I, Julie B. Anderson, hereby submit this original work as part of the requirements for the degree of Master of Public Health in Public Health - Health Education/Health Promotion.

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Abstract

AN ABSTRACT OF THE THESIS FOR THE MASTERS OF PUBLIC HEALTH DEGREE IN HEALTH PROMOTION AND EDUCATION, PRESENTED March 1st, 2013 AT THE UNIVERSITY OF CINCINNATI

TITLE: Benefits, barriers, and cues to male HPV vaccination among university students

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Human Papillomavirus (HPV) is the most common sexually transmitted disease (STD) in the United States. HPV can lead to cancers of the cervix, vulva, vagina, penis, anus and throat, as well as genital warts. College students are at great risk of acquiring HPV, as they disproportionately acquire the most sexually transmitted diseases out of the sexually active populations. Recently, the quadrivalent human papillomavirus vaccine, Gardasil, created by Merck, is the first vaccine developed to prevent cervical cancer, precancerous genital lesions and genital warts related to HPV types 6, 11, 16, and 18. The vaccine is given in a three dose series and is instructed to be administered to adolescents ages 11 to 12 years old. The vaccine was initially recommended exclusively for females but this recommendation has been expanded to be administered among males. A large proportion of adolescents have not been given or completed the three dose series, therefore catch up vaccinations are needed, particularly among adolescent males.

The purpose of this study is to assess college students’ knowledge and attitudes of HPV, the HPV4 vaccine, and vaccination of college-aged males by utilizing the Health Belief Model. Analyses were conducted to examine whether the perceived benefits, barriers, and cues to action for the HPV4 vaccination differs based on: grade level, ever having had sexual intercourse,
number of sexual partners, previously been tested for an STD, previously been diagnosed with an
STD, or knowing someone who has been HPV4 vaccinated.

A convenience sample of 204 male participants were surveyed during the 2011 autumn
quarter. The sample included students from a variety of general education courses. Valid and
reliable subscales were developed for the 72-item. Descriptive statistics, independent samples t-
tests, and Pearson correlations were used to analyze the data. Results indicated that overall,
participants’ knowledge of HPV and the HPV vaccine was low. The results also found that the
number of perceived barriers and the number of perceived cues significantly correlated with
males’ likelihood of receiving the HPV vaccine. Recommendations have been made for future
studies.
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Chapter 1

The Problem

Human Papillomavirus (HPV) is the most common sexually transmitted disease (STD) in the United States. It is estimated that 20 million Americans are currently infected with HPV. Each year 6 million people will become infected, and at least 50% of men and women will be infected with HPV at one point in their lives (CDC, 2010a). There are more than 100 different types of HPV; of these, more than 40 can affect the genital area among males and females, as well as the mouth and throat (CDC, 2010a). Ninety percent of most HPV infections can go away on its own within two years. Yet there are enduring “high-risk” HPV types that most commonly lead to cervical cancer, but can also cause other cancers of the vulva, vagina, penis, anus, and throat (CDC, 2010a). Additionally, other HPV types considered “low-risk” can cause genital warts; rarely, these “low-risk” HPV types can also infect the throat and cause recurrent respiratory papillomatosis, or RRP (CDC, 2010a).

College students are at greater risk of acquiring sexually transmitted diseases, including HPV. The college age population accounts for a quarter of all sexually active people but acquires almost half of all new STDs (Weinstock, Berman, & Crates, 2004). One in two sexually active adolescents will contract an STD by the age of 25 (American Social Health Association [ASHA], 2005). It has been hypothesized that college students are at greater risk because those who live alone or with roommates may be more likely to become sexually active than those who live at home with their family or relatives (MacDonald et al., 1990).

Due to the asymptomatic nature of HPV most people do not know they are infected, and even though they may not show signs of HPV they can still pass the infection to sex partners.
HPV is sexually transmitted by genital skin to skin contact typically during vaginal, oral, and anal sex. Male condoms can be used as a method of contraception that acts as a barrier to keep bodily fluids such as semen, vaginal secretions, and blood from passing from one person to the other during sexual intercourse (U.S. Food and Drug Administration, 2010). Since HPV is contracted by skin to skin contact, condoms do not give full protection against transmission as they do for other STDs (chlamydia, gonorrhea, syphilis, etc.). Other options for people to lower their HPV risk include: abstaining from sexual activity, limiting the number sex partners, choosing sex partners who have had no or few previous sex partners, or being in a mutually exclusive relationship (CDC, 2010a). Fortunately, people now have an additional option to prevent some types of HPV by receiving the quadrivalent human papillomavirus vaccine (HPV4).

The quadrivalent human papillomavirus vaccine, Gardasil, created by Merck, is the first vaccine developed to prevent cervical cancer, precancerous genital lesions and genital warts related to HPV types 6, 11, 16, and 18. The U. S. Food and Drug Administration (FDA) approved the HPV4 vaccine for females and males ages 9 to 26 years old (FDA, 2006; CDC, 2011b). The Advisory Committee on Immunization Practices (ACIP) recommends the HPV4 vaccine for females ages 11 to 12 years old and catch-up vaccination for females ages 13 to 26 years old who have not been previously vaccinated or completed the 3-dose series (Markowitz et al., 2007). The ACIP recently extended the recommendation to include males for routine use in 11 to 12 years olds and catch up for males aged 13 through 21 years who have not been vaccinated or completed the 3-dose series, to consider vaccinating males ages 22 through 26 years old (Campos-Outcalt, 2012; CDC, 2011b), and recommends routinely vaccinating men who sleep with men (MSM) or human immunodeficiency virus (HIV) positive ages 22 to 26.
The Problem 3

years old (Campos-Outcalt, 2012). Vaccinating males would lower diagnostic and treatment costs of penis, anus, neck cancers, and genital warts. Also, vaccinating men would lower the HPV incidence rates among women who are not already vaccinated—especially since female vaccination rates are low (Thompson, 2011). Vaccinating both males and females could potentially protect the unvaccinated individuals through a herd effect (Stupiansky, Alexander, & Zimet, 2012; Brisson, van de Velde, Franco, Drolet, & Boily, 2011; Paavonen, 2010). Males will benefit since males have been found to have more sex partners than females, and are not tested or screened for HPV like women are during their annual pap test (Jones & Cook, 2008).

Despite the known benefits, HPV4 uptake is low among men and women (CDC, 2011a; CDC, 2011b; Schluterman, Terplan, Lydecker, & Tracy, 2011). Many young adults have run into challenges of the 3-dose regimen (Hernandez et al., 2010; Dayley et al., 2011), the financial cost (Katz, Krieger, Roberto 2011; Allen, Fantasia, Fontenot, Flaherty, & Santana, 2009; Thomas & Goldstone, 2012; Wheldon, Daley, Buhi, Nyitray, & Giuliano, 2011; Hernandez et al., 2010; Reiter, Brewer, McRee, Gilbert, & Smith, 2010), perceived uncertainty of the HPV4 vaccine’s efficacy (Hernandez 2010; Thomas and Goldstone 2012), concern of the safety and side effects (Dayley et al 2011; Wheldon et al., 2011; Thomas and Goldstone 2012; Allen et al., 2009; Ferris 2009; Thomas and Goldstone 2012; Hernandez et al., 2010; Allen et al., 2009; Katz et al., 2011), not knowing where to they can receive the vaccine or if it would be accessible to them (Dayley et al., 2011; Allen et al., 2009 et al 2010; Daley et al., 2011) or believing their doctor might refuse to vaccinate them (Reiter et al., 2010a; Gilbert, Brewer, Reiter, Ng, & Smith, 2011). Likewise, little has been done to promote the HPV4 vaccine, especially to young adults and even more so men, as most vaccine manufacturer’s advertisements are geared toward young females (Stupiansky et al., 2012).
Statement of the Problem

The purpose of this study is to assess male college students’ intention to receive the male HPV4 vaccination, knowledge of the vaccination, and benefits, barriers, and cues toward receiving the HPV4 vaccination.

Research Questions

More specifically, this study examines the following research questions:

1. How knowledgeable are male college students regarding the male HPV4 vaccination?
2. What are the most frequent benefits, barriers, and cues to male HPV4 vaccination?
3. How likely are male college students to receive the HPV4 vaccination?
4. Does intention to receive the vaccine differ based on knowledge, benefits, barriers, and cues to HPV4 vaccination?

Hypotheses

Null Hypothesis 1. There will be no significant difference of males’ intention to receive the HPV4 vaccine based on knowledge.

Null Hypothesis 2. There will be no significant difference of males’ intention to receive the HPV4 vaccine based on perceived barriers.

Null Hypothesis 3. There will be no significant difference of males’ intention to receive the HPV4 vaccine based on perceived benefits.

Null Hypothesis 4. There will be no significant difference of males’ intention to receive the HPV4 vaccine based on cues to action.
Operational Definitions

1. HPV4: The quadrivalent human papillomavirus vaccine
2. Perceived benefit: A factor that one considers to be an advantage for males to receive the HPV4 vaccine.
3. Perceived barrier: A factor that one considers to be an obstacle for males to receive the HPV4 vaccine.
4. Cue to action: Any indicator that may help increase males’ likelihood to receive the HPV4 vaccine.
5. Sexual intercourse: The insertion of the penis into the vagina.

Delimitations

1. This study was delimited to male University of Cincinnati students enrolled in a health, fitness, and leisure class, a health education class, and an introductory level psychology class during Autumn quarter of 2011.
2. This study sampled students in selected courses and therefore may not be representative of all University of Cincinnati students or college students in general.
3. To be eligible for this study, one had to be male and could read English.

Limitations

This study was limited by:

1. This study was limited by the honesty of all participants.
2. This study was limited by the participants’ ability to have clearly read and understood the items on the questionnaire.
3. This study was limited by the self-reporting accuracy of the participants.

4. This study was limited by the comfort level of the participants in answering questions about their sexual history.

Assumptions

It was necessary to make certain assumptions during the design and implementation of the study:

It was assumed that all participants understood the survey and completed it as accurately and honestly as possible.
Chapter Two

Review of Literature

The purpose of this study is to assess college students’ knowledge and attitudes of HPV, the HPV4 vaccine, and vaccination of college-aged males by utilizing the Health Belief Model. Analyses were conducted to examine whether the perceived benefits, barriers, and cues to action for the HPV4 vaccination differs based on: grade level, ever having had sexual intercourse, number of sexual partners, previously been tested for an STD, previously been diagnosed with an STD, or knowing someone who has been HPV4 vaccinated. Chapter one introduced the problem, research questions and hypotheses, and provided the delimitations, limitations, assumptions, and operational definitions for this study. Chapter 2 presents a review of the literature to support the need of this study.

Extent of Human Papillomavirus in the United States

The epidemic of sexually transmitted diseases (STDs) contributes to enormous health consequences in the United States (Centers for Disease and Control [CDC], 2010d). The Centers for Disease Control and Prevention (CDC) estimates that there are approximately 19 million new sexually transmitted infections each year, which costs the United States healthcare system $16.4 billion annually (CDC, 2010c). Yet these figures do not reflect all STD cases as many are undetected or undiagnosed because of their asymptomatic nature (Weinstock et al., 2004). Asymptomatic STDs include human papillomavirus (HPV). HPV is the most common sexually transmitted disease (STD) in the United States, and is currently infecting 20 million Americans. Each year another 6 million people will be infected, and at least 50 percent of men and women
will have HPV at one point in their lives (CDC, 2010a). There are more than 100 types of HPV, of which more than 40 types infect the genital areas of males and females, and can infect the mouth and throat (CDC, 2010a). HPV is sexually transmitted by genital skin-to-skin contact. And due to the asymptomatic nature of HPV most people do not know they have it but can still pass it to his or her sex partners. In 90% of most HPV cases, the infection will go away on its own within two years. However, there are enduring high-risk HPV types that can cause cervical cancer, and other cancers of the vulva, vagina, penis, anus, and neck (CDC, 2010a). Each year in the U.S. about 12,000 women will be newly diagnosed with cervical cancer (CDC, 2010a), and approximately 3,700 deaths will be related to HPV (U. S. Food and Drug Administration [FDA], 2006). Nearly half of all vulva cancers and about 70 percent of all vaginal cancers are HPV-related (American Cancer Society, Inc., 2011). Approximately 800 men will acquire HPV-related penile cancer, and almost 1100 men will develop HPV-related anal cancer. There are also chronic low-risk HPV types that can cause genital warts among both females and males. Genital warts are currently infecting 1% of sexually active adults in the U.S. (CDC, 2010b). Rarely, other HPV types can infect the throat and cause recurrent respiratory papillomatosis (RRP) (CDC, 2010a).

The costs of human papillomavirus place a financial burden on the United States’ healthcare system. The direct medical costs associated with HPV-related cervical, vulva, and vaginal cancers range from $8,000 to $19,000 per case (Insinga, Ye, Singhal, & Carides, 2008). The costs of other HPV-related cancers, not including cervical cancers, are approximately $148 million in 2003 year dollars (Hu & Goldie, 2008). Yet these costs do not include the quality of life lost or the years of life lost amongst those who suffer, have suffered, or have partners who suffer from HPV.
Women who receive abnormal tests results from papilloma tests (also known as “pap tests” or “pap smears”) related to HPV experience high levels of anxiety, distress, and self-blame. Positive HPV pap test results can lead to lower self-esteem, relationship problems, and sexual reproductive issues (Herzog & Wright, 2007). Partners of women with abnormal pap test results may also experience guilt and anxiety. Furthermore, people fear that having HPV could be a serious threat to one’s sex life and might make it difficult to find a long-term primary partner (Katz et al., 2011).

Genital warts impact one’s emotional well-being and overall quality of life. Woodhall et al. (2008) examined the health-related quality of life (HRQoL) of men and women who were diagnosed with genital warts. The study found genital warts adversely affect people’s HRQoL scores, in comparison to those without genital warts. Similar results were also found by Sénécal et al. (2011). Lower scores are attributable to pain and discomfort, anxiety and depression, and the effect on one’s usual activities of having genital warts (Woodhall et al., 2008; Sénécal et al., 2011). Psychosocial burden of having genital warts also causes a decrease in one’s quality of sleep, and a reduction in the ability to concentrate on everyday matters (Sénécal et al., 2011).

Extent of HPV and college students

College students are at greater risk of acquiring sexually transmitted diseases, including HPV. This young adult population accounts for a quarter of sexually active people, but acquires almost half of all new STDs cases (Weinstock et al., 2004). It has been shown that one in two sexually active adolescents will contract an STD by the age of 25 (American Social Health Association [ASHA], 2005). College students could be at greater risk because they live alone or
live with roommates, and might be more likely to become sexually active than those who live at home with relatives (MacDonald et al., 1990).

Prevention of HPV

Human papillomavirus is transmitted from an infected person to his or her sex partner during sexual activity. HPV is similar to other STDs such that a person can be infected without having any signs or symptoms, and as a result can unintentionally transmit the infection to others. However, unlike many STDs, HPV is transmitted by skin-to-skin contact; other STDs, for example chlamydia or gonorrhea, are transmitted through bodily fluids, such as semen and vaginal secretions. Male condoms can be used as a method of contraception that acts as a barrier to sustain bodily fluids such as semen, vaginal secretions, and blood from passing from one person to the other during sexual intercourse (U.S. Food and Drug Administration, 2010). But condoms cannot offer the same protection from HPV as they do for other STDs because of the skin-to-skin nature of transmission. Therefore, the only way for one to ensure prevention of HPV is abstaining from any sexual contact. Other options to lower HPV risk include: limiting the number of sex partners, choosing sex partners who have had no or few previous sex partners, or being in a mutual exclusive relationship (CDC, 2010a). Condoms can offer some protection, but there is inconsistent evidence of their overall effectiveness and who would benefit more from condom use, the receptive or the insertive partner during intercourse (Hogewoning et al., 2003; Bleecker et al., 2003).
**HPV Vaccine**

The quadrivalent human papillomavirus (HPV4) vaccine, Gardasil, was created by Merck, and is the first vaccine developed to prevent cervical cancer, precancerous genital lesions and genital warts related to HPV types 6, 11, 16, and 18. HPV types 6 & 11 cause approximately 90% of all genital warts in both females and males; HPV types 16 & 18 contribute to 70% of cervical cancer, and cancers of the vagina, vulva, anus, penis and throat (FDA, 2006). A bivalent human papillomavirus vaccine (HPV2) has been developed by GlaxoSmithKline (Cervarix) to provide protection against HPV types 16 and 18. The HPV4 vaccine, as well as HPV2 vaccine, is a recombinant vaccine that is given in three doses over a 6 month period. The second dose is administered 1 to 2 months after the first dose and the third dose is administered 6 months after the first dose. The minimal interval between the first and second dose of vaccines is 4 weeks, and the minimum interval between the second and third is 12 weeks. The minimal length of time between the first and third dose is 24 weeks. The entire series has to be re-administered if one receives a dose that is different than the recommended schedule. The vaccine is recommended prior to any sexual contact to ensure its total effectiveness (CDC, 2010b). However, the vaccine can still be beneficial to those who have already had sexual contact. Both vaccines are now approved for vaccination among females; only the HPV4 vaccine is approved for vaccination among males.

The U. S. Food and Drug Administration (FDA) approved the HPV4 vaccine in June of 2006 for females ages 9 to 26 years old (FDA, 2006). The ACIP recommends vaccinating females who are 11 to 12 years old and catch-up vaccination for females ages 13 to 26 years old who have not been previously vaccinated (Markowitz et al., 2007).
In October 2009, the FDA licensed the HPV4 vaccine for use in males ages 9 to 26 years old for the prevention of genital warts caused by HPV types 6 and 11. However, at that time the ACIP did not advise for routine use among males. The ACIP had 4 reasons for not including males in the recommendation: (1) the vaccine was only effective against genital warts, (2) the cost effectiveness was low for use in males, (3) the vaccine was less beneficial as more females were being vaccinated, and (4) the most effective approach to prevent HPV disease was believed to be emphasizing vaccination rates among females (Campos-Outcalt, 2012). On October 25, 2011 the ACIP extended the recommendation to males. The recommendation includes routine use among males ages 11 to 12 years old; catch up vaccination for males aged 13 through 21 years who have not been vaccinated or completed the 3-dose series; to consider vaccinating males ages 22 to 26 years old (Campos-Outcalt, 2012; CDC, 2011b); and routine use among men who sleep with men (MSM) or men who are HIV positive ages 22 to 26 years old (Campos-Outcalt, 2012). These recommendations take into account that the HPV4 vaccine will provide males protection from genital warts, anal cancer, penile cancer, and cancer of the throat and mouth. Furthermore, because the vaccination rates among females are low, vaccinating men will reduce HPV-related cancers among women (Thompson, 2011).

Benefits of male HPV vaccination

The HPV4 vaccine among males could lower the costs of diagnosis and treatment of anal, penile and neck cancers, and genital warts. Although vaccination of males debatably may be not cost-effective, the indirect impact could greatly reduce the incidence and prevalence rates of HPV among women who are not already vaccinated; this would then lower the costs of HPV-related diseases and could make the HPV4 vaccine cost effective. Vaccinating both males and
females could potentially protect unvaccinated individuals by causing a herd immunity effect (Stupiansky et al., 2012; Brisson et al., 2011; Paavonen, 2010). Herd immunity is reached when there is a decline in illness that can be prevented by immunizations, through which directly protects those vaccinated while indirectly protecting those who have not been (Nandwani, 2010). Herd immunity would be achieved most quickly by vaccinating both males and females (Stupiansky et al., 2012). Additionally, a sex neutral approach could be more acceptable as both sexes are accountable for HPV transmission. This could then balance the responsibility among both females and males (Stupiansky et al., 2012; Jones & Cook, 2008). Also, it has been suggested that vaccinating young males might be more socially acceptable among some cultures or communities, compared to vaccinating young females. In the end, males will benefit since they have been found to have more sex partners than women, and are not tested or screened for HPV like women are during their annual pap test (Jones & Cook, 2008).

**Lack of HPV4 Vaccination among both sexes**

Despite the known benefits, the HPV4 vaccination is low among men and women (CDC, 2011b; Schluterman et al., 2011). The HPV4 vaccine reception in females has increased since 2006, but remains quite low. In 2010, coverage with at least 1 dose among females aged 13 through 17 years was less than half and completion of the three dose series was only 32% (CDC, 2011a). Males aged 13 to 17 years, with at least 1 dose, was less than 2% (CDC, 2011a). Some speculate the low rate of vaccinating males could be due to the recent HPV4 vaccine coverage for males as compared to females, and that parents are still unaware that the HPV4 vaccine can be given to their sons (Stupiansky et al., 2012).
HPV4 Vaccination among college students and young adults

Previous research has examined the acceptance and behaviors of parents to vaccinate their sons and daughters, and have found most to be apprehensive. Catch up vaccinations are direly needed and therefore the HPV4 vaccine must be promoted to men and women when they move into adulthood and begin making their own health care decisions. This age group is at great risk for acquiring sexually transmitted diseases, including HPV. The young adult population represents a quarter of all sexually active people, yet they acquire almost half of all new STD cases (Weinstock et al., 2004). College students are at high risk, as it has been hypothesized that people who live alone or with roommates are more likely to become sexually active than those who live at home with their family of relatives (MacDonald et al., 1990). Although the already sexually active populations may not reap the total benefits of the HPV4 vaccine, about one third of college students have never had a sexual relationship (Sandfort & Pleasant, 2009). For those reasons, it is important to understand the knowledge and attitudes regarding HPV and the HPV4 vaccine among college aged males and females to promote and increase HPV4 vaccination.

Knowledge of HPV

A large portion of young adults have reported low awareness of the prevalence of HPV (Katz et al., 2011; Reiter, Brewer, Smith 2010; Reiter, Brewer, McRee 2010; Sandfort & Pleasant, 2009). And studies have found a portion of those who are aware lack critical HPV knowledge (Katz et al., 2011; Gilbert et al., 2011; Reiter et al., 2010b; Sandfort & Pleasant, 2009). Students who are aware that HPV is an STD knew very little about its symptoms, treatment, or chronic nature. Allen et al. (2009) found the majority of the male students
incorrectly describe the symptoms as discharge or burning sensation, and believe HPV testing is
done with blood or urine samples. In comparison to men, women are more aware that HPV can
have no visible signs or symptoms (Sandfort & Pleasant, 2009); yet some did not understand that
HPV can be transmitted between partners without showing symptoms (Allen et al., 2009). Some
students mistakenly believe HPV can be cured with treatment; Katz et al. (2011) found about
65% of male college students are unclear that antibiotics cannot cure HPV like they can for other
STDs. Sandfort and Pleasant (2009) found a large portion of students do not know HPV is not
transmitted via bodily fluids. Most notably, only 11% of males and 16% of females know that 1
out of 2 sexually active people will contract HPV at one time in their lives (Sandfort & Pleasant,
2009).

Men are considerably less knowledgeable that HPV can infect both males and females
compared to women (Sandfort & Pleasant, 2009). Katz et al. (2011) found most students know
women can be infected with HPV, but about half do not know HPV can also infect males. This
has also been seen in an all-female sample, who did not know the rate of male HPV infection is
comparable to the rate among females. Also, a large portion of this age group does not know
males can experience negative health consequences from HPV (Wheldon et al., 2011; Reiter et
al., 2010a).

Studies show that young adults have little understanding about HPV’s relationship to
genital warts (Reiter et al., 2010a; Reiter et al., 2010b; Licht et al., 2010). Only 27% of a male
sample can correctly identify the connection of HPV to genital warts (Sandfort & Pleasant,
2009). While Gerend & Barley (2009) found about three quarters of the male college students are
significantly confused about the difference of genital warts and genital herpes. Of those who
know HPV can cause cervical cancer among women, a large portion of them do not know HPV
can cause cancers in males. Men especially, knew less about the association of HPV and cancers, and only about one fourth of young adults were aware of the connection between HPV to anal, penile, or oropharyngeal cancer in males (Allen et al., 2009; Gerend & Barley 2009; Reiter et al., 2010a; Reiter et al., 2010b; Licht et al., 2010; Wheldon et al., 2011). Reiter et al. (2010a) found only 58% of gay and bisexual male adults understand that HPV causes cancers in males, of which 32% can identify anal cancer, 28% can identify penile cancer, and 25% can identify oral cancer.

Many young adults do not know that HPV is transmitted through skin-to-skin contact. A great number of men and women do not know that condoms cannot fully protect against HPV (Katz et al., 2011; Sandfort & Pleasant, 2009; Licht et al., 2010). Others mistakenly report that HPV can be transmitted through kissing, or from having warts on their hands or feet and then touching the genital area (Sandfort & Pleasant, 2009). Students also do not understand that HPV can be passed by oral sex. Sandfort and Pleasant (2009) found almost half of students do not know that HPV could be spread through oral sex; Katz, Krieger, Roberto (2011) found over 70% of male college students did not know that HPV can be transmitted from person to person during oral sex play.

Previous research has found that young adults lack awareness of the HPV4 vaccine. Only a little more than half of the male college students know the HPV4 vaccine exists (Sandfort & Pleasant, 2009). College males who are aware of the vaccine can make a connection that women receive the vaccine to prevent cervical cancer, but do not know the vaccine protects against other health consequences among both sexes (Allen et al., 2009). Katz, Krieger, and Roberto (2011) found only 11.5% of male college students have heard of a vaccine to prevent genital warts; a large portion of adults have heard of the HPV vaccine, but only 18% knew that the HPV4
vaccine is approved to protect against genital warts and most cervical cancers (Ragin et al., 2009). Not surprisingly, many young adults are not aware the HPV4 vaccine is available to males. Three quarters of males do not know there is a vaccine that is FDA approved and available to boys and men (Wheldon et al., 2011). Gilbert et al. (2011) found 66% of gay and bisexual men and 60% of heterosexual men believe the vaccine is only for women; only 21% of gay and bisexual men and 7% of heterosexual men think the HPV works in males; while only 37% of gay and bisexual males and 17% of heterosexual males believe their doctor can give the HPV4 vaccine to males.

**Perceived Benefits, Barriers, and Cues to receive the HPV4 Vaccine**

Even though the health benefits of the HPV4 vaccine are medically recognized (American Cancer Society, Inc., 2011; Markowitz et al., 2007), many people at risk still are unaware of the vaccine and its benefits (Katz, Krieger, Roberto 2011; Gilbert et al 2011; Reiter et al., 2010a; Sandfort & Pleasant, 2009; Ragin et al., 2009). This could mostly be due to people not being familiar with HPV nor its consequences (Allen et al., 2009; Gerend & Barley 2009; Reiter et al., 2010a; Reiter et al., 2010b; Licht et al.,2010; Wheldon et al., 2011; Licht et al., 2010). Thomas and Goldstone (2012) found men who are well-informed can recognize the effectiveness against HPV infections. Those who have previously had HPV express the vaccine will be beneficial to prevent future HPV infections. Men who have sex with men (MSM) and bisexual males acknowledge the moderate physical and psychological benefits of the vaccine (Wheldon, et al., 2011). Mothers of adolescent males believe the HPV4 vaccine is beneficial to protect their sons’ future spouses or partners from HPV-related disease (Reiter, McRee, Gottlieb, & Brewer, 2010c).
Despite knowing the benefits the HPV vaccine, a large portion of young adults run into challenges to receive the vaccine. A substantial barrier is having to complete the 3-dose series. Schluterman et al. (2011) reviewed outpatient claims at gynecological clinics and few females (only 18%) ages 18 to 26 had received the first dose of the vaccine, with only 4% who completed the entire vaccine series. Young men ages 18 to 26 years old also agree that having to return to the clinic three times over 24 weeks is a hindrance (Hernandez et al., 2010). Forty-two percent of men report taking off time from work and school to return to the clinic would be a major obstacle (Daley et al., 2011).

Young adults express apprehension of receiving the HPV4 vaccine because of the high cost. As of July 2012, the retail price of the HPV4 vaccine is about $130 per dose, which means it will cost someone $390 to complete the series without insurance (CDC, 2012). Forty-four percent of male and female college students report the high cost as their top reason why they cannot receive the vaccine (Katz et al., 2011). Men especially voice much concern about their inability to afford it (Allen et al., 2009; Thomas & Goldstone, 2012; Wheldon et al., 2011); seventy-three percent of men indicate the high cost will prevent them from completing the entire required series (Hernandez et al., 2010). In a sample of gay and bisexual men, three men said they tried to receive the HPV vaccine but could not afford it (Reiter et al., 2010a). Men are more willing to receive the vaccine if it is free (Ferris et al., 2009), and some report they are willing to pay up to 100 dollars (Daley et al., 2011). Almost half of the male college students report they will only receive the vaccine if the series is completely covered by their health insurance (Katz et al., 2011).

Efficacy of the HPV4 vaccine is an important factor for those who consider receiving the vaccine. A large portion of men surveyed (65%) state they need more information about the
vaccine and its effectiveness before making a decision to be vaccinated; the remaining portion of the men do not think the vaccine would work (Hernandez et al., 2010). In a sample of MSM, some decline the vaccine believing they are too old to benefit, or feel the vaccine is not necessary if they have already been infected with one type of HPV (Thomas & Goldstone, 2012).

Another concern among young adults is the safety and side effects of the vaccine (Daley et al., 2011; Wheldon et al., 2011; Thomas & Goldstone, 2012; Allen et al., 2009; Ferris et al., 2009; Thomas & Goldstone, 2012). Sixty-nine percent of men say they would ask for more information about all of the potential side effects before making a decision (Hernandez et al., 2010). Men also said they need more information about the safety reviews (Hernandez et al., 2010; Allen et al., 2009), and the long-term side effects (Katz et al., 2011). Many men who consider being vaccinated do not know where to receive the vaccine or claim they do not have a place to go (Daley et al., 2011). College men are hesitant about the accessibility of the location and are concerned about needing transportation to receive the vaccine (Allen et al., 2009; Daley et al., 2011). About half of men are unsure if their doctor will recommend the HPV4 vaccine to them, and 37% actually believe their doctor will not recommend it at all (Reiter et al., 2010a). It was found, that a few men who tried to receive the vaccine said their doctor refused because he would not give it to males (Gilbert et al., 2011; Reiter et al., 2010a).

Little has been done to promote the HPV4 vaccine, especially to young adults and even more so to males. Most vaccine manufacturer’s advertisements are geared toward young females (Stupiansky et al., 2012). Surprisingly, 60% of MSM said they first heard about the HPV4 vaccine from their healthcare provider (Thomas & Goldstone, 2012), but this has not been found elsewhere. Few studies have considered the percentages of someone knowing someone who
had been vaccinated. Wheldon et al., (2011) found 39% of gay or bisexual men indicate they personally know someone who is vaccinated. Only 9% of heterosexual men report knowing a family member or friend who has been vaccinated (Reiter et al., 2010b). Studies have reviewed how people first learn about HPV. A large majority of people hear about it from television (Gerend & Barley, 2009; Katz et al., 2011; Sandfort & Pleasant, 2009; Thomas & Goldstone, 2012) and the internet (Katz et al., 2011); two-thirds of young adults report their sources of HPV is from television commercials, and the rest state the internet is their main source (Sandfort & Pleasant, 2009). Some people report learning of HPV from a friend (Gerend & Barley, 2009); fifty-three percent of students say a friend has been their first source of hearing about HPV (Katz et al., 2011). Others learn about HPV from news programs and news media (Katz et al., 2011; Thomas & Goldstone, 2012). Students also indicate learning about HPV in a health education class or from a health education program (Katz et al., 2011; Gerend & Barley, 2009; Sandfort & Pleasant, 2009).

A major problem found is those who are aware of HPV still lack essential information. About one-fifth of males and females report feeling confused about HPV. About 6% do not know who they can trust about HPV, while 5% say they do not know who to talk to about HPV (Sandfort & Pleasant, 2009). As the majority of young adults learn of HPV from television, Sandfort and Pleasant (2009) found men and women want to hear more information from their healthcare providers (67%) and gynecologists (45%). The internet is also another source people want to learn more HPV information (43%). Thomas and Goldstone (2012) found men will be vaccinated if a healthcare provider recommends them to be. They report their least likely reason to be vaccinated would be from advertisements, a friend’s recommendation, or a desire to cure HPV infection.
Health Belief Model

The Health Belief Model was developed in the 1950s by Hochbaum, Leventhal, Kegeles, and Rosenstock to help explain why an individual chooses to engage in preventive health behaviors (Maiman & Becker, 1974). The theory is constructed of 5 components: 1) perceived susceptibility, 2) perceived severity, 3) perceived benefits, 4) perceived barriers, and 5) perceived cues to action. An individual with greater perceived susceptibility, or who feels more vulnerable to the health threat, will more likely engage in the preventive health behavior. However, in order to be motivated the person must perceive the health threat as severe. Taking action is also reliant on one’s perceived benefits, or the anticipated outcome of engaging in the behavior. The outcome must be greater than the perceived barriers or the possible challenges that one thinks he or she might come across when attempting the preventive behavior.

Essentially the end result of the preventive health behavior must be valued more than the cost of doing the behavior. Unfortunately, obstacles and personal barriers might be too troublesome for an individual in which the person fails to do the healthy behavior or avoids the behavior in general. Therefore, for a behavior to be beneficial it would have to effectively reduce one’s susceptibility to the health threat, and overcome any obstacles (inconveniences, unpleasantness, pain, or expense) in order to achieve or maintain the health outcome (Rosenstock, 1974). The behavior is controlled by the individual’s readiness to take action. Usually one has to be reminded over and over again that the action is required to achieve the health outcome (Cummings, Jette, & Rosenstock, 1978). The Health Belief Model terms these as “cues to action”; a “cue” is defined as a triggering mechanism that is needed for the appropriate action to be initiated (Becker, Drachman, & Kirscht, 1974). The strength of the cue to take action depends on one’s level of perceived threat, the perceived benefits versus barriers, and the readiness to act.
Summary

HPV is the most common sexually transmitted disease (STD) in the United States, and is currently infecting 20 million Americans. Each year another 6 million people will be infected, and at least 50 percent of men and women will have HPV at one point in their lives (CDC, 2010a). There are more than 100 types of HPV, of which more than 40 types infect the genital areas of males and females, and can infect the mouth and throat (CDC, 2010a). College age students are at great risk of acquiring HPV. Recently the HPV vaccine has been made available to the public. However, many of those eligible have not received the vaccine or have taken other preventive measures to reduce their risk for infection. To understand why or why not one would seek vaccination can be examined by the Health Belief Model.
Chapter Three

Methods

Human Papillomavirus (HPV) is the most common sexually transmitted disease (STD) in the United States. Each year 6 million people will become infected, and at least 50% of men and women will be infected with HPV at one point in their lives (CDC, 2010a). High-risk types of HPV can infect the genitalia of men and women that commonly lead to cervical cancer, but can also cause other cancers of the vulva, vagina, penis, anus, and throat; low-risk HPV types can lead to genital warts (CDC, 2010a). Recently, the quadrivalent human papillomavirus vaccine (HPV4) has been made available and approved for use in females and males. Despite the benefits of this vaccination, uptake has been low especially among males.

The purpose of this study is to assess college students’ knowledge and attitudes of HPV, the HPV4 vaccine, and vaccination of college-aged males by utilizing the Health Belief Model. Analyses were conducted to examine whether the perceived benefits, barriers, and cues to action for the HPV4 vaccination differs based on: grade level, ever having had sexual intercourse, number of sexual partners, previously been tested for an STD, previously been diagnosed with an STD, or knowing someone who has been HPV4 vaccinated.

Chapter one introduced the problem, research questions and hypotheses, and provided the delimitations, limitations, assumptions, and operational definitions for this study. Chapter 2 presents a review of the literature to support the need of this study. This chapter describes the methods used in this study.
Participants

A convenience sample of students from the University of Cincinnati served as the participants for this study. Based on the total population of 14,911 male students (U.C. Student Fact Book, 2011), a sample of 95 was needed to have a confidence level of 95% with a confidence interval of 10%. Participants were male students currently enrolled in a sample of 13 general education courses at the University of Cincinnati main campus during the 2011 autumn quarter. Participation was voluntary and no incentives were offered.

Instrumentation

A two-page, 72-item survey was developed to determine the participants’ intention to receive the HPV4 vaccination, knowledge of the vaccine, and benefits, barriers, and cues of receiving the HPV4 vaccination. The survey was divided into eight sections (Appendix A). The first section of the survey asked participants to check “True”, “False”, or “Don’t know” for each of the 15 statements regarding to HPV and the HPV vaccine.

Section two of the survey addressed the perceived barriers for males to receive the vaccine. The item provided 11 barriers for receiving the vaccine and asks participants to check all that apply. An “other” item was also included. Each checked barrier received a score of 1, while each unchecked barrier received a score of 0, resulting in an overall potential range of 0 to 12.

Section three of the survey addressed the perceived benefits for males to receive the HPV4 vaccine. The item provided 7 benefits for receiving the vaccine and asks participants to check all that apply. An “other” item was included as well. Each checked barrier received a
score of 1, while each unchecked barrier received a score of 0, resulting in an overall potential range of 0 to 8.

Section four of the survey addressed how strongly he agrees or disagrees with statements about HPV and the HPV4 vaccine using a 5-point scale ranging from “Strongly disagree” to “Strongly agree”. Statements in this section included “I feel that females should receive the HPV vaccine”, “I feel that males should receive the HPV vaccine”, and “I feel that sexually active college students are at risk for HPV”.

The fifth section of the survey addressed cues to action for receiving the HPV4 vaccine. The section provided 15 cues to receive the HPV4 and asks participants to check all that apply. An “other” item was included. Each checked cues received a score of 1, while the uncheck cues received a score of 0, resulting in an overall potential range of 0 to 16.

Section six of the survey addressed the likelihood of doing things regarding the HPV4 on a 4-point scale ranging from not likely at all to extremely likely. Statements in this section included “Get the HPV vaccine within the next 12 months”, “Seek out more information about the HPV vaccine”, “Talk to a health care professional about the HPV vaccine”, “Talk to a friend about the HPV vaccine”, and “Talk to a partner about the HPV vaccine”.

The seventh section of the survey requested the participant to provide background information about their sexual health and behavior, HPV and the HPV4 vaccination. There were seven questions listed and the participant was instructed to check “Yes”, “No”, or “Not Sure”. The first four questions asked about the HPV4 vaccine: “Has a doctor talked to you about the HPV vaccine?”, “Has your doctor recommended you to get the HPV vaccine?”, “Do you know a male who has received the HPV vaccine?”, “Do you know a female who has received the HPV vaccine?”. The next question asked “Have you ever had sexual intercourse?”, and “if yes, how
many partners have you had sexual intercourse with in your lifetime?” with a space provided for
the students to write the number of partners. The remaining questions are “Have you ever been
tested for a sexually transmitted disease?” and “Have you ever had a sexually transmitted
disease?”

The last section of the survey instrument asked participants about their demographic and
background information. This section consisted of six items that assessed their sex, age, grade,
race/ethnicity, marital status and sexual orientation.

**Instrument Testing**

Validity and reliability of the survey were established using a variety of tests. A panel of
experts was used to establish face and content validity. Face validity was established by
developing the survey instrument from a comprehensive review of literature. The content
validity of this survey instrument depended on the degree that the survey measured all of the
areas that represent the concept. The concept of the survey was to determine the knowledge of
HPV and HPV4 vaccine, attitudes and beliefs of HPV and HPV4 among males, and likelihood of
receiving the HPV4 vaccine. The survey was first sent to an expert panel to determine the
content validity. The expert panel consisted of an expert in survey design and research from the
University of Cincinnati, and one health education professor from the University of Cincinnati.

The researcher sent every expert on the panel the survey instrument with a cover letter
that explained the purpose of this particular study and why the expert had been selected to
participate in the review of the instrument. This information was sent to the panel of experts via
emails. The cover letter directed the expert to critique the survey and examine if the questions
were clear and comprehensible; the experts were asked if the items measured what they were
intended to measure. The researcher invited the experts to provide feedback, revisions, and any questions that might have about the instrument. The researcher requested these critiques to be returned within two weeks either via email. The expert panel confirmed that the items on the survey instrument measured what they intended to measure and only suggested minor modifications. The researcher revised the instrument with the panel of experts’ feedback.

Stability reliability of the survey instrument was proven by the test-retest method. The survey was distributed to a convenience sample of 16 undergraduate university students on the main campus of the University of Cincinnati at two different points in time. The students were members of a health, fitness, and leisure course and represented various grade levels, majors, and race/ethnicities. The survey was administered to the participants at the beginning of their class. The survey administer told the students that their participation was voluntary and the participants had the option to withdrawal participation from the study at any time. The following page included information about anonymity and confidentiality, length of time to complete the survey, and the process of obtaining the participant’s consent. Due to anonymity, the participants were asked to write the last four digits of their phone numbers on the right corner of the first page of the survey. They were told this is the same number they will use to write on the right corner of the first page of the survey that will be distributed in a week during the same class in order to differentiate the surveys. The identical procedure for the first round was followed for the second round of surveys during the following week. The participants were re-informed about the anonymity and confidentiality of the study, the duration of the time to complete the survey and their consent to participate in the study. After the surveys were received, responses on the first surveys were compared to the second surveys to determine if there were any inconsistencies of the responses between the two surveys completed at different times. The data was entered into
SPSS software program to calculate the correlation coefficient. Pearson correlation coefficients were computed to assess stability reliability for parametric items and yielded coefficients >.80. Similarly, Kendall’s tau-b correlation coefficients were computed for nonparametric sections of the survey and yielded coefficients >.80.

**Procedures**

The research study proposal, survey instrument, cover letters, and informal and formal consent forms were approved by the researcher’s thesis committee. The forms were then submitted to the University of Cincinnati Institutional Review Board (IRB) and subsequently approved.

The primary researcher selected instructors of general education courses from the University’s list of course offerings. These courses consisted of a variety of health education and health, fitness, and leisure undergraduate courses. The researcher emailed the instructors of the courses the survey with a cover letter explaining the purpose of the study and requesting permission to administer the survey in their courses during the 2011-2012 academic year of the autumn 2011 quarter. The instructors who granted permission were requested to email the researcher the days and times of their classes, the number of sections, and the number of students in each section. A total of 9 instructors were asked to participate, and seven of the instructors responded to the email, and five agreed that the researcher could administer the surveys in their courses. Surveys were distributed to those courses during class time in October of 2011.

A total of 22 classes were surveyed, which included 13 Health, Fitness, and Leisure courses and nine Health Education courses. The researcher introduced the purpose of the study to the students that were enrolled and present in the approved courses, and informed the students
that their responses would be anonymous. The researcher requested the students refrain from placing any identifying information on the survey in order to ensure their anonymity. The research information sheet distributed to all students included the following statement: “By completing the survey, you grant your permission to participate in this study.” The survey took approximately five to ten minutes to complete.

The researcher told the students to return the surveys once complete. The researcher instructed the students to put their completed surveys face down in an enveloped that was placed on a table at the front of the classroom. After all the participants returned their surveys, the researcher counted the number of returned surveys in order to know how many surveys were collected, completed, or that did not meet the requirements to be used in the study. A total of 220 surveys were retrieved, and of that number 16 surveys were discarded due to not meeting the requirements of completion. As a result a sample of 204 was gathered to be utilized in the study. Surveys were kept locked in a personal filing cabinet of the researcher’s office until the data entry was completed. Upon completion of data entry and analysis, all surveys were shredded.

Data Analysis

The program SPSS (Version 21.0) was used for data analysis. The demographic and background information were described by descriptive statistics, including frequencies, means, standard deviations and ranges. A series of independent samples t-tests were computed with a set alpha level of 0.05 in order to determine the significance.
Chapter 4

Results and Discussion

The purpose of this study was to examine male college students’ knowledge, perceived barriers, benefits, cues to action, and the extent of intention to receive the HPV4 vaccine. The Health Belief Model (HBM) suggests that the number of perceived benefits, barriers, and cues help to predict specific behaviors. Thus, this study examined the relationship between the number of perceived benefits, barriers, and cues to action and intention to receive the HPV4 vaccine. Chapter one discussed the research questions, hypotheses, delimitations, limitations, assumptions, and operational definitions; Chapter two provided a comprehensive review of the literature; Chapter three discussed the methods used in this study. This chapter discusses the results of the research.

Participants

Students (n = 204) enrolled in sections of general education courses (Health, Fitness, and Leisure courses and Health Education during the 2011 Autumn quarter at a Midwestern University served as the participants of this study. Initially, a total of 257 surveys were distributed and 220 were returned, resulting in a response rate of 89.5%. Sixteen surveys were incomplete and therefore eliminated, resulting in a total sample size of 204 and a total participation rate of 79.4%. A power analysis was conducted a priori based on a total population of 14, 911 male students with a confidence level of 95% and a confidence interval of 10% and indicated that a sample of 95 students was needed to achieve a representative sample.
**Demographic and Background Characteristics**

Most participants were white (76.0%) (Table 4.1). Grade levels included freshmen (15.2%), sophomores (23.0%), juniors (24.0%), seniors (37.3%), and graduate students (0.5%). Ages ranged from 18 to 29 (M = 20.82, SD = 1.90). Marital status of participants were mainly single and not in a steady relationship (61.8%), single and in a steady relationship (24.8%), and also there were a few that were engaged (2.5%) and married (1.0%). Participants were also asked if they had ever had sexual intercourse. The majority of students said yes (81.9%) than who said no (17.2%). Two participants were not sure (1.0%). Participants were requested to respond whether they knew a female who received the HPV vaccine. The majority of participants (68.1%) reported they did not know a female who was vaccinated whereas 27.0% did know a female who was vaccinated and 10 participants reported they were not sure (4.9%). Participants were requested to respond whether they knew a male who received the HPV vaccine. The majority of the students said (90.7%) reported they did not know a male who was vaccinated whereas 5.9% did know a male who was vaccinated and six participants reported they were not sure (2.9%).

**HPV Knowledge**

Students were asked questions regarding their knowledge on Human Papillomavirus (Table 4.2). Students were instructed to check True or False to 15 items. Overall, participants scored an average of 6.71 (SD = 3.24) correctly (Table 4.2).
### Table 4.1 Demographic and Background Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grade Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>31</td>
<td>15.2</td>
</tr>
<tr>
<td>Sophomore</td>
<td>47</td>
<td>23.0</td>
</tr>
<tr>
<td>Junior</td>
<td>49</td>
<td>24.0</td>
</tr>
<tr>
<td>Senior</td>
<td>76</td>
<td>37.3</td>
</tr>
<tr>
<td>Graduate Student</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>25</td>
<td>12.3</td>
</tr>
<tr>
<td>Asian</td>
<td>8</td>
<td>3.9</td>
</tr>
<tr>
<td>Hispanic</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>White</td>
<td>155</td>
<td>76.0</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
<td>4.4</td>
</tr>
<tr>
<td><strong>Relationship Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single &amp; not in a steady relationship</td>
<td>126</td>
<td>61.8</td>
</tr>
<tr>
<td>Single &amp; in a steady relationship</td>
<td>71</td>
<td>34.8</td>
</tr>
<tr>
<td>Engaged</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Ever had Sexual Intercourse</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>167</td>
<td>81.9</td>
</tr>
<tr>
<td>No</td>
<td>35</td>
<td>17.2</td>
</tr>
<tr>
<td>Not Sure</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Do you know a female who received the vaccine?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>55</td>
<td>27.0</td>
</tr>
<tr>
<td>No</td>
<td>139</td>
<td>68.1</td>
</tr>
<tr>
<td>Not Sure</td>
<td>10</td>
<td>4.9</td>
</tr>
<tr>
<td><strong>Do you know a male who received the vaccine?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>12</td>
<td>5.9</td>
</tr>
<tr>
<td>No</td>
<td>185</td>
<td>90.7</td>
</tr>
<tr>
<td>Not Sure</td>
<td>6</td>
<td>2.9</td>
</tr>
</tbody>
</table>

N = 204; Percents refer to valid percents; Missing values excluded
### Table 4.2 HPV Knowledge (True or False)

<table>
<thead>
<tr>
<th>Item</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPV can go away on its own without treatment.</td>
<td>24</td>
<td>11.8</td>
</tr>
<tr>
<td>HPV can cause anal cancer.</td>
<td>23</td>
<td>11.3</td>
</tr>
<tr>
<td>One out of every two college students will have HPV at one point in their life.</td>
<td>23</td>
<td>11.3</td>
</tr>
<tr>
<td>Using condoms fully protects against HPV.</td>
<td>22</td>
<td>10.8</td>
</tr>
<tr>
<td>HPV can cause penile cancer.</td>
<td>21</td>
<td>10.3</td>
</tr>
<tr>
<td>Only females can be infected with HPV.</td>
<td>19</td>
<td>9.3</td>
</tr>
<tr>
<td>HPV can be easily treated</td>
<td>15</td>
<td>7.4</td>
</tr>
<tr>
<td>HPV can cause cervical cancer.</td>
<td>13</td>
<td>6.4</td>
</tr>
<tr>
<td>Human Papillomavirus (HPV) is a sexually transmitted disease.</td>
<td>11</td>
<td>5.4</td>
</tr>
<tr>
<td>Currently the FDA has only approved the HPV vaccine for females.</td>
<td>11</td>
<td>5.4</td>
</tr>
<tr>
<td>The HPV vaccine helps protect against genital warts.</td>
<td>11</td>
<td>5.4</td>
</tr>
<tr>
<td>HPV can be sexually transmitted by skin-to-skin contact.</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>A person who has HPV will always show signs or symptoms.</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>The HPV vaccine helps protect against HPV-related cancers.</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>The HPV vaccine helps protect against other STDs (such as Chlamydia, Gonorrhea, etc.)</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

N=204; Percents refer to valid percents; Missing values excluded
Perceived barriers of the HPV Vaccine

Section two on the survey asked participants, “What do you feel are barriers of males getting the HPV vaccine?” Students were instructed to check all that apply from a list of 11 potential barriers plus an option for “Other”. Students marked a mean of 4.70 (SD= 2.38) items.

The top reported perceive barriers included: potential side effects (21.6%), fear of getting shots (needles) (19.1%), and feel that there is not enough research on its effectiveness (13.2%) (Table 4.3). The least reported barriers were: do not feel there is a need to get vaccinated (2.5%), financial cost of the HPV vaccine (1.5%), and not sexually active (1.5%).

Perceived benefits of the HPV Vaccine

Section three on the survey asked participants, “What do you feel are benefits of males getting the HPV vaccine?” Students were instructed to check all that apply from a list of 7 potential benefits plus an option for “Other”. Students marked a mean of 4.99 (SD= 2.10) items. The top reported perceived benefits included: reduces the risk of spreading HPV to another person (15.4%), reduces the risk of penile cancer (12.7%), reduces feelings of worry and anxiety about getting HPV (8.3%), and allows a person to feel good that they will not spread HPV (8.3%) (Table 4.4). The least reported benefits were: reduces the risk of genital warts (2.9%), reduces the risk of cervical cancer for female sex partners (4.9%), and allows a person to feel protected against getting HPV (7.8%).

Perceived cues to receiving the HPV Vaccine

Section five on the survey asked participants, “Which of the following do you feel would help males get the HPV vaccine?” Students were instructed to check all that apply from a list of
### Table 4.3 Perceived Barriers of the HPV Vaccine

<table>
<thead>
<tr>
<th>Item</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential side effects</td>
<td>44</td>
<td>21.6</td>
</tr>
<tr>
<td>Fear of getting shots (needles)</td>
<td>39</td>
<td>19.1</td>
</tr>
<tr>
<td>Feel that there is not enough research on its effectiveness</td>
<td>27</td>
<td>13.2</td>
</tr>
<tr>
<td>Concerns about safety</td>
<td>24</td>
<td>11.8</td>
</tr>
<tr>
<td>Embarrassment</td>
<td>22</td>
<td>10.8</td>
</tr>
<tr>
<td>Needing to go 3 times to the doctor to get the complete vaccine</td>
<td>12</td>
<td>5.9</td>
</tr>
<tr>
<td>Do not feel comfortable receiving a vaccine to prevent an STD</td>
<td>9</td>
<td>4.4</td>
</tr>
<tr>
<td>Lack of knowing where to go to get the HPV vaccine</td>
<td>8</td>
<td>3.9</td>
</tr>
<tr>
<td>Do not feel there is a need to get vaccinated</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>Financial cost of the HPV vaccine</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Not sexually active</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>3.9</td>
</tr>
</tbody>
</table>

N=204; Percents refer to valid percents; Missing values excluded
Table 4.4 Perceived Benefits of the HPV Vaccine

<table>
<thead>
<tr>
<th>Item</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduces the risk of spreading HPV to another person</td>
<td>31</td>
<td>15.2</td>
</tr>
<tr>
<td>Reduces the risk of penile cancer</td>
<td>26</td>
<td>12.7</td>
</tr>
<tr>
<td>Reduces feelings of worry and anxiety about getting HPV</td>
<td>17</td>
<td>8.3</td>
</tr>
<tr>
<td>Allows a person to feel good that they will not spread HPV</td>
<td>17</td>
<td>8.3</td>
</tr>
<tr>
<td>Allows a person to feel protected against getting HPV</td>
<td>16</td>
<td>7.8</td>
</tr>
<tr>
<td>Reduces the risk of cervical cancer for female sex partners</td>
<td>10</td>
<td>4.9</td>
</tr>
<tr>
<td>Reduces the risk of genital warts</td>
<td>6</td>
<td>2.9</td>
</tr>
<tr>
<td>Other</td>
<td>81</td>
<td>39.7</td>
</tr>
</tbody>
</table>

N=204; Percents refer to valid percents; Missing values excluded
15 potential cues to receiving the HPV vaccine plus an option for “Other”. Students marked a mean of 8.76 (SD= 4.08) items. The top reported cues included: if one’s sexual partner goes with them to get the vaccine (11.8%), if one’s sexual partner goes with them to provide emotional support (8.8%), and if the vaccine were free (8.8%) (Table 4.5). The least reported cues were: having a parent who encourages getting the vaccine (1.5%), having a doctor recommend getting the vaccine (2.0%), and having a partner who encourages getting the vaccine (2.5%).

**Hypotheses Testing**

*Null Hypothesis 1.* There will be no significant difference of males’ intention to receive the HPV4 vaccine based on knowledge.

A t-test was conducted to compare knowledge scores of males who intend to receive the HPV vaccine within the next 12 months and knowledge scores of males who do not intend to receive the HPV vaccine within the next 12 months. Results indicated knowledge scores of males with intention to receive the vaccine (M=6.85, SD=3.12) did not significantly differ from knowledge scores for males with no intention to receive the vaccine (M=6.64, SD=3.27); \( t \) (199) = .468, \( p = 0.640 \). Therefore, the null hypothesis was not rejected.

*Null Hypothesis 2.* There will be no significant difference of males’ intention to receive the HPV4 vaccine based on perceived barriers.

A t-test was conducted to compare the number of perceived barriers of males who intend to receive the HPV vaccine within the next 12 months and the number of perceived barriers of males who do not intend to receive the HPV vaccine within the next 12 months. Results showed males with intention (M=5.04, SD=2.57) perceived significantly more barriers than the perceived
### Table 4.5 Cues to Action for the HPV Vaccine

<table>
<thead>
<tr>
<th>Item</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>If one’s sexual partner goes with them to get the vaccine</td>
<td>24</td>
<td>11.8</td>
</tr>
<tr>
<td>If the vaccine is free</td>
<td>18</td>
<td>8.8</td>
</tr>
<tr>
<td>If one’s sexual partner goes with them to provide emotional support</td>
<td>18</td>
<td>8.8</td>
</tr>
<tr>
<td>Knowing where to go to get the vaccine</td>
<td>16</td>
<td>7.8</td>
</tr>
<tr>
<td>Hearing/seeing ads on TV/Radio/Internet about the vaccine</td>
<td>16</td>
<td>7.8</td>
</tr>
<tr>
<td>Receiving educational information about the HPV vaccine</td>
<td>15</td>
<td>7.4</td>
</tr>
<tr>
<td>If the vaccine is available on campus</td>
<td>13</td>
<td>6.4</td>
</tr>
<tr>
<td>Knowing someone who has gotten the vaccine</td>
<td>11</td>
<td>5.4</td>
</tr>
<tr>
<td>Having a friend who encourages getting the vaccine</td>
<td>10</td>
<td>4.9</td>
</tr>
<tr>
<td>If a friend goes with them to provide emotional support</td>
<td>10</td>
<td>4.9</td>
</tr>
<tr>
<td>Knowing of someone who has had an HPV-related cancer</td>
<td>7</td>
<td>3.4</td>
</tr>
<tr>
<td>If a friend goes with them to get the vaccine</td>
<td>6</td>
<td>2.9</td>
</tr>
<tr>
<td>Having a partner who encourages getting the vaccine</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>Having a doctor recommend getting the vaccine</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Having a parent who encourages getting the vaccine</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Other</td>
<td>28</td>
<td>13.7</td>
</tr>
</tbody>
</table>
barriers of males with no intention (M=4.28, SD=2.02); t (199) =2.33, p = 0.02. Therefore, the null hypothesis was rejected.

*Null Hypothesis 3.* There will be no significant difference of males’ intention to receive the HPV4 vaccine based on perceived benefits.

A t-test was conducted to compare the number of perceived benefits of males who intend to receive the HPV vaccine within the next 12 months and the number of perceived benefits of males who do not intend to receive the HPV vaccine within the next 12 months. Results showed the perceived benefits of HPV vaccine among males with intention (M=5.26, SD=1.85) did not significantly differ from the number of perceived benefits of males with no intention (M=4.72, SD=2.25); t (199) =1.848, p = 0.06. Therefore, the null hypothesis was not rejected.

*Null Hypothesis 4.* There will be no significant difference of males’ intention to receive the HPV4 vaccine based on cues to action.

A t-test was conducted to compare the cues of action among males who intend to receive the HPV vaccine within the next 12 months and the number of cues to action among males who do not intend to receive the HPV vaccine within the next 12 months. Results showed males with intention (M=9.95, SD=3.98) reported significantly more cues to action than the males with no intention to receive the vaccine (M=7.627, SD=3.78); t (199) =4.243, p = 0.00. Therefore, the null hypothesis was rejected.

*Discussion*

A total of 204 male students completed a survey regarding their perceived benefits, barriers, and cues to action, and intention to receive the HPV vaccine. Participants of this study were enrolled in a variety of general education courses at a Midwestern university.
The majority of the participants were white (76.0%). Grade levels were mixed with freshmen (15.2%), sophomores (23.0%), juniors (24.0%), seniors (37.3%), and graduate student (0.5%). Ages ranged from 18 to 29. Most participants were single (61.8%), single and in a steady relationship (24.8%). The majority of males reported having had sexual intercourse (81.9%). Only 27% of participants knew a female who had been vaccinated; only 5.9% of participants knew of a male who had been vaccinated.

The knowledge scores were poor. More than half of the questions were answered incorrectly, with a mean score of 6.71 out of 15 True and False items. Potential side effects, fear of getting shots, and feeling that there is not enough research on the HPV vaccine effectiveness were reported as the top three barriers of receiving the HPV vaccine. The least reported barriers included: not feeling a need to receive vaccinated, the cost, and not being sexually active. Students reported the top three benefits of the vaccine as: reduces the risk of spreading HPV to another person, reduces the risk of penile cancer, reduces feelings of worry and anxiety about contracting HPV, and allows a person to feel good that they will not spread HPV. The least reported benefits were: reduces the risk of genital warts, reduces the risk of cervical cancer for female sex partners, and allows a person to feel protected against HPV. The most common cues to action included: if one’s sexual partner goes with them to receive the vaccine, if one’s sexual partner goes with them to provide emotional support, and if the vaccine were free. The least common cues were: having a parent who encourages receiving the vaccine, having a doctor recommend receiving the vaccine, and having a partner who encourages receiving the vaccine.

This study included 4 hypotheses which examined two dependent variables: intention to receive the HPV vaccine, and no intention to receive the HPV vaccine. Four independent
variables were examined: HPV knowledge, the number of perceived benefits, the number of perceived barriers and the number of cues to action.

Results show that intention to receive the HPV vaccine in the next 12 months did not differ on HPV knowledge, nor did it differ on the number of perceived benefits (Table 4.6). The results did show that intention is dependent on the number of perceived barriers, in which those who perceived more barriers reported a higher intention to receive the HPV vaccine. The results also showed that those who intend to receive the HPV vaccine in 12 months perceive a higher number of cues to action.
Table 4.6 Intention of the HPV vaccine based on Knowledge, Perceived Barriers, Perceived Benefits, and Cues to Action

<table>
<thead>
<tr>
<th></th>
<th>M (SD)</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention</td>
<td>6.85 (3.13)</td>
<td>.468</td>
<td>199</td>
<td>.640</td>
</tr>
<tr>
<td>No Intention</td>
<td>6.64 (3.27)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Barriers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention</td>
<td>5.04 (2.57)</td>
<td>2.36</td>
<td>199</td>
<td>.021</td>
</tr>
<tr>
<td>No Intention</td>
<td>4.28 (2.02)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Benefits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention</td>
<td>5.26 (1.85)</td>
<td>1.848</td>
<td>193.90</td>
<td>.066</td>
</tr>
<tr>
<td>No Intention</td>
<td>4.73 (2.25)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cues to Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention</td>
<td>9.95 (3.98)</td>
<td>4.24</td>
<td>199</td>
<td>.000</td>
</tr>
<tr>
<td>No Intention</td>
<td>7.63 (3.78)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N = 204; Missing values excluded
Chapter Five

Conclusions and Recommendations

Human papillomavirus (HPV) is the most common sexually transmitted disease (STD) in the United States, and is currently infecting 20 million Americans; At least 50 percent of men and women will have HPV at one point in their lives (CDC, 2010a). HPV can cause cervical cancer, and other cancers of the vulva, vagina, penis, anus, and neck, as well as genital warts and rarely recurrent respiratory papillomatosis (RRP) (CDC, 2010a). The costs of human papillomavirus place a financial burden on the United States’ healthcare system (CDC, 2010c). HPV can also induce high levels of anxiety, distress, self-blame, and relationship problems (Herzog & Wright, 2007).

HPV can unintentionally be transmitted to others regardless of signs or symptoms. Condoms do not offer full protection because of the nature of the skin-to-skin transmission. The quadrivalent human papillomavirus vaccine (HPV4) can protect against four HPV types that can cause genital warts and cancers (FDA, 2006). The HPV4 vaccination rates are low among men and women (CDC, 2011a; CDC, 2011b; Schluterman et al., 2011); And even more so college-aged students, who are in dire need of this protection as one in two sexually active adolescents will contract an STD by the age of 25 (American Social Health Association [ASHA], 2005). Despite the known benefits, HPV4 vaccination is low among females and even more so males (CDC, 2011a; CDC, 2011b; Schluterman et al., 2011). Some speculate the low rate of vaccinating males could be due to the recent HPV4 vaccine coverage for males as compared to female (Stupiansky et al., 2012).
Conclusions and Recommendations

Following a comprehensive reviews of the literature, few published studies were found that examine college male involvement of intention to receive the HPV vaccine (Nandwani, 2010; Reiter et al., 2010b; Wheldon et al., 201; Stupiansky, 2012). Importantly, understanding males’ HPV knowledge and beliefs are direly needed. The Health Belief Model’s (HBM) constructs of perceived barriers, benefits, and cues to action can be employed in order to predict specific behaviors. Therefore, the purpose of this study is to assess male college students’ intention to receive the HPV4 vaccination, knowledge of the vaccination, and benefits, barriers, and cues toward receiving the HPV4 vaccination. Chapter one discussed the research questions, hypotheses, delimitations, limitations, assumptions, and operational definitions; chapter two provided a comprehensive review of the literature; chapter three discussed the participants, instrumentations, procedures, and data analysis; and chapter four provided the results of this study. This chapter presents the conclusions, discussion of the findings, and provides recommendation for the field and future research.

Conclusions

A total of 204 male college students were surveyed regarding their knowledge, perceptions, and intentions of the HPV vaccine. Students were enrolled in general education classes during the 2011 Autumn quarter at a Midwestern university. The majority of the participants were white (76.0%), and upper classmen (61.3%). The average age was 21 (M = 20.82, SD = 1.90). The majority of males were single and not in a steady relationship (61.8%), have had sexual intercourse (81.9%), and did not know a male who received the HPV4 vaccine (93.6%).
Students failed the knowledge portion of the questionnaire with an average score of 6.71 (SD=3.24) of 15 true and false questions. The results showed that males’ knowledge scores did not differ based on intention to receive the HPV4. The study revealed that males who reported intention to receive the HPV4 vaccine were significantly more likely to perceive more barriers, than those males who reported no intention to receive the vaccine. Males’ intention to receive the vaccine in the next 12 months did not differ based on the perceived benefits of the HPV4 vaccine. Males who perceived more cues to action were significantly more likely to report intention to receive the vaccine in the next 12 months compared to males who reported less cues.

Discussion

This study reveals males lack knowledge of HPV and the vaccine. These results are similar to other studies assessing males’ HPV knowledge (Allen et al., 2009; Gerend & Barley 2009; Reiter et al., 2010b; Reiter et al., 2010a; Licht et al., 2010; Wheldon et al., 2011; Reiter et al., 2010a; Licht et al., 2010).

The males sampled were similar to other studies, finding that the majority of males (80.4%) recognized that HPV is a sexually transmitted disease (Allen et al., 2009; Reiter et al., 2010a; Reiter et al., 2010b; Sandfort & Pleasant, 2009). Although the sample of men expressed recognition as an STD, only 83 males (40.7%) answered that HPV can transferred by skin-to-skin contact; this result has been seen by other samples with Sandfort and Pleasant (2009) found only 28% of their participants correctly identified that HPV cannot be transmitted via bodily fluids such as blood and semen, and 51.5% were unclear that HPV could be transmitted by skin-to-skin contact. Three quarters of the men correctly answered False to “A person who has HPV will always show signs of symptoms”, a high amount compared to other studies (Allen et al.,
More than half of the men knew HPV can cause cervical cancer (65.2%), but only a small portion knew that HPV can cause anal cancer (26.5%) or penile cancer (30.9%). The lack of anogenital cancer in males is a common theme in other studies, with only 28% of gay and bisexual males recognized the connection to anal cancer (32%) and penile cancer (28%) (Reiter et al., 2010a). Gerend & Barley, (2009) found less than 25% were aware of the connection between HPV and anogenital cancers in men; Only 14% of heterosexual males knew HPV can cause anal cancers, and only 17% knew HPV causes cancer penile cancer (Reiter et al., 2010b); while Allen et al. (2009) found that no one recognized the associated HPV with anal, penile, or oropharyngeal cancer.

Compared to other studies, a little over three quarters of men answered that HPV does not only cause a potential health threat to females (N= 155, 76.0%) Other studies have found only about half of the samples knew that males could also become infected with HPV that can cause problems for males Sandfort & Pleasant 2009; Katz et al., 2011; Reiter et al., 2010a; Reiter et al., 2010b). Only 48 of the (23.5%) 204 students acknowledged the high prevalence of HPV that 1 out of 2 college students will have HPV at one point in their life; which is comparable to Katz et al. (2011) that only 26.1% of the students knew that HPV infection is common.

More than half of the males (64.7%) knew that condoms do not offer full protection; far better than the students sampled by Katz et al. (2011) who found only 35.2% knew that condoms did not offer total protection against HPV. However, both this study and Katz et al. (2011) found that HPV infection cannot be easily treated with 27.9% and 35.8%, respectively. And only 23 males (11.3%) knew that HPV can go away on its own without treatment.

In regards to the HPV vaccine, majority of the males (N=155, 77.1%) did not know the FDA has approved the vaccine for routine use in men, which was similarly seen in other studies
Conclusions and Recommendations

Gilbert et al., 2009; Reiter et al., 2010a; Wheldon et al., 2011). The majority of men also did not know that the HPV vaccine helps protect genital warts (N=144, 70.6%). About half of the sample knew that the vaccine offers protection against some HPV-related cancers (N=104, 51.0%), and less than half of the men knew that the vaccine does not offer protection against other STDs such as chlamydia or gonorrhea (N=88, 43.1%).

Even though the health benefits of the HPV4 vaccine are medically recognized (American Cancer Society, Inc., 2011; Markowitz et al., 2007), many people at risk still are unaware of the vaccine and its benefits (Katz et al., 2011; Gilbert et al., 2011; Reiter et al., 2010b; Sandfort & Pleasant, 2009; Ragin et al., 2009). This could mostly be due to people not being familiar with HPV nor its consequences (Allen et al., 2009; Gerend & Barley 2009; Reiter et al., 2010a; Reiter et al., 2010b; Licht et al., 2010; Wheldon et al., 2011). Thomas and Goldstone (2011) found men who are well-informed can recognize the effectiveness against HPV infections. Those who have previously had HPV express the vaccine will be beneficial to prevent future HPV infections. Men who have sex with men (MSM) and bisexual males acknowledge the moderate physical and psychological benefits of the vaccine (Wheldon, et al., 2011). Mothers of adolescent males believe the HPV4 is beneficial to protect their sons’ future spouses or girlfriends from HPV-related disease (Reiter et al., 2010c).

This study examined college males’ perceived barriers to receive the HPV4 vaccine; the top reported perceive barriers were found to be: potential side effects (21.6%), fear of getting shots (needles) (19.1%), and feel that there is not enough research on its effectiveness (13.2%). Potential side effects has been found as a concern for other college students (Daley et al 2011; Wheldon et al., 2011; Thomas & Goldstone, 2011; Allen et al., 2009; Ferris et al., 2009; Thomas & Goldston, 2011). Sixty-nine percent of men say they would ask for more information about all
of the potential side effects before making a decision (Hernandez et al., 2010), and their long-term side effects (Katz et al., 2011). Needing more research was also found by Ferris et al. (2009). Those students’ voices that more research on the benefits for men would be more likely to accept the vaccine.

The least reported barriers were: do not feel there is a need to be vaccinated (2.5%), financial cost of the HPV vaccine (1.5%), and not sexually active (1.5%). This present study did contradict most other studies in terms to the cost of the vaccine; other studies show that a substantial barrier to receiving the vaccine was due to the high cost (Katz et al., 2011; Allen et al., 2009; Thomas & Goldstone, 2011; Wheldon et al., 2011); and that the cost of completing all three series would prevent them to receive the vaccine (Hernandez et al., 2010). Men would receive the vaccine if it were free or at a very low cost (Ferris et al., 2009; Daley et al., 2011). However, this present study found that cost of the HPV vaccine was not a concern for the college males. This could be due to male’s not being aware of the vaccine, and therefore do not associate the vaccine as costly. Also, considering that this study found males who report more barriers were still more likely to receive the vaccine, could be due because some of the males have heard of the HPV vaccine and may know that it is both available and beneficial to men. Also, they might have done prior research and aware that the HPV vaccine is covered by their health insurance. Katz et al. (2011) found that men would be more likely to receive the vaccine if the series is completely covered by health insurance. What is unique about this study’s college campus is that the HPV4 vaccine is actually covered by student health insurance at the time data collection was conducted. Finally because of the ACIP recommendation, more private insurers are offering the vaccine at no- or low-cost.
The top reported perceive benefits include: reduces the risk of spreading HPV to another person (15.4%), reduces the risk of penile cancer (12.7%), reduces feelings of worry and anxiety about contracting HPV (8.3%), and allows a person to feel good that they will not spread HPV (8.3%). Reducing the risk of spreading HPV to another person is a benefit of the HPV vaccine considering another study which found that some people fear that having HPV could be a serious threat to one’s sex life and might make it difficult to find a long-term main partner (Katz et al., 2011). Also, despite the fact that the majority of these males sampled did not know that the HPV vaccine does reduce their risk of penile cancer, they did answer that this reduction would be a considerable benefit of receiving the vaccine if it were to be true. The least reported benefits were: reduces the risk of genital warts (2.9%), reduces the risk of cervical cancer for female sex partners (4.9%), and allows a person to feel protected against getting HPV (7.8%). Seeing the majority of men did not know that the HPV vaccine helps protect against genital warts (N= 144, 70.6%), it is not surprising to see that genital wart protection would not be perceived as an important benefit. Jones and Cook (2008) found men were more likely to accept the vaccine should it prevent against cervical cancer and genital warts, rather than cervical cancer alone.

Also, the heterosexual males sampled may not have had first-hand experience with a female partner who suffered from an HPV-related health complication, such as an abnormal pap test. Human papillomavirus related abnormal pap tests can lead to lower self-esteem, relationship problems, and sexual reproductive issues (Herzog & Wright, 2007). Partners of women with abnormal pap test results may also experience guilt and anxiety. Mothers of adolescent males have been found to be believe the HPV4 is beneficial to protect their sons’ future spouses or girlfriends from HPV-related disease; although it is unknown if that sample of mothers had previously experienced HPV-related health consequences (Reiter et al., 2010c). A person who
reports the benefit of feeling protected from HPV has been seen among men who have previously had HPV-related health consequences, and therefore the vaccine would offer a moderate value to their physical and psychological health (Wheldon, et al., 2011); however, it is unknown whether or not they had experienced HPV-related problems in the past. Regardless of the perceived benefits, the results were unlike other studies in that there was not a significant correlation between perceived benefits and the likelihood of receiving the vaccine (Wheldon et al., 2011).

Professional research is considerably lacking on the cues to action of males intention to receive the HPV vaccine. This study did find that the cues to action were significantly correlated with the intention to receive the HPV vaccine. The top reported cues found were: if one’s sexual partner goes with them to receive the vaccine (11.8%), if one’s sexual partner goes with them to provide emotional support (8.8%), and if the vaccine were free (8.8%). Notably, study did not find the cost of the HPV4 a significant barrier, however, an advertisement of something being “free” may spark more males interest to inquire about or to receive the vaccine. The least reported cues were: having a parent who encourages receiving the vaccine (1.5%), having a doctor recommend receiving the vaccine (2.0%), and having a partner who encourages receiving the vaccine (2.5%). This study did not show the same results as Jones & Cook (2008), who found their sample were more likely to receive the vaccine if their doctor recommended it. What is interesting is that physical and emotional support contributes as a larger factor to increase their likelihood of intending to receive the vaccine, such that the encouragement of one’s partner does not carry the same effect of actually going with them.

Finally, the results found that the number of perceived barriers and the number of perceived cues significantly correlated with males’ likelihood of receiving the HPV vaccine.
Usually, a greater number of perceived barriers will significantly lower the intention of college students performing health behaviors (Ebert, Kang, Ngamvitroj, Park, & Von Ah (2003). Interestingly, this study found that if a male perceives more barriers, he is more likely to receive the HPV vaccine. This is differs from previous studies that found the opposite, in that the more barriers reduced the likelihood of HPV vaccine. A possible reason for this is that those who were willing to receive the HPV vaccine, had already inquired about it, which in those cases, males could have learned what the HPV vaccine involves compared to those who were not likely to be vaccinated. This study found that the more cues to action, the increase in likelihood to receive the HPV vaccine.

Recommendations

Recommendations for practice. When considering strategies to help increase the likelihood males receiving the HPV vaccine, individuals should consider the findings of the present study. This study indicates that the number of perceived barriers and the perceived cues to action help predict the extent of one’s likelihood to receive the HPV vaccine. Although males who report more perceived barriers were found to be more likely to receive the vaccine, this information may speculate that males could have previously considered the vaccine, have done some research and discovered the possible difficulties they might endure. In which case, by reducing those perceived barriers may enable males to successfully receive the full vaccination. This study also found that those who report more cues to action are more likely to receive the vaccine, in that greater number of cues may help males receive the vaccine. Especially the strength of the cue can increase the readiness to act. Such that these college males consider their
partners who physically went, provided emotional support, would increase their likelihood of being vaccinated.

Furthermore, these results reveal that college males lack crucial knowledge of HPV and the vaccine. Males are oblivious of their risk and potential health consequences of HPV. Interventions should be developed to increase male awareness of HPV and the vaccine. By doing so, more males may acknowledge the benefits of being vaccinated which would then further the increase in their likelihood of obtaining the vaccine. Thomas and Goldstone (2012) found men who are well-informed can recognize the effectiveness against HPV infections.

Recommendations for improving this research. One recommendation for improving this research study would be to modify the response options for the perceived benefits, barriers, and cues sections. The subjects were asked to “check all that apply” to each section. It may have been more beneficial for them to check their “top-three” or to rank them in the order of importance. This may provide more insight as to whether it is the number of the barriers and the number of the cues that is important, or is it the strength of each of the perceived barriers and the perceived cues that significantly are more valuable to increase their likelihood to receive the HPV vaccine. Also, improving the cues to action questions could be more beneficial to combine the choice of “If one’s sexual partner goes with them to provide emotional support with the item of “If one’s sexual partner goes with them to receive the vaccine”. Some students may read these items as the same. In which case, males may have seen this as the same and therefore responded the same to both, or only to one of those items.

Furthermore, it may have been beneficial to assess whether the males have been, or know of men and/or women who have been affected by HPV, and not just limiting it to HPV-related cancer. Perhaps putting this question in another location in addition to or rather than the cues to
Conclusions and Recommendations

action section would be useful. Knowing this could give another indication of why someone would or would not be more likely to be vaccinated. And may give insight to whether or not those who have been affected might have a greater understanding of the benefits of receiving the HPV vaccine.

Recommendations for future research. More studies need to assess college males’ knowledge and their beliefs and attitudes of HPV and the HPV vaccine. This study surveyed students at a Midwestern university, which may restrict the ability to generalize the results to other college males at other universities. Replication studies should be conducted in universities in different geographical areas to determine whether similar results were found.

This study found two of the constructs of the HBM to be helpful to understand the likelihood of whether a male would receive the HPV vaccine. Interventions should be developed around this theory, with an addition of education to the males of HPV, their risk, the health consequences, and the availability of the HPV vaccine. Adding the educational piece may assess that the males perceive the vaccine as beneficial that could possibly even improve their likelihood of receiving the vaccine.

Also, studies could consider the females’ perspective and attitudes of males receiving the HPV vaccine. Perhaps understanding females’ of awareness of HPV and males, and the availability of the vaccine for males could help promote males to become aware and increase their likelihood. Previous studies have shown a positive relationship of females’ influence on males seeking reproductive health services. Women are pleased with men who receive reproductive care services at health clinics. A large portion of those males seeking services report they learned about the clinic by “word of mouth” from their female sex partner or from female friends (Raine, Marcell, Rocca, & Harper, 2003). Thus promoting male vaccines to
women could potentially increase uptake among adolescent males, or give insight to researchers on a new approach and understanding of HPV male vaccination.
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