


College Men and Women and Their Intent to Receive Genital Human Papillomavirus Vaccine

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Abstract

The study set out to investigate what influences the intentions of college students to get vaccinated against genital human papillomavirus (HPV). College men and women were surveyed to understand their intentions. Regression was used and supported that the constructs of the health belief model (HBM) as well as gender, norms, and information seeking contributed to predicting intent to receive the HPV vaccine, $R^2 = .61$, $F(6, 159) = 39.41$, $p < .001$. Benefits and barriers were the most influential variable, and men were more likely to intend to receive the vaccine. The findings should be applied to future campaigns aimed at increasing preventive health behaviors, especially vaccinations among college students.

Keywords

genital human papillomavirus, health belief model, norms, information seeking

In 2006, one advancement in health care was the release of the Gardasil vaccination which protects against the most common sexually transmitted infection, genital human papillomavirus (HPV; Centers for Disease Control and Prevention [CDC], 2012a). Cervarix is another HPV vaccine, but it protects against fewer strains of HPV and is only available to women. Initially, the Gardasil vaccine was only available to women and specifically targeted young girls (11 to 12 years old), but in 2009, it was approved for use with men (U.S. Food and Drug Administration, 2010). Although it was approved for use, it was not endorsed publicly for use with men until October 2011. At this time, the Advisory Committee on Immunization Practices (ACIP) recommended that men and women ages 11 to 26 should receive the HPV vaccine (CDC, 2012b).

Prior to this recommendation by the ACIP, the vaccines were targeted toward young children (11 to 12 year olds). This means that the current college population did not have the option to be vaccinated, at that age, and therefore, they will be investigated in the current study. The Gardasil vaccine is important because of the ability to protect against some of the most common and dangerous strains of HPV (6, 11, 16, and 18) as well as because it is available to both men and women (Friedman & Shepard, 2007). Strains 6, 11, 16, and 18 cause a variety of cancers, including cervical, vaginal, penile, and oropharyngeal; they are also responsible for 90% of genital warts cases (CDC, 2012a; U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute, 2012). The most recent report on cancer in the United States revealed that HPV continues to

be an issue (Jemal et al., 2013). Most cancers are decreasing, but a few associated with HPV, particularly oropharyngeal and anal, are on the rise (Jemal et al., 2013). One of the main concerns with the vaccine, and potential cause for the increase in HPV related cancers, is the lack of immunization rate, particularly among the college population (Licht et al., 2010).

The ACIP recommendation for males to receive the vaccination increases the need for research that looks at both men and women. One of the more studied populations in regard to HPV vaccination rates are college women. Licht et al. (2010) found that in a sample of 406 college women, only 44% had received at least one HPV vaccination shot. While vaccination rates are somewhat low, the likelihood of contracting HPV is fairly high as the CDC (2012a) estimated that around six million people will contract HPV each year. College students are no different, and when 263 couples were checked for an HPV infection, more than 60% (64%) had at least one partner who was carrying a strain of the virus (Burchell, Tellier, Hanley, Coutlee, & Franco, 2010). The proliferation of HPV among college students appears to be high, and the next step is determining how to reach this at risk population.

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Health Belief Model (HBM)

One of the most popular theories for studying health behaviors and following health recommendations is the HBM (Allen et al., 2010; Janz & Becker, 1984). The four main constructs of HBM are perceived susceptibility, severity, benefits, and barriers (D'Souza, Zyngier, Robinson, Schlotterlein, & Sullivan-Mort, 2011). The model predicts that behavior is influenced by weighing the threat (susceptibility and severity) and their ability to reduce the threat (benefits and barriers; Marlow, Waller, Evans, & Wardle, 2009). HBM provides a framework that has shown significant relationships between the four variables and intentions to perform a recommended health behavior (Harrison, Mullen, & Green, 1992). Additional variables are being tested because more knowledge surrounding what is most influential in increasing intentions could lead to better promotional messages targeted at college students in regard to vaccine uptake.

Mehta and Sharma (2011) found in a sample of college men that perceived susceptibility was a significant contributor to vaccine intentions. Gainforth, Cao, and Latimer-Cheung (2012) found similar results with a group of almost 300 college females, as their feelings of susceptibility increased so did their intent to get vaccinated. For someone to take action, they must feel that they are susceptible to contracting HPV and that it would pose severe consequences (genital warts/cancer; Harrison et al., 1992; Marlow et al., 2009). If both of these conditions present themselves, then the individual is more likely to take the recommended action.

Hypothesis 1 (H1): Perceived susceptibility positively influences behavioral intention.

Hypothesis 2 (H2): Perceived severity positively influences behavioral intention.

In a study of college age women (18 to 26 years), some of the barriers to getting the HPV vaccine were lack of time, cost of the vaccine, as well as short- and long-term side effects from the vaccination (Brewer & Fazekas, 2007; Katz, et al., 2009). Time is an important potential barrier because the vaccine is administered over a 6-month period and requires a total of three injections. Another study found that worry related to the side effects from the vaccine lowered young women's intentions to receive the HPV vaccination (Juraskova, Bari, O'Brien, & McCaffery, 2011). In addition to any barrier to getting vaccinated, there are benefits such as limiting the chances of getting genital warts, being infected with cancer, or spreading HPV strains that could cause cancer in a sexual partner. Juraskova et al. (2011) used HBM to predict vaccine intention and found that perceived benefits were a significant factor that contributed to vaccine intention. Marlow and colleagues (2009) as well as Mehta, Sharma, and Lee (2013) each found similar results indicating that the promotion of the benefits of the vaccine over any barriers was significant. HBM uses benefits and barriers as

one variable with the perceived barriers being subtracted from the perceived benefits (Janz & Becker, 1984).

Hypothesis 3 (H3): Benefits minus barriers positively influences behavioral intention.

Norms

Norms relate to the social pressure that can be placed on individuals to perform certain actions to stay in line with the expectations of their particular social group (Bandura, 2004). Friends, significant others, parents, and anyone who is valued are important sources of information among college students, and they can play a role in influencing whether someone knows about HPV, the available vaccine, and whether they feel support to get vaccinated (Allen et al., 2009; Gainforth et al., 2012; Pleasant & Sandfort, 2009; Ratanasiripong, Cheng, & Enriquez, 2013). The current study expects norms to be an influence on vaccination intent as they have influenced other health behaviors (Bandura, 2004)

Hypothesis 4 (H4): Norms will positively effect behavioral intention.

Knowledge of HPV

To actively seek a vaccine, individuals will most likely need to have some knowledge about the vaccination so they feel comfortable receiving the injections. In the survey by Licht et al. (2010), they found that most of the women participating were not aware that both men and women are affected by HPV, that it can be transmitted from skin to skin contact, and that it is responsible for causing most of the cases of genital warts. Another survey of more than 1,400 found similar results regarding low knowledge that HPV causes genital warts and that most sexually active individuals will contract HPV during their lifetime (Marlow, Zimet, McCaffery, Ostini, & Waller, 2013). In a survey of both men and women, the females surveyed were more knowledgeable when it came to understanding that women suffer negative consequences more often, that HPV can cause cervical cancer, and women were more aware that vaccines existed to protect against HPV (Marlow et al., 2013; Pleasant & Sandfort, 2009; Ratanasiripong et al., 2013). Men were less aware of the connection between HPV and genital warts and were less likely to understand the risk HPV poses to their health (Pleasant & Sandfort, 2009). There have been studies related to men and their knowledge or willingness to receive the HPV vaccine, but more studies need to be done to understand what will influence them to receive the HPV vaccine (Gainforth et al., 2012). In addition to not having as many studies look at their knowledge of HPV, men have not been the target of most vaccination programs (Marlow et al., 2013; Stupiansky, Alexander, & Zimet, 2012). Research has shown that women are more likely to take protective action in terms

of their health and they are more likely to follow the recommendations of a physician (Courtenay, McCreary, & Merighi, 2002; Weiss, Larsen, & Baker, 1996). This research indicates that women may be more likely to be vaccinated, and this study will provide greater insight now that men are eligible to be vaccinated.

Hypothesis 5 (H5): Females will have greater intent to receive the HPV vaccine.

Information Seeking

Katz, Krieger, and Roberto (2011) surveyed 165 male college students about where they found their information regarding HPV. The most popular sources of information were television, Internet, and their friends. Other studies have found similar results with television and the Internet being the most popular information sources (Katz et al., 2009; Pleasant & Sandfort, 2009). The Internet was particularly important to those learning about HPV because they said, after hearing about the vaccine, they used the Internet to gather more information (Katz et al., 2009). Using the Internet to find information is only part of the equation as individuals may find information from a variety of sources. The current study looks to see what kind of influence information seeking will have on intent to get vaccinated.

Hypothesis 6 (H6): Information seeking positively increases behavioral intention.

Method

A convenience sample of students was recruited from undergraduate courses at a large university in the southern United States during the spring of 2012. Professors of communication courses were approached to see if they would offer the survey to their students. Those who accepted agreed to send an email to their students that contained details about the study and a link to the survey. The survey was hosted by a secure online site which allowed complete anonymity, which was important because of the sensitive nature of the topic. If students chose to participate, they clicked on the link (in the email) and it took them to the survey which took about 15 min to complete. To be eligible for the study, the student needed to be at least 18 years of age and to have not received any HPV vaccine shot. Those who had received a shot were not eligible because if they were included in the sample, it could artificially inflate or deflate the behavioral intention measure. The research was reviewed and approved by the university's institutional review board (IRB).

The study looked to better understand the influence of six key variables on behavioral intention. The first three hypotheses dealt with the influence of perceived susceptibility, perceived severity, and the combination of benefits and barriers on intentions to receive the HPV vaccine. These are all

elements of the HBM which have been found to be useful in understanding what influences an individual to take a recommended health action (Allen et al., 2010; Janz & Becker, 1984). The final three hypotheses were added to improve the understanding of what influences intentions. These predicted that norms, being female, and seeking health information would increase vaccine intentions.

Participants

The analyses were run using the Statistical Package for the Social Sciences (SPSS) 16.0. A total of 350 students received an email detailing the study and the restrictions on participation, and of these students, 53% (186) completed the survey. The population contained a total of 105 men (56.5%), 81 women (43.5%), and as a group, they were on average 19 years old ($M = 18.92$). Most of the population identified themselves as White (70.4%), while the second largest group was Asian (17.7%).

Measures

The survey consisted of a number of measures that were drawn from the literature. Each of the scales was a 7-point scale with answer choices ranging from *strongly disagree* to *strongly agree*. To measure *behavioral intention*, four Likert-type questions were used. The questions centered around whether the participant planned on "considering getting the HPV vaccine," whether they would "try to get the HPV vaccine," whether they would "get the complete HPV vaccine," and "if approached by a health care provider, would you get the vaccine." *Perceived severity* was a four-item Likert-type scale, and each of the questions dealt with feelings related to how being infected with HPV would be disruptive to their "social life," "physical health," "romantic relationship," and "life overall." The behavior measure and the perceived severity scale were modified from scales created by Gerend and Barley (2009). An additional four-item Likert-type scale measured *perceived susceptibility*. The susceptibility measure dealt with the likelihood of infection and asked whether the participants felt vulnerable to contracting HPV and used statements such as "It is likely that I will contract HPV" (Cismaru & Lavack, 2006; Courneya & Hellsten, 2010; Duncan, Schaller, & Park, 2009).

Benefits and *barriers* measures were adapted from research related to the HPV vaccination (Friedman & Shepard, 2007; Katz et al., 2011; Stupiansky et al., 2012). The four benefits questions asked participants how willing they would be to receive the vaccine if it protected them and their partners from genital warts and different types of cancer. Six questions were used for measuring the impact of barriers. Some of the questions asked whether the effectiveness, safety, fear of pain, cost, and time spent making trips to the doctor would lessen the chances of the participant getting vaccinated.

Norms were measured with seven Likert-type questions that asked participants whether they felt their friends would support them in receiving the vaccination as well as questions that asked about their communication with friends related to their health (Borsari & Carey, 2003; Cialdini, Reno, & Kallgren, 1990). Two norms statements were “My closest friends would approve of me getting the HPV vaccination” and “My friends and I talk about safe sex practices.”

Information seeking was a nine-item Likert-type scale which asked questions about the use of the media such as television, newspapers, and the Internet to find information related to health and HPV. One information seeking item was “I have searched online *many* times to find information related to HPV.” Outside of these measures, participants answered questions related to demographics, sexual history, health insurance, and current relationship status.

All of the scales were found to be reliable, with eight scales having a reliability over .90 and two scales *Norms* ($\alpha = .86$) and *Barriers* ($\alpha = .77$) being reliable, but not having as high of a reliability score. Next, each of the individual scales was averaged. The average barriers score was subtracted from the average benefits score (Janz & Becker, 1984). In determining whether someone performs a certain action related to their health, they often weigh the benefits and barriers together rather than separately and to achieve this, they need to be subtracted from one another to create a single variable. If the benefits outweigh the barriers, the variable will be positive, and if the barriers are more influential, then the variable will be negative.

Results

The first three hypotheses predicted that susceptibility (H1), severity (H2), and benefits and barriers (H3) would positively influence behavioral intention. Regression was used to test these hypotheses, and all three were supported as they accounted for 51% of the variance in behavioral intention, $R^2 = .51$, $F(3, 159) = 54.75$, $p < .001$. Of these variables, the benefits and barriers contributed the most ($\beta = .53$, $p < .001$), next was perceived vulnerability ($\beta = .27$, $p < .001$), and finally perceived severity ($\beta = .25$, $p < .001$). The next step was to investigate the final three hypotheses which predicted that norms (H4), being female (H5), and information seeking (H6) would all have positive effects on intent to receive the vaccine. These were added to the regression equation that included severity, vulnerability, and benefits and barriers, and they significantly improved the model by increasing the variance explained, $R^2 = .61$, $F(6, 159) = 39.41$, $p < .001$. All six variables were significant contributors, with benefits and barriers again being the most influential ($\beta = .46$, $p < .001$); next was norms ($\beta = .28$, $p < .001$), perceived severity ($\beta = .17$, $p = .005$), information seeking ($\beta = .16$, $p = .004$), gender ($\beta = -.16$, $p = .005$); and finally perceived vulnerability ($\beta = .12$, $p = .035$). After looking at the hypotheses, it was important to look at the sexual history and experiences of the population as they might influence

intentions. In terms of sexual intercourse, 107 members (58%) of the population had intercourse with a majority (42%) having between one and four sexual partners. Two additional equations were run with sexual intercourse and number of sexual partners added to the regression. Neither variable contributed significantly to the prediction of intent to receive the HPV vaccine.

Discussion

The current study supports the use of the HBM for understanding vaccine intentions and added to the predictive ability of HBM. Although severity, susceptibility, and benefits and barriers played significant roles, so too did norms, gender, and information seeking. Working together, these variables were able to create a strong model that fit the data. The most significant finding of the study was that males had greater intention to get vaccinated than did females. This went against what was predicted in the fourth hypothesis. The negative influence in the regression equation showed that men (coded as 1) had greater intentions to get vaccinated than did females (coded as 2). This is interesting as this is one of the first studies that was able to look at males who were eligible and endorsed by the ACIP to receive the HPV vaccine. The recommendation that males be vaccinated was released in October 2011, and the study was conducted the following spring.

HBM

The HBM is one of the most often used theories to help explain why individuals take protective action related to their health. As predicted, in the first three hypotheses, perceived susceptibility, severity, benefits and barriers all were strongly associated with intentions to receive the HPV vaccine (Janz & Becker, 1984; Juraskova et al., 2011; Marlow et al., 2009; Mehta & Sharma, 2011). The benefits and barriers variable had a significant positive relationship with behavioral intention and demonstrates a need to highlight how the benefits of receiving the vaccination outweigh the potential barriers (Juraskova et al., 2011; Mehta et al., 2013). Perceived severity had the next largest effect of the HBM variables, and as individual feelings of severity increased, so did behavioral intention. Next was perceived susceptibility, and although it was a relatively small effect, it still was positively associated with intention. Those who felt susceptible were more likely to be planning on getting vaccinated.

Norms

Overall, the norms variable had a positive effect in the model which was predicted in the fourth hypothesis. The participants greatly valued the opinions of their friends. The norms variable was positive such that more communication and support from friends increased intent to get vaccinated. This

finding is similar to that of Dillard (2011) and Ratanasiripong et al. (2013) who found that subjective norms was an important factor, for females, in increasing intent to get vaccinated. The current study adds males to this finding and illustrates that norms are important for both males and females.

Information Seeking

Another communication variable included in the model was information seeking, and the sixth hypothesis predicted that it would increase intent to get vaccinated. This variable did not limit information seeking to one source in particular, but allowed it to occur across a range of sources with the hopes that this would eliminate any issue of participants remembering which source they found the information through. The more that someone searched for health information, the more likely they were to intend on getting vaccinated. This is an important finding because it suggests that those who are interested in finding more information are finding information that supports that getting vaccinated is a good decision.

Two variables that were not significant in the model were related to sexual experiences of the participants. This finding is promising, in that no matter the sexual history of the individuals, they were all influenced by the same variables. Future research can draw from these findings to put in motion campaigns that will better target the college population for current and future health problems. These campaigns are necessary to lower the risk of a population who is in danger of contracting various cancers and genital warts.

Limitations

One limitation is that participants self-reported their information and may not be able to accurately recall their knowledge or actions related to HPV. Participants self-selected into the study, and those who decided to complete the survey may have had an interest in HPV. More detailed questions about the sexual history, history of sexually transmitted infection, and use of contraception could present a clearer picture as to why some may be reluctant to get vaccinated. Another important series of questions to ask would center on the cost of the vaccine and their knowledge of their insurance coverage. Cost was listed as a barrier, but if the participants were unaware if their insurance would cover any of the cost associated with the vaccination, then their thoughts on cost would be altered. The recent changes to the insurance landscape with the introduction of the Affordable Care Act should be investigated to see how it influences vaccination costs and intentions. The sample was not racially diverse which inhibits the generalizability of the results to a larger population.

Future Research

It is necessary to conduct longitudinal research to determine if these participants actually follow through with their

intentions and receive the HPV vaccine. Future campaigns should focus on young people's friends as the norms variable played an important role in increasing intent to be vaccinated. The HPV measures used in the study can be used in other research as they provided insight into intentions to get vaccinated. Finding reliable measures is one aspect that researchers have been looking for to better understand intentions related to HPV (Allen et al., 2010). Men have only had the opportunity to receive the vaccination for a few years, and more research on this population should be conducted. The current study laid the groundwork for this population which needs to be studied more in depth as they appear interested in getting vaccinated.

Declaration of Conflicting Interests

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