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# Knowledge and Attitudes Regarding the Human Papillomavirus and HPV Vaccine Among College Students: A Gender Comparison Study

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The University of Southern Mississippi

Knowledge and Attitudes Regarding the Human Papillomavirus  
and HPV Vaccine Among College Students: A Gender Comparison Study

by

Kristen L. O'Flarity

A Thesis

Submitted to the Honors College of The University of Southern Mississippi in Partial  
Fulfillment of the Requirements for the Degree of Bachelor of Science in the Department  
of Community Health Sciences

May 2012



Approved by

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Charkarra Anderson-Lewis  
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David R. Davies, Dean  
Honors College



## Dedication and Acknowledgements

I would like to dedicate this project to my mother, Mary O'Flarity, who was with me every step of the way in this research process. Thank you for your endless support, patience, love, and passing along your passion for research gene!

I offer tremendous appreciation to my academic and thesis advisor, Dr. Charkarra Anderson-Lewis. Thank you for lending your precious time to help and guide me--I would be lost without you.

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Love,  
Kristen O.

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## Abstract

**Objective:** Both young men and women should obtain the human papillomavirus (HPV) vaccine in order to reach its intended public health benefits. Because men are behind in this vaccination campaign, this study compared knowledge and attitudes regarding HPV and the vaccine among college-aged men and women in order to improve vaccination strategies among this at-risk population.

**Methods:** A convenience sample of 95 university students, 40 men and 55 women, ages 18 to 26 (mean age of 20.2) completed self-administered pencil-and-paper questionnaires with approximately 40 questions that assessed the desired variables. Knowledge was measured through multiple choice and true/false questions. Attitudes were measured by Likert scale responses following theoretical framework. Data were analyzed and summarized through descriptive statistics using SPSS software.

**Results:** Awareness of the HPV vaccine's availability for men was significantly low for both genders, particularly for men. Health practitioners' and parents' approval both play a pivotal role in considering the vaccine. For men, peers' approval was also important in this decision-making process. Overall, females showed higher rates of awareness in HPV and the vaccine and indicated more positive social norms associated with obtaining the vaccine.

**Conclusions:** According to the results of this study, the HPV vaccine is still prevalently associated with female health and therefore detracting from the male consumer. In order to increase uptake of the HPV vaccine in both genders, a gender neutral vaccine campaign that does not focus on one specific health issue is suggested.

## Chapter 1: Introduction

In 2005, Merck & Company, Inc. announced that its experimental vaccine, Gardasil, was 100% effective in preventing the sexually transmitted virus of human papillomavirus (HPV) strains 16 and 18 in women; together these strains cause about 70% of cervical cancers. The vaccine also proved to be 99% effective in preventing HPV strains 6 and 11, which together cause about 90% of genital warts (Kaiser Family Foundation, 2006). Four years later, in October 2009, the vaccine was approved for males ages 9 to 26, who can also contract genital warts and easily pass the cervical cancer-causing strains to their female sexual partners. Much research and publicity has focused on HPV's association with cervical cancer; however, HPV is also associated with a substantial proportion of anogenital and oral cancers (Schaefer, 2010). In fact, the number of HPV-related non-cervical cancers diagnosed annually in the United States approximately equals the number of cervical cancers (Gillison, Chaturvedi, & Lowy, 2008). Anal and oral cancers remain particularly serious since there are currently no effective or widely used screening procedures for these diseases (Gillison et al., 2008).

Vaccination is a significant step towards decreasing the prevalence of disease, and therefore morbidity and mortality associated with that disease. Currently, no cure exists for HPV, making efforts towards prevention for both sexes essential (Janousek, 2010; Jones & Cook, 2008). Indeed, Objective 25 of Healthy People 2020 is to decrease the number of HPV infections in the United States (U.S. Department of Health & Human Services, 2000). Moreover, by vaccinating men as well as women, society can benefit from herd immunity, where enough vaccinated people decrease exposure of the infection

to the rest of the population (Ferris, Waller & Miller, 2008). Vaccinating both sexes against the high-risk strains of HPV would also avoid putting responsibility for prevention solely on the woman (Jones & Cook, 2008). A sex-neutral vaccination program would therefore be ideal (Ferris, Waller & Miller, 2008).

In the United States, HPV is the most common sexually transmitted virus with estimates predicting that 75% of sexually active people will contract the virus at some point in their lifetime (CDC, 2009). Genital HPV's highest rate of infection is found among sexually active people ages 17 to 26—specifically, college-aged individuals, due to increased risky behavior after leaving home (Dunne et al., 2007). Furthermore, in 2010, the state of Mississippi was ranked first in sexually transmitted infections in the nation (CDC, 2011). Increased uptake of the HPV vaccine among at-risk individuals would have significant public health benefits, decreasing the morbidity and mortality associated with cervical, anal, oral, and penile cancers. Substantial savings in healthcare costs, as well as the emotional costs associated with cancer and genital warts, would also likely result (Jones & Cook, 2008).

However, despite the benefits that the HPV vaccine offers, immediate acceptance of this preventative measure is not guaranteed. Thousands of U.S. women between the ages of 9 and 26 have already been vaccinated against HPV; yet, men are far behind in the HPV vaccine campaign (Reiter, Brewer, & Smith, 2010). Due to the relatively new approval for vaccination in men, the public health field knows relatively little about males' ideas concerning a vaccine that has been predominately female-focused. The information that this proposed research will gather can play a valuable role in improving interventions to reach men more effectively in order to increase vaccination rates. Thus,

this study will address the research question, “What are the knowledge and attitudes of college males, as compared to college females, regarding HPV and the HPV vaccine?”

## Chapter 2: Literature Review

### OVERVIEW

Due to the relatively new release of the human papillomavirus vaccine, few studies have been done regarding knowledge and attitudes regarding the human papillomavirus and its vaccine. Fewer of these studies have utilized theoretical framework to support the research. Most studies have been conducted on knowledge pertaining to only the HPV virus since the early 2000s; measured knowledge about the HPV vaccine is scarce. The vast majority of these studies have been done among females of various ages. The few studies assessing males have only been performed prior to vaccine allowance for men.

### THEORETICAL FRAMEWORK

Theoretical-based models are an integral part of predicting health behavior, and therefore a useful tool in investigating HPV vaccine acceptability among men. The health belief model (HBM) is the primary model used in vaccination behavior literature. Particular constructs of the model—perceived susceptibility, perceived severity, perceived effectiveness of the vaccine, barriers, and cues to action—have been found to significantly predict influenza vaccination behavior (Schaefer, 2010). The literature suggests that the HBM is also a useful model for HPV vaccine acceptability.

According to the health belief model (HBM), a person's intention to perform a given preventative behavior is influenced by one's knowledge of a disease threat and one's attitudes regarding that disease (Rosenstock, 1974). Three relevant studies have used the health belief model as a construct of their research regarding HPV vaccine

behavior. Holguin (2009) investigates the knowledge and attitudes of young women regarding the HPV vaccine and cervical cancer. While Holguin's study relates closely to the proposed research, she suggests that future research should consider using a combination of models or frameworks. She affirms that behavioral outcomes are usually complementary with considerable overlap. Another study by Gerend & Barley (2009) also utilizes the HBM to assess acceptability of the HPV vaccine among men ages 18 to 45. Both Holguin (2009) and Gerend & Barley (2009) use only four of the six constructs of the HBM to identify attitudes for their respective studies: perceived susceptibility, perceived severity, perceived barriers, and perceived benefits. The most recent study to date by Schaefer (2010) thoroughly investigates HPV vaccine acceptability among college-aged women utilizing the HBM, focusing on vaccinated versus non-vaccinated women's attitudes concerning HPV and the HPV vaccine. Schaefer (2010) includes all six constructs of the HBM to classify attitudes for her study: perceived susceptibility of HPV, perceived severity of HPV, perceived barriers to receiving the vaccine, perceived benefits of the vaccine, self-efficacy to actively get the vaccine, and cues to action to receive the vaccine. Including all six constructs in the research came to be particularly important because self-efficacy and cues to action accounted for unique variance in differentiating vaccinated from unvaccinated women.

Holguin's (2009) suggestion to integrate other models besides HBM relates to Janousek's (2010) study, which integrates social learning theory (SLT) and theory of planned behavior (TPB). According to the research of Janousek (2010), concepts from SLT and TBP best explain the attitudes, beliefs, and HPV vaccine knowledge of college women. Janousek defines attitudes using the concepts of the TPB: behavioral beliefs,

normative beliefs, and control beliefs. The integration of both SLT and TBP models suggests that knowledge about HPV, attitudes about the vaccine, risk behaviors, and prior experiences are associated with HPV vaccine acceptability. Schaefer (2009) also acknowledges theory overlap in her study, particularly with the theory of planned behavior. In accordance with the TPB construct of subjective norm, Schaefer (2009) found that college-age women who believed their parents, doctors, friends, and partners would approve of HPV vaccination were more likely to accept the vaccine. In addition, it was the strongest predictor of HPV vaccine intentions, “above and beyond” the HBM constructs.

Each of these studies concluded that having a clearer understanding of the knowledge and attitudes of the participants in their respective studies would greatly enhance intervention methods for increasing interest and uptake of the HPV vaccine. The existing literature indicates the need for more research among college-aged men using all six constructs of the HBM, in addition to other theoretical constructs in order to more accurately obtain an understanding of HPV vaccine attitudes.

## HPV KNOWLEDGE

Studies have shown that both young women and men lack knowledge of sexually transmitted infections including HPV. The majority of these studies have assessed only women due to their susceptibility to cervical cancer. For instance, Baer, Allen, and Braun (2000) found that only 35.3% of young adult women have heard of HPV infection, similar to the findings of another study where 36% of the participants that had heard of HPV (Fazekas, Brewer, & Smith, 2008.) Additionally, Holcomb, Motino, Crawford, &

Ruffin, reported that only 39% of the participants, 85% of whom were women, knew that HPV caused cervical cancer (2004). A study of 15 to 20 year old adolescents, half women, half men, showed that 87% of the participants had never heard of HPV (Dell, Chen, Ahmad, & Stewart, 2000). A surprising study done among male and female first-year physician assistant students demonstrated a relatively low level of HPV and cervical cancer knowledge (Lambert, 2001). Other studies showed high awareness of genital warts, such as in Baer's et al. (2000) study where 95.5% women were aware, but only 11.6% of those women knew that genital warts were caused by HPV. These results are somewhat similar to another study of both males and females that found only 88% of college and adult participants had heard of genital warts and only 33.8% knew that HPV caused genital warts (Holcomb et al., 2004).

In research conducted post-licensing of the HPV vaccine, overall HPV knowledge has still remained low (Fazekas, Brewer, & Smith, 2008). Gerend & Magloire (2008) found that HPV knowledge has increased since the vaccine has been on the market, though most of the female participants still did not believe they were at risk for HPV. Results were similar for a study on men only, which was still done before the vaccine was available to them (Reiter, Brewer, & Smith, 2010).

Various studies have demonstrated that knowledge and awareness about HPV is associated with vaccine acceptability (Ferris, Waller & Miller, 2008; Gerend & Barley, 2009; Lenselink, Schmeink & Melchers, 2008). In a study by Jones & Cook, intent to receive the vaccine was significantly greater among those answering two or three HPV knowledge questions correctly compared to those getting none or only one question correct (2008). Their conclusions regarding this study observe that knowledge about HPV

varies by gender and certainly affects interest in the vaccine. Although knowledge is not a direct predictor of health behavior in regards to the HBM, Tiro et al. (2007) consider it to be an underlying factor. Other researchers have reached this conclusion (Viswanath, 2006; Waller, McCaffery, & Wardle, 2004). Therefore, measuring knowledge about HPV is an important step towards increasing uptake in the HPV vaccine.

## HPV VACCINE KNOWLEDGE

While the above studies have surveyed knowledge regarding HPV, fewer studies have assessed knowledge about the vaccine itself. In a pilot study performed by Moraros et al. (2006), women on the U.S.-Mexico border were asked if they were aware of the vaccine in addition to its benefits and disadvantages. While 86% of the women had not heard of the vaccine, 63% could name some benefits of being vaccinated against HPV. Only 8% said the vaccine would truly protect them against the virus.

A study published in 2009 by Caskey, Lindau & Alexander compared vaccine knowledge scores of women in relation to vaccination status. Respondents who had received at least one HPV vaccine injection were more likely (84% versus 51%) to accurately answer that the HPV vaccine protects against cervical cancer and that condoms are still required despite vaccination. The study concluded that few young women have the false beliefs that the HPV vaccine will protect them against sexually transmitted infections other than HPV. A similar study by Schaefer (2010) did indeed assess specific HPV vaccine questions along with basic HPV questions, yet classified this entire assessment as “HPV knowledge.” She found that vaccinated women had significantly higher levels of HPV knowledge than unvaccinated women.

Barnack, Reddy, Perifanos, & Nichol (2008) investigated knowledge regarding the HPV vaccine among Texas adults. They found that 77.0% of women had heard of the vaccine compared to 62.4% of men. Specific knowledge questions regarding the vaccine were not assessed. The above studies demonstrate that further measurement of HPV vaccine awareness needs to be assessed in order to appropriately address vaccine campaign needs and public health interventions.

#### ATTITUDES & VACCINE ACCEPTABILITY

Despite the high prevalence of HPV and risky sexual behavior among college students, limited research has specifically examined vaccine acceptance in this high-risk group since the licensure of the vaccine. The following studies found on vaccine acceptability were rendered either before the HPV vaccine was released prior to 2006 or after the vaccine was made available for women only. These studies utilize a hypothetical vaccine scenario in their assessments, which certainly suggest the need for updated research regarding the current HPV vaccine.

A few studies have evaluated acceptability of a vaccine depending on how the purpose of the vaccine is marketed. Acceptability of a hypothetical HPV vaccine that protects against both cervical cancer and genital warts was high in studies conducted among college students ranging from 74%–78% (Boehner, Howe, & Bernstein, 2003; Jones & Cook, 2008). Males tended to prefer a vaccine that protected against more types of HPV and that provided direct protection for males. For instance, only 34% of college males would accept a vaccine that protected against cervical cancer alone, whereas 78% would accept a vaccine that protected against both cervical cancer and genital warts

(Jones & Cook, 2008). In contrast, when presented with benefits of partner protection in addition to self-protection, acceptability did not increase “over and above” in a study done by Gerend & Barley (2009). One study evaluated both male and female participants before the HPV vaccine was on the market. The results concluded that there was no difference in acceptability between the sexes (Boehner, Howe, & Bernstein, 2003). Liddon et al. (2010) suggests in their review of the literature that future studies should evaluate acceptability in the context of a licensed vaccine and not hypothetical situations.

In 2008, Ferris, Waller & Miller performed a study to assess reasons for men wanting or not wanting the vaccine. The most frequently cited reasons for vaccination included the desire to stay healthy, prevention of cancer in sexual partner, prevention of anal, penile, and head and neck cancer, fear of cancer, and prevention of genital warts. The most common reasons for not wanting to receive the vaccine included being in a monogamous relationship and not at risk, not generally interested, and insufficient evidence to prove benefit of the vaccine to men. Another study that measured college males’ perceptions of HPV and cervical cancer demonstrated that men did not acknowledge HPV to be serious for themselves. Yet the men did indicate that they felt HPV infection was severe for their partners (McPartland et al., 2005).

Studies have suggested that sexual orientation of men has an effect on vaccine acceptability. In a national study done by Gilbert et al. (2010), more gay and bisexual men were willing to receive the HPV vaccine (73%) compared to 37% among heterosexual men in the study. They also had higher awareness and anticipated regret if they had decided against the vaccine. Reiter et al. (2010) studied only gay and bisexual men due to their higher rates of HPV infection and anal cancer. The study found that

interest in the HPV vaccine was significantly high. Another study recruited only heterosexual college males in their research (Gerend & Barley, 2009). The reasoning behind this criterion was that the researchers predicted that acceptability of the HPV vaccine would be higher among males with female partners. Contrary to the researchers' predictions, presenting men with the benefits of the HPV vaccine for their female partners did not increase vaccine acceptability significantly compared to presenting them with the benefits to men alone; nor did effects of this manipulation depend on whether men were currently in a committed relationship.

In the conclusion of Gerend & Barley's (2009) study, the point was presented that current HPV vaccination campaigns typically highlight the benefits of the HPV vaccine for women, as Gardasil is known as the "cervical cancer vaccine" and publicity materials always illustrate young women or girls. Currently, the effect this message has on men's interest in the HPV vaccine is uncertain. The researchers suggest that future research is needed to examine if men consider HPV infection to be a primarily female health problem. Essentially, this point also justifies the need to discover males' attitudes toward the vaccine that is now licensed for them.

## VACCINE STATUS

Although the vaccine is administered over the course of six months, this time frame does not seem to fully account for the discrepancy between those who initiate the vaccine series and those who complete it (Schaefer, 2010). A national survey inquiring vaccination status has not been conducted among college-aged men; therefore, it remains difficult to have an accurate picture of HPV vaccine uptake among this population.

Legitimate surveillance data were also not publically available.

The HPV vaccine program requires three injections over six months to render fully effective. Despite these immunization recommendations by the Advisory Committee on Immunization Practices, the college-aged cohort has thus far demonstrated low uptake of the HPV vaccine altogether (Daley et al., 2010). Two studies reported similar results that 10% (Jain et al., 2009) and 9% (Caskey, Lindau & Alexander, 2009) of women aged 18–26 years had only initiated the HPV vaccine schedule. A recent study (Schaefer, 2010) showed a promising vaccination rate among women in the Mid-Atlantic region: out of 208 participants, 150 were vaccinated, while 58 women were not. It remains unknown whether this pattern also applies to college-aged men since no studies have explored the number of men in this age group who are vaccinated.

Since the HPV vaccine has been available for men for only two years, research can explore the differences between men who have received the HPV vaccine and those who have not. Obtaining data concerning vaccine status is significant because the public health field needs to know if males are receiving the vaccine at all and their reasons why. Once these reasons are procured, they may be applied to public health messages to increase interest in the vaccine.

## CONCLUSION

After reviewing the literature, it is clear that there is a lack of information concerning males' knowledge and attitudes regarding the HPV vaccine, especially since October 2009 when the vaccine was made available to them. While research on hypothetical vaccines provides useful information about health decisions, studies

concerning the currently available HPV vaccine are more applicable to men's actual health behavior. This topic remains an important area to study since the factors that influence intention to receive a hypothetical may be different than a real vaccine.

The proposed research will contribute to the literature by obtaining knowledge and attitudes of college-aged men regarding HPV and the vaccine according to theory-based models. This contribution relates back to the research question, "What are the knowledge and attitudes of college males regarding the HPV vaccine as compared to college females?" The following chapter entails the methods required in order to answer this research question.

### Chapter 3: Methods

This chapter includes how the sample was selected, a description of the participants, and the instrumentation used to collect the data. An explanation of the data collection process and analysis is also presented.

#### RESEARCH DESIGN

The researcher performed a quantitative study using self-administered pencil-and-paper questionnaires to answer the research question, “What are the knowledge and attitudes of college males, as compared to college females, regarding HPV and the HPV vaccine?” While the focus of this study is men, women will also be given the same questionnaire to offer comparison data.

#### SAMPLE

This study utilized a convenience sample at the University of Southern Mississippi. In order to be considered for the data analysis, respondents must have been between the ages of 18 to 26, the traditional college student age range. Between three classes, completed questionnaires totaled 100, and 95 of these questionnaires fit the criteria for this research. The invalid responses were therefore not included in the analysis of this research. Participants were 42.1% male (n=40) and 57.9% female (n=55).

#### INSTRUMENT AND VARIABLES

A questionnaire, approximately 40 questions in length, assessed the desired variables in this study (See Appendix A). The instrument was derived from the study of

Schaefer (2010), whose questionnaire uses an HPV and HPV vaccine knowledge assessment tool, a comprehensive health belief model assessment, and an assessment of subjective norms from the theory of planned behavior. While this validated questionnaire was written for women only, the questions have been modified and updated to assess the current HPV vaccine available for both men and women.

### *Demographics*

The questionnaire begins by asking for the participants' age, gender, classification in college, ethnicity, race, and relationship status.

### *HPV & HPV Vaccine Awareness*

Basic HPV and HPV vaccine awareness questions were asked by participants responding with “(a) Yes, (b) No, (c) Not sure” to the following questions: “Before taking this survey, had you ever heard of HPV (human papillomavirus)?”; “Before taking this survey, had you ever heard of the HPV vaccine (Gardasil®, Cervarix®)?”; “If yes, where have you heard about the HPV vaccine?” (a. Health care provider, b. A friend, c. A family member, d. Television or radio, e. Internet, f. Newspaper or magazine, g. At school, h. Other (specify), i. I don't remember, e. Never heard of it) and “Did you know that Gardasil® is now available for men?”

### *HPV Knowledge*

Knowledge about HPV and the HPV vaccine was assessed with eleven items. There are five multiple choice questions including items such as, “Which of the following health issues are related to HPV? (Please select all that apply.), with the choices “(a) Cervical cancer, (b) Penile cancer, (c) HIV, (d) Genital warts, or (e) I don't know” There are also six true/false statements including items such as, “HPV affects only women” and

“HPV can occur without symptoms.” For scoring purposes, each possible response equaled one point. The items were summed to create total scores ranging from 0 to 17, with a score of 17 being the highest level of knowledge and 0 being the lowest.

### *Measuring Attitudes*

The following sections of the instrument assessed participants’ attitudes towards HPV and the HPV vaccine according to the constructs of the health belief model (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and cues to action). In addition, subjective norms, according to the theory of planned behavior, were assessed.

### *Perceived Susceptibility*

Six items were used to measure participants’ perceived susceptibility to HPV infection. Three items measured a participant’s perceived absolute risk of developing HPV and HPV-related diseases if not vaccinated. These items included questions such as, “What are your chances of contracting HPV if you didn’t have the HPV vaccine?” Three items are related to perceived relative risk of developing HPV and HPV-related diseases if not vaccinated. These items included questions such as, “What are your chances of contracting HPV if you didn’t have the HPV vaccine compared to other college-aged individuals?” All six items are rated on a 10% increment scale of 0-100%. The percentages will be averaged to create a final score ranging from 0-100% where low scores indicated low perceived susceptibility and high scores indicated high perceived susceptibility if not vaccinated.

### *Perceived Severity*

The perceived severity measure contained six items that assess respondents’

reactions to a potential diagnosis of HPV and concerns about potential consequences of infection. The six items included statements such as, “I would be embarrassed to let others know that I have HPV if I found out that I contracted the disease,” and “If I contracted HPV, it could harm my future health.” Participants will rate these statements on a 5-point Likert scale where 1 means “Strongly Disagree” and 5 means “Strongly Agree.” Low scores (1-2) indicate low-perceived severity and high scores (4-5) indicate high-perceived severity.

#### *Perceived Benefits*

Six items were used to measure participants’ perceived benefits of receiving the HPV vaccine. The items included statements such as, “Getting the HPV vaccine is important for my health” and “Gardasil is effective in preventing an HPV infection.” These items were rated on a 5-point scale where 1 means “Strongly Disagree” and 5 means “Strongly Agree.” Low scores (1-2) indicate low levels of perceived benefits and high scores (4-5) indicate high levels of perceived benefits of receiving the HPV vaccine.

#### *Perceived Barriers*

Perceived barriers were assessed by participants’ responses to three items about the perceived negative aspects of the vaccine. These items refer to the difficulties to receive the vaccine and include questions such as, “If other people knew I received Gardasil, I would be embarrassed,” and “In your opinion, how expensive is Gardasil? (about \$360 for all three doses).” These items are rated on a 5-point scale where 1 means “Strongly Disagree” and 5 means “Strongly Agree.” Low scores (1-2) indicate low levels of perceived barriers and high scores (4-5) indicate high levels of perceived barriers to receiving the HPV vaccine.

### *Self- Efficacy*

Self-efficacy refers to a person's belief in his ability to overcome the necessary barriers to receive the HPV vaccine. The one item asked, "How confident are you that you could get the HPV vaccine?" This question is also rated on a 5-point scale where 1 means "Not Confident" and 5 means "Very Confident".

### *Cues to Action*

Cues to action refer to triggers either internally or within the environment that could potentially influence health behavior. The items asked questions such as, "Have you ever known anyone who has had HPV?" and "Has a health care provider ever recommended that you receive the HPV vaccine?" These questions are rated on a Likert scale where "Never" is equivalent to 1 point, "1-2 times" is equivalent to 2 points, "3-4 times" is equivalent to 3 points and "5+ times" is equivalent to 4 points. The question "Have you ever known anyone who has had negative side effects from a vaccine?" is reverse coded. Low scores indicating a lower number of positive cues to action and high scores indicating a higher number of positive cues to action for receiving the HPV vaccine.

### *Subjective Norms*

Subjective norms in this study refer to an individual's perception about getting the HPV vaccine, which is influenced by the judgment of significant others. Subjective norms towards HPV vaccination were measured by six items. Five of the items included statements such as, "If they knew about the HPV vaccine, most people whose opinions I value would approve/disapprove of me getting vaccinated against HPV" and "If my friends knew about the HPV vaccine, they would approve/disapprove of me getting

vaccinated against HPV.” Answers are rated on a Likert scale ranging from 1-5 where 1 means “Strongly Disapprove” and 5 means “Strongly Approve.” Items were summed to create a total score ranging from 6 to 30 where low scores represent perceived negative feelings toward HPV vaccination by important others and high scores represented perceived positive feelings toward HPV vaccination by important others.

#### *Decision-making*

One item evaluated the decision-making aspect of HPV vaccination. Participants will be asked to rate their level of satisfaction with their decision to receive or not yet receive the vaccine on a 5-point scale, where 1 indicates “Not at all satisfied” and 5 indicates “Very satisfied.”

#### *HPV Vaccination Status*

HPV vaccination status was asked by one multiple-choice item. This item asks, “Which of the following best describes your current situation?” followed by the choices (a) Have completed the series of 3 shots for the HPV vaccine, (b) Have started, but not completed, the series of 3 shots for the HPV vaccine, (c) Have scheduled an appointment with my doctor to receive the HPV vaccine, (d) Have not received the HPV vaccine or scheduled an appointment to receive the HPV vaccine. Participants who indicate that they had not yet completed the vaccine series will be asked if they plan to finish.

#### *Other variables*

The questionnaire also assessed the independent variables sexual history and sexual orientation. Sexual history was assessed by asking 4 items (a. yes b. no c. not sure): “Have you ever had (a) vaginal sex? (b) anal sex (c) oral sex)” and “Have you ever had a sexually transmitted disease?” Sexual orientation was assessed by asking participants,

“Do you consider yourself to be one or more of the following (circle all that apply)” (a) Straight (b) Gay or lesbian (c) Bisexual (d) Transgender.

At the end of the survey, the question is posed, “After completing this survey, how interested are you in learning more about the HPV vaccine?” (a) Very interested (b) Somewhat interested (c) Not interested.

The Institutional Review Board reviewed and approved the final questionnaire and the proposed study procedure in order to proceed to the data collection portion of this study (See Appendix C).

## PROCEDURES

Upon receiving permission from the Institutional Review Board and the instructors of introductory undergraduate courses, questionnaires were distributed to three different classes. To the researcher’s understanding, these courses had a diversified population of students of various classifications, majors, and demographics that stand as an adequate representation of the university population.

The researcher was present at each questionnaire distribution and explained to each class that the questionnaires were completely anonymous and voluntary. Anyone who wished to not complete a survey was asked to leave the classroom to ensure confidentiality of the volunteers. Consent forms and questionnaires were then distributed to everyone in the class. The researcher ensured utmost confidentiality during this procedure, particularly by making sure students are spatially spread out during the data collection, as well as having questionnaires returned face down. The instrument took approximately ten to fifteen minutes to complete. The finished questionnaires were kept

in a sealed, confidential folder that was opened and viewed only by the researcher. HPV informational brochures were also handed out to all participants upon completing the survey. An incentive of extra credit was offered to the participants.

## ANALYSIS

In order to perform a comparative analysis among male and female participants regarding their knowledge and attitudes of HPV and the HPV vaccine, the collected data were analyzed using the Statistical Package for the Social Sciences, 17.0 for Windows (SPSS, Inc., Chicago IL). A t-test was performed to statistically analyze overall knowledge and attitudinal scores between genders. Pearson Chi-Square tests were performed to examine the relationship between genders regarding specific knowledge responses as well as specific attitude responses. Descriptive statistics were used to summarize the data collected.

The following chapter will present the results of this statistical analysis.

## Chapter 4: Results

This chapter reports the results of the data collection, including sample description of demographics, knowledge scores, and attitudinal scores.

### *Reporting of demographics*

The mean age of participants (N=95) was 20.2 years of age, made up of 42.1% males (n=40) and 57.9% females (n=55). The largest portion of the participants was from the freshmen class (42.1%), followed by sophomores (26.3%), juniors (23.2%), seniors (3.2%), “super-seniors” (4.2%), and a graduate student (1.1%). Out of 95 respondents, the majority were African-American (56.8%), followed by Caucasian (48.4%), Native American (3.2%), Asian (2.1%), and unknown race (2.1%). 2.1% of participants self-reported to be of Hispanic ethnicity.

<b>Demographic variable</b>	<b>Frequency (n)</b>	<b>Cumulative percent (%)</b>
Gender		
Male	40	42.1
Female	55	57.9

Age		
18	25	29.0
19	29	31.2
20	16	16.8
21	9	9.7
22	7	7.4
23	5	5.3
24	1	1.1
25	1	1.1

Classification		
Freshman	40	42.1
Sophomore	25	26.3
Junior	22	23.2
Senior	3	3.2
Super senior	4	4.2
Grad student	1	1.1

Ethnicity		
Non-Hispanic	73	76.8
Hispanic	2	2.1
Unknown	7	7.4
Did not answer	13	13.7

Race		
Native American	3	3.2
African-American	53	56.8
Asian	2	2.1
White	46	48.4
Unknown	2	2.1

Note: Some participants indicated more than one race

#### *Vaccine status*

In reporting vaccination status, 22% of the 95 participants (n=20) had completed the three-part series of the HPV vaccine; 7.4% (n=7) had partially completed it. All 27 of these respondents were females, while no male respondents indicated being vaccinated with a least one dose.

#### *Sexual experience*

Out of 95 respondents, 72.6% participants (n=69) self-reported to have had vaginal sex, 22.1% of respondents (n=21) have had anal sex, and 67.4% of respondents (n=64) have had oral sex. 11.6% of respondents (n=11) self-reported they have been diagnosed with a sexually transmitted infection in their lifetime.

### *Reporting awareness*

67% of total respondents had heard of HPV before taking the survey, 81.1% of females (n=43) and 60.0% of males (n=24). 77.4% of respondents had heard of the HPV vaccine, 70.0% of males and 83.0% of females. However, when prompted with the question, “Are you aware that Gardasil is now available for men?” only 11.8% of respondents (n=11) replied that they were aware of the availability; 3 males and 8 females. Although not shown to be statistically significant, these numbers are visually very low,  $X^2(2, N = 93) = 1.37, p > .05$ .

<b>Awareness variable</b>	<b>Male (n)</b>	<b>Female (n)</b>	<b><i>p</i></b>
Heard of HPV	60.0% (24)	81.1% (43)	>.05
Heard of HPV vaccine	70.0% (28)	83.0% (44)	>0.05
Aware vaccine is available for men	7.5% (3)	15.1% (11)	>0.05

As for information sources of the HPV vaccine, the most common were television/radio (51.6%), health care provider (50.5%), and school (34.4%). In a gender analysis, significantly more females (60.4%) had heard of the HPV vaccine through a health care provider versus males (22.5%) who had heard of the vaccine through the same source,  $X^2(1, N = 95) = 13.3, p < .01$ .

### Reporting of knowledge and attitudes

Knowledge scores could range from a total score of 0 to 17. Females’ overall scores averaged slightly higher with 54% correct (M=9.10, SD=2.81) than the scores of males at

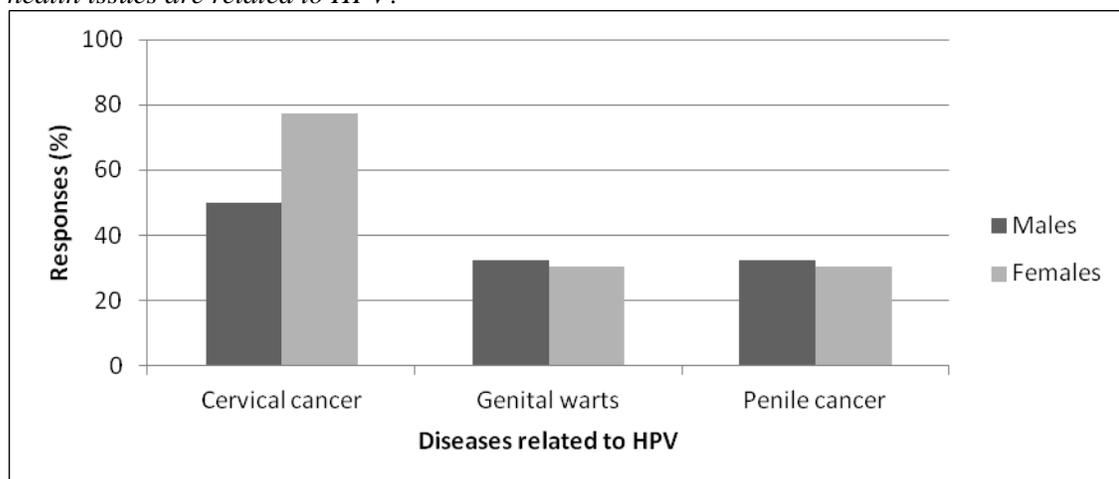
46% correct ( $M=7.93$ ,  $SD=3.21$ ), yet no significant difference was evident,  $t(91) = -1.84$ ,  $p > .05$ .

Additionally, no significant difference was found between overall attitudinal scores in comparing males and females,  $t(91)=-0.24$ ,  $p > .05$ . In fact, the scores were virtually equivalent, with males' scores averaging 3.33 ( $SD=0.32$ ) and females' scores averaging 3.33 ( $SD=0.40$ ), marginally indicating favorable attitudes towards HPV and the vaccine.

#### *Comparison of selected knowledge scores (males versus females)*

In order to determine which diseases were more associated with HPV, participants were asked which health issues are related to HPV, as well as which diseases could be potentially prevented with the HPV vaccine. In regards to the question, "The HPV vaccine (Gardasil) may prevent which of the following? (Please select all that apply)." 40.0% of males versus 79.2% of females answered cervical cancer; 37.5% of males versus 24.5% of females answered genital warts; and 15.0% of males versus 5.7% of females answered oral cancer. Results were very similar when asked about diseases related to HPV as shown below in Figure 1.

Figure 1  
*Comparison by gender and disease of correct responses to the question, "Which of the following health issues are related to HPV?"*



When presented the true/false statement, “HPV affects only women,” 89.1% of all participants correctly answered with “false.” 87.5% of men (n=35) and 88.7% of women (n=47) answered correctly showing that there is no significant difference between males and females understanding that the virus affects both sexes,  $X^2(2, N = 93) = 0.99, p > .05$ .

However, an overwhelming majority of both sexes incorrectly answered to the true/false statement, “Currently, men cannot be tested for HPV” (true). 90.0% (n=36) of men and 86.8% of women (n=46) answered incorrectly, leaving only 10.0% of men (n=4) and 11.3% of women (n=6) to answer the statement correctly.

#### Comparison between genders regarding attitudes

##### *Attitudes regarding cues to action*

Three variables were analyzed in determining triggers that could potentially influence vaccination behavior. Participants were asked their perceptions regarding gender-specific television commercial scenarios that advertise for the HPV vaccine, displayed below in Table 3.

A difference in attitudes between genders was statistically significant when prompted with the statement, “I would consider the HPV vaccine more if it were recommended to me by commercials/ads with males my age,” as 55.2% (n=31) of males indicated they agreed or strongly agreed; 21.6% of females (n=11) agreed or strongly agreed,  $X^2(4, N = 95) = 17.43, p = .002$ . However, difference in attitudes was not significant when prompted with the statement, “I would consider the HPV vaccine more if it were recommended to me by commercials/ads with females my age.” 28.2% of males (n=11) agreed or strongly agreed, while 44.2% (n=23) of females agreed or strongly

agreed, which is less than the percentage of males who would prefer to see their own gender in these commercials,  $X^2(4, N = 95) = 5.70, p > .05$ .

<b>Attitude</b>	<b>Males (n)</b>	<b>Females (n)</b>	<b><i>p</i></b>
Would consider the vaccine if commercials featured female peers	28.2% (11)	44.2% (23)	>.05
Would consider the vaccine if commercials featured male peers	55.2% (31)	21.6% (11)	=.002

#### *Attitudes regarding vaccine benefits*

Four items were analyzed to compare participants' perceived benefits of receiving the HPV vaccine, including efficacy in preventing certain cancers as well as HPV spread to partners. Results are shown below in Table 4.

A significant difference was found in attitudes regarding the HPV vaccine's effectiveness in preventing specific cancers. 40.0% of men (n=16) agreed or strongly agreed that Gardasil is effective in preventing cervical cancer, while 66.0% (n=32) of women indicated that Gardasil is effective in preventing this female disease,  $X^2(4, N = 93) = 10.51, p < .05$ . Further, no difference was found between genders regarding effectiveness of preventing penile cancer,  $X^2(4, N = 93) = 1.72 p > .05$ . Precisely similar attitudes regarding the vaccine's effectiveness in preventing oral cancer applied to both genders with, once again, no significance between the two groups,  $X^2(4, N = 92) = 1.33 p > .05$ .

In order to determine perceptions regarding benefit of the vaccine as a means to prevent spread of HPV, participants were prompted with the statement, "Gardasil is effective in preventing the spread of HPV to partners." Results were statistically

significant when compared between genders who agreed or strongly agreed,  $X^2(4, N = 92) = 10.25, p < .05$ .

<b>Attitude</b>	<b>Male (n)</b>	<b>Female (n)</b>	<b>p</b>
Effective in preventing cervical cancer	40.0% (16)	66.0% (32)	<.05
Effective in preventing penile cancer	27.5% (11)	28.3% (15)	>.05
Effective in preventing oral cancer	26.0% (10)	28.3% (15)	>.05
Effective in preventing HPV spread to partners	52.7% (29)	35% (n=14)	<.05

*Attitudes regarding HPV severity*

The majority of both genders agreed or strongly agreed that contracting HPV could harm their future health (70.0% of males and 79.2% of females) with no significant difference between the two variables,  $X^2(4, N = 93) = 0.99, p > .05$ .

*Attitudes towards vaccination behavior*

Attitudes were significantly different between genders in response to the statement, “Getting Gardasil would go against my beliefs.” 49.1% of females strongly disagreed with the statement, as compared to 25.6% of males who also strongly disagreed,  $X^2(4, N = 92) = 9.81, p < .05$ .

*Attitudes regarding subjective norms*

In order to assess the external influences of attitudes regarding HPV vaccine acceptability, the researcher gauged subjective norms derived from the theory of planned behavior shown below in Table 5. These subjective norms include embarrassment to obtain the vaccine, parental approval, doctor’s approval, acquaintance of others who have

received the vaccine, and believing the vaccine is for only females.

When prompted with the statement, “If other people knew I received Gardasil, I would be embarrassed,” difference in attitudes between genders was marginally significant,  $X^2(4, N = 95) = 8.08, p = .08$ . 37.5% of males (n=15) indicated that they would be embarrassed, while 15.4% (n=8) of females indicated the same attitude.

Perceptions of parental approval to be vaccinated were nearly equal between genders, yet relatively favorable towards vaccination. When asked if their parents would approve/disapprove of the participant getting vaccinated, 55.0% of males (n=22) believed their parents would approve or strongly approve. No difference among genders was statistically evident, as 60.0% of females (n=33) believed their parents would approve or strongly approve,  $X^2(4, N = 93) = 5.1, p > .05$ . Likewise, when asked if they believed their doctor would approve of vaccination, significance was marginal. However, the majority of males (57.5%) and females (70.9%) agreed or strongly agreed.,  $X^2(4, N = 93) = 7.93, p = .09$ .

Furthermore, a significant difference was found when comparing genders' acquaintance of at least one person who had received the HPV vaccine. Only 10% of males (n=4) admitted to knowing people who have received the HPV vaccine, while 85.0% of females (n=45) knew people who have received the vaccine,  $X^2(4, N = 93) = 31.67, p < .001$ .

No significant difference was observed between genders when prompted with the statement, “The HPV vaccine seems like a vaccine for girls only,” with nearly equivalent responses across the Likert scale from strongly agreeing to strongly disagreeing,  $X^2(4, N = 95) = 0.96, p > .05$ . 40% (n=16) of males agreed or strongly agreed, while 35.8% of

females (n=19) believed that the HPV vaccine seemed like it was for girls only. Slightly more females disagreed (41.5%; n=22) than males (32.5%; n=13).

<b>Attitude</b>	<b>Males (n)</b>	<b>Females (n)</b>	<b>p</b>
Would be embarrassed if others knew about obtaining vaccine	37.5% (15)	15.4% (8)	=.08
Parents would approve getting vaccine	55.0% (22)	60.0% (33)	>0.05
Doctor would approve getting vaccine	57.5% (23)	70.9% (39)	=0.09
Know others who have received vaccine	10% (4)	85.0% (45)	<.01
Believe the vaccine seems like a vaccine for girls only	40% (16)	35.8% (19)	>.05

#### *Attitudes regarding barriers*

In terms of expense of the vaccine, females generally felt that the price of the vaccine was more costly than males' perception of the price, (51.0% versus 30.8%), although the difference in perception was marginally different,  $X^2(4, N = 95) = 5.70, p > .05$ .

In measuring perception of pain of the vaccine, there was also a discernible difference between males and females. 34.1% of females indicated that getting the vaccine would be painful versus 15.0% of males who indicated the same belief,  $X^2(4, N = 95) = 9.93, p = .04$ .

Following this segment of the study, the next section will provide a critical discussion of these results in the context of the research question, "What are the knowledge and attitudes of college males, as compared to college females, regarding

HPV and the HPV vaccine?” Limitations to the study as well as conclusions will also be provided.

## Chapter 5: Discussion

This final section of the research provides a discussion of the results, study limitations, and final thoughts and conclusions provided by the researcher.

In the current study, 77.4% of respondents had heard of the HPV vaccine, yet when asked if they were aware that Gardasil is now available for men, only 11.8% of participants replied that they were aware of the availability: 7.5% of males and 15.1% of women. This finding certainly highlights the context of this research. Although four years have passed since the release of the vaccine for men, individuals, especially men, are still unaware of this availability. Even more, they are unaware of the importance of obtaining the vaccine.

The findings of the current study show that most participants, with no significant difference between genders, understand that HPV affects both sexes. Additionally, the majority of both genders agreed or strongly agreed that contracting HPV could harm their future health. However, most participants did not know that men cannot be tested for HPV (90% of men; 87% of females), which is alarming. Women have the opportunity to get routine testing through pap smears and therefore have more likelihood of catching incidence of HPV. Meanwhile, because men cannot be screened, likelihood increases for men to develop cancers linked to HPV. Likelihood to spread the virus also greatly increases, placing both genders at risk. The reality that men cannot be tested for HPV is another evident reason to be vaccinated. Future HPV vaccination campaigns should publicize this fact in order to create a sense of necessity for men to obtain the vaccine.

Likewise, 52.7% of females agreed while 35% of males agreed that Gardasil is effective in preventing the spread of HPV to partners. While one third is still a promising

number, more men must be aware that they are partly responsible for the spread of HPV. Therefore, their vaccination is essential for the full benefit of being vaccinated against HPV.

In many cases, there was no significant statistical difference between genders in comparing both knowledge and attitudes of HPV and the vaccine. Females' knowledge scores averaged slightly higher (54%) than the scores of males (46%), yet no significant difference was evident. Although these findings show some promise in knowledge levels, education is still critical in order to increase awareness of HPV pervasiveness and potentially serious health consequences of virus acquisition. However, knowledge is only one key to changing health behavior, as attitudes are another key to consider. In comparing averaged attitudinal scores between males and female, scores were virtually equivalent and slightly favored positive attitudes towards the vaccine. Likewise, Boehner, Howe, & Bernstein's study (2003) concluded that there was no difference in HPV vaccine acceptability among the sexes. It is important to note that this particular study assessed attitudes before any vaccine was available on the market. This study, in addition to others, had proposed the need for further research to determine acceptability for an actual, non-hypothetical vaccine. The conclusions of the current study with a real vaccine suggest consistency in previous findings.

Other findings from this study show lack of HPV awareness among both genders and more so among men. In order to determine which diseases were more associated with HPV, participants were asked which diseases could be potentially prevented with the HPV vaccine. Overall, females significantly scored higher in naming correct diseases, regardless of gender-specific diseases. Nevertheless, cervical cancer was the most

frequently named disease between both genders. Even genital warts, an infection widely infused with current HPV vaccine messaging as a preventable disease, had equally low response rates next to penile and oral cancer. Furthermore, no significant difference between genders was observed in responses to the statement, “The HPV vaccine seems like a vaccine for girls only.” 40.0% of males believed that the HPV vaccine seemed like it was for girls only, as did 35.8% of females. Thus, these findings may implicate that the HPV vaccine is inherently associated as a cervical cancer vaccine and therefore may not be a priority for men.

In order to investigate HPV vaccine messaging among genders further, participants were asked if they would consider the vaccine more if it were recommended to them by (a) males their age and (b) females their age in the media. Perceptibly, each gender showed a significant difference in attitudes in regards to their respective genders’ advertising. However, men showed slightly more interest in the HPV vaccine if advertisements featured males their age (55.2%), while only 44.2% of females showed interest with female advertisement. In further assessing cues to action through peers, male participants showed more interest in the vaccine, as compared to females, if friends had recommended it (37.5% versus 17%). Peer education, particularly for men, may be a valuable tool in disseminating vaccine information and increasing acceptability, whether through audiovisual methods or in-person methods.

These findings lead to investigating what can be done to increase vaccine acceptability among males. Assessing subjective norms provided useful findings in how other people’s attitudes towards the vaccine affect participants’ own views. Previous research has shown that physician recommendation is one of the strongest factors that

contribute to vaccine acceptability (Rosenthal, Kottenhahn, Biro, & Succop, 1995; Zimet, Mays, Winston, et al., 2000). In accordance with the current study, participants indicated they would consider obtaining the vaccine more if their healthcare provider approved of it. The current study also showed that the most common source of hearing about the HPV vaccine was from a healthcare provider. These findings point out the essential role health care providers play in educating individuals about HPV and encouraging them to receive the vaccine.

Furthermore, parents' approval also played a factor in positive vaccine attitudes. When asked if their parents had known about the HPV vaccine, half of males (50.0%) believed their parents would approve of them getting vaccinated, and 60.0% of females believed their parents would approve. As shown through these findings, both healthcare providers and parents should be incorporated into an HPV vaccine campaign. Jones & Cook's study (2008) also agreed to this conclusion, even though their results were not as significant. Moreover, specific education for these adults on encouraging youth to be vaccinated may play an influential role in increasing vaccine uptake.

Other assessed subjective norms tended to point towards the importance of creating the HPV vaccine as a social norm. For example, when prompted with the statement, "If other people knew I received Gardasil, I would be embarrassed." 37.5% of males said they would be embarrassed, while only females 15.4% indicated the same attitude. A vaccine campaign that focuses on a gender-neutral theme that seeks to normalize getting vaccinated may be a useful approach to increasing uptake. To further support this concept, only 10% of males admitted to knowing people who have received the HPV vaccine, while 85.0% of females knew people who have received the vaccine. These

statistics illustrate the current situation where females are more open to discuss vaccine uptake among fellow females than with males. An assumption can be made that males do actually know females who have received the HPV vaccine, yet this information has not been shared. Perhaps this idea suggests the need to incorporate vaccine campaign messages that encourage openness about the vaccine between genders and create a sense of gender-neutrality.

The current study also assessed attitudes concerning barriers to obtaining the HPV vaccine. Significant data results pointed to expense, which may be a variable to incorporate in future studies or consider during vaccine campaigning. Females generally felt that the price of the vaccine (about \$360 for the entire series) was pricy (51.0% versus 30.8% of males). According to the study of Jones & Cook (2008), having to pay only \$50 for the vaccine made 63.3% of participants “much less likely to accept the vaccine.” Interestingly, the actual price of the vaccine is \$360, substantially more costly than Jones & Cooks’ hypothetical vaccine price of \$50. Jones & Cook (2008), as well as Hoover, Carfioli, and Moench (2000), suggest in their studies that insurance coverage for the vaccine would significantly increase vaccine acceptance. The current study supports this conclusion. Insurance coverage or a sliding scale program should certainly be considered as part of the HPV vaccine campaign.

Although the current study is cross-sectional in nature, the survey tool certainly provided somewhat of an intervention effect in attitudes towards the vaccine. The first section of the survey asked participants if they had ever considered receiving the vaccine. 82.5% of males had never considered, while 41.5% of females had also never considered receiving the vaccine. The final part of this survey asked the question, “After taking this

survey, how interested are you to learn more about the HPV vaccine?” 83% of all respondents were either very interested or somewhat interested in learning more about the HPV vaccine. In fact, interest results virtually flipped for males: 82.5% of males were now interested in learning more about the vaccine. Interest doubled for females, with 88.1% interest in learning more at the end of the survey. These findings demonstrate how quickly attitudes can change in the course of taking a questionnaire. Increasing interest in the HPV vaccine may just be this simple. Although interest cannot directly translate into intention to receive the vaccine, this factor is certainly a start to improving vaccine awareness and uptake.

### *Limitations*

Several limitations were encountered in this study. First, the questionnaire required unvaccinated participants to report their current perceptions of the vaccine, whereas vaccinated participants were asked to retrospectively report on their thoughts when they were contemplating getting the vaccine. Since retrospective recall was involved, the amount of time that had passed since vaccination may have influenced their responses.

Limitations of this research also included utilizing a convenience sample at the University of Southern Mississippi. Because the focus of this study was the male gender, an oversampling of male participants may have been more useful. However, time and resources of the current study were limited, and therefore the natural ratio of females to males at the University of Southern Mississippi was utilized.

Only three introductory classrooms in this study were used to recruit participants, which may have limited variability of results. One of these classrooms was a health class,

and this environment may have influenced students' attitudes towards their health differently than the non-health classes surveyed. Additionally, students who decided to attend class on these days may be systematically different than those students who decided not to attend class on the survey day.

This study was also limited by the fact that the participants were enrolled in a higher education setting and therefore may not be representative of all individuals in the 18 to 26 age group. For instance, college students are likely to have greater access to health information compared to those who are not in school (Schaefer, 2009; Allen et al., 2009). This factor could affect external validity and restricts the generalizability of the results. Although the generalizability of these results may be limited in a sample of 100 college students at a single university, the findings have implications for future research as well as implications for the design and implementation of an HPV vaccine campaign.

#### *Conclusions and future recommendations for research*

To once again set the context of this study, Baer, Allen, and Braun (2000) predicted that vaccinating women only would be 68% as effective as vaccinating both genders. According to this statistic, both genders are important components in reducing the spread of HPV and health-related consequences of this pervasive virus. The current study has provided a baseline in order to develop appropriate vaccination awareness strategies.

Health education can indeed address both knowledge and attitudes regarding HPV. Extensive efforts must be made to educate young men and women about the pervasiveness of HPV and advantages of vaccination. Therefore, if both men and women believe they are at risk for becoming infected with HPV, and perceive HPV infection as

severe, they may be more likely to receive a vaccine that prevents HPV (Schaefer, 2009). These conclusions highlight the key responsibility of finding innovative ways to educate young men and women. While women may always be the main focus of HPV vaccination campaigns, informing them about the importance of men being vaccinated could be an indirect strategy to having males vaccinated. Communicating to women to encourage their significant others, brothers, or male friends to get vaccinated could make a difference in increasing vaccine uptake among males at risk.

While Jones & Cook (2008) created a gateway into the current study, these new findings have shifted their previous conclusion that promotional campaigns need to be gender specific to increase uptake. Conversely, the researcher of the current study believes that a vaccine campaign should focus on gender neutrality and social acceptance of vaccine uptake between both genders. Since Jones & Cook's 2008 study, the market has long-emphasized the HPV vaccine as the "cervical cancer vaccine," which has most likely contributed to lack of vaccine uptake among males. Even the current HPV vaccine campaign's emphasis to prevent genital warts has been downplayed according to the awareness levels indicated in the current study. The current campaign has been too gender specific and may have created problems in reaching out to the male gender as a result. Nevertheless, the current study has confidence that increasing vaccine uptake among males is not too late, as long as gender neutrality is considered. HPV affects both genders, whether with cervical, penile, oral, anal cancer, or genital warts. Ferris, Waller & Miller's study reached the same conclusion in 2008 that a sex-neutral campaign would be the best approach once the vaccine was released for men. Both genders play a role in HPV's spread and acquisition, yet both genders together can also play a momentous role

in HPV's prevention.

This area of research is open to a variety of study designs in order to gather more insight into males' attitudes regarding HPV susceptibility and the HPV vaccine. Future research should consider an all-male study that analyzes correlations between certain variables and intentions to receive the vaccine. A larger sample would be more useful, especially capturing male participants who have been vaccinated. A comparison study of vaccinated versus non-vaccinated participants would be advantageous to further determine HPV vaccination campaign needs. A study of qualitative nature may help determine *why* males are choosing to be or not be vaccinated. Also, attitudes towards specific vaccine campaign concepts should be assessed in future studies. A series of follow-up studies would be valuable in order to track changes in knowledge and attitudes over time and ideally HPV vaccination status accordingly.

This study has helped contribute to the existing research by providing male comparison data of knowledge and attitudes regarding HPV and the HPV vaccine. Although the nature of the sample and size were limited, this study has indeed provided some insight into how men and women differ, as well as agree, in their attitudes towards a potentially dangerous sexually transmitted infection and a means of protecting them from this infection. With these findings, future research can continue to find innovative ways to hinder the spread of the virus, including increasing uptake of the preventative HPV vaccine.

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## APPENDIX A: SAMPLE QUESTIONNAIRE

Please read before continuing:

**Introduction/Purpose:** Honors student Kristen O'Flarity is conducting a research study to find out more about college students' beliefs regarding the new vaccine predicted to prevent certain strains of Human Papillomavirus (HPV), which may lead to certain cancers and genital warts. USM students who are between the ages of 18-26 will be asked to participate because they fall into the target population of individuals recommended to get this vaccine. Approximately 100 participants will be involved in this study.

**Procedures:** If you agree to participate in this research, you will be asked to complete an anonymous survey, which may take approximately 10 to 15 minutes to complete. Please do not put your name or any identifiable information on this survey. When you have completed the survey, please return it to the research coordinator.

**Risks:** There is minimal risk in participating in this study. Some questions will ask you about your sexual history and may provoke emotional discomfort. However, if you have concerns you may ask questions to your physician or contact Student Counseling Services at 601.266.4829.

**Benefits:** Participation in this research may not have a direct benefit to you at this time; however, the researchers may be able to collect information which may assist health professionals to better understand students' attitudes towards their health and possibly determine their intentions to get vaccinated against HPV.

**Voluntary Nature of Participation and Right to Withdraw without Consequence:** Participation in this study is entirely voluntary. You may withdraw at anytime without consequence.

**Confidentiality:** No personal identifiable information is being asked. The survey is completely anonymous and no one will know how you answered the questions. This cover letter will hide any information you provide when it is returned to the researcher.

**IRB Approval Statement:** **This project has been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board at 601-266-6820. Participation in this project is completely voluntary, and participants may withdraw from this study at any time without penalty, prejudice, or loss of benefits.**

If you have any other questions or concerns, please feel free to contact the conductor of this research project, Kristen O'Flarity, at [kristen.oflarity@eagles.usm.edu](mailto:kristen.oflarity@eagles.usm.edu) or call 504.352.4986.

**NOTE:** You must be at least 18 to complete this survey.

Thank you for taking the time to take this survey! Your honest answers are very important! ☺

Current Age: \_\_\_\_\_ (years)

Please circle your response:

Gender: a) Male b) Female

Current year in College: (1) Freshman (2) Sophomore (3) Junior (4) Senior 5) Super Senior (6) Grad Student

Ethnicity: (1) Non-Hispanic (2) Hispanic or Latino (3) Unknown or prefer not to answer

Race (please circle all that apply):

(1) American Indian or Alaska Native

(4) Asian

(2) Native American or Other Pacific Islander

(5) White

(3) Black or African American

(6) Unknown or prefer not to answer

Current relationship status:

a.) Single b.) Non-exclusive relationship c.) Committed/exclusive relationship d.) Other

Before taking this survey, had you ever heard of HPV (human papillomavirus)?

a. Yes b. No c. Not sure

Before taking this survey, had you ever heard of the HPV vaccine (Gardasil®, Cervarix®) ?

a. Yes b. No c. Not sure

If yes, where have you heard about the HPV vaccine? (Circle all that apply.)

- a. Health care provider
- b. A friend
- c. A family member
- d. Television or radio
- e. Internet
- f. Newspaper or magazine
- g. At school
- h. Other (specify):

Did you know that Gardasil® is now available for men?

a. Yes b. No c. Not sure

Have you ever considered receiving the HPV vaccine?

a. Yes b. No c. Already received it

Which of the following best describes your current situation?

- a. Have completed the series of 3 shots for the HPV vaccine.
- b. Have started, but not completed, the series of 3 shots for the HPV vaccine.
- c. Have scheduled an appointment with my doctor to receive the HPV vaccine.
- d. Have not received the HPV vaccine or scheduled an appointment to receive the HPV vaccine.

If you have received only one or two of the HPV vaccine shots, do you plan to complete the vaccine series?

a. Yes b. No c. Not sure d. N/A

Directions: Please answer the following questions about the human papillomavirus (HPV) and the HPV vaccine (Gardasil) to the best of your knowledge. Circle your answer clearly.

Which of the following health issues are related to HPV? (Please select all that apply.)

- a. Cervical cancer
- b. HIV
- c. Penile cancer
- d. Genital warts
- e. I don't know

How do you think HPV is transmitted or spread?

- a. Coughing or sneezing
- b. Genital skin-to-skin contact
- c. Contact with bodily fluids (blood)
- d. I don't know

How can HPV infection be prevented? (Please select all that apply.)

- a. By practicing abstinence
- b. By taking antibiotics
- c. By using condoms
- d. By being vaccinated
- e. I don't know

The HPV vaccine (Gardasil) may prevent which of the following? (Please select all that apply.)

- a. Genital warts
- b. Cervical cancer
- c. Herpes
- d. Oral cancer
- e. I don't know

What is the main side effect associated with the HPV vaccine (Gardasil)?

- a. Vomiting
- b. Soreness at the site where the shot is given
- c. Headache
- d. Joint pain
- e. I don't know

Please circle True or False in order to answer the following statements:

HPV affects only women.	True	False
HPV can occur without symptoms.	True	False
HPV is one of the most common sexually transmitted infections in the United States.	True	False
Currently, men cannot be tested for HPV.	True	False
The HPV vaccine is only for people who are sexually active.	True	False
The HPV vaccine protects against only genital warts in men.	True	False

Please circle the appropriate number next to each statement regarding your thoughts about HPV and the HPV vaccine (Gardasil).

(1 = Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree)

\*\*If you have already received the HPV vaccine, please think back to when you were contemplating getting the vaccine and answer the questions according to your thoughts and perceptions at that time.

\*\*If you have not received the HPV vaccine, please answer the questions according to your current thoughts and perceptions. Please answer these questions regardless of whether or not you are currently sexually active.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I would be embarrassed to let others know that I have HPV if I found out that I contracted the disease.	(1)	(2)	(3)	(4)	(5)
Gardasil is effective in preventing an HPV infection.	(1)	(2)	(3)	(4)	(5)
I would consider the HPV vaccine more if it were recommended to be by commercials/ads with males my age:	(1)	(2)	(3)	(4)	(5)
I would consider the HPV vaccine more if it were recommended to be by commercials/ads with females my age:	(1)	(2)	(3)	(4)	(5)
It would be difficult for me to ask for the HPV vaccine because it's associated with an STD.	(1)	(2)	(3)	(4)	(5)
The HPV vaccine seems like a vaccine for girls only.	(1)	(2)	(3)	(4)	(5)
Gardasil is effective in preventing genital warts.	(1)	(2)	(3)	(4)	(5)
In your opinion, how expensive is Gardasil? (~\$360 for the entire series)	(1)	(2)	(3)	(4)	(5)
If I contracted HPV, it could hinder my present relationship.	(1)	(2)	(3)	(4)	(5)
Having to get multiple doses of Gardasil is time consuming.	(1)	(2)	(3)	(4)	(5)
Gardasil is effective in preventing cervical cancer.	(1)	(2)	(3)	(4)	(5)

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Gardasil is effective in preventing some types of penile cancer.	(1)	(2)	(3)	(4)	(5)
Gardasil is effective in preventing oral cancer.	(1)	(2)	(3)	(4)	(5)
Getting Gardasil would go against my beliefs.	(1)	(2)	(3)	(4)	(5)
If other people knew I received Gardasil, I would be embarrassed.	(1)	(2)	(3)	(4)	(5)
If I contracted HPV, it could harm my future health.	(1)	(2)	(3)	(4)	(5)
One of the benefits to getting Gardasil is peace of mind about my health.	(1)	(2)	(3)	(4)	(5)
In your opinion, how likely is it that Gardasil causes significant side effects?	(1)	(2)	(3)	(4)	(5)
Gardasil is effective in preventing the spread of HPV to partners.	(1)	(2)	(3)	(4)	(5)
Getting Gardasil is important for my health.	(1)	(2)	(3)	(4)	(5)
If I found out I had contracted HPV, I would be devastated.	(1)	(2)	(3)	(4)	(5)
Getting Gardasil is painful.	(1)	(2)	(3)	(4)	(5)
I would worry about what my partner or future partners would think if I got Gardasil.	(1)	(2)	(3)	(4)	(5)

In the following section, please circle the number in the appropriate box indicating how many people you know according to the following:

	Never	1 – 2 people	3 – 4 people	5+ people
Have you ever known anyone who has had negative side effects from a vaccine?	(1)	(2)	(3)	(4)
Have you ever known anyone who has received the HPV vaccine (Gardasil)?	(1)	(2)	(3)	(4)
Have you ever known anyone who has had HPV?	(1)	(2)	(3)	(4)

In the following section, please circle the number in the appropriate box indicating how you think the following people would respond:

	Strongly Disapprove	Disapprove	Neutral	Approve	Strongly Approve
If my friends knew about the HPV vaccine, they would approve/disapprove of me getting vaccinated against HPV.	(1)	(2)	(3)	(4)	(5)
If my parents knew about the HPV vaccine, they would approve/disapprove of me getting vaccinated against HPV.	(1)	(2)	(3)	(4)	(5)
If my partner knew about the HPV vaccine, he/she would approve/disapprove of me getting vaccinated against HPV.	(1)	(2)	(3)	(4)	(5)
If my doctor knew about the HPV vaccine, he/she would approve/disapprove of me getting vaccinated against HPV.	(1)	(2)	(3)	(4)	(5)
If they knew about the HPV vaccine, most people who are important to me would get themselves vaccinated against HPV if they were at risk.	(1)	(2)	(3)	(4)	(5)

For the following questions, please circle your best-estimated percentage:

What do you think are your chances of contracting HPV if you didn't get the HPV vaccine?

a. 0%	b. 10%	c. 20%	d. 30%	e. 40%	f. 50%	g. 60%	h. 70%	i. 80%	j.90%	k.100%
-------	--------	--------	--------	--------	--------	--------	--------	--------	-------	--------

What do you think are your chances of contracting genital warts if you didn't get the HPV vaccine?

a. 0%	b. 10%	c. 20%	d. 30%	e. 40%	f. 50%	g. 60%	h. 70%	i. 80%	j.90%	k.100%
-------	--------	--------	--------	--------	--------	--------	--------	--------	-------	--------

Females only: What do you think are your chances of developing cervical cancer if you didn't get Gardasil?

a. 0%	b. 10%	c. 20%	d. 30%	e. 40%	f. 50%	g. 60%	h. 70%	i. 80%	j.90%	k.100%
-------	--------	--------	--------	--------	--------	--------	--------	--------	-------	--------

Males only: What do you think are your chances of developing penile or anal cancer if you didn't get Gardasil?

a. 0%	b. 10%	c. 20%	d. 30%	e. 40%	f. 50%	g. 60%	h. 70%	i. 80%	j.90%	k.100%
-------	--------	--------	--------	--------	--------	--------	--------	--------	-------	--------

How likely is it that the benefits of Gardasil outweigh the potential side effects? Select the number that best describes your thoughts.

Unlikely                      1                      2                      3                      4                      5                      Likely

How confident are you that you could get Gardasil? Select the number that best describes your level of confidence in getting the vaccine.

Not Confident                      1                      2                      3                      4                      5                      Very Confident

If you HAVE received the HPV vaccine: Select the number that best describes your level of satisfaction with your decision to get vaccinated.

How satisfied are you with your decision to receive the HPV vaccine?

Not at all Satisfied                      1                      2                      3                      4                      5                      Very Satisfied

If you have NOT received the HPV vaccine: Select the number that best describes your level of satisfaction with your decision to not yet get vaccinated.

How satisfied are you with your decision to not yet receive the HPV vaccine?

Not at all Satisfied                      1                      2                      3                      4                      5                      Very Satisfied

Remember that the following information is 100% anonymous and confidential:

Have you ever had:

- a.) vaginal sex (1) Yes(2) No
- b.) anal sex (1) Yes(2) No
- c.) oral sex? (1) Yes(2) No

Do you consider yourself to be one or more of the following (circle all that apply):

- (1)Straight
- (2)Gay or lesbian
- (3)Bisexual
- (4)Transgender

Have you ever had a sexually transmitted infection (Chlamydia, Trichomonas (trich), Gonorrhea, Pubic lice/"crabs", Genital herpes, Syphilis, genital warts, Human papillomavirus (HPV))?

- (1) Yes(2) No

After completing this survey, how interested are you in learning more about the HPV vaccine?

- (1) Very interested
- (2) Somewhat interested
- (3) Not interested

That's it – Thank you for your time! We really appreciate it.  
Please return this completed survey to the research coordinator.

APPENDIX B:

LETTER OF APPROVAL FROM THE HONORS COLLEGE  
AT THE UNIVERSITY OF SOUTHERN MISSISSIPPI

July 8, 2011

Kristen O'Flarity  
kristen.oflarity@eagles.usm.edu

Dear Kristen:

Your prospectus, "Knowledge and Attitudes Regarding Human Papillomavirus and HPV Vaccine Among College Males," has been approved. If the topic or the nature of your research changes, you should prepare and submit a revised prospectus that accurately describes the project.

In addition, when preparing the thesis, please adhere to the guidelines that are posted on the Honors College website at [www.usm.edu/honors](http://www.usm.edu/honors). And be sure to check the Thesis Timeline link on the website to ensure that you meet prescribed thesis and graduation deadlines.

Sincerely,

A handwritten signature in black ink that reads "Paula Mathis". The signature is written in a cursive style with a large, looped initial 'P'.

Paula Mathis  
Coordinator of Senior Honors

cc: Charkarra Trisc Anderson-Lewis  
[chakarra.andersonlewis@usm.edu](mailto:chakarra.andersonlewis@usm.edu)

APPENDIX C:

NOTICE OF COMMITTEE ACTION  
FROM THE INSTITUTIONAL REVIEW BOARD



THE UNIVERSITY OF  
**SOUTHERN MISSISSIPPI**

INSTITUTIONAL REVIEW BOARD  
118 College Drive #5147 | Hattiesburg, MS 39406-0001  
Phone: 601.266.6820 | Fax: 601.266.4377 | www.usm.edu/irb

**NOTICE OF COMMITTEE ACTION**

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: **11092902**  
PROJECT TITLE: **Knowledge and Attitudes Regarding Human Papillomavirus and HPV Vaccine Among College Males**  
PROJECT TYPE: **Honors College Thesis**  
RESEARCHER/S: **Kristen O'Flarity**  
COLLEGE/DIVISION: **College of Health**  
DEPARTMENT: **Community Health Sciences**  
FUNDING AGENCY: **N/A**  
IRB COMMITTEE ACTION: **Exempt Approval**  
PERIOD OF PROJECT APPROVAL: **10/04/2011 to 10/03/2012**

  
\_\_\_\_\_  
Lawrence A. Hosman, Ph.D.  
Institutional Review Board

10-4-2011  
\_\_\_\_\_  
DATE