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Knowledge and Acceptance of HPV and the HPV Vaccine in Young Men and Their Intention to be Vaccinated

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Knowledge and Acceptance of HPV and the HPV Vaccine in Young Men and Their Intention to be Vaccinated

by

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DEDICATION

I dedicate this dissertation to my Lord and Savior, Jesus Christ for his abundant down-pouring of blessings throughout my life and for always being the Light unto my pathway. Your grace and mercy has brought me through. I seek to please GOD and not men because I am a servant of Christ! To my husband, Shaka Jasper, thank you for your commitment to our union and thank you for providing me with your strength which carries me when I am weak and weary. I thank GOD daily for blessing me with a Christian man whose wisdom is enlightening and humbling. I am forever grateful to you for choosing me to be your wife. It is truly an honor to be Mrs. Jasper. To my sister, Sherima Cobb, thank you for being my best friend and one of my biggest supporters. The feeling that overcomes me when you say how proud you are of me is one that I cannot explain. I love you forever and for always. Our sisterly bond is truly unbreakable! To my beautiful children, Briell, Jordan, and Jazmin, you have always been my inspiration. I try to set excellent examples in life so that you can see that all goals are obtainable. There is nothing that you cannot do as long as you keep GOD first and pray about everything. Mommy loves you! Finally, to my niece and the strongest girl that I've been blessed to know, Remiah! You are truly my fourth child and I want you to know that I look up to you just as much as you look up to me. You have been through so much and your courage is to be commended. Thank you for gracing me with your spirit and your smile. "Auntie" loves you and I will always be here for you.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Sexually active young men are at high risk of contracting HPV and developing genital warts and penile/anal cancers. They contribute significantly to the incidence of HPV in women. The HPV vaccine, Gardasil, was approved in 2009 for use in preventing HPV 6 and 11 in young males ages 9 to 26. Knowledge and awareness of the virus and the vaccine is limited among young men. Promoting education and prevention measures regarding HPV and reducing personal risks to HPV is significant in narrowing the gap between acquisition of the HPV virus and cancer sequelae. A correlational design utilizing cross-sectional survey methodology was used for this study. Seventy participants completed a HPV vaccine survey at a university in Southwestern United States. The survey measured their knowledge and acceptance of the HPV vaccine and their intention to be vaccinated. Male participants were likely to accept or consent to receive the vaccine however they reported low intent to actually get the HPV vaccine. Acceptance of the vaccine was greater among minorities and participants who reported regular doctor visits. Knowledge of HPV and HPV prevention was low. Young men may benefit from HPV vaccine educational marketing strategies that include enhancing their communication skills on HPV, the HPV vaccine and reducing risky sex behaviors.

CHAPTER I: INTRODUCTION

Awareness of Human Papillomavirus (HPV) related cancers has continuously grown around the United States, and the link between HPV and cervical cancer has been well documented. HPV is prevalent among young sexually active adults and is currently the most common sexually transmitted infection (STI) worldwide, causing cervical cancer, penile cancer, anal cancer and an increasing number of squamous cell carcinomas at specific sites (Cubie, 2013). Cervical cancer is attributable to infection with two high risk subtypes of HPV, HPV 16 and HPV 18, which account for about 70% of all cases (Whyte, 2012). HPV infection is generally asymptomatic, however it can manifest as genital warts in men and women. High risk HPV 16 and 18 are linked to cervical cancer in women and penile cancer in men (Jones, & Cook, 2008; Centers for Disease Control and Prevention [CDC], 2013). Cervical cancer was one of the most common types cancer deaths for women worldwide (American Cancer Society, 2014). Approximately, 80% of females have been exposed to the HPV virus by age 50 (Jain, et al., 2008). In fact, most individuals who engage in sexual intercourse are likely to contract the virus at some point during their lifetimes. The majority of these infections will be asymptomatic and clear within 1to 2 years (Tota, Chevarie-Davis, Richardson, deVries, & Franco, 2011).

Statement of the Problem

Men and HPV. In the 1980's HPV was considered to be a women's-only virus because of its link to cervical cancer (McCabe, 2014). Now the rates of cervical cancer are falling in women and the effects of HPV in men are rising. Within the United States, men are 25% more

likely than women to fall victim to HPV-associated cancers (Sanchez, Tung, Amos, & Lu, 2011). The ACS currently estimates that over 2,000 new cases of HPV-related cancers in men are reported annually, thus there has been recent interest in the effects of HPV infection and disease in men.

A study funded by the National Institutes of Health (NIH) (2008) found that male HPV infection significantly contributes to infection and cervical disease in women. Scientist have discovered that HPV is a major cause of anal and penile cancer in men, both heterosexual and homosexual, and HPV infections among men appear to be similar to the levels of women (D'Souza & Dempsey, 2011). In fact, men having sex with men (MSM) risk for anal cancer is comparable to women's risk for cervical cancer (Wheldon, Daley, Buhi, Nyitray, & Giuliano, 2011). HPV has also been linked to oropharyngeal cancers and genital warts (D'Souza & Dempsey, 2011).

HPV 16 and 18 have shown to be the most common HPV viral types present in penile, anal and oropharyngeal cancers (Cubie, 2013; CDC, 2013). Estimates in the United States include over 2,000 cases of men with anal cancer, almost 2,000 new cases of penile cancer, and approximately 5,000 new cases of oropharyngeal cancer for men annually (Sanchez, Tung, Amos, & Lu, 2011; CDC, 2013). Researchers have reported high risk male populations, most notably men who have sex with men and those men infected with HIV/AIDS, are at an increased risk for oncogenic HPV viral strains and HPV-associated anal cancers (Sanchez, Tung, Amos, & Lu, 2011). Previous studies also suggest HPV awareness is on the rise in men; however, many misconceptions still exist, and knowledge is still limited. High prevalence of HPV among young adult males supports the assumption that this problem exists because knowledge and awareness of the virus is limited among young men. This study used a cross-sectional design to sample

young males. It involved young men, ages 18 to 26, and the study examined their knowledge of HPV and HPV related illnesses, their attitudes about the HPV vaccine, their acceptance or consent to receive the vaccine and their intentions or likelihood to be vaccinated. It is important for men to understand how to reduce personal risks of HPV infection which may ultimately reduce the incidence of HPV-related illness in this population and subsequently reduce infection rates in women.

Purposes of the Study

The purpose of this study was to explore factors associated with differences in knowledge, attitude and acceptance of the HPV vaccine in young men. In addition this research measured the intention to receive the HPV vaccine, Gardasil, in a select group of young men ages 18 to 26 years; measured how knowledgeable young men were about HPV and the vaccine; and identified favorable or unfavorable attitudes toward accepting the vaccine.

Research Questions

The following questions were addressed in this study:

1. What are young men's intentions on receiving the HPV vaccine?
2. What are the attitudes of young men toward accepting the HPV vaccine?
3. What factors are associated with differences in attitudes of acceptance for the HPV vaccine in young men?
4. How knowledgeable are men of HPV, HPV-associated illnesses and HPV prevention?

Definition of Terms

Intention. The likelihood of engaging in the act of actually getting the HPV vaccine (Wheldon, Buhi, & Daley, 2012).

Acceptance. Consenting or approving the HPV vaccine as beneficial (Wang, Phoenix, Lau, Lau & Lai, 2013).

Knowledge. The awareness of information (Wheldon, Buhi, & Daley, 2012).

Attitude. A persons thoughts or feelings toward something (Aragones, Bruno, & Ganey, 2013).

Significance of the Study

HPV vaccine. Gardasil, a quadrivalent vaccine which protects against four types of HPV, was licensed in 2006 by the United States Department of Agriculture (USDA) and approved by the Food and Drug Administration (FDA) for use in women ages 9 to 26 years. In 2009, it was approved for use in preventing HPV 6 and 11 in males ages 9-26 years (CDC, 2013). Gardasil is the only approved vaccine for use in boys and men. In November 2010, Gardasil was approved for the prevention of anal cancer and neoplasia in males and females (FDA, 2014). The HPV vaccine has proven to stimulate immunogenicity in males and females (Dochez, Bogers, Verhelst, & Helen, 2014). This vaccine, Gardasil, is manufactured by Merck & Co., Incorporation, and is the first vaccine developed to prevent cervical cancer, precancerous lesions, and genital warts due to HPV (CDC, 2013). Gardasil, which is nearly 90% effective, is also used for the prevention of vulvar and vaginal cancer, caused by HPV types 6, 11, 16 and 18, in women. Gardasil is administered in three injections over a six-month period (Merk; Zimet &

Rosenthal, 2010). In 2011, the Advisory Committee on Immunization Practices (ACIP) recommended the routine use of the HPV vaccine in males aged 11 or 12 years, recommended vaccination of males aged 13 to 21 years who have not been vaccinated previously, and males aged 22 to 26 years may also be vaccinated (Katz, Kam, Krieger, & Roberto, 2012). According to the National Immunization Survey data (2014), only 38% of girls and 14% of boys completed the 3-dose series vaccine in 2013. Despite availability of the vaccine, rates of vaccination remain low in men (McCabe, 2014)

Getting this information out to men and getting them vaccinated has the potential to be of great significance in the efforts to decrease the incidence of HPV-associated cancers, especially in the high risk male population such as men-having-sex-with men and HIV positive men, one of the largest groups to suffer from HPV-associated cancers (Wheldon, Daley, Buhi, Nyitray, & Giuliano, 2011). Identifying factors that influence intentions in relation to vaccination in the male population is necessary to develop prevention strategies.

Although this area of research is increasing, there is limited research published on readiness to accept the FDA approved HPV vaccine among young men. Thus, the results of this study may be useful in understanding intentions about receiving immunization against HPV infection in this population. The knowledge gained by participating in this study may offer a better quality of life to young men by increasing their awareness of the HPV vaccine and its role in cancer prevention. It is vital that this information be shared with men because men play a significant role in the transmission of the virus. They tend to have more sex partners than females, they visit the doctor less frequently, and they rarely exhibit any symptoms if infected (Katz, Kam, Krieger, & Roberto, 2012). Vaccinating men can help prevent the transmission of the virus and will indirectly benefit women.

Promoting education and prevention measures regarding HPV is significant in narrowing the gap between acquisition of the HPV virus and cancer sequelae. Much of the research regarding the HPV virus focuses on women due to the history of the disease and its connection to cervical cancer (Cubie, 2013). However, HPV virus in men can cause health problems as well (e.g. penile cancer, anal cancer, colon cancer, oropharyngeal cancer) (Wang, Mo, Lau, & Lai, 2013).

The association of HPV and its link to different cancers in men has emerged in the media and literature (Kelly, Leader, Mittermaier, Hornik, & Capella, 2009; Kang & Moneyham, 2010; Cubie, 2013). In June of 2013, well known actor, Michael Douglas, reported to The Guardian (2013) that his diagnosis of throat cancer was related to HPV and oral sex. Throat cancer is an oropharyngeal cancer and refers to a malignancy that occurs in the tonsils, base of the tongue, and the upper throat (D'Souza & Dempsey, 2011). Douglas later reported that it was cancer of the tongue, another form of throat cancer. The 2013 Annual Report to the Nation on the Status of Cancer reported around about 13,000 new cases of oropharyngeal linked to HPV diagnosed in both men and women in 2009 (the last year of complete available data). Of the new cases, more than 10,500 were in men. More than 60% of oropharyngeal cancers are caused by HPV, according to the National Cancer Institute (Jemal et al., 2013).

Knowledge and HPV. A recent study on gender differences found that men did not perceive themselves to be susceptible to HPV, and another study concluded that the scores for HPV knowledge were higher for women than for men, and men had a higher level of shame (Kim, 2013; Jones & Cook, 2008). HPV prevention in both genders is necessary, however the need for awareness and knowledge of HPV and HPV-related illnesses are at an emergent level

for males. Evidence suggests that use of HPV vaccination within male populations will help decrease the incidence of HPV-associated cancers (Kang et al., 2014).

Summary

HPV has become one of the most prevalent sexually transmitted infections. This chapter identifies the prevalence of the problem and defines the statement of the problem. The specific purposes and the significance of the study are mentioned. This chapter also includes the research questions and the definitions of terminology.

CHAPTER II: REVIEW OF LITERATURE

Chapter two presents the review of literature. First the conceptual framework is described, followed by the review of literature. Epidemiology of HPV is described. HPV-associated cancers in the male population are presented, followed by literature on knowledge, intention and attitudes towards acceptance of the vaccine in relation to men. Priority for clinical research is explained.

Theoretical Framework

The Theory of Planned Behavior by Icek Ajzen has been used throughout research to examine intentions for a specific behavior. According to the theorist Icek Ajzen, intentions toward a behavior are influenced by three constructs: attitudes toward the behavior, subjective norms and perceived behavioral control (Ajzen, 1991). Perceived behavioral control and intention are directly related to behavior. Attitude, subjective norms, and perceived behavioral control are hypothesized to work together to determine intentions to perform a behavior (Ajzen, 1991).

For the purposes of this study, the constructs attitude, acceptance and knowledge are applicable to examining factors that impact an individual's intention to be vaccinated. Determinants that are directly linked to an individual's behavioral intentions are his or her attitudes toward performing the behavior (Reynolds & O'Connell, 2012), acceptance of the vaccine and knowledge of HPV. Attitudes toward the actual behavior are determined by beliefs;

if a young man feels that performing a behavior (receiving the HPV vaccine) will lead to a positive outcome (protecting themselves from HPV related illnesses), they tend to have a more favorable attitude toward the behavior (Lino et al., 2013). Having a favorable attitude toward the vaccine may increase their acceptance of the vaccine which directly affects their intentions. The more knowledge they have about the benefits of the vaccine will also directly affect their intentions. Intention is defined as the likelihood that the individual engages in the act of actually getting the HPV vaccine (Wheldon, Buhi, & Daley, 2012).

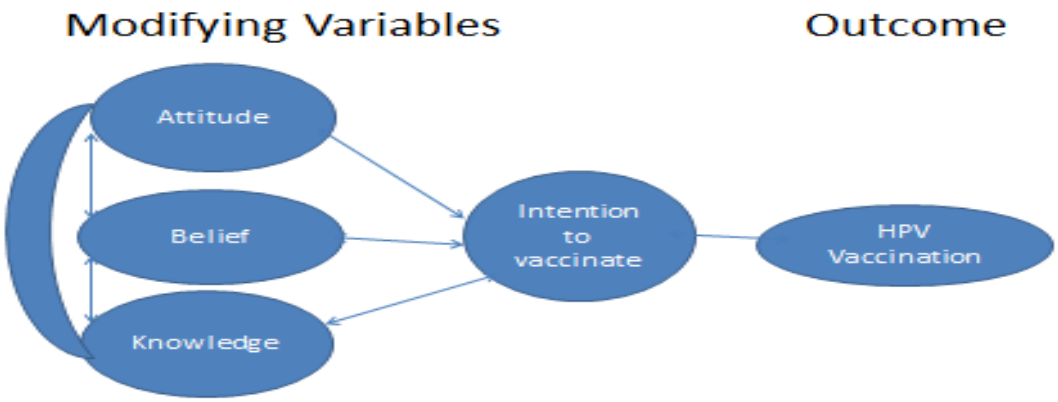

Figure 1: Modified Theory of Planned Behavior

Epidemiology of HPV

HPV is estimated to be the most common sexually transmitted infection (STI) in the United States with the highest rates of infection being among sexually active young adults under the age of 25 (CDC, 2013). HPV currently affects an estimated 20 million people (Jacob, Bradley, & Barone, 2005; Kahn & Bernstein, 2005; Koshiol, Laurent, & Pimenta, 2004;

Moscicki, 2011; CDC, 2013; Schiffman & Castle, 2006). HPV is the second most costly STI, second only to HIV, far outnumbering other STIs such as chlamydia or gonorrhea (Centers for Disease Control and National Center for HIV/AIDS, 2009). Human papillomavirus causes genital warts in men and women and it is associated with anogenital warts and oral cancers (Wheldon, Buhi, & Daley, 2012). It is estimated that 5.5 million new genital HPV infections occur in the United States each year (CDC, 2013, Dunne et al., 2007; Frazer et al., 2006; Gerend, & Magloire, 2008). The link between HPV infections and cervical cancer has been recognized for more than 20 years and is responsible for over 600,000 cancers each year – higher than any other cancer associated with an infectious disease (Moscicki, 2011).

Currently, more than 100 papillomaviruses exist. Papillomaviruses are small viruses that infect cutaneous and mucosal epithelial tissue (Zur Hausen, Fox, Wang, & Parsonnet, 2010). Papillomaviruses can enter the body through mucous membranes, such as the mouth, eyes, or throat and they are divided into subgroups of either low or high risk, depending on their likelihood of causing neoplasia (Dochez, Bogers, Verhelst, & Rees). Low risk HPV infections (commonly strains 6 and 11) usually cause symptomatic cauliflower-like warts and low-grade cell changes on the genitals, vagina, cervix, penis or anus. High risk HPV infections (commonly strains 16 and 18) are associated with anogenital, cervical, and penile cancers in men and women, however, 40 HPV strains have been identified in the high risk class as potentially oncogenic or cancer-causing (Sanchez, Tung, Amos, & Lu, 2011).

It is estimated that about 75% of the reproductive-age population will be infected with HPV at some point in their lives, and that infection is most common in the 15 – 24 age group (CDC, 2013). In other words, all sexually active individuals are at risk for HPV, unless in a

monogamous relationship where neither partner has ever been infected with HPV. Unfortunately, most individuals with HPV will never know that they are infected.

In areas with a high incidence of cervical cancer, men's sexual behavior is a risk factor for cervical neoplasia. More recently, scientists have discovered that HPV is linked to cervical cancer in women and is a major cause of anal and penile cancer in men, both heterosexual and homosexual (Dochez, Bogers, Verhelst, & Rees, 2014).

HPV-Associated Cancers in the Male Population

Male HPV infections significantly contribute to infection and subsequent cervical disease in women (Kim, 2012). Much of the information about HPV virus centers on women because of the connection with cervical cancer. Knowledge not well disseminated is that male HPV infection significantly contributes to infection and subsequent cervical disease in women (CDC, 2013). HPV virus in men can cause health problems as well in the genitourinary system of males also. Presently, the HPV virus has been linked to cancers of the anus, penis, and colon. Oropharyngeal cancers of the tonsils, throat and tongue have also been connected to HPV (Gross, & Pfister, 2009). More than half of the sexually active men in the United States will have HPV at some time in their lives which can increase their risk of transmitting the virus and getting cancer (Kim, 2012). The American Cancer Society estimates that about 1,250 men in the U. S. were diagnosed with penile cancer in 2008 and about 2,020 men were estimated to have received a diagnosis of anal cancer in 2009 with a steady predicted increase thereafter (CDC, 2011).

Specific to anal exposure the risk of anal cancer is about 17 times higher in sexually active gay and bisexual men than in men who have sex only with women. Men who have HIV

(human immunodeficiency virus) are at higher risk of exposure to high risk HPV strain with the potential sequelae of anal cancer (Sanchez, Tung, Amos, & Lu, 2011). The United States as a whole has a relatively low incidence of anal cancer, but men having sex with men have one of the highest rates of anal cancer for any given population (CDC, 2009). HPV is estimated to be responsible for 90% of all anal cancer. HPV associated anal cancers in high-risk populations has now become more prevalent than HPV associated cervical cancer (Sanchez, Tung, Amos, & Lu, 2011).

In addition to the correlation between HPV and anal cancer, HPV has been found to have a significant role in other cancers. HPV has been found in cancers of the head, neck, throat, and oral cavity, in addition to other body sites. A study on penile cancer reported up to 80% of samples as having a HPV strain present (Sanchez, Tung, Amos, & Lu, 2011). Approximately 40% of all penile tumors are thought to be attributable to HPV infection (Anic & Giuliano, 2011). Penile cancer is rare but it accounts for approximately 0.5% of all cancers in men worldwide (Parkin & Bray, 2006; CDC, 2013). The disease affects mostly men ages 50-70 years, however it has affected younger males. The incidence of penile cancer in the US is highest among Hispanics and men who live in the Southern US or areas with high poverty levels (Bleeker et al., 2009). A quantitative review of studies found HPV present in 45.4% of invasive penile tumors (Backes, Kurman, Pimenta, & Smith, 2009) and when reviewing the prevalence of HPV in invasive penile tumors, findings indicated that among those with HPV, HPV 16 was the most common type detected, followed by HPV 18 and HPV types 6 and11 (Miralles-Guri et al., 2009).

In addition, high risk strands of HPV has been estimated to be a contributing factor in up to 25% of oral cancers, such as the mouth, throat, and tongue. HPV is more common in throat

cancers, with a significant amount of throat and tonsillar cancers found to be HPV 16 and 18-positive (Wheldon, Daley, Buhi, Nyitray, & Giuliano, 2011). Recent research has found that there is a significantly high and disproportional incidence of HPV-associated cancers in high-risk male populations (Sanchez, Tung, Amos, & Lu, 2011).

Other types of HPV (6 and 11) viruses rarely cause cancer in men, but they can cause genital warts. At a given point in time, about 1% of sexually active men in the U.S. will have genital warts (Gross, & Pfister, 2009). A study that was conducted on men having sex with men found that prevalence of HPV infection was 48%. When compared to men having sex with women, men having sex with men were more likely to have oncogenic HPV types and multiple HPV types present in the anus (Wheldon, Daley, Buhi, Nyitray, & Giuliano, 2011). Men having sex with men are at an increased risk for these HPV associated cancers.

The state of science on knowledge about HPV infection in men and its relation to anogenital cancer continues to be limited, this is partially due to the lack in valid methods for sampling male genitalia, lack in routine preventive methods, and the burden of HPV is far lighter in men.

Knowledge, Intention, and Attitude Towards Acceptance of the HPV Vaccine

The literature has documented that males of all ages lack knowledge about HPV, the vaccine, morbidity, transmission and prevention. Acceptance of the HPV vaccine in young males has been associated with being aware of HPV, having more lifetime sex partners, perceiving themselves at risk for HPV having peer acceptance of the vaccine and believing that their parents and peers would encourage them to be vaccinated (Katz, Kam, Kreiger, & Roberto, 2012). Acceptability of the HPV vaccine is on average higher in studies that are conducted with

bi-sexual and gay man when compared to heterosexual men (Wheldon, Daley, Buhi, Nyitray, & Giuliano, 2011; Anic & Giuliano, 2011; Daley et al., 2010; Jones & Cook, 2008). Other studies conducted with men having sex with men reported a prevalence acceptability ranging from 36% to 86% (Wang, Phoenix, Lau, Lau, & Lai, 2013). It has been noted that vaccine acceptance is higher among males who had recommendations from their parents, partners, doctors and peers. Factors associated with vaccine acceptance among men include knowledge about HPV, perceived threat, and perceived barriers to the vaccine (Daley et al., 2011). In order for this vaccine to be effective, acceptance in males is essential.

Attitude toward an outcome is vital when trying to encourage a specific behavior. A study aimed at the attitudes of men with intentions to receive the HPV vaccine listed intentions as high and positive when there was repeated exposure to HPV information (Daley et al., 2011), thus vaccine intentions are driven largely by attitudes toward the vaccine (Wheldon, Daley, Buhi, Nyitray, & Giuliano, 2011). There is limited theory based research on attitudes toward the HPV vaccine. Maximizing vaccine uptake in the male population requires research to see what factors influence their attitudes and acceptance of the HPV vaccine.

HPV awareness appears to be on the rise in men, however knowledge is still limited in the male population and positive attitudes toward vaccination and prevention is limited as well. Studies suggest that there is still much confusion and continued lack of awareness surrounding the difference in genital herpes and HPV infection, the asymptomatic nature of HPV infection, the link between HPV and cervical cancer, anal cancer, and penile cancer (Gerend, & Magloire, 2008; Jones & Cook, 2008; Katz, Kam, Krieger, & Roberto, 2012). In a study of gender differences and personal prevention against HPV findings suggest that men are not mindful of personal susceptibility to HPV (Kim, 2013). However, men who participated in a study geared

at increasing knowledge of HPV and the vaccine appeared to be receptive to hearing about the potential consequences of infection to themselves and their partners (Kim, 2013). Because of the evidence based information in the literature about HPV and its link to cervical cancer, it's clear that this information is well known, however, awareness of other important facts remain limited in males, such as the link between HPV, genital warts, and various cancers and also, male susceptibility. Understanding factors such as attitude toward a behavior as it relates to HPV vaccine intentions are important healthcare concerns. Attitude is considered to be an important cognitive factor in healthy behavior outcomes (Reynolds & O'Connell, 2012). A positive attitude toward received HPV information was found to correlate with preventive sexual behaviors (Kim, 2013). When applying the theory of planned behavior to HPV prevention, it is assumed that HPV knowledge and attitudes about the HPV vaccine influences intentions related to HPV prevention. HPV prevention is necessary for men; therefore the factors related to attitude and knowledge toward HPV prevention is being explored.

Males and Vaccine Acceptance

It has been noted that vaccine acceptance is higher among males who had recommendations from their parents, partners, doctors and peers. Other factors associated with vaccine acceptance among men include knowledge about HPV, perceived threat, and perceived barriers to the vaccine (Daley et al., 2011). In order for this vaccine to be effective, acceptance in males is essential (Wang, Mo, Lau, Lau, & Lai, 2013; Katz et al., 2012).

Priority for Clinical Research

Most men: 1) do not understand their role in the spread of HPV; 2) do not understand the link between penile and anal neoplasia and HPV; 3) are not knowledgeable of HPV and HPV

prevention; 4) are not aware that having HPV can be asymptomatic; 5) are not aware that having HPV can not only be detrimental to the health of women but also to their health; 6) Most young, sexually active men are not aware that there is an HPV vaccine available to them.

Summary

A review of literature was presented in order to indicate how particular research findings clarify knowledge, acceptance and attitude toward HPV and the HPV vaccine. An epidemiological view was presented and findings from studies which involve men and their relation to the virus and vaccine were summarized. The Theory of Planned Behavior is explained as it relates to the relevance of the study. The theoretical framework is used to guide some of the research.

CHAPTER III: METHODOLOGY

Chapter three outlines the research methods for this study. A description of the sample and setting follow, and inclusion and exclusion criteria, instrumentation, procedures, approval, and informed consent are presented. Finally, the data analysis is presented. Figure 1 illustrated a conceptual model of the constructs evaluated in this study.

Sample and Setting

Completing a power analysis with desired effect size of 0.7, 2-sided alpha of .05, and a desired power of .80, the sample size needed was 70 participants. A random sample of 73 university students was selected. Three were excluded from the sample because they were older than the age of 26. The sample included young men between the ages of 18 and 26 recruited from a university in Southwest United States. This University was chosen because of location and accessibility to the preferred population sample. The selection criteria included males ages 18 to 26 that could read and write English. Men who had received any part of the HPV vaccination series were excluded from the study.

Instrumentation

Survey. The Human Papillomavirus Immunization Knowledge and Acceptance Survey (HPVIKAS) (Appendix A) was used to measure the variables knowledge, attitude and acceptance. It included 17 "true-false" items that operationalized knowledge. HPV knowledge was measured by items such as "The HPV vaccine cures cervical cancer once it has developed,"

"HPV can be in a person's body for many years and you not know it," "The best way to prevent being infected with HPV is to avoid genital sex," "HPV can cause ano- genital cancer." True items were coded as 1 and false items as 2. Because of this particular data being categorical a mean was not calculated for each item; however, a mean score total for percentage correct was calculated. A plot was created showing the percentage of responses that were correct for each question. Ten items that are scored on a summative rating scale operationalized attitude and acceptance. Participants were asked to respond to each statement in terms of their own degree of agreement or disagreement. Each item was summed together for scoring and means were calculated. Questions 18 to 22 of the survey measured attitudes of non-acceptance (Table 5). Mean scores that were less than or equal to 2 were defined as unfavorable attitudes and non-acceptance of the vaccine, however mean scores greater than 2 for this set of questions were interpreted as favorable for non-acceptance of the vaccine. Questions 23 to 27 of the survey measured attitudes of acceptance (Table 6). Mean scores that were less than or equal to 2 were defined as favorable attitudes and acceptance of the vaccine, mean scores greater than 2 were considered to be unfavorable. Participants were instructed to select one of four responses: strongly agree, agree, disagree, or strongly disagree. Examples of the questions are "I believe new vaccines are created to make money for doctors," "I believe the good of vaccines outweigh the bad," "Immunizations protects against or prevents the development of diseases should contact with the disease occur." The responses to each item were combined to determine a favorable or unfavorable attitude of acceptance and a mean was calculated. Content validity and internal consistency was established by conducting a Cronbach's alpha coefficient analysis and was reported as .80. The questionnaire took approximately 15 minutes to complete.

Demographic. The Demographic questionnaire (Appendix B) was used to describe basic demographics of the participants. The specific items examined were: race, ethnicity, age, level of education, parent education level, sexual orientation, religion, doctor visits, and health insurance. Intention for vaccination was measured by marking a point on an 11-point visual analogue scale where "0" indicated no intention and "10" indicated a strong intention. Scores ranging from "0" to "3" were considered low. Scores ranging from 4 to 6 were considered to be medium or undecided and scores "7" or greater were high intentions. Data were collected between January 2014 and July 2014.

Procedures

The study and questionnaires were approved by the Institutional Review Board (IRB) for the University of South Florida before the initiation of the study. One research assistant (RA) was involved in participant recruitment and questionnaire distribution/data collection and had credentialed herself with the Collaborative Institutional Training (CITI) Basic Course in the Protection of Human Research Subjects, as per the regulation of the USF. Permission to use the survey was gained from the original author.

Recruitment and data collection. The RA was hired to recruit participants, distribute questionnaires and collect surveys and demographic forms after they were completed. The RA was given a formal orientation regarding the study, expectations, inclusion criteria, tips on how to approach and recruit participants. Potential study participants were approached by the RA and asked to take part in the study. The RA approached participants during breaks in a common gathering space on the college campus. Only individuals who met inclusion criteria were invited to participant. Those who agreed to participate signed an IRB approved informed consent and

were given a copy of the signed consent form. Participants were given a chance to ask questions. Survey packets were distributed with instructions on completion. The informed consent statement described the study objectives and steps used to ensure confidentiality and rights. Participants were informed that they had the right to withdraw from the study at any time. All data was locked into a file cabinet and will be shredded at the completion of the study. To maintain compliance and to promote completion of the questionnaire, each participant was entered into a drawing to receive a $100 gift card. There were a total of 5 drawings. The study records remained confidential. Identities were not revealed. All information was treated with confidentiality. An assigned code identification number was assigned to each name. The data was kept locked in file cabinets in the office until completion of the research study.

Data Analysis

Data analysis and entry was done using SAS version 9.1.3. The program was password protected. Results are reported as aggregate data only. Statistical analysis answered four research questions. The following section presents the questions tested and the data analysis procedures. Descriptive statistics including mean and standard deviation were tabulated for interval and continuous variables; percentages were tabulated for categorical variables. For survey instruments, scale scores were created for attitude and acceptance. Univariate analyses followed by multiple logistic regression analysis were conducted separately for constructs to assess factors associated with men's attitudes toward acceptance of the vaccine.

Question one. "What are young men's' intentions on receiving the HPV vaccine?" For this question, means and frequencies were calculated.

Question two. "What are the attitudes of young men toward accepting the HPV vaccine?" For this question, means and frequencies were calculated.

Question three. "What factors are associated with differences in attitudes of acceptance for the HPV vaccine in young men?" Logistic Regression analysis was used to investigate if race, sexuality or age affected attitude towards acceptance of the HPV vaccine.

Question four. "How knowledgeable are men of HPV, HPV-associated illnesses and HPV prevention?" For this question, means and frequencies are calculated.

Summary

In this chapter a description of instrumentation for this investigation was presented. The criteria for selection of the sample, the procedures for the data collection and the methods with which the data were analyzed was also discussed. The validity of the HPVIKAS was assessed. Participants were given a questionnaire with a consent form. The consent forms were collected and given a code for confidentiality purposes. Data were analyzed using descriptive and analytical methods using SAS 9.1.3.

CHAPTER IV: RESULTS

Chapter IV first presents the results of this study related to knowledge, attitude and acceptance of HPV and the HPV vaccine. This is followed by a presentation of the results according to each research question.

Sample

Seventy men attending a state university in Southwest Florida expressed interest in participating in the study. All surveys were returned. Demographic data collected included race, ethnicity, education, age, sexuality and religion. Of 70 respondents, 34 (49%) identified as white, 14 (20%) as black, and 22 (31%) as other race. Other race included Asian, American-Indian or Alaskan Native, and Native Hawaiian or Pacific Islander. There were 56 (80%) self-reported non-Hispanic participants and 14 (20%) self-reported Hispanics. The majority of the men were greater than the age of 20 years with a mean age of 23. When asked about sexuality, 63 (90%) reported being heterosexual. The majority of the sample self-reported religion as Christian with 22 (31%) reported being non-religious (Table 1).

Of the 70 respondents, a majority self-reported having health insurance 60 (86%) and 39 (56%) reported going to the doctor regularly. For each participant, regular healthcare visits was defined as every 6 to 12 months (Table 2).

Table 1: Frequency and Percentage of Demographics

Variables	Frequency (F)	Percentage (%)
Race		
White	34	49
Black	14	20
Other	22	31
Ethnicity		
Hispanic	14	20
Non-Hispanic	56	80
Education		
<degree	30	43
>=degree	40	57
Age		
<=20	20	29
>20	50	71
Sexuality		
Heterosexual	63	90
Other	7	10
Religion		
Christian	38	54
Other religion	10	14
No religion	22	31

Table 2: Frequency and Percentage of Health Visits

Health Visits	Frequency (F)	Percentage (N)
Regular visits with MD	39	56
No regular visits with MD	30	43
Health Insurance		
YES	60	86
NO	10	14

Research Question Number One

To test the first research question, "What are young men's intentions on receiving the HPV vaccine"? For this analysis, scores ranging from "0" to "3" were considered low. Scores ranging from 4 to 6 were considered to be medium or undecided and scores "7" or greater were high intentions. Intentions to get vaccinated against HPV were low among respondents with a mean response of 2.6 (SD = 3.09). Only 9 (13%) of the respondents reported a likelihood to receive vaccination (score of 7 or more). Fifty-one participants (73%) reported low or no intention to get vaccinated (score of 0 to 3) (Table 3).

Table 3: Sample Means and Standard Deviation for Vaccine Intentions

Level of Intention	**N**	**M**	**SD**
Low < 3	51	0.5	0.9
Medium 4 - 6	10	4.7	0.5
High >7	9	8.0	1.2
Overall	70	2.6	3.1

Table 4 presents the frequencies and percentages of the participants in reference to the original scale that measured intention. Thirty participants (42%) chose zero, 10 (14%) chose one, 7 (10%) participants chose 5 and only 2 (3%) chose 10 when asked how likely they were to receive the HPV vaccine. In summary, this data supports low intention (scores of 0-3) to receive vaccination for HPV in young men.

Table 4: Frequency Table for Intention

Level of Intention	Frequency (F)	Percent (%)
0	30	42
1	10	14
2	6	10
3	5	10
4	3	3
5	7	10
6	0	0
7	4	5
8	3	3
9	0	0
10	2	3

Research Question Number Two

To test question 2, "What are the attitudes of young men toward accepting or not accepting the HPV vaccine?" On a 1 to 4 scale (from Strongly Agree to Strongly Disagree), ratings for attitude toward vaccine non-acceptance were high (meaning a tendency to disagree with the statements). As seen in Table 5, mean scores for all non-acceptance items were around 3, indicating that respondents generally disagreed with negative statements, such as, "I believe that vaccines are created to make money for the government."

Table 5: Means and Standard Deviation for Attitude Towards Vaccine Non-Acceptance

	Questions: Attitude for vaccine none acceptance	**M**	**SD**
Q18:	I believe vaccines are created to make money for doctors	3.24	0.71
Q19:	I believe getting several vaccines at one time causes problems	2.92	0.76
Q20:	Religion plays a part in my decision making about the vaccine	3.51	0.76
Q21:	I believe vaccines are created to make money for the government	3.14	0.89
Q22:	I believe vaccines cause other illnesses	3.04	0.89

On a 1 to 4 scale (from Strongly Agree to Strongly Disagree), ratings of attitude towards vaccine acceptance were relatively low (meaning a tendency to agree with the statements). As seen in Table 6, mean scores for all but one acceptance item were around 2 which corresponds to the Descriptor "agree." Thus, participants tended to agree with statements such as "I believe the good of vaccines outweighs the bad." Of note, there was overall disagreement with the statement "HPV is not serious enough for a vaccine."

Figure 2 shows percentages of answers for the questions that determine acceptance for the HPV vaccine. Approximately 60% of the sample disagree with the following statements, "receiving several vaccines at one time causes a problem; religion plays a part in my decision making about the HPV vaccine; vaccines are created to make money for the government; and that vaccines cause other illnesses.

Table 6: Means and Standard Deviations for Attitude for Vaccine Acceptance

Questions: Attitude for vaccine acceptance		M	SD
Q23:	I believe the vaccine prevents cervical cancer and genital warts	2.12	0.83
Q24:	I believe the good of vaccines outweigh the bad	1.65	0.76
Q25:	Immunizations protect against or prevent diseases should contact with the disease occur	1.77	0.80
Q26:	People should have the right to refuse vaccines for certain reasons	2.04	0.88
Q27::	HPV is not serious enough for a vaccine	3.45	0.65

A majority (more than 50%) of respondents agreed that the vaccine prevents cervical cancer and genital warts. Close to 50% agreed that the good of the vaccine outweighs the bad. A little more than 40% reported an attitude of acceptance for immunizations protecting against or preventing the development of diseases. Only about 9% agree that patients should have the right to refuse vaccinations because of medical, religious, or personal reasons. More than fifty percent of respondents strongly disagree with the statement "HPV is not serious enough for a vaccine."

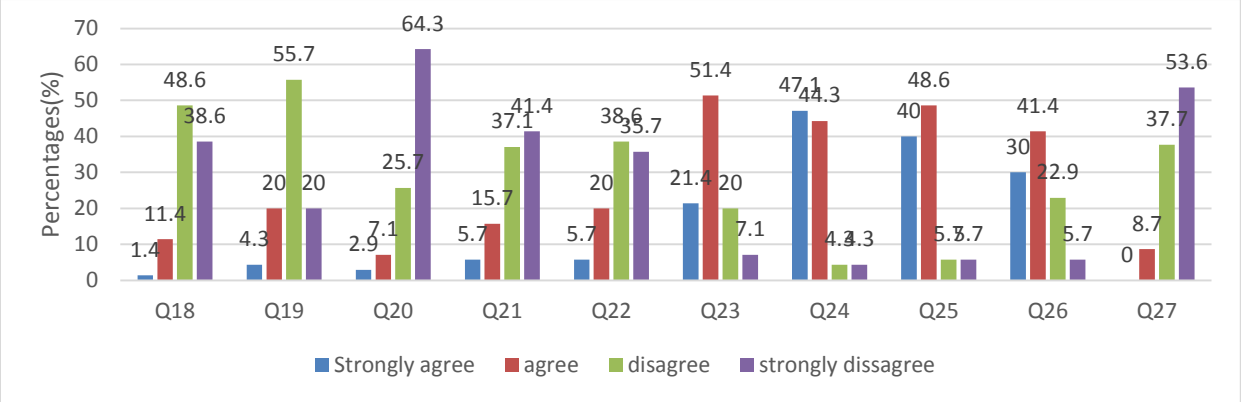

Figure 2: Percentages for Attitudes of Acceptance and None Acceptance

Research Question Number Three

To test question three, "What factors are associated with differences in attitudes of acceptance for the HPV vaccine in young men?" As stated above, a logistic regression analysis was used to examine factors associated with differences in attitudes of acceptance. There were no significant independent predictors associated with favorable attitudes of acceptance for the HPV vaccine in males ages 18 to 26 years (Table 7). While not statistically significant, the strongest suggestion for factors potentially associated with greater acceptance of the HPV vaccine (e.g. perhaps assessed with a larger sample) included Hispanic ethnicity, no religious affiliation, black race, and lack of insurance.

Research Question Number Four

How knowledgeable are men of HPV, HPV associated illnesses, and HPV prevention? As shown in Figure 3 and Table 8, most respondents (91%) correctly answered the question "the HPV vaccine does not cure cervical cancer once it has developed". Fifty-eight percent answered correctly for, "HPV vaccine prevents cervical cancer from developing." Sixty-nine percent of respondents correctly answered the knowledge question that asked if "girls have to receive three shots of the HPV vaccine." However, the knowledge response to Q4 was practically an even split (49% correct and 51% incorrect) when asked if boys have to receive three shots of the HPV vaccine. Unfortunately, the aggregate percentage HPV knowledge score was less than 70% when asked: Q6, the best time to get the vaccine is before any possible exposure to the virus; Q7, the vaccine prevents all genital warts; Q9, the virus can be in a person's body for many years and not know; Q11 another way to decrease the risk of getting HPV is being in a long-term relationship; Q12 people who are infected with HPV will always have symptoms; Q13 there is

no cure once you are infected with HPV; and Q16 the vaccine is recommended for all boys between the ages of 9 and 26.

In summary, knowledge for HPV was relatively low (i.e. below 70%) among this group of male college age students. The cohort when sampled was knowledgeable about the literature on women and HPV but lower vaccine knowledge was noted in regards to males and HPV.

Summary

Four research questions were investigated in this research study. Each of these was concerned with the HPV vaccine and constructs that have an influence on attitudes and acceptance of the HPV vaccine such as age, race and sexuality. Intentions of young men to receive the vaccine were also analyzed.

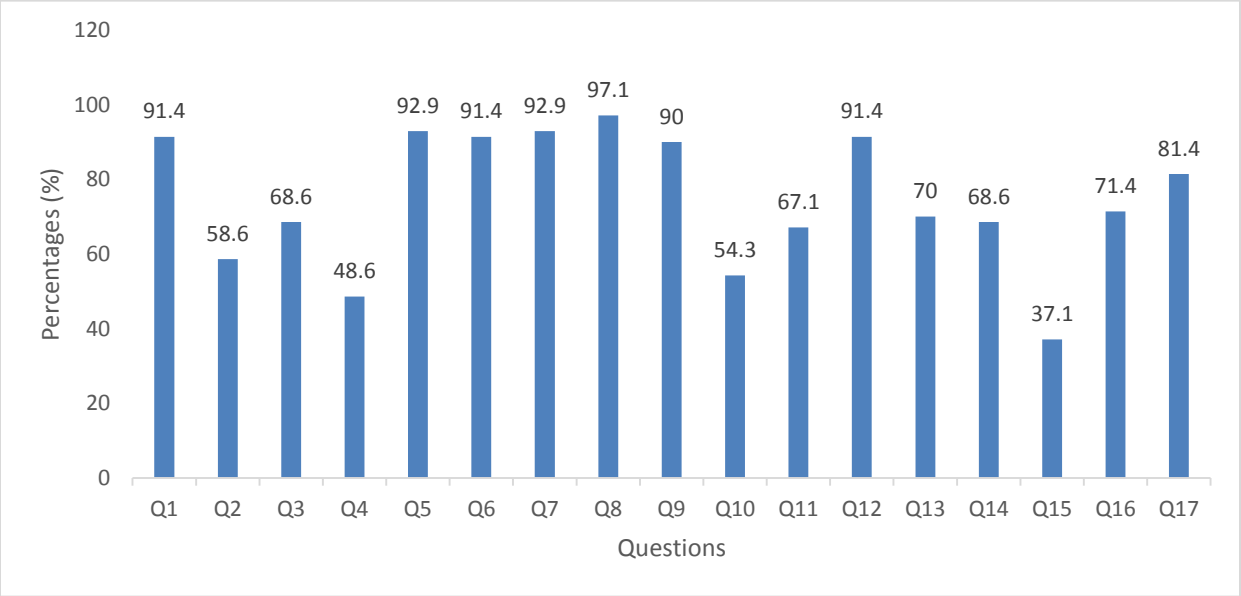

Figure 3: Display of Percentage of Correct Responses to Knowledge Questions

Table 7: Logistic Regression with Multivirate Analyses for Predicting Acceptance

Variable		**N (% that accepts)**	**OR**	**95% CI**	***p***
Race					
	White	15 (44)	1		
	Black	6 (43)	1.54	0.33 – 7.28	0.306
	Other	6 (27)	0.43	0.10 – 1.9	0.190
Ethnicity					
	Non-Hispanic	20 (36)	1		
	Hispanic	7 (50)	4.2	0.77 – 22.76	0.096
Education					
	>=degree	15 (38)	1		
	<degree	12 (40)	0.88	0.22 – 3.55	0.854
Age					
	>20	19 (38)	1		
	<=20	8 (40)	0.81	0.16 – 3.97	0.793
Sexuality					
	Other	4 (57)	1		
	Heterosexual	23 (37)	0.71	0.10 – 5.36	0.744
Religion					
	Other religion	3 (30)	1		
	Christianity	13 (34)	0.68	0.06 – 7.21	0.414
	No religion	11 (50)	1.64	0.16 – 16.28	0.352
Health					
	Regular visits	13 (33)	1		
	No regular visits	13 (43)	1.12	0.30 – 4.15	0.968
Insurance					
	Yes	21 (35)	1		
	No	6 (60)	3.10	0.5 – 19.29	0.225

p = <0.05*.

Table 8: HPV Knowledge Questions and Percent Correct for Each Item

Question	(%)	Question	(%)
1. The HPV vaccine cures cervical cancer once it has developed	91	10. The HPV vaccine prevents cervical cancer from developing	54
2. Girls should get three shots of the vaccine	59	11. Boys should get three shots of the vaccine	67
3. Girls who get the HPV vaccine do not need to get pap smears	69	12. The best time to get the vaccine is before any possible exposure to the virus	91
4. The vaccine prevents ALL genital warts	49	13. The vaccine prevents pregnancy	70
5. HPV can be in a person's body for many years and you not know it	93	14. The best way to prevent being infected with HPV is to avoid genital sex	69
6. Another way to decrease risk for getting HPV is to be in a long term relationship	91	15. People who are infected with HPV will always have symptoms	37
7. There is no cure once you are infected with HPV	93	16. HPV can cause anogenital (anal/butt) cancer	71
8. It is not possible to get infected with HPV from the vaccine	97	17. The HPV vaccine is recommended for all boys between the age of 9 and 26 years of age	81
9. It is recommended that men older than 30 years ask their healthcare provider for the HPV test	90	Total Percent Correct	74

CHAPTER V: DISCUSSION, CONCLUSION, AND IMPLICATIONS FOR NURSING

This final chapter presents the syntheses of the research results including the discussion of the findings, conclusion, and implications for nursing. This study presents the summary of the knowledge of HPV and HPV prevention in young men ages 18 to 26, and their attitudes for acceptance of the vaccine. This study also explored demographic factors and how they may predict an individual's acceptance of the vaccine. This study provided minimal detail of college student's awareness about HPV and it highlighted predictors that may be associated with HPV vaccine acceptance.

Summary of the Study

A cross-sectional survey design was used for this study. Descriptive statistics and logistic regression was used to assess knowledge and acceptance of the HPV vaccine and factors that may predict a favorable attitude towards acceptance. Participants were 70 men attending a state university in the Southwest United States. Descriptive data for the sample were obtained with frequencies, percentages, means, and standard deviations. The sample predominately represented white (49%) male college aged students. Seventy one percent of the sample was aged 20 years or older with a mean age of 23.

Discussion

The science linking HPV to sexual and reproductive health cancers is well established. The most common STI worldwide, HPV, has potential sequelae of cervical, penile and anal

cancer. Specifically, high risk subtypes, HPV 16 and 18 are linked to sexual and reproductive health cancers in men and women. There has been recent interest and little research in the effects of HPV infections and disease in men. This research adds to the science of HPV and men.

Research question number one. The first research question investigated men's intention on receiving the HPV vaccine. One of the most notable findings from this study is the majority of participants who do not intend to receive the vaccine. Perhaps this is because of the limited marketing about the vaccine availability in this population and lack of HPV awareness, including their perceived susceptibility to the virus. Because of this finding, the incidence of HPV and HPV related illnesses may be expected to increase among sexually active young adults unless intervention strategies are put into place. Another explanation as to why intentions to get vaccinated were low could be because parents of participants may not be familiar with the vaccine. This age range of men relies heavily upon health advice from their parents. Parental barriers include limited access to tailored information for patients, cost, cultural barriers, and perceived risks outweighing perceived benefits could affect intentions to receive the vaccine as well as acceptance of the vaccine. Targeting parents and providing them with information on the HPV vaccine could be a strategy to be tested to potentially increase rates of intention. On another note, a study about attitudes toward intention to receive the vaccine reported that respondents stated they would be more willing to receive the vaccine if it was recommended by their clinician (Kang & Moneyham, 2013). A study conducted by Moffitt Cancer Center found that fewer than 15% of physicians recommend this vaccine to young men (McCabe, 2014). Healthcare providers are important sources of information and parents value information from physicians. The construct intention in relation to young men and what influences their intention should be explored further. Increasing this cohort's intentions on receiving the vaccine would be

expected to aid in the prevention of HPV. Exploring additional factors beyond demographics that may be related to a young man's intention to be vaccinated should be considered. The success rates of this vaccine will likely depend, in large part, on physician's ability to recommend the HPV vaccine.

Research question number two. Attitudes for accepting the vaccine were generally favorable for young men overall. However, this finding was largely at odds with the finding of low intentions actually receive the vaccine by study participants. Findings from this study were not consistent with similar research findings that vaccine intentions are driven largely by attitudes toward the vaccine and beliefs about the outcomes of being vaccinated (Wheldon et al., 2011). Although the HPV vaccine has no real identified difference in side effects when compared to other vaccines, reports of adverse reactions are a concern (Kang & Moneyham, 2010). Some physicians have stated concerns of safety, as well, which is a preventing factor from recommending the HPV vaccine. Minorities indicated a non-significant trend towards more favorable attitudes of acceptance for the vaccine when compared to whites. Whereas this was not a significant finding; it does however suggest a rationale to explore attitudes of levels of acceptance among whites. On a positive note, the fact that minorities were certainly no less and suggested a higher likelihood of accepting the vaccine than whites is notable that current data supports minorities being disproportionally affected by HPV (Aragones, Bruno, & Gany, 2013). Having minorities being potentially more likely accept the vaccine is a step in the right direction given overall higher risk status. Also, there was a non-significant suggestion of homosexuals having a more favorable attitude of acceptance when compared to heterosexuals. This suggestion is encouraging since research has shown that homosexuals are considered high risk for contracting oncogenic strains, HPV 16 and 18. High acceptance will hopefully yield high

intentions to get vaccinated among this population. The Theory of Planned Behavior has shown to be a valid model for predicting behaviors conceptually; however, it did not support my assumption that high acceptance and favorable attitudes will lead to high intentions. This finding was probably due to the participants rushing through the questions and not accurately understanding the items.

Research question number three. Further investigation is needed to determine specific factors, ideally those that are modifiable, that significantly influence acceptance of the HPV vaccine in young men. The findings of the present study suggest that strategies aimed at HPV prevention should attempt to increase marketing and awareness of the vaccine which may result in an increase of acceptance. Education is needed on the dynamics of the vaccine and what role it plays in prevention of HPV in men and how it can indirectly increase prevention in women. The majority of HPV studies have aimed prevention efforts to women and gay men. In a study about gender differences, findings showed that men do not perceive themselves susceptible to HPV which could explain why findings from this study suggest that heterosexual appear to be less likely to accept the vaccine. This suggests that HPV prevention is not a high priority for them and subsequently this decision can, in the worst case, affect mortality rates in both genders. Minorities altogether had a favorable attitude for acceptance of the vaccine when compared to whites. Those with no formal religious affiliation provided a suggestion of being more likely to accept the vaccine. It has been documented that vaccine acceptance is higher among males who had recommendations from their parents, partners, doctors and peers. In the present study, there were little relationships between men who did and did not go to the doctor regularly and their likelihood to accept the vaccine. In this study, men who reported having insurance non-significantly reported being less likely to accept the vaccine. This apparent trend may suggest

misconceptions about whether insurance will pay for the vaccine. Highlighting some of the findings in this analysis should be considered when exploring interventions for vaccine acceptance that are aimed at this population. Decreasing the transmission of HPV is a high priority when attempting to reduce the incidence of cervical cancer, anal cancer, neck cancer and penile cancer.

Research question number four. An intriguing finding was the high proportion of respondents who think HPV infection can occur with HPV vaccination. Perhaps this finding sheds some light as to why many individuals have low or no intention for receiving the vaccine. This study supports the fact that there are still poor understandings about the HPV vaccine; however, an exception is the fact that more than half of the respondents understand that the vaccine prevents cervical cancer, yet does not cure it. An important issue is to enhance knowledge and HPV awareness in this population. Future studies need to clarify the knowledge of the HPV vaccine in young adult males. HPV education is necessary to enhance the intentions of young men to prevent HPV.

Young men between the ages of 18 and 26 appear to have low knowledge of HPV and HPV prevention. They were aware that there is no cure for HPV and the best way to prevent contraction of the virus is avoiding genital sex. They were also aware that having the virus does not always mean one will be symptomatic. However, their understanding of the HPV vaccine was limited in the aspect of the number of shots needed in order for the vaccine to be effective. Anogenital cancer was addressed and findings showed that they know HPV can lead to sexual and reproductive cancers. More than half of the participants thought that receiving the vaccine can lead to cancer, which is an obvious misconception. Studies have revealed that the HPV virus is linked to cancers of the anus, penis, colon, tonsils, throat and tongue (Gross & Pfister, 2009);

however, the HPV vaccine was approved in 2009 to prevent anal and penile cancers in men. Evidence suggests that use of HPV vaccination within male populations will help decrease the incidence of HPV-associated cancers (Kang et al., 2014). This warrants the need to educate young men on the dynamics of the vaccine and its benefits as a priority. Healthcare providers need to continue to stress HPV's link to anogenital cancer as well as other cancers and encourage prevention. It's important that we continue to educate young women on the benefits of the vaccine and we need to urge them to aid in the awareness of HPV to men.

Although the research in relation to HPV has been centered toward women, the risk of anal cancer among gay males is comparable to women's risk for cervical cancer (Wheldon et al., 2011). These findings alone are serious enough to encourage health care providers to promote marketing for this vaccine. This study also indicates awareness of HPV is on the rise in this population (i. e. young adults) however there are still many misconceptions about the vaccine. HPV education is very necessary in this population, which is consistent with findings of previous studies. Given that HPV prevention should begin at the primary prevention level, it should be stated that being in a monogamous relationship, getting vaccinated before possible exposure to the virus and receiving the entire series of vaccines are important factors in controlling the risk of HPV.

Implications for nursing. This research has important implications for nursing. The findings suggest that health education is needed to enhance knowledge and awareness of HPV and the HPV vaccine. The dynamics of the vaccine and behavioral recommendations for HPV prevention and the importance of regular doctor visits should be emphasized. Nurses at local health departments and clinics should provide brief educational interventions within the community. When Gardasil was first introduced to the market for girls, the marketing campaign

was evident and visible. The same structure and models should be used for boys. Even when attempting to increase the awareness of HPV in males, it may not translate into HPV prevention behaviors. Nurse educators should engage interventions that include repeated exposure to information about HPV vaccination in males. Nurse educators should target fathers and partner with them to help increase vaccination in young males. This may result in higher intentions to get vaccinated. Young men value the opinion of parents so there should be interventions aimed at getting parents involved in HPV prevention. There is a substantial need for educational campaigns to disseminate knowledge about HPV and personal consequences of HPV infection. Given the low levels of HPV knowledge, increasing the awareness is a start. Future research should include other populations involved in making decisions about getting vaccinated, including adolescents, parents and young women. There should be qualitative studies conducted to help healthcare providers understand what influences young men's intentions and there needs to be more research data on the efficacy of the vaccine and its benefits. Interventions aimed at having partners see the clinician together could help decrease barriers.

Limitations. Limitations in this study should be considered when presenting the findings. Although attempts were made to recruit a racially diverse sample, the sample as a whole was small and there was not equal representation among races. It was a convenience sample so the findings may generalize only to young college men. Studies with much larger sample sizes are needed to determine whether HPV awareness has increased in student populations and within the community. Another limitation of this study could be that only young men ages 18 to 26 years were examined and it did not include ages 9 to 17. The HPV vaccine has been approved for use in young men ages 9 to 26 by the FDA. Clinical trials are being evaluated to determine the feasibility of the HPV vaccine in older men; future studies should

assess this cohort's receptivity to the vaccine and identify effective ways to inform men about HPV prevention and HPV vaccination.

Conclusions

The present study examined the knowledge, attitudes of acceptance, factors related to vaccine acceptance, and intentions to prevent HPV in young men ages 18 to 26. The findings suggest that there are still misconceptions about the vaccine in this population. To promote the HPV vaccine among men, healthcare providers need to correct perceptions of the vaccine in general by discussing vaccination with parents and engaging in discussion with young men. In addition, there may be important differences in terms of race, religion, age and sexuality when it comes to acceptance of the vaccine and intentions on being vaccinated. Further study is required to identify both modifiable and non-modifiable factors associated with acceptance and intention to receive the HPV vaccine. While HPV education is very much necessary for young men, enhancing awareness about HPV prevention and reducing risky sex behaviors are necessary for the entire college population. There is a need to further increase the understanding of the prevalence and incidence of HPV related cancers that affect both genders. There should be efforts to increase the intentions to get vaccinated by changing attitudes toward HPV vaccination and helping men to make informed decisions.

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