreted within this context rather than intending generalizations to other regions of the country and/or other sub-populations. In the context of a discussion on the importance of culturally-relevant smoking cessation programs, which can be generalized to any other health issue where disparities play a major role, Borelli states that “there are arguments for and against special populations research. On the one hand, critics contend that cultural adaptation is cost inefficient and fear that it will produce an ‘endless proliferation of adapted variants or evidence-based interventions for various clinical problems in various target communities’. On the other hand, dissemination of evidence-based interventions without consideration of cultural factors could lead to lower treatment participation, failed change attempts, and disengagement from future change attempts, especially among underserved populations who are already at high risk for treatment failure” (Borelli, 2010). Major strides have been made toward cervical cancer control in the United States, and the burden of cervical cancer is now limited to “pockets” of underserved populations (including African American women) who have not been reached through our “standard of care” approach (Scarinci et al., 2010). Therefore, it is critical that we developed theory-based, culturally-relevant interventions targeting these “pockets” in order to eliminate cervical cancer in this country.

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Table 1

Phase 1 Topic Guide

CERVICAL CANCER
What do you know about cervical cancer?
Who is more prone to have cervical cancer? What are your chances of having cervical cancer?
What are the factors that contribute to the development of cervical cancer?
How could cervical cancer be prevented? What are the health practices that help to prevent cervical cancer?
If screening (Pap smear) is mentioned the moderator should explore the factors associated with screening. If not mentioned, they should make a transition to the following questions:
What kind of resources helps (FOR THE FOCUS GROUPS IN CLINICS/ would help you to get a Pap smear (FOR THE FOCUS GROUPS IN COMMUNITY) (e.g., access to health care, health insurance, financial resources)?
What kind of social networks help (FOR THE FOCUS GROUPS IN CLINICS/ would help (FOR THE FOCUS GROUPS IN COMMUNITY) you to get a Pap smear? For example, having friends to go with women to get screening help? How about family?
HPV
We mentioned to you that we are interested in finding out what you know about HPV. What have you heard about HPV before today?
What do you know about HPV?
How serious do you think HPV infection is?
Who do you think is most likely to get HPV infections?
What have you heard about testing for HPV?
What are your thoughts regarding the effectiveness of HPV testing in detecting cervical cancer early?
(POWERPOINT PRESENTATION)
Now that you know more about HPV and cervical cancer, what do you think are your chances of having HPV infection?
How serious do you think HPV infection is?
What are your thoughts about getting tested for HPV?
What are your thoughts regarding the effectiveness of HPV testing in detecting cervical cancer early?
What do you think about collecting your own sampling for the HPV test?
What would be your preference: get a Pap smear or get your own sampling for HPV testing
What would be the advantages to you getting a Pap smear at the clinic over getting your own sampling for HPV testing in your home?
What would be the advantages to you getting your own sampling for HPV testing in your home over getting a Pap smear in the clinic?
What would be your concerns about getting your own sampling at home?
What would be the barriers to collect your own sampling at home?
What would motivate you to get your own sampling at home?
What would your family think about doing the test at home?
What would your significant other think about doing the test at home?

Table 2

Phase 2 Topic Guide

USABILITY OF SELF-COLLECTION DEVICE FOR HPV TESTING:

Tell us about your overall experience in using the device at home.

- What was easy about using the device at home?
- What were the difficulties in using the device at home?
- Now, let's walk through every step of using the device at home and discuss your experience in each step. Your opinion is important to us.
- How about introducing the device in the vagina?
  - How was it?
  - What were your concerns or difficulties?
- How did you know that the device was in the right place?
- How about turning the device inside?
  - How was it?
  - What were your concerns or difficulties?
- How about taking the device out?
  - How was it?
  - What were your concerns or difficulties?
- How about putting the sample in the container?
  - How was it?
  - What were your concerns or difficulties?
- What do you think would motivate you to get your own sampling at home?
  - What would make it easier?
  - What changes do we need to make?

Table 3

Demographic Profile

Variable	Phase 1 clinic (n=30)	Phase 1 community (n=57)	Phase 2 (n=9)
Age[1]	40.9 (13.0)	43.1 (10.6)	39.2 (8.8)
Range	18–81	29–78	25–51
Education	12 (2.7)	12.1 (2.7)	13.62 (3.2)
Range	7–20	6–22	10–18
Marital status			
Single	50%	54.3%	50%
Married or living together	40%	21%	50%
Separated/Divorced	6.6%	17.5%	
Widowed	3.3%	7%	
Having children	90%	94.7%	88%
Health insurance coverage	70%	57%	77.8%
Have heard about HPV	40%	41%	62.5%
When was the last Pap smear			
Past 12 months	63.3%	29.8%	Not Available
Between 1 and 2 years	10%	15.7%	
Between 2 and 3 years	3.3%	8.7%	
Between 3 and 5 years	6.6%	24.5%	
5 years or more	3.3%	12.2%	
Never	3.3%	3.5%	
Do not remember	10%	5.2%	

[1] Mean (Standard deviation)

Table 4

Major Identified Themes in Phase I and Representative Quotes

Theme	Representative Quotes
Overall knowledge and beliefs	**Irregular periods as contributing factor to cervical cancer** "*Irregular periods, that's what they check you for when you have your Pap smear. They take a little sample of your tissues and stuff. Irregular periods are what really cause it. Because you can bleed too much, that's serious sign of it.*" **Sexual behavior as contributing factor to cervical cancer** "*Having sex can cause that too. That's what I am saying, so that can cause cancer, you know. In the way and the position you have sex*". **Sexually transmitted infections, especially repeated infections as contributing factor to cervical cancer** "W*ell I would say something like you know they continue to get these STDs you know time after time. You know how they are, one probably has it. You know and get rid of it. They continue and continue to get STDs. I think; I would think that probably be some cause of it*". **Lack of knowledge on the link between HPV and cervical cancer** "*I've heard the word before, but I think I read something about it in a magazine before and I think it's some type of humm, it's dealing with an STD I think, I think it is I'm not sure but I think I read something about it in a magazine before. Something dealing with the pelvic or something… I remember that part*".
Perceived Susceptibility	**Perceived susceptibility to cervical cancer** *"We as women, especially black women";* "*No news, is good news so we won't go like she said, we could be hurting or anything we'll be just like well, take a Tylenol, it could be something serious, but we as a black race are scared to go to the MD, and a lot of us can't afford to go to the MD…*". **Perceived susceptibility to HPV infection** "*Black women because they have more children".* *"…It's just like my daughter she'll say: mom you need to go [to the doctor], I say wait a minute baby, I say: I just believe God did everything, you know…gone be alright*". *"If you don't get it treated, it will kill you. I know it could become fatal."*
Perceived Seriousness	*"If you don't get it treated, it will kill you. I know it could become fatal."*
Perceived Benefits and Motivators	"*I know it can kill you…and I think you should have an exam at least a Pap smear every year; if you are 40 or if you are having really heavy menstrual (cycle) and I think those are the most important things (to) try to take care of yourself*". "*Limit the number of sex partners, because you know just because you, you may be fine but the next person may not be they may not take care of themselves like you do, so you have to be careful with who you mess with or who you fool around*". "*Make sure everything is good you know, my body's healthy you know everything you know everything's in good shape*". "*…if I see any kind of discharge or anything I would go and get a Pap smear*".
Perceived Barriers	"*Regardless of how old you get it is still embarrassing. When they stick that thing up your legs it is cold and it is very uncomfortable, but you bear with it because you know this is something you need to do in order to know what is happening on in the inside of your body. Maybe you can close your eyes and think of something positive*".
Likelihood of Taking Preventive Action	**Reasons for preferring self-collection** "*I don't like to go to the doctor and so you will have more people home testing because a lot of people don't want that discomfort or embarrassment*". **Reasons for preferring a physician to collect a sample** "*If there's a way to mess that up, I'll find it. I would rather not even take a chance like that. I would rather have somebody else who know what they are doing*". **Concerns about getting the HPV sampling at home** "*If I do it at home by sending it off it might get mixed up. I just take mine while I'm there and I know were it is at. If I send it off it might get lost in the mail*".