

Acceptance of the Human Papillomavirus Vaccine among College-Age Adults: Survey Research

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### **Abstract**

Every year in the United States, 6.2 million new cases of Human Papillomavirus, a sexually transmitted infection, are diagnosed making HPV the most common sexually transmitted infection in the U.S. (Centers for Disease Control and Prevention [CDC], 2008). HPV infection is also the most common cause of cervical cancer (National Cancer Institute [NCI], 2010). Gardasil and Cervarix are two FDA approved vaccines that prevent the most common types of HPV and recommended administration is for females and males between the ages of 9-26. Data suggests that college-age adults are at considerable risk for infection with HPV; however research shows that knowledge and acceptance of the HPV vaccine remain relatively low among this group. The Receptiveness to HPV Vaccine (RHPVV) Survey examines acceptance of the HPV vaccine among college-age adults at a small university. A random sample of 500 on-campus students were e-mailed a survey for electronic response, 13.4 % (n=67) surveys were completed. Results show that lack of insurance, low levels of knowledge regarding HPV vaccination, and a low perceived risk for infection among college-age adults may be the leading barriers to choosing vaccination. This information may be used by healthcare providers to guide education about vaccination to increase acceptance.

## **Introduction**

### **Purpose of the Study**

The purpose of this study was to identify whether or not college students accept the HPV vaccine and why or why not. The goal of this study was to discover what attitudes and beliefs college-age adults have about HPV vaccination that may influence their receptiveness to the vaccine. The Receptiveness to HPV Vaccine (RHPVV) Survey asked college students to identify areas of influence for recommending the HPV vaccine.

### **Significance of the Study**

Vaccination against HPV has the potential to greatly reduce the numbers of those infected with the virus and also the cases of cervical cancer. Several sources suggest that acceptance of the vaccine has many barriers and healthcare providers' knowledge of those barriers can provide them with focused educational and support efforts to promote vaccination. Targeting the population of college-age adults concerning acceptance of the vaccine can prove especially important considering the high rates of infection and at risk behaviors among this age group.

## **Literature Review**

The National Cancer Institute states, "Infection of the cervix with Human Papillomavirus (HPV) is the most common cause of cervical cancer" (NCI, 2010, para. 5). Additionally, the Centers for Disease Control and Prevention (CDC, 2008) cites HPV as, "the most common sexually transmitted infection in the United States, with 6.2 million people being newly infected every year," (para. 1). In June, 2006, the Food and Drug Administration approved the first vaccine to protect against the most common types of HPV which has the potential to drastically reduce the cases of HPV and subsequently cervical cancer as well.

### **Human Papillomavirus**

Human Papillomavirus is a sexually transmitted infection that can infect the body; the areas of contact are generally the genital area, mouth, or throat. The disease may go unnoticed with no clinical symptoms, but other times the virus can cause visible papillomas, also known as warts (American Cancer Society [ACS], 2010). HPV is cited as being the most common sexually transmitted infection in the United States, it is estimated that, "at least 50% of sexually active men and women get it [HPV] at some point in their lives" (CDC, 2009, para. 15). Other estimates are as high as a 75% lifetime risk for infection (ACS, 2009).

More than 90% of new cases of HPV infections clear within 2 years, with clearance usually occurring in the first 6 months (CDC, 2008). It is those cases that do not clear after extended periods, which are the most harmful and are associated with the highest risk for cancer. In regard to treatment for HPV, the CDC states that, "HPV infections are not treated; instead treatment is directed at the HPV-associated conditions" (CDC, 2008, para. 9). For those with visible anogenital warts, a course of wart removal therapy may be done. Recurrence of warts is common.

### **HPV and Cancer**

The CDC states, "More than 100 HPV types have been identified, over 40 of which can infect the genital area," (CDC, 2008, para.1). Also, the CDC states, "High-risk HPV (HR-HPV) types are detected in 99% of cervical cancers; approximately 70% of cervical cancers worldwide are due to types 16 and 18," (CDC, 2008, para. 2). The classification of types of HPV is based on cancer-causing potential or risk. Low-risk types include HPV 6 or 11 which mostly contribute to anogenital warts, high-risk types are known to cause cancers and include types 16 and 18 (CDC, 2008). In 2003, the CDC estimated that there were 11,820 new cases of cervical



cancer attributable to high-risk type HPV infection of the cervix (CDC, 2008). Among cervical cancer, HPV can also cause cancer of the anus, vulva/vagina, penis, and mouth/pharyngeal area (CDC, 2008).

HPV causes cell changes in the areas infected which can then develop into cancer if present for prolonged periods of time. As the CDC states, "Persistent HPV infection can result in precancerous cervical lesions as well as invasive cervical cancer," (CDC, 2008, para.11). These changes are often identified during routine Papanicolaou tests, also known as a Pap smear. Abnormal Pap tests results are categorized by increasing grade of abnormality in squamous cells of the cervix. If abnormal Pap test results are discovered, further testing is done through colposcopic examination of the tissue to determine the exact type of carcinoma and to determine the appropriate treatments (CDC, 2008).

Treatment of cervical cancer follows that of most other cancers. The three main treatments include surgery, radiation therapy, and chemotherapy. Depending on the stage and course of the cancer, a combination of treatments may be used (General Treatment Information, ACS, 2010). The earlier cervical abnormalities and cancer are detected, the better the prognosis, however, even with treatment cervical cancer can result in death. According to statistics from the CDC, in 2007, 4,021 of the 12,280 women diagnosed with cervical cancer in the United States died from their condition (CDC, 2007). These grim statistics point to the need for some sort of prevention from future cases.

### **HPV Vaccines**

In 2006, the Food and Drug Administration (FDA) approved Gardasil®, the first vaccine to protect against the most common types of HPV. Clinical trials of the vaccine in more than 21,000 women showed 90% to 100% effectiveness in prevention of anogenital warts caused by

HPV (Slade et al., 2009). Gardasil, Human Papillomavirus Quadrivalent Vaccine, Recombinant, has been found to be effective in preventing HPV types 6, 11, 16, and 18 which are the most common types identified in cervical cancer cases. Additionally in 2009, Cervarix ® was also approved to protect against HPV types 16 and 18, which are two high risk types of HPV. Also, in 2009, Gardasil was approved for use in males, adding to the scope of protection against this virus and against cervical cancer (U.S. Food and Drug Administration, 2009).

The Advisory Committee on Immunization Practices (ACIP) of the CDC recommends, “routine vaccination of females aged 11 or 12 years with 3 doses of either Cervarix or Gardasil,” and vaccination can be started as early as age 9 (CDC, 2010, p. 628). For those who were not vaccinated between the ages of 11 to 12 and who have not previously completed the three shot series, vaccination is recommended between the ages of 13 to 26 years (CDC, 2010). Similarly, for males, vaccination may be done between the ages of 9-26. These recommendations are based on vaccination before the age of first sexual activity and before possible exposure to HPV.

### **Vaccine Safety**

Slade et al. (2009) completed a study analyzing the safety of the HPV vaccine, Gardasil. This study analyzed reports from the Vaccine Adverse Events Reporting System (VAERS) related to adverse events reported in relation to Gardasil vaccine administration. Following vaccination, adverse events reporting saw a rate of 53.9 reports per 100,000 vaccines administered (Slade et al., 2009). Results from this study suggest that Gardasil is safe and associated with risks for adverse events proportional to those seen with other vaccines. The Food and Drug Administration and the CDC continue to recommend vaccination concluding that the benefits of vaccination outweigh the risks.



**Current Vaccination Rates**

Current data from the CDC's National Immunization Survey in 2009 regarding vaccination coverage for HPV among adolescents aged 13-17 shows that in the state of Minnesota, 44.9% of respondents had had the vaccine, keeping in mind that this rate most likely reflects the rate in mostly females because vaccination was only first approved for males in 2009 (CDC, National Immunization Survey, 2009). The American College Health Association's (ACHA) (2009), National College Health Assessment (NCHA), found that 29.5% of college students who responded to the survey had been vaccinated against HPV.

**Barriers to Vaccination**

Since the release of the vaccine in 2006, several studies have been conducted to determine the receptiveness to the vaccine among the public. In one study, Brewer and Fezekas (2007) conducted a systematic review of 28 studies of HPV-related beliefs and HPV vaccine acceptability. Most of the studies they examined were small, cross-sectional studies of parents and adults, (Brewer & Fezekas, 2007). Results from this review were analyzed using the Health Belief Model as a theoretical construct for explaining behaviors and attitudes toward the vaccine. Among identified barriers to vaccination, those commonly reported included, cost, low perceived vaccine safety, limited knowledge about HPV, and low perceived susceptibility to infection (Brewer & Fezekas, 2007). Brewer and Fezekas (2007) concluded stating, "HPV vaccine programs in the United States should emphasize the high likelihood of HPV infection, high vaccine effectiveness, and physician's recommendations, and address barriers to vaccination," (p. 113).

Another commonly discussed possible barrier to vaccination is the belief that vaccination against HPV will encourage risky sexual behavior. Brewer & Fezekas discovered that out of the

studies they analyzed that addressed this issue, only 6-12% of parents agreed with this statement (Brewer & Fezekas, 2007). In another study targeted toward mother's and adolescents' views on whether or not HPV vaccination would encourage risk compensation behavior and encourage unprotected sex, a majority of mothers and adolescents both agreed that vaccination would not encourage risky sexual behavior (Marlow, Forster, Wardle, & Waller, 2009).

The barrier of cost is a significant one. Each dose of the vaccine costs about \$130 and most effective coverage against HPV is considered after three separate doses (ACS, 2010). Most insurance plans including preventative services will cover the cost of the three dose series, but without insurance, the cost may be a barrier to elective vaccination (American Social Health Association, 2006).

An additional issue that presents a significant barrier to vaccination is lack of knowledge about HPV and the vaccine. Lambert (2001) conducted a study in which college students were administered a questionnaire about HPV. Results from this study found that college students answers to HPV-specific items were answered correctly 45% of the time indicating a lack of knowledge among this group. When Caron, Kispert, and McGrath (2009) asked women about their attitudes and beliefs about HPV vaccination, findings reflected that, "lack of knowledge was the predominant reason respondents would not get the HPV vaccine even if it were offered for free," (para. 25).

In studying acceptance of the HPV vaccine among males, a study by Gerend & Barley (2009) assessed HPV vaccine acceptability among a group of young adult men. Among the identified predictors of vaccine acceptability was, "being sexually active, having a current sex partner, having more lifetime sex partners, and receiving a previous STI test," (p. 60).

Additionally, "Awareness of HPV, awareness of the HPV vaccine, and HPV knowledge were all



positively correlated with vaccination intentions,” (Gerend & Barley, 2009, p. 60). In a similar study among males, Ferris et al. (2009) concluded that increased education about HPV and the vaccine would, “facilitate even wider acceptance of the HPV vaccine by men,” (p. 34). Other publications studying the acceptance of the HPV vaccine recommend educational interventions as a means of increasing acceptance of the HPV vaccine among all age groups (Lopez & McMahan, 2007; Allen et al., 2008).

### **College-Age Adults at High Risk**

Dunne et al. (2007) found that HPV infection was highest among females aged 20-24 years of age with a prevalence rate of 44.8% among that age group. For males, a systematic review of available literature was done to assess the prevalence of HPV infection among men of varying ages. Of the studies analyzed in this review, the average overall prevalence of HPV in men was greater than 20% with widely varying rates of infection among the studies analyzed (Dunne, Nielson, Stone, Markowitz, & Giuliano, 2006). The studies presented a wide range of age groups, but the study presenting the highest percentage of prevalence for HPV infection was that of men ages 22-57 with a prevalence rate of 72.9% (Dunne et al., 2006).

In the American College Health Association’s (ACHA, 2009) National College Health Assessment (NCHA), responses about sexual activity illustrated risky sexual behaviors which place college-age adults at higher risk for HPV infection. The survey asked college students to report how many sexual partners they have had within the past 12 months. Of the total respondents, 28.8% stated they had not had any sexual partners within 12 months, 45% had one partner, 10.8% had two partners, 6.1% had three partners, and 9.2% had four or more partners within the past 12 months. When asked about the use of condoms (mostly or always) or other protective barriers within the past 30 days results showed that those students who were sexually

active responded, that 5% used protection during oral sex, 52.3% used protection during vaginal intercourse, and 30.4% used protection during anal intercourse (American College Health Association [ACHA], 2009).

### **Guiding Research Questions**

1. Do college-age adults accept the HPV vaccine? Why or why not?
2. What are the attitudes and beliefs of college-age students on HPV vaccination?
3. What influences college-age adult's to recommend others to be vaccinated for HPV?

### **Theoretical Framework**

The theoretical framework of the Health Belief Model was used as a guide to make changes to the existing survey model from a study conducted by Caron, Kispert and McGrath (2009). The health belief model was then used in analysis of the results of the RHPVV Survey. This model was applicable to this study in that it describes health beliefs and behaviors. In this case, it was used to analyze college-age adult's health beliefs in relationship to acceptance of the HPV vaccine. As defined by the National Institutes of Health's Cancer Institute (2005), the health belief model (HBM), "addresses the individual's perceptions of the threat posed by a health problem (susceptibility, severity), the benefits of avoiding the threat, and factors influencing the decision to act," (National Institutes of Health [NIH], 2005, p. 13). In this case, the threat is infection with HPV and possibly cervical cancer.

Areas of the health belief model include six different areas believed to be indicators of readiness to take action to promote or maintain health. Included are, perceived susceptibility, perceived severity of condition, perceived benefits to taking action, perceived barriers, cues to action or reminders, and self-efficacy (NIH, 2005). In this study, areas of the health belief model



were addressed while analyzing the results of the RHPVV survey to determine how acceptance of the HPV vaccine among college-age adults is affected by various health beliefs.

### **Methods**

A survey method was adopted to assess various beliefs and attitudes toward the HPV vaccine after the literature review (Caron, Kispert, & McGrath, 2009). With written permission from the authors the survey used in the study, *Human Papillomavirus Vaccine: Attitudes, Behaviors, and Beliefs of At Risk Women*, was used as a starting point for this study (Caron et al., 2009). The RHPVV Survey was expanded to include males and the existing survey was adjusted to fit this study using areas of the health belief model as a guide to design.

Caron et al. (2009) conducted a self-report questionnaire to a, "relevant sample of 361 college students from a large, public, state supported Northeastern university in 2007," (para. 8). Among the study's conclusions was that, "Sexually active respondents would recommend the HPV vaccine to others, and disagreed that vaccination would encourage risky sexual behavior," (Caron et al., 2009, para. 1). Like many other studies, this one also identified a relationship between reported knowledge of HPV and attitudes, behaviors, and beliefs toward vaccination (Caron et al., 2009).

### **Population and Sample**

The RHPVV Survey was conducted at a small northern Minnesota public university. The enrollment at this University consists of 4,932 undergraduate students (Bemidji State University, 2010). The RHPVV Survey was electronically sent to a randomly selected sample of 500 on-campus undergraduate male and female students. The random sample was provided by the University's Vice President for Student Development and Development. Sixty-seven survey responses were received for a response rate of 13.4%.

### **Study Design**

This non-experimental, survey research study was conducted in January of 2011. All responses were self-report via electronic mail (Polit & Beck, 2004). Responses were collected and analyzed using an online survey tool (SurveyMonkey.com, 2011). All responses were anonymous. Institutional Review Board Approval was obtained through the Human Subjects committee of the College of Graduate Studies at the University.

### **Results**

The purpose of this study was to identify whether or not college students accept the HPV vaccine and why or why not. Also, another goal of this study was to discover what attitudes and beliefs college-age adults have about HPV vaccination. Lastly, the HPV Survey analyzed what might influence college-age adults to either recommend vaccination to others or not.

The research questions that were answered included:

1. Do college-age adults accept the HPV vaccine? Why or why not?
2. What are the attitudes and beliefs of college-age students on HPV vaccination?
3. What influences college-age adult's to recommend others to be vaccinated for HPV?

### **Demographics**

This sample included 62.7% (n=42) females and 37.3% (n=25) males. When asked about race, 91.0% (n=61) of participants self-identified as White. Respondents also included, American Indian or Alaskan Native, 3.0% (n=2); Asian, 4.5% (n=3); and Other/two or more races, 1.5% (n=1). Below, Table 1 outlines the age groups represented in this study.



Table 1

Survey Question; Please Indicate your Age

Response	Percent %	n
18	11.9	8
19	23.9	16
20	16.4	11
21	17.9	12
22	7.5	5
23	6.0	4
24	3.0	2
24+	13.4	9

### Sexual Behavior

The RHPVV Survey asked several questions to gain baseline knowledge of the sexual behavior of participants. A majority 79.0% (n=49) responded that they have had sexual intercourse (vaginal, anal, or oral) in their lifetime. When asked, "How many sexual partners have you had in your lifetime," responses ranged from 1 to 25 with an average of 4.3 sexual partners per lifetime. Most, 56.3% (n=27), responded that they had first had sexual intercourse between the ages of 16-18. Other responses included; 11-12, 2.1% (n=1); 13-15, 18.8% (n=9) and; 19-22, 22.9% (n=11). When asked about current relationship status, 54.1% (n=33), identified as single. Responses are summarized in Table 2.

Table 2

Survey Question; What is Your Relationship Status

Response	Percent %	n
Single	54.1	33
Dating	6.6	4
Monogamous relationship	24.6	15
Married or living with a partner	14.8	9
Divorced	1.6	1

Participants were also asked about condom use during sexual intercourse. Results varied and were inconclusive. Responses are displayed in Table 3.

Table 3

Survey Question; How Often Do You Wear A Condom When You Are Having Sexual Intercourse

Response	Percent %	n
Every time	22.9	11
Most of the time	22.9	11
Sometimes	16.7	8
Hardly ever	22.9	11
Never	16.7	8

### Results of Research Questions

#### Research Question One: Acceptance of HPV Vaccine

In response to the first research question, "Do college-age adults accept the HPV vaccine? Why or why not," included the following results. Table 4 shows results from the survey question, "The information you have about the vaccine has caused you to."

Table 4

Survey Question; The Information You Have About The Vaccine Has Caused You To (Select All That Apply)

Response	Percent %	n
Be vaccinated	41.4	24
Speak to your physician or other health professional about the vaccine	27.6	16
Share your knowledge with family or friends	22.4	13
Do further research on your own about the vaccine and the link between cervical cancer and HPV	24.1	14
Visit Merck or GlaxoSmithKline website	1.7	1
I have no information about the vaccine	25.9	15

A majority of respondents to this question have already been vaccinated against HPV, however 25.9% (n=15) also responded that they had no information about the vaccine, which correlates closely with research that suggests low levels of knowledge about the vaccine poses as a possible barrier for accepting vaccination. When cross tabulated with gender, results showed that 57.9% (n=11) of males who responded to this question answered that they had no information about the vaccine and 10.5% (n=2) responded as having been vaccinated. Compared to females, results were opposite in that 56.4% (n=22) of females who responded to this question had been vaccinated and 10.3% (n=4) responded that they had no information about the vaccine.

However, when asked, "Do you know what Human Papillomavirus (HPV) is," 77.4% (n=48) responded "yes", 9.7% (n=6) "no", and 12.9% (n=8) responded "not sure." There

appears to be an overall perceived knowledge of HPV itself, but knowledge of the HPV vaccine may be lacking among this group.

Participants who have not been vaccinated were asked, "Why would you choose not to get the HPV vaccine" and the results are presented in Table 5.

Table 5

Survey Question; Why Would You Choose Not To Get The HPV Vaccine? (Select All That Apply)

Response	Percent %	n
Religious beliefs	4.0	1
Safety concerns	28.0	7
Cost	20.0	5
Do not think it is important	16.0	4
Do not feel you are at risk	48.0	12
Need more information	32.0	8
Do not believe in vaccination	12.0	3

The response, "need more information," is consistent with existing research and also with the results in Table 4. The majority response, "Do not feel you are at risk," 48.0% (n=12), correlates with results in Table 6 which summarizes responses to the question, "I am concerned about possibly acquiring HPV."

Table 6

Survey Question; I Am Concerned About Possibly Acquiring HPV

Response	Percent %	n
No	69.4	43
Yes	22.6	14
Don't Know	9.7	6



In response to the question, "Women and men between the ages 9 and 26 should get the HPV vaccine to protect against genital warts and cervical cancer," 43.5% (n=27) of respondents answered that they agree with this statement. Table 7 displays the responses to this question.

Table 7

Survey Question; Women And Men Between Ages 9 And 26 Should Get The HPV Vaccine To Protect Against Genital Warts And Cervical Cancer (Select One Response)

Response	Percent %	n
Completely agree	27.4	17
Agree	43.5	27
Disagree	8.1	5
Completely disagree	1.6	1
Unsure	19.4	12

This illustrates that a majority either "completely agree" or "agree" that women and men should be vaccinated against HPV reflecting levels of acceptance among those surveyed.

When assessing what possible effects current sexual behavior practices have on acceptance of the HPV vaccine, the results from the question, "How often do you wear a condom when you are having sexual intercourse," was cross tabulated with the question, "Information you have about the vaccine has caused you to," and the results suggest that risky sexual behavior, may be a reason for accepting vaccination. Of respondents who answered that they "hardly ever" wear a condom, 63.6% (n=7) had responded that they had been vaccinated. Also, 50.0% (n=4) who said they "never" wear a condom during sexual intercourse had also been vaccinated.

**Research Question Two: Attitudes and Beliefs**

When asked about whether or not vaccination against HPV would encourage risky sexual behavior, 37.1% (n=23) answered that they agreed with this statement and 30.6% (n=19) disagreed with this statement.

Qualitatively, comments provided in the, "additional comments," section of the RHPVV Survey provided some further insight into attitudes and beliefs toward vaccination. One participant identified with the belief that vaccination would encourage risky sexual behavior and stated it as his/her reason for not electing to be vaccinated. They stated, "The only reason I wouldn't jump on board for such a vaccination is that, for me, it would totally encourage more unprotected sex, which is something I am trying to stop engaging in" (study participant). Another student who had a personal experience with HPV infection and identified some personal issues that accompany infection commented: "I am a student that has had HPV. I contracted it after being raped and I really do not appreciate that fact that I knew nothing about it. Due to it I have had several problems with my body" (study participant). This student went on to state support of spreading knowledge to others about HPV. This person's experience only affirms the need for increased awareness of HPV, its prevalence, its consequences, and prevention against it.

Some people have strong attitudes and beliefs toward all types of vaccinations. The next comment illustrates that there may be some common misconceptions that attribute to some of these strongly held beliefs about vaccination.

I believe that vaccinations are good preventative measures, but also too many can backfire. I find this one [HPV vaccine] unnecessary in that we already have a preventative measure for cervical cancer which doesn't pose potentially harmful side effects...the regularly performed pap smear.

The RHPVV Survey asked, "Do you get regular Papanicolaou tests, also known as a Pap smear." Results show that among women, 43.5% (n=27) responded "no", they do not get a regular Pap smear and 32.3% (n=20) responded, "yes" suggesting that Pap smears may not be effective for early detection of HPV and cervical cancer among this age group due moderate rates of Pap smear examinations.

Lastly, beliefs about risky sexual practices and personal accountability for risky behaviors may be related to some strongly held beliefs against vaccination. "If people would learn self-control with sex (as well as finances, diet, etc.) and wait until they are married we wouldn't have most of these problems" (study participant).

### Research Question Three: Influences on Recommendation

College-age adults who are accepting of the vaccine are in a potential position to recommend vaccination to others, increasing the probability of acceptance among others. Survey results showed that a majority of those surveyed would either be very likely or somewhat likely to recommend that others receive the vaccine. Table 8 displays the results.

Table 8

Survey Question; How Likely Would You Be To Recommend That Others Receive The Vaccine?

Response	Percent %	n
Very likely	24.2	15
Somewhat likely	25.8	16
Somewhat unlikely	9.7	6
Not likely	14.5	9
Don't know/not sure	29.0	18

When participants were asked to indicate from what sources they have received information about the HPV vaccine, top responses included; "One Less" commercial, 67.4%



(n=31); Family, 43.5% (n=20); and Friends, 43.5% (n=20). This suggests that influences from others such as family, friends and the media are important in providing information and recommendations for vaccination.

When asked, "Do you have health insurance," 93.9% (n=62) of respondent answered yes and 6.1% (n=4) answered no. Table 9 displays the cross tabulation of results from the questions, "Do you have health insurance," with, "The information you have about the vaccine has caused you to."

Table 9

The Information You Have About The Vaccine Has Caused You To: (Select All That Apply)

Cross tabulated with Do you have Health Insurance?

	Do you have Health Insurance		
	Yes	No	Total Responses
Be Vaccinated	44.4% (24)	0.0% (0)	41.4% (24)
Speak to your physician or other health professional about the vaccine	29.6% (16)	0.0% (0)	27.6% (16)
Share your knowledge with family or friends	24.1% (13)	0.0% (0)	22.4% (13)
Do further research on your own about the vaccine	24.1% (13)	25.0% (1)	24.1% (14)
and the link between cervical cancer and HPV			
Visit Merck or GlaxoSmithKline website	1.9% (1)	0.0% (0)	1.7% (1)
I have no information about the vaccine	22.2% (12)	75.0% (3)	25.9% (15)



Additionally, when the results from the question asking about health insurance was cross tabulated with gender, it was found that 95.2% (n=40) females responded that they had health insurance and 91.7% (n=22) males had health insurance coverage.

### **Discussion**

#### **Research Question One: Acceptance of HPV Vaccine**

Findings from the RHPVV survey depict that an overwhelming identified barrier to acceptance of vaccination among this group was insufficient knowledge about the vaccine. When asked, “Do you know what HPV is,” results show that this group self-reports high levels of knowledge about HPV itself, but accompanying knowledge of the HPV vaccine is lacking, especially among males. In the cross tabulation of the question concerning information about the vaccine (Table 4) with gender, 57.9% (n=11) of males stated they had no information about the vaccine and only 10.5% (n=2) had already been vaccinated for HPV. In contrast, females had higher rates of vaccination, 56.4% (n=22), and only 10.3% (n=4) had no information about the vaccine. This gender difference could very well be related to the fact that the vaccine was only made available to males in 2009, however, this suggests that since that time, males may not have received enough information or recommendations about the vaccine.

This is similar to findings by Caron et al. (2009) in that they identified that, “lack of knowledge was the predominant reason respondents would not get the vaccine,” (Caron et al., 2009). Additional studies identify low levels of knowledge as a barrier and, among males, Ferris et al. (2009) concluded that increased education about HPV and the vaccine would, “facilitate even wider acceptance of the HPV vaccine by men,” (p. 34).

Despite findings from several sources suggesting that college-age adults are at high risk for HPV, results from the RHPVV survey show a very low perception of risk among college-age

adults surveyed. A majority, 48.0% (n=12), of participants who have not yet chosen to be vaccinated choose not to because they do not feel they are at risk (Table 5). Additionally, as presented in Table 6, an overwhelming number of respondents responded that they are not concerned about possibly acquiring HPV. According to the Health Belief Model, people will be motivated to take action, in this case accept being vaccinated, if they perceive they are at risk for the condition (NIH, 2005). These results show that these respondents have little perception of risk for HPV and will therefore not be likely to accept the HPV vaccine to protect them against infection.

These results from the RHPVV survey are similar to those found by Lopez and McMahan (2007) in their study which also used the Health Belief Model to assess women's perceptions and knowledge of HPV and cervical cancer. In their findings, "only 15.6% of the participants felt they were susceptible to HPV infection," (p. 20). However, evidence from sources such as the American College Health Association [ACHA], suggests that college-age adults' sexual activity places them at risk for acquiring HPV. As stated earlier, when studying prevalence of HPV, Dunne et al. (2007) found that HPV infection was highest among females aged 20-24 years of age with a prevalence rate of 44.8% among that age group. This illustrates the increased risk for HPV among college-age females in this specific age range. Additionally, the CDC data states that as many as 50% of sexually active individuals will acquire HPV in their lifetime (CDC, 2009).

In addition to addressing the level of perceived risk for infection, Table 5 also displays additional barriers to choosing vaccination. Among these personally perceived barriers to vaccination are, religious beliefs, safety concerns, do not think it is important, need more information, and do not believe in vaccination. As shown in Table 5, 16.0% (n=4) thought that



the vaccine was not important. This is connected to the idea that if they don't perceive any risk, which is true for a majority of respondents, there may be no perceived benefits to action. The response, "do not think it is important," is something that relates to the Health Belief Model's principle of, "perceived benefits". This is described as when individuals, "believe taking action would reduce their susceptibility to the condition or its severity," (NIH, 2005, p. 13).

Table 7 shows results from the question, "Women and Men between ages 9 and 26 should get the HPV vaccine to protect against genital warts and cervical cancer," and illustrates that a majority either "completely agree," 27.4% (n=17) or "agree," 43.5% (n=27) suggesting that acceptance of the HPV vaccine should be relatively high among this age group. In contrast, further results from the RHPVV Survey displays that in actuality, vaccination rates remain relatively low. The RHPVV Survey exhibits that 41.4% (n=24) of participants who responded to the question, "The information about the vaccine has caused you to," have chosen vaccination. Similarly, results from the American College Health Association's (ACHA) National College Health Assessment (NCHA) (2009) results display a relatively low, 29.5% vaccination rate for HPV among college students who responded to the survey in 2009.

Table 5 displays that 20.0% (n=5) of respondents identified cost as a barrier to choosing vaccination. Further analysis of results suggests that cost, or being uninsured, may prove to be a significant barrier to choosing to be vaccinated. When results from the question asking if individuals had health insurance was cross tabulated with the question, "Information about the vaccine has caused you to," results depicted in Table 9 display that having health insurance plays an important role in acceptance of the HPV vaccine. All of the respondents, 44.4% (n=24), who had been vaccinated also had health insurance. Of the participants who did not have health insurance, 75.0% (n=3) responded that they also did not have any information about the vaccine.



The factor of health insurance may play a part in being provided with sufficient information from health care providers about the vaccine in order to make a decision about vaccination.

As stated earlier, each dose of the vaccine costs about \$130 and most effective coverage against HPV is considered after three separate doses (ACS, 2010). For those who do not have insurance, the vaccine proves to be very expensive. Although 93.9% (n=62) of respondents responded that they do have health insurance, Table 9 depicts just how important being uninsured may be for vaccination rates. Another significant finding is that among those surveyed, females had higher rates of insurance than males. This finding could be a significant contributor to the low vaccination rates among men. This is similar to national results from Callahan & Cooper (2004) in which they found that among a sample of young adults aged 19-24, "32% of male participants and 27% of female participants reported being uninsured," (p. 292). Males may prove to be a difficult population to reach in order to promote vaccination. Within the construct of the Health Belief Model, "barriers to action," is one of the six identifiers of taking action to promote health. In this case, the barrier of cost will be an obstacle to choosing vaccination.

An additional finding was that many respondents who either, "hardly ever" wore a condom during sexual intercourse, and those that "never" wore a condom, had already been vaccinated suggesting a possible link to the idea that those who engage in risky sexual practices are more likely to be vaccinated. This is similar to the research done by Gerend & Barley (2009) which concluded that, "being sexually active, having a current sex partner, having more lifetime sex partners, and receiving a previous STI test," all of which are risky sexual behaviors, are among predictors of vaccination in young adult males (p. 60)

### **Research Question Two: Attitudes and Beliefs**

Qualitative examination of the comments provided in the additional comments section of the RHPVV Survey gave insight into individual attitudes and beliefs toward vaccination. The comment provided by the student with a personal experience with HPV suggests that this experience has made that individual more prone to encourage education about HPV. Little knowledge about the virus can have negative consequences for those who know nothing about it and later become infected. Other comments suggested that there are some strongly held attitudes and beliefs against vaccination for several reasons, some of them misinformed. One such comment strongly suggested there was misinformation about the purpose of the Pap smear and its ability to detect rather than prevent cervical cancer. As another comment suggested, this individual chose not to be vaccinated in an attempt to discourage engaging in unprotected sex. Beliefs of another individual pertained to the idea of self-control and sexual responsibility. This response highlights the belief of this participant that sex before marriage may be a very key cause of HPV and abstinence and sexual responsibility would result in reductions in infection.

Perception of whether or not HPV vaccination would encourage risky sexual behavior is something that could pose as a variable for choosing vaccination among college-age adults' who wish to avoid risky sexual behavior. Results from the question, "Do you believe that vaccination against a sexually transmitted infection may encourage risky sexual behavior," display that 37.1% (n=23) answered that they agreed with this statement and 30.6% (n=19) disagreed with this statement. These results highlight a difference from the literature in that when Marlow et al. (2009) asked parents and younger adolescents the same question, a majority disagreed. This also differs from the study results of Caron et al. (2009) in which they found that, "Sexually active respondents would recommend HPV vaccine to others and disagreed that vaccination would encourage risky sexual behavior," (para 1).



It is clear that everyone has different opinions about the vaccine, some of them misinformed; leading to the conclusion that individual opinion and beliefs cannot be overlooked when providing education about vaccination. Education may need to be tailored to provide information regarding specific values and beliefs held by the individual.

### **Research Question Three: Influences on Recommendation**

Results from the RHPVV Survey show that, among participants asked, “How likely would you be to recommend that others receive the vaccine,” (Table 8) many selected that they would be either “very likely,” or “somewhat likely.” However, despite the fact that together, these responses make the majority, 29.0% (n=18) also responded, “don’t know/not sure,” suggesting that they don’t have enough information themselves in order to make a recommendation.

Recommendation of the vaccine to others could play a significant role in the acceptance of the vaccine. As Allen et al. (2008) concluded, “Interventions on college campuses should stress vaccination as a normative behavior...,” meaning behavior that is widely accepted and common among others has a higher likelihood of acceptance (p. 420). This normative behavior would include peer recommendations promoting vaccination. Conroy et al. (2009) had similar conclusions to their study of acceptance among women aged 13-26. They concluded that, “Normative beliefs—a measurement of the participant’s belief that her medical provider, her parents, and others would approve of her receiving the HPV vaccine—was the only attitudinal predictor of vaccination in this study,” (p. 1681).

When participants of the RHPVV survey were asked from what sources participants had heard about the HPV vaccines Gardasil and Cervarix, 67.4% (n=31) responded, “One Less Commercial;” a commercial promoting Gardasil. Other responses to this question included



“family,” 43.5% (n=20) and “friends,” 43.5% (n=20). This shows what an influence public media has on spreading the word about these vaccines and it should be a goal to use this media to further the campaign promoting vaccination. This is similar to conclusions made by Caron et al. (2009) when they stated, “Continued use of the media will be important to incorporate into future public health education and awareness efforts,” (Caron et al., 2009, para. 26) The high prevalence of family and friends as informants is supported by Allen et al (2008) illustrating the impact of normative behavior. Provided that information from family and friends is accurate and positive, this could play a role in influencing the likelihood that these college-age adults will, in turn recommend vaccination to others, or provide others with information about the vaccine which could effectively increase vaccination rates.

Recommendations from others and the media are what the Health Belief Model calls, “cues to action.” The RHPVV Survey identified that there are, in fact several cues to action among this group including family, friends, and television commercials. Cues to action are effective at encouraging taking action to promote health and exists when others are, “exposed to factors that prompt action (e.g., a television ad or a reminder from one’s physician...),” (NIH, 2005, p. 13).

Another finding of the RHPVV survey that may have implications on the ability of participants to recommend vaccination is related to health insurance. Of the participants who did not have health insurance, 75.0% (n=3) responded that they also did not have any information about the vaccine (Table 9). These participants would not be able to recommend vaccination to others, nor would they have access to health care providers who could recommend vaccination to them.

### **Limitations**

Limitations in this study included:

1. Low response-rate of participants to the RHPVV survey. There were 500 surveys distributed via electronic mail and 67 responses for a response rate of 13.4%. This survey cannot be generalized to other populations due to the limited number of responses.
2. The demographics of the sample limit the generalizability of these findings 91% (n=61) white.
3. The reliability and validity of this survey have not been tested which limits the use of this survey for additional populations.

### **Conclusions and Implications for Practice**

The RHPVV Survey was used to assess acceptance of HPV vaccination among college-age adults. The study showed that among those surveyed, the most common barriers to acceptance of HPV vaccination included a lack of knowledge regarding the vaccine, especially among males, a low perceived risk for infection, and lack of health insurance. College students in this population reported high levels of knowledge of HPV itself, however most participants did not perceive themselves as being at risk for this virus. While the vaccine has newly been recommended for males, and is highly marketed as an attack on cervical cancer, males should be given adequate knowledge about vaccination in order to make an informed decision about the vaccine. When providing education about vaccination, it will be important to assess personal values and beliefs that can lead to misconceptions about vaccination and HPV infection.

A target intervention for promoting this vaccine among college-age adults should be aimed at raising awareness of the high rates of infection among sexually active adults and associated risk for infection. As the Health Belief Model suggests, perceived risk plays a

significant role in choosing health promoting behaviors. Results from the RHPVV survey clearly depict that among those surveyed; there is an overwhelmingly low perceived risk for infection. Risky sexual behaviors and prevalence rates of infection among college-age adults need to be addressed when providing information regarding vaccination.

A surprising finding was the impact of having health insurance on the ability to recommend the vaccine to others. Access to healthcare and health education can influence health and wellness seeking behavior. Especially among males, health care providers should be aware of the possible lack of knowledge regarding HPV vaccination due to a higher lack of insurance rates compared to that of the female patient. Resources that are available to assist with the cost of vaccination would be helpful in raising the rates of vaccination among the uninsured college-age adult.



APPENDICES

APPENDIX A  
INFORMED CONSENT FORM

**Informed Consent Form****Survey: Attitudes and Beliefs about Human Papillomavirus (HPV) Vaccine Among College Students**

Happy New Year.

I am a senior nursing student conducting a survey as a part of my thesis project. I would like to invite you to participate in this brief survey of college student's attitudes and beliefs about Human Papillomavirus (HPV) and the HPV vaccines. I hope this survey helps you learn more about what you know, or maybe what you don't know about HPV and the vaccine.

If you decide to participate, the survey will take about 5-8 minutes to complete.

Any information that is obtained will be completely anonymous and confidential. Please make no marks on the survey that could identify you individually.

The survey is completely voluntary. You may choose not to participate or not to answer any specific question. You may skip any question you are not comfortable in answering.

You can make a copy of this form, which you may keep for your records. If you have health concerns regarding HPV or the vaccine, please contact your healthcare provider or the Center for Student Health and Counseling at Bemidji State University [(218) 755-2053] for further information.

If you have questions about this study please contact me (Emily Pippo) at (320) 492-0989 or Dr. Jeanine Gangeness at (218) 755-3870.

By reading this information and choosing to participate in the survey you agree to take part in the study.

Thank you very much!



APPENDIX B

RECEPTIVENESS TO HPV VACCINE (RHPVV) SURVEY

### Receptiveness to the Human Papillomavirus (HPV) Vaccine

In this section, are some questions that examine the connections between your background and your knowledge of the HPV vaccine.

1. Please indicate your age:

- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 24+

2. What is your sex?

- 1 Male
- 2 Female

3. What race do you consider yourself to be? (Select one response)

- 1 White
- 2 Black or African American
- 3 American Indian or Alaskan Native
- 4 Asian
- 5 Native Hawaiian or Pacific Islander
- 6 Two or more races
- 7 Other \_\_\_\_\_

In this section are questions related to your income and educational levels. This will assess access to healthcare and HPV vaccination.

4. Is your annual household income from all sources: (Select one response)

- 1 Less than \$10,000 (0- \$10,000)
- 2 Less than \$15,000 (\$10,001 to \$15,000)
- 3 Less than \$20,000 (\$15,001 to \$20,000)
- 4 Less than \$25,000 (\$20,001 to \$25,000)
- 5 Less than \$35,000 (\$25,001 to \$35,000)
- 6 Less than \$50,000 (\$35,001 to \$50,000)
- 7 Less than \$75,000 (\$50,001 to \$75,000)
- 8 \$75,001 or more

5. What is the highest grade or year of school you completed? (Select one response)

- a. Eighth grade or less
- b. Some high school
- c. High school or GED certificate
- d. Some technical school
- e. Some college
- f. College graduate
- g. Post grad or professional degree

14. Do you get regular Papanicolaou tests, also known as Pap smear?

- 1 Yes
- 2 No
- 3 Doesn't apply because I am a male

In this section, are some questions about the source(s) from which you may have heard about the HPV vaccine.

15. Do you know what Human Papillomavirus (HPV) is?

- 1 Yes
- 2 No
- 3 Not Sure

16. Prior to this survey, had you ever heard of Gardasil™ or Cervarix™, vaccines that protect against HPV and cervical cancer?

- 1 Yes
- 2 No (If no, then please skip to question 17)
- 3 Not Sure

17. From which of the following sources have you received information about Gardasil™ or Cervarix™? (Please select all that apply)

- |                             |                         |                               |
|-----------------------------|-------------------------|-------------------------------|
| 1 "Tell Someone" commercial | 7 Radio                 | 13 Nurse                      |
| 2 "One Less" commercial     | 8 Newspaper Articles    | 14 Other health professional  |
| 3 Talk show                 | 9 Medical Journals      | 15 University Health Services |
| 4 News show                 | 10 Merck website        | 16 Family                     |
| 5 Magazine advertisements   | 11 thehpvtest.com       | 17 Friends                    |
| 6 Magazine articles         | 12 General Practitioner | 18 GlaxoSmithKline website    |
| Other _____                 |                         |                               |

In this section, are questions about some of your attitudes and behaviors about the HPV vaccine.

18. If the HPV vaccine was offered for free, would you get the vaccine?

- 1 Yes (if yes, please skip to question 20)
- 2 No
- 3 Not Sure

19. Why would you choose not to get the HPV vaccine? (Please select all that apply)

- 1 Religious beliefs
- 2 Safety concerns
- 3 Cost
- 4 Do not think it is important
- 5 Do not feel you are at risk
- 6 Need more information
- 7 Do not believe in vaccination
- 8 Other \_\_\_\_\_



20. The information you have about the vaccine has caused you to: (Select all that apply)

- 1 Be vaccinated
- 2 Speak to your physician or other health professional about the vaccine
- 3 Share your knowledge with family or friends
- 4 Do further research on your own about the vaccine and the link between cervical cancer and HPV
- 5 Visit Merck or GlaxoSmithKline website
- 6 I have no information about the vaccine

21. How likely would you be to recommend that others receive the vaccine? (Select one response)

- 1 Very likely
- 2 Somewhat likely
- 3 Somewhat unlikely
- 4 Not likely
- 5 Don't know/not sure

For the last section, please select the degree to which you agree or disagree with the following statements.

22. Women and men between ages 9 and 26 should get the HPV vaccine to protect against genital warts and cervical cancer. (Select one response)

- 1 Completely agree
- 2 Agree
- 3 Disagree
- 4 Completely disagree
- 5 Unsure

23. Do you believe that vaccination against a sexually transmitted infection may encourage risky sexual behavior? (Select one response)

- 1 Completely agree
- 2 Agree
- 3 Disagree
- 4 Completely disagree
- 5 Unsure

24. I am concerned about possibly acquiring HPV.

- 1 Yes
- 2 No
- 3 Don't know

Please provide any additional comments.

APPENDIX C  
DEBRIEFING STATEMENT

### **Debriefing Statement**

Thank you very much for taking your time to participate in this survey. This debriefing form is for you to keep for your records.

The purpose of this study is to identify the knowledge college students have about Human Papillomavirus (HPV) and the HPV vaccines. In previous research, there has been a gap in knowledge about HPV and the vaccines among college-age adults. It is hypothesized that my study will reveal similar results at Bemidji State University.

Hopefully, with information about how much knowledge Bemidji State University students have and how much information they need related to HPV and the vaccine, healthcare providers can better understand how to educate their patients about the vaccine and risks for HPV.

Results from this survey and the study can be found on the Student Health and Counseling Center's education office and will also be presented at the Student Achievement Celebration in the Spring.

It is not expected that you will suffer any adverse effects from this study. If that should happen or if you have health concerns regarding HPV or the vaccine, please contact your healthcare provider or the Center for Student Health and Counseling at Bemidji State University.

Again, thank you for participating in this study.



APPENDIX D

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