

The Male Factor: Human Papillomavirus (HPV) and HPV4 Vaccine Acceptance Among African American Young Men

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Abstract The Human Papillomavirus (HPV) is one of the most prevalent sexually transmitted infections (STD) in the United States. In the U.S., racial and ethnic minorities are disproportionately affected by STDs. In 2009 the Food and Drug Administration approved the HPV4 vaccine for young men. It is necessary to understand African American young men's HPV knowledge, health beliefs, and perceived risk in relation to HPV4 vaccine acceptance. To date, there remains paucity in the literature regarding African American young men's HPV knowledge and HPV4 vaccine acceptance. The current study was a non-probability convenience sample of 68 African American college students. This study was part of a larger project of HPV4 vaccine acceptance. Participants completed a 68-item questionnaire about personal characteristics, HPV, and the HPV4 vaccine. A majority of the young men had heard about HPV (85 %, $n = 58$), however, only 38 % ($n = 26$) knew about the HPV4 vaccine for women. Only 12.2 % ($n = 9$) of the respondents knew of an HPV4 vaccine for men. The top three barriers to HPV4 vaccination were that insurance would not cover the vaccine; they would have to pay a lot for the vaccine and worrying that the vaccine is not safe. Study findings suggest that HPV and HPV4 education programs, and low or no cost HPV4 vaccinations for African American young men are needed.

Keywords HPV · HPV4 vaccine · Acceptance · African American · Male

Introduction

In the United States, there is an epidemic of sexually transmitted diseases (STDs). One of the most prevalent among all STDs is the Human Papillomavirus (HPV). HPV is the name of a group of viruses that includes more than 100 different strains or types. Of these, about 30 exist in the genital area. HPV types are often referred to as “low-risk” (wart-causing) or “high-risk” (cancer-causing), based on whether they put a person at risk for cancer. There are approximately 13 high-risk strains of HPV, of which two (types 16 & 18) are believed to cause about 70 % of all cervical cancer and 85 % of anal cancer [1].

HPV is most often transmitted through unsafe sexual practices. The sexual behaviors specifically associated with greater risk are; (1) intercourse at an early age, (2) multiple sexual partners and (3) sex with a partner who has had multiple sexual partners [2]. Oral, vaginal or anal sexual contact without a condom, are also considered to be risky sexual health behaviors. Young adults may erroneously view oral sex as a behavior without risk. However, oral HPV infections are on the rise with studies suggesting that the prevalence of oral HPV is higher among men than women [3, 4]. Furthermore, it has been estimated that oral cancers will surpass cervical cancer rates by the year 2020 [5].

A disproportionate number of today's young adult women and men engage in unsafe sexual practices that enhance the risks of contracting a sexually transmitted disease. Although young people aged 15–24 years old (college age) represent only 25 % of the sexually experienced population, they acquire nearly half of all the 20 million new STDs that occur each year [6]. Additionally, racial and ethnic minorities continue to be disproportionately affected by STDs in the United States. Data in the

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CDC's 2012 STD Surveillance Report indicates higher rates of most reportable STDs among minority racial and ethnic populations [1].

Those who live in communities with high rates of STDs are at greater risk for being exposed to an STD during sexual intercourse. In Missouri, sexually transmitted diseases have increased at an alarming rate. In the 2013 STD profile, the CDC ranked the City of St. Louis number 1 in the nation for chlamydial infections (1297.4 per 100,000 persons) and second in gonorrheal infection (551.3 per 100,000 persons) [7]. A report by the CDC noted that half of Missouri teenagers are sexually active and estimates that 50 percent of them will contract an STD by the age of 25 [8]. In communities where STD rates are higher, individuals may have a more difficult time reducing their risk for infection [8]. Furthermore, individuals living in those communities, who have had only one sex partner, are at an increased risk of infection.

There has been a recent trend in the sexual risk taking behavior of young adults. Terms such as “hooking up”, “friends with benefits” and “booty calls” all refer to casual sexual interactions. The “hook-up” culture is common with young people, particularly on college campuses, with estimates of up to 81 % of students reporting at least one hook-up experience [9]. In a recent study, 46.6 % ($n = 1469$) college students did not use a condom in their most recent casual sex encounter [10]. Furthermore, men can have HPV even if years have passed since they had sex, as HPV can stay in the body for up to 2 years before naturally ridding itself [7]. Coupled with the fact that HPV is often asymptomatic; without visible symptoms, men with HPV may pass the disease on to their partner during one of these “hook-ups” without realizing it.

In 2009, the Food and Drug Administration (FDA) licensed the HPV4 vaccine for boys between the ages of 9 and 26 for the presentation of genital warts [11]. In 2011, the Advisory Committee on Immunization Practices (ACIP) updated the recommended routine use of HPV4 to males between 11 and 12 years of age. Beyond this age, the ACIP states that boys between the ages of 13–21 may receive the catch-up doses if they have not been previously vaccinated. Young men between the ages of 13 and 26 may also be vaccinated [12].

Since its approval, the HPV4 vaccine Gardasil has been heavily promoted in the media for women. However, the HPV4 messages regarding the vaccine's relationship and effectiveness have not addressed the “male factor”. HPV does not only affect women, it also may lead to genital warts and HPV-related cancers in men. Most men who have a genital HPV infection may not have any signs or symptoms and the infection may clear on its own or could last a few years. The transmission and trajectory of HPV, as well as the negative HPV associated outcomes effect

heterosexual men as well as men who have sex with men (MSM). Furthermore, men who have sex with men are at a higher risk for negative outcomes related to HPV types 6, 11, 16, & 18 when compared to heterosexual men. A current study stated that at baseline, only 8 % of heterosexual men were infected with HPV 6,11,16, or 18 as compared to 30 % of MSM (23 % when considering only MSM external genital sites) [13]. However, HPV is not a reportable STD and test to detect HPV in men do not currently exist. Therefore, the numbers of men infected with HPV is underestimated.

All sexually active men are susceptible to acquiring HPV infection over the course of their lifetime. The overall prevalence of HPV seems to be high in men. In a systematic review of prevalence of HPV infection among men, prevalence's of HPV were 1.8–72.9 % [14]. HPV is an STD that has negative health related outcomes for men and has the potential to lead to HPV-related cancers. HPV positive men can develop HPV-related cancers, such as anal, penile, head, neck, mouth, and throat. HPV positive men who have sex with women may be putting their partners at risk for HPV-related cancers, particularly cervical cancer.

Conceptual Framework

The Health Belief Model (HBM) has been used for decades to explain and predict health behaviors [15]. The HBM has successfully predicted a wide range of health behaviors, including sexually transmitted infection vaccination [16]. The model posits that a person's intention to perform a given preventative behavior is influenced by one's knowledge of a disease threat and one's attitude regarding the disease [15]. Prior to the current study, nine studies were found that included a limited number of the HBM constructs of the model in relation to HPV and HPV4 vaccination. Male respondents in studies addressing susceptibility and severity of HPV stated low levels of risk for HPV infection and perceived HPV infection to be more severe for female partners [17, 18].

In a national sample of heterosexual men, moderate levels of perceived barriers (cost and adverse effects) to getting a hypothetical HPV vaccine were reported (mean = 2.76, SD = 0.87) [19]. In their study, Gerend and Barley asked the single item self-efficacy question “I am confident in my ability to get the HPV vaccine” [20]. HPV vaccine acceptability was uniquely predictive of self-efficacy to receive the vaccination. The HBM has been used as a framework for HPV studies that included African American young adults [17, 20, 21]. The current study incorporated all constructs of the model, except “cues to action”, in the examination of HPV and HPV4 vaccination among African American young men.

Study Purpose

Research studies regarding HPV have not included African American males residing in the State of Missouri, a state with high rates of STDs. The purpose of this cross sectional descriptive study was to explore knowledge and health beliefs in relation to HPV, as well as the contributing factors of HPV4 vaccination among African American young men. This study adds to the current body of research in assessing African American young men's knowledge of HPV and HPV4 vaccine acceptance post HPV4 vaccine licensure in the U.S.

Methods

Study Sample

The sample was recruited from a population of African American students in the St. Louis region of the State of Missouri during four academic semesters from September 2011 through May 2012. A non-probability convenience sample was utilized in this study. African American students, between the ages of 18–26, were invited to participate in the study. The study received approval from the University's Institutional Review Board (IRB).

Data Collection

The study employed an e-mailed link recruitment strategy. An e-mail letter of invitation to participate in the study was sent to African American students enrolled at one of the study sites. Due to confidentiality, representatives at each site sent the e-mail invitation to students via their college address. An e-mail reminder was sent 2 weeks after the initial letter of invitation. Interested students were instructed to click on the embedded secure SurveyMonkey, link [22]. Once on the SurveyMonkey site, the student was instructed to read the informed consent document. The consent document provided information about the purpose of the study, as well as potential benefits and risks in participating in the study. The total time for study participation was approximately 15 min. Upon completion of the questionnaire, participants had the option of leaving contact information to be entered into a drawing for a \$25 gift card. The contact information was a separate entry, distinct from the survey.

Instrumentation

A cross-sectional questionnaire regarding HPV and HPV4 knowledge and awareness, as well as, HPV4 acceptance was sent to participants. HPV knowledge and awareness

was measured using the Men's Health Attitudes Study: Pre-survey (MHAS) developed by Gerend and Barley in 2009. The 68-item web-based survey was a composite of existing items and scales previously used in HPV research [20]. The question items on the survey had been validated in prior studies with racially diverse samples of young adults [16, 20, 21].

The survey included questions regarding demographic and sexual health behavior characteristics, HPV and HPV4 vaccine knowledge, constructs of the HBM and intention to receive the HPV4 vaccination. Intention to vaccinate against HPV was assessed using five items that were scored on a 6-point Likert scale from 1 = "very unlikely" to 6 = "very likely". For example, (1) how likely is it that you'll try to get more information about the HPV vaccine and (2) how likely is it that you'll actually get the HPV vaccine? Scores were summed to create a total intention score, where a higher score indicated greater intention. A total of 17 knowledge questions comprised the knowledge scale. Questions about HPV knowledge were scored as "true", "false", or "don't know" with 1 point given for each correct answer (0–17). A higher total score was reflective of greater HPV knowledge.

Five constructs of the Health Belief Model were scored on Likert scales: (1) Four questions on perceived susceptibility were on a 6-point scale from 1 = "very unlikely" to 6 = "very likely"; (2) two questions on perceived severity were on a 5-point scale from 1 = "not at all" to 5 = "very severe"; (3) four questions on perceived benefits were on a 6-point scale from 1 = "disagree strongly" to 6 = "agree strongly"; and (4) two questions on self-efficacy were scored on a 6-point scale from 1 = "disagree strongly" to 6 = "agree strongly". Nine questions on perceived barriers were prefaced with the statement "would the following factors prevent or keep you from getting vaccinated against genital HPV in the future". Items scored as either "yes" or "no" with each "yes" response receiving a score of 1. A total score was obtained (range of 0–9) with a higher score indicating more perceived barriers.

Data Analysis

Data from the on-line surveys were exported from SurveyMonkey to a Microsoft Excel file. Descriptive statistics were used to assess demographic questions as well as the health behaviors of young adults in the study. A correlation was used to examine the relationship between HPV and HPV4 knowledge and one's intentions to receive the HPV4 vaccination. Multiple regression was used to test the Health Belief Model constructs and one's intention to receive the HPV4 vaccination. All data were analyzed using the Statistical Package for Social Sciences Version 19 [23]. For all

inferential statistics, the level of significance was set at $p = .05$.

Results

Participant Characteristics

The sample population consisted of 68 male students with a mean age of 20.71 (SD = 1.72), as described in Table 1. The year in college was equally represented from freshman (20.6 %, n = 14) through senior year (26.5 %, n = 6). Graduate students were least represented in the sample (8.8 %, n = 6). Forty-two percent (n = 28) of the participants reported that they were not currently dating, with 31 % (n = 21) stating they were currently single but in a committed relationship. However, as described in Table 2,

Table 1 Sociodemographic characteristics of African American Male Students Male (N = 68)

Characteristics	Mean	SD	N	%
Age (years)	20.71	1.72		
<i>Class rank</i>				
1st year			14	20.6
2nd year			9	13.2
3rd year			21	30.9
4th year			18	26.5
≥5th year			6	8.8
<i>Relationship status</i>				
Single and dating			18	26.5
Sing, but in a committed relationship			21	30.8
Not currently dating			28	41.2
Married			1	1.5
<i>Sexual orientation</i>				
Sex with women			57	83.8
Sex with men			5	7.4
Sex with men and women			6	8.8
<i>Heard of HPV</i>				
Yes			58	85.3
No			10	15.7
<i>Where heard of HPV</i>				
Healthcare provider			30	51.7
Friend			18	31.0
Partner			4	6.8
Class			29	50.0
Television or radio			29	50.0
Family			11	18.9
Internet			22	37.9
Magazine			10	17.2

82.4 % (n = 56) reported being sexually active at the time of the study. Sixty-six percent (n = 45) of the participants reported having had sexual intercourse on or before the age of 18. Of those who were in a relationship at the time of the survey, 61.0 % (n = 25) stated that they did not use condoms to prevent sexually transmitted diseases. Of the

Table 2 Sexual demographics and risk factors of African American Male students (N = 68)

Risk factor	N	%
<i>Sexually active</i>		
Yes	56	82.4
No	12	17.6
<i>Age at first intercourse</i>		
12	3	5.3
13	3	5.3
14	5	3.5
15	5	8.9
16	10	17.8
17	10	17.8
18	9	16.1
19	6	10.7
20	2	3.5
21	3	5.3
22	0	0.0
23	0	0.0
Never had sex	12	21.4
<i>Current partner use of condom to prevent STDs</i>		
Always	16	0.24
Not always	25	0.37
No current partner	27	0.39
<i>Know What a Pap Test Is</i>		
Yes, correct response checked	31	45.6
Yes, incorrect response checked	37	54.4
<i>You or any sexual partner ever had abnormal pap test</i>		
Yes	5	7.4
No	19	27.9
Don't know	44	64.7
<i>Specific risk factor for HPV</i>		
Having sex at an early age ^a	19	27.9
Having frequent sex	30	44.1
Having many sex partners ^a	54	79.4
Using birth control pills	1	1.5
Alcohol use	10	14.7
Being under the age of 25 ^a	12	17.6
Drug use	14	20.6
Having unprotected sex ^a	5	7.0

N = represents those who responded to 'yes' to these as risk factors

^a Generally accepted as the risk factors for HPV

current sexually active participants, 48.2 % ($n = 56$) stated that they did not use a condom during their last sexual encounter. However, when asked “which of the following puts you at risk for HPV”, the participants stated that having many sex partners (80.0 %), having frequent sex (41.0 %) and having sex at an early age (28.0 %) were the most risky behaviors for contracting HPV. Less than half of the participants did not know or perceive that condom use or frequent and early age sex as being risks for contracting HPV. When asked where they receive information regarding HPV, men reported receiving it from their healthcare provider (44.1 %), television and radio (42.6 %) or from a class (42.6 %).

Contributing Factors of HPV4 Vaccine Acceptance

HPV and HPV4 Vaccine Knowledge

At the time of the study, eighty-five percent ($n = 58$) of the respondents had heard of HPV at the time of the study, but many did not know that there was an HPV4 vaccine available for young men. Twenty-six respondents (38.2 %) in this study knew there was an HPV vaccine for women with only 13.2 % ($n = 9$) who knew there was a vaccine to prevent HPV infection for men. Respondents were very knowledgeable on questions about HPV even though they were unaware of the HPV4 vaccine for men, as presented in Table 3. The relationship between knowledge and intention to receive the HPV4 vaccination was examined. A statistically significant correlation was identified; $r(63) = .268$, $p < .05$.

Health Belief Model Constructs

A standard multiple regression analysis was used to assess five constructs of the model to predict one’s intention to accept the HPV4 vaccination. The constructs included perceived severity, perceived susceptibility, perceived benefit, perceived barriers, and self-efficacy. Regression results, as reported in Table 4, indicated that the overall model significantly predicted young men’s intention to receive the HPV4 vaccination $R^2 = .526$; $F_{5,57} = 12.636$, $p < .001$. The R^2 value of 53 % indicated that just over half of the variability in young men’s intention to receive the HPV4 vaccination was predicted by the variables included in the model. Perceived benefits made a statistically significant unique contribution to the equation (62.5 %).

Although perceived barriers were not uniquely predictive of HPV4 vaccination intention within the regression model, perceived barriers with African American young adults was found to be a significant factor in ones intention to receive the HPV4 vaccine [20, 24, 25]. Therefore, the relationship between the HBM construct of perceived

barriers and intention to receive the HPV4 vaccination was further investigated. There was a statistically significant correlation; $r(63) = -.230$, $p < .05$. As shown in Table 5, the top three barriers of concern expressed by men in this study were that (1) insurance would not cover the cost of the HPV4 vaccination (80.0 %), (2) if they have to pay a lot for the vaccination (78.5 %) and (3) that it is not safe (75.4 %).

Discussion

Over the past 10 years, there has been a considerable amount of research examining HPV awareness, knowledge and vaccine acceptance in the United States. However the majority of research focused on samples of parents, adolescents and women. Heterosexual men have not been the primary focus of HPV and HPV4 vaccine related research until fairly recently. This study is one of a few to include African American men in their sample since the HPV4 licensure. To the authors’ awareness, this is the only study examining HPV and HPV4 vaccination with African American college students in the state of Missouri.

There are two studies that examined HPV and the HPV4 vaccine acceptance in Missouri which focused on young women and parents of adolescent girls [26, 27]. One study assessed the intent and concerns of HPV vaccination among African American parents and guardians of girls ages 9–17 [27]. Interestingly, the influence of physician recommendation was a recurring theme on parents’ intention to obtain HPV vaccination for their daughters. Although physician recommendation was not specifically examined in the current study, most men stated that they received their HPV information from a physician. The good news is that African American young men are seeing a healthcare provider and are receiving HPV information. On the other hand, these same young men are not receiving information regarding the HPV4 vaccine which could protect them from negative HPV-related health outcomes. Healthcare professionals are in an opportune position to provide HPV4 vaccination information to their African American male patients.

After the approval and marketing efforts of the HPV4 vaccination, studies demonstrated that HPV awareness increased [28–30]. The current study is similar to this upward trend in general awareness of HPV; however, limited awareness still exists regarding the HPV4 vaccine for males. Higher level of HPV knowledge and a subsequent increase in perceived risk of HPV infection lead to higher levels of intention to receive the vaccine [31]. Young men in the current study, with greater knowledge about HPV and the HPV4 vaccine for men would be more likely to accept the HPV4 vaccination supports previous research.

Table 3 HPV Knowledge Responses of African American Male Students (n = 68)

Items	Correct answer	n	%
Most people with genital HPV have no visible signs or symptoms	True	57	83.8
HPV can cause herpes	False	36	52.9
Genital warts are caused by HPV	True	46	67.6
HPV can cause cervical cancer in women	True	59	86.7
HPV can cause oral cancer in men	True	41	60.2
HPV can cause anal (rear end) cancer in women	True	50	73.5
If a woman’s Pap smear is normal, she does not have HPV	False	20	29.4
An abnormal Pap smear may indicate that a woman has HPV	True	46	67.6
Genital warts are caused by the herpes virus	False	28	41.1
Pap smears will almost always detect HPV	True	24	35.2
There is a vaccine to prevent HPV Infection that is available for women	True	26	38.2
Having one type of HPV means that you cannot acquire new types	False	45	66.1
People can transmit HPV to their partner(s) even if they have no symptoms of HPV	True	57	83.8
HPV can cause cancer of the penis or anus (rear end) in men	True	52	76.4
HPV can cause oral cancer in women	True	42	61.7
There is a vaccine to prevent HPV infection that is available for men	True	9	13.2
Having multiple sexual partners increases a person’s risk of getting HPV	True	61	89.7

HPV, Human Papillomavirus. HPV knowledge: Number (%) answering correctly

Data reporting HPV4 vaccine uptake for men between the ages of 18–26, in the U.S., is lacking [20]. In a nationwide study of parents and sons, only 2 % of adolescent males have received at least one dose of the HPV4 Vaccine [19].

Table 4 Regression analysis summary for perceived severity, perceived susceptibility, perceived benefit, and self-efficacy variables contributing to HPV4 vaccination intention

Variable	B	SE B	β	t	p
Perceived susceptibility	.111	.143	.075	.777	.440
Perceived severity	.139	.102	.132	1.356	.180
Perceived benefits	.762	.134	.625	5.682	.000*
Perceived barriers	.096	.060	.148	1.595	.116
Self-efficacy	.009	.146	.007	.063	.950

R² = .53 (*p < 0.001). Perceived Severity, Perceived Susceptibility, Perceived Barriers and Self-efficacy were not significant predictors

Eighty percent of those who did not receive the vaccination were unaware that HPV vaccine could be given to males. Low HPV4 uptake may be due to the overall lack of knowledge and awareness of the vaccine availability for young men.

The constructs of the Health Belief Model and how they may contribute to ones intention to receive the HPV4 vaccine were explored. Perceived benefit was a unique significant predictor of HPV4 intention to accept the vaccination. If African American young men believe there is more of a benefit to them by receiving the HPV4, then they are more likely to protect themselves with the vaccination. In order to believe it is beneficial, a young man would have to know that HPV4 exists and comprehend how it can protect them from STD’s, HPV-related outcomes, HPV-related cancers, and how their preventative action will also protect their partners. A majority of men in this study did

Table 5 HPV4 Vaccination Barriers of African American Male Students (N = 68)

Items	n	%
Having to pay a lot for the HPV4 vaccine	51	75.0
Fear that I could get HPV from getting the HPV4 vaccine	34	50.0
Having to get shots	11	16.0
Fear that people might think poorly of me if I get vaccinated for HPV	9	13.2
Worrying that the HPV4 vaccination won’t work	27	39.7
Worrying that the HPV4 vaccine isn’t safe	49	72.0
If health insurance wouldn’t pay for the HPV4 vaccination	52	76.4
If it took a lot of effort to get the HPV4 vaccination	37	54.4
If it took a lot of time to get the HPV4 vaccination	31	45.5

HPV4 vaccination barriers: number (%) answering “yes”

not know there was a licensed HPV4 vaccine available for them. Therefore, they were less apt to understand how the vaccine could be of benefit to them. Although knowledge is not a direct predictor of health behavior, it is the first step in making informed health decisions.

Perceived barriers of HPV4 vaccination were also a unique predictor of intention to receive the HPV4 vaccination. Although a young man may fully understand the benefit of the HPV4 vaccine, if he perceives the barriers to getting the vaccination to be great, then the chances that he will receive it are decreased. Similar to several studies [20, 25, 32], concerns were voiced from participants that insurance will not cover the cost of the HPV4 vaccine and that they would have to pay a lot for the vaccine, if not covered. Young men under the age of 19, who are eligible for the Vaccine for Children (VFC) program, may obtain the vaccination at no cost. Young men who obtain insurance through the health exchanges may be covered or pay a co-payment for the HPV4 vaccination. However, young men over the age of 19, who are uninsured and fall out of the coverage options described, there are two options; (1) pay the total cost of approximately \$360 for the series of three shots or (2) apply for assistance through programs such as Merck and GlaxoSmithKline's program which provides free vaccines to low-income adults [33].

Typically, students must have some form of health insurance while enrolled in school. This study did not ask participants if their insurance covered the HPV4 vaccination or if they had heard of any HPV4 vaccination assistant programs. Cost as a barrier to vaccination may have been a perception among study participants who may not have been unaware of financial resources to offset the expense of the vaccination. Removing barriers to HPV4 vaccination, perceived or tangible, comes through knowledge acquisition. Additionally, knowing what resources are available regarding the HPV4 vaccination and how to access those resources must be a top priority in increasing HPV4 vaccine uptake with African American men.

The recruitment of African American males into research studies has been widely documented [35]. The Tuskegee Syphilis Study has left a legacy of distrust of research participation by African Americans, particularly men [34, 35]. Although research participation in the African American community is challenging, it is a dynamic community where research must take place. The current study provides insight into what African American young male students in Missouri know and believe regarding HPV and the HPV4 vaccination. However, the small sample size suggests that this study experienced similar recruitment challenges that have been historically reported.

There are limitations to consider with the current research study. The study involved recruitment of a non-probability convenience sample of African American

students. Those who participated may have had a higher interest in HPV and the HPV4 vaccine than those who did not participate. The study employed a self-reporting survey methodology. Self-report is a required element for full disclosures on the sensitive nature of sexual health knowledge and behavior. However, it also lends itself to recall bias and social desirability [36]. Although the vaccine is available to young adults between the ages of 18–26, the results of this study cannot be generalized to all African American men of this age or those who are not in a public college or university system. The instrument was modified from a survey which was limited in reliability and validity. Future HPV related research would benefit from an instrument that was psychometrically rigorous.

Conclusions

To date, there is no cure for HPV; therefore, one of our best defenses is through prevention by way of HPV education and HPV4 vaccination. A significant predictor of HPV4 vaccination among this population was that of perceived benefit. Healthcare providers should not only emphasize the benefits of the HPV4 vaccination in relation to positive sexual health behaviors, but also the relationship of the negative HPV-related outcomes. Healthcare providers must continue to have open dialogue with young men regarding sexual health. Today we know that sexual behaviors can have negative outcomes far beyond an STD. It is imperative that discussion about HPV and the HPV4 vaccination with African American men include the preventative benefits of reducing the risk of cervical cancer, oral, anal, penile, head, and neck cancers. There are going to be perceived and tangible barriers, such as the cost, which may hinder a young man from accepting the HPV4 vaccination. However, this is an area where healthcare providers can intervene with the community and work with young men in finding the appropriate resources needed to alleviate these barriers.

The majority of studies to date have been assessments regarding knowledge and awareness of HPV and the HPV4 vaccination. Intervention studies with African American young men are needed to increase awareness of HPV, HPV knowledge around transmission, health outcomes in relation to HPV, and HPV4 vaccination access. In a 2013 report from the CDC, only 9.6 % of men between the ages of 19–26 received the first dose of the HPV vaccine with only 6 % receiving the second in the series three dose vaccination [37]. One of the goals of Healthy People 2020 is to promote healthy sexual behaviors, strengthen community capacity and increase access to quality services to prevent sexually transmitted diseases (STDs) and their complications [38]. Evidence outlining best practices for successful

interventions regarding HPV and HPV4 vaccination is needed in order to decrease HPV and significantly increase HPV4 vaccination uptake among African American young men.

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