Knowledge of HPV, Perception of Risk, and Intent to Obtain HPV Vaccination among Male University Students

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Abstract

Human papillomavirus (HPV), the most common sexually transmitted virus in the world, is associated with almost all cases of cervical cancer. It is also related to vulvar, vaginal, penile, anal, and oropharyngeal cancer. HPV vaccination is recommended by the Centers for Disease Control and Prevention (CDC) for both boys and girls. Unfortunately, because prevention efforts have focused primarily on young women, many young men are unaware of the virus, its consequences, or preventive strategies. The purpose of this study was to determine knowledge level of HPV, perceived risk of HPV and intent to obtain HPV vaccination among male university students. Participants completed a 31-item survey. Knowledge-based questions indicated rudimentary knowledge of HPV. Fifty percent knew that HPV was the most common STI, over half (52%) knew of the HPV association with multiple cancers, 39% could correctly identify the virus and 35% could identify virus strains controlled by vaccination. Most agreed (54%) or strongly agreed (19%) they were at a high risk for HPV. A significant majority agreed (49%) or strongly agreed (39%) that unprotected sexual activity put them at risk but nearly half (46%) were unaware that HPV vaccinations were available for males. Despite this awareness, 86% were not vaccinated and 65% of these respondents did not plan to become vaccinated. In addition, of 86% who were not vaccinated, 45% did not perceive themselves at risk and 47% were not aware of a vaccination. Only 9% were fully vaccinated against HPV and 6% had received partial vaccinations. Though male students understand the scope of HPV infection and perceive themselves to be at risk, are or intend to be vaccinated. This is a significant issue for public health, which needs to focus on this critical but neglected target population.

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Introduction

Human Papillomavirus (HPV) is one of the most common sexually transmitted pathogens in the United States. Recent data indicate that 79 million people are currently infected and suggest that 14 million new infections occur every year (Satterwhite et al. 2013). The virus infects epithelial cells of skin and mucosa, and has been associated with cancer of the throat, vulva, vagina, cervix, anus, and penis (Centers for Disease Control and Prevention [CDC] 2012). Over 150 types of HPV have been identified, and approximately 40 can affect the genitalia and throat area. Most infections are asymptomatic, transient, and non-oncogenic, though some result in the appearance of genital warts. A small group of persistent oncogenic strains is responsible for most cancer cases and is thought to be responsible for approximately 26,000 new cancer cases each year, 17,000 in women and 9,000 in men (CDC 2013a).

Two prophylactic vaccines directed at HPV types that cause cervical and other HPV-related cancers have been licensed by the Food and Drug Administration. Clinical trials demonstrate that both vaccines, administered as a 3-dose series, have very high efficacy for

prevention of cervical pre-cancers (FUTURE II Study Group 2007; Paavonen et al. 2009; Kjaer et al. 2009). In addition, one vaccine has been shown to prevent associated vaginal, vulvar, and anal pre cancers as well as associated genital warts (Joura et al. 2007; Future I/II Study Group 2010; Palefsky et al. 2011). The Advisory Committee on Immunization Practices (ACIP) has recommended that both girls and boys be routinely vaccinated at age 11 or 12, noting that the vaccine may be administered beginning at age nine (CDC 2007; 2010; 2011). Additional recommendations included vaccination of all girls/young women through age 26 and all boys/young men through age 21 who had not been vaccinated previously (CDC 2010; 2011).

Despite these recommendations, HPV vaccination rates remain low in the United States. Initially viewed as a public health breakthrough, vaccination initiatives have encountered unexpected resistance. Attempts to mandate immunization have met opposition in a number of states, and have been attacked as an intrusion on individual rights and an erosion of parental rights (Charo 2007). In addition, public health efforts have been hindered by a growing trend toward parental opposition toward vaccines based on flawed information and the misguided perception that many vaccines are more risky than the diseases they prevent (Poland and Jacobson 2011).

Among adolescent girls, there has been a slow increase in vaccination rates, but these rates remain far below targets suggested by *Healthy People 2020*. Between 2007 and 2011 HPV vaccination coverage rose an average of 6 percentage points each year. However, there was no observed increase from 2011-2012 (CDC 2013b). In 2012, the vaccine rate for adolescent girls receiving at least one dose was 53.8%, but coverage for all three doses was only 33.4% (CDC 2013b). State vaccination rates for adolescent girls varied widely in 2012, from 12.1% in Mississippi to 57.7% in Rhode Island (CDC 2013b).

Encouraging and improving vaccination coverage is critical for reducing the burden of disease and cancer related to HPV. In order to do this, it is necessary to understand what targeted individuals perceive to be the benefits to vaccination and the barriers to becoming vaccinated. Most studies on the implementation and success of vaccination programs have focused on adolescent girls. Although current ACIP recommendations specify routine vaccinations for both boys and girls, little research has been conducted on vaccination rates of young men and their perceptions of the benefits and barriers associated with this preventive procedure. This information is critical, because vaccination could drastically reduce the occurrence of anogenital warts in men, decrease the potential for associated cancers, and mitigate the risk of transmitting the virus to intimate sexual partners. The purpose of this study was to determine men's knowledge of HPV, perceived risk of becoming infected with HPV, and intent to obtain the HPV vaccination, in order to inform public policy and develop appropriate intervention measures.

Methods

Male students at a large public university in the Midwestern United States were asked to complete a 31-item survey which collected demographic data and assessed knowledge of HPV, HPV vaccination status, perceived risk of HPV infection, and intent to obtain HPV vaccination. The survey was distributed via email to males who were 18 or older. Descriptive statistics were used to analyze the results and determine correlation between variables. Study procedures were approved by the University Institutional Review Board.

Results

Participants

Demographic data are presented in Table 1. Although 367 graduate and undergraduate students responded to the survey, not all respondents answered all questions. Consequently, there

is a very slight discrepancy in total *n* sizes for some results. Over half of respondents were seniors or graduate students, while the remainder were equally represented among first, second, and third year undergraduates. Eighty percent of respondents were Caucasian, which is reflective of the regional demographic.

Table 1. Demographic Characteristics of Male University Students: Perceived Benefits and Barriers to HPV Vaccination

Variable	*(n)*	*(%)*	
Age		**361**	**100**
18		16	4.4
19		55	15.2
20		40	11.0
21		45	12.4
22		40	11.0
23		31	8.6
24		23	6.4
Older than 24		111	31.0
Year in School	**360**		
Freshman		60	17.0
Sophomore		61	17.0
Junior		69	19.0
Senior		88	24.0
Graduate Student		82	23.0
Race		**359**	
Caucasian/White		288	80.0
African American		16	4.0
Hispanic or Latino		9	3.0
Asian or Pacific Islander		26	7.0
American Indian/Alaskan Native/Native American	2	1.0	
Biracial/Multicultural		5	1.0
Other		13	4.0

Awareness of the HPV Vaccination

Initially, participants were asked whether they were aware of the HPV vaccination. Results are presented in Table 2. Of 326 respondents, 176 (54%) indicated they were aware and 150 (46%) indicated they were unaware the vaccine was available for males. Forty eight percent (n = 159) indicated they had been unaware of HPV vaccinations at all before participating in the survey. The remaining respondents indicated learning about the HPV vaccination from physician visits (10%), university courses (5%), high school courses (5%), friends, family and/or peers (7%), and Media (18%). Those who chose 'Other' as a source listed radio, internet searches, medical careers, and military service as sources of information.

Table 2. Awareness of HPV Vaccinations in Male University Student Respondents

Awareness of HPV Vaccinations	Male University Students	
	n	%
Yes	176	54%
No	150	46%
Total	326	100%

Vaccination level of participants

Students were also asked whether they had received the HPV vaccination and, if so, how many doses they had received. Results indicated that only 28 (9%) of respondents had received all three doses of the HPV vaccination and 18(6%) had received partial doses. The majority (86%) had not received the vaccination.

Perceived benefits of the HPV vaccination

Likert type questions were used to assess what respondents perceived as benefits to receiving the HPV vaccination. Participants were asked to select responses ranging from "Strongly Agree" to "Strongly Disagree." Results are presented in Table 3. A total of 146 participants (45%) agreed and 103 (32%) strongly agreed that a benefit to becoming vaccinated is that it protects them and their sexual partners from HPV. In addition, 41% of participants (n =131) agreed and 20% (n=66) strongly agreed that becoming vaccinated protects them against certain cancers linked to HPV.

Table 3. Perceived benefits of HPV vaccinations among male university students: Frequency Distributions and Percentages

Statement	SD	D	Unsure	A	SA	Total
	(*n*) %		(*n*) %	(*n*) %	(*n*) %	(*n*) %
HPV vaccinations beneficial for males	13(4)	6(2)	91(28)	136(41)	84(25)	330(100)
Vaccination protects me/sexual partners	10(3)	7(2)	58(18)	146(45)	103(32)	324(100)
Protects me against HPV related cancers	12(4)	15(5)	99(30)	134(41)	66(20)	326(100)
Don't perceive any vaccination benefits	92(28)	144(44)	71(22)	10(3)	9(3)	326(100)
HPV vaccinations only benefit females	76(23)	123(38)	101(31)	6(18)	6(2)	324(100)

Perceived barriers to becoming vaccinated for HPV

Respondents were then asked what they perceived to be barriers to becoming vaccinated for HPV. Results are presented in Table 4. Participants were asked to select all responses they felt applied to them. The overwhelming majority of responses indicated that the young men either did not see themselves at risk (45%) or did not know that the HPV vaccine existed (47%). Respondents also selected lack of insurance (8%), minimal insurance (11%), perceived cost of the vaccine (11%), or concern about side effects (14%). Eighteen percent of respondents chose 'Other,' listing time constraints, monogamy, age, celibacy, marriage, and laziness as reasons for not being vaccinated.

Table 4. Perceived Barriers to HPV Vaccination in Male University Students

Barrier	*n*	% of Respondents
I do not see myself at risk	121	**45**
I was not aware a vaccine existed	126	**47**
Lack of insuranc**e**	21	8
Minimal insurance coverage	29	11
Cost of vaccination	30	11
Concerned about side effects	38	**14**
Other	49	18

**Other: *Time constraints, older than recommended age, not sexually active, monogamous, married, gay, too lazy, have not thought about it.*

Knowledge of HPV and HPV vaccine awareness

This study also assessed whether respondents' knowledge of HPV was related to awareness of the HPV vaccination. Participants responded to questions on basic knowledge of HPV and were then asked to indicate whether or not they were currently aware of HPV vaccinations. Levene's Test for Equality of Variances was used to determine differences in basic HPV knowledge between those who were aware of the HPV vaccination and those who were not. Those who indicated they were aware of HPV vaccinations scored a mean of 4.87 correct responses on the knowledge based questions. Those who indicated they were not previously aware of HPV vaccinations scored a mean of 3.71 correct responses on the knowledge based questions. Results indicated a significant difference in knowledge of HPV and awareness of HPV vaccinations. The standard deviation for individuals who were aware of HPV was 1.4 and 1.58 for those unaware of HPV ($t(303) = 6.785$, $p < .05$). Those who indicated they were aware of the HPV vaccination did score higher on the knowledge based questions. Results are presented in Table 5.

Table 5. Relationship of HPV Knowledge to HPV Vaccine Awareness in Male University Students

Respondents	***n***	***Mean***	***St. Dev.***	***T***	***Sig***		
Aware of HPV Vaccinations	**176**	**4.87**		**1.4**		**6.785**	**.05**
Unaware of Vaccinations		**150**	**3.71**	**1.58**	**6.785**		

Perceived risk of HPV infection

Participants also responded to 5 *Likert* type questions which assessed their perceived risk of becoming infected with HPV. Responses were measured on a 5-point scale ranging from Strongly Disagree to Strongly Agree. Results indicated that over 73% of respondents either strongly agreed (19%) or agreed (54%) that, as university students, they were part of a population at high risk for HPV. Close to 90% either strongly agreed (39%) or agreed (49%) that engaging in unprotected sex put them at risk for contacting HPV. In addition, nearly half either strongly disagreed (9%) or disagreed (40%) that engaging in protected sex did not put them at risk for contracting HPV. These results indicate that many male university students believe that they and their peers are at risk for HPV and are aware of the relative risks of engaging in unprotected and protected sex. Results are presented in Table 6.

Table 6. Perceived risk of HPV in Male University Students: Frequency Distribution (*n*) and Percentages (%)

Statement	SD (*n*) %	D (*n*) %	Unsure (*n*) %	A (*n*) %	SA (*n*) %	Total (*n*) %
If Vaccinated I am **not** at risk (for HPV)	30(10)	98(32)	115(37)	55(18)	9(3)	307(100)
As a U student I am in a group at high risk for HPV	15(5)	15(5)	54(17)	167(54)	60(19)	310(100)
If I engage in unprotected sex I am at risk for HPV	5(2)	5(2)	27(9)	152(49)	119(39)	308(100)
If I am not vaccinated I am at risk for HPV	14(5)	20(7)	52(17)	153(50)	64(21)	303(100)
If I engage in protected sex I am **not** at risk for HPV	28(9)	123(40)	96(31)	50(16)	10(3)	307(100)
If I or partner use condom that will protect against HPV	22(7)	92(30)	103(34)	76(25)	10(3)	303(100)

Intent to become vaccinated

The concluding questions examined whether respondents intended to become vaccinated against HPV. Those who indicated they had not been vaccinated were asked to respond to these questions. Of the 282 respondents, 67% answered that they were not likely (35%) to become vaccinated or unsure about becoming vaccinated (32%). When asked about becoming vaccinated in the near future, 65% indicated that they did not plan to become vaccinated. The remainder indicated that they planned on obtaining the vaccination within three months (5%), six months (6%), or a year (24%). These results indicate that the majority of respondents who were not previously vaccinated do not intend to becoming vaccinated for HPV. Results are presented in Table 7.

Table 7. Perceived Intent to Obtain HPV Vaccination among Male University Students: Frequency Distributions (*n*) and Percentages (%)

Statement	Response	n	%
How hesitant are you to become vaccinated?			
	Not hesitant:	90	32%
	Somewhat hesitant:	55	19%
	Unsure:	91	32%
	Hesitant:	33	12%
	Very hesitant:	14	5%
How likely are you to obtain the HPV vaccination?			
	Not likely:	100	35%
	Somewhat likely:	47	17%
	Unsure:	90	32%
	Very likely:	25	9%
	Certain in the near future:	20	7%
I plan on becoming vaccinated:			

Within 3 months:	15	5%
Within 6 months:	17	6%
Within a year:	67	24%
I do not plan on becoming vaccinated:	183	65%

Discussion

This study was designed to supplement current public health information on uptake of the HPV Vaccine, focusing on young male university students. Many respondents had little knowledge of HPV infections and HPV vaccinations. The majority were not vaccinated against HPV and were not aware that a vaccination was available and recommended for males. Respondents who indicated awareness of the HPV vaccine demonstrated significantly higher levels of basic knowledge related to HPV. Although most respondents agreed that university students were at high risk for HPV, nearly half did not perceive themselves to be at risk. Close to 90% of participants agreed that unprotected sex put students at risk for HPV, and that vaccinations reduced this risk. Nonetheless, of the 85% who were not vaccinated, 65% indicated that they did not intend to become vaccinated.

These results suggest that, even though the HPV vaccine is available and recommended for young boys and men, increased educational efforts are needed to encourage vaccination in this priority population. As indicated by responses from these subjects, knowledge of the virus as well as the vaccination may be lacking or distorted. In addition, though young men may be aware that they are in a high risk population, many do not perceive themselves to personally be at risk. Because health beliefs can have a significant impact on health behaviors (Rosenstock, Strecher and Becker 1984; Lau, Quadrel, and Hartman, 1990) this lack of knowledge may hamper public health efforts to encourage vaccination.

Though it may be difficult to generalize from this study due to the relatively small sample size, some implications for public health practice can be suggested. Because many adolescents and young men, as well as their parents, have little knowledge about the HPV vaccine and its potential benefits, their decisions may be influenced by flawed or false information. HPV rates are highest among adults between the ages of 18 and 28, so it is important to investigate what specific strategies might encourage acceptance of the vaccine in this high-risk population (McPartland, Weaver, Shu-Kuang, & Koutsky, 2005). Those involved in public health and healthcare, as well as family members, can be influential in promoting HPV education and vaccine adoption. One of the most significant predictors of HPV vaccination in a clinical setting is the recommendation of a health care provider (Dorell, Yankey, Kennedy, and Stokley, 2013).

Other variables may also impact knowledge, attitudes and behaviors related to HPV awareness and vaccine access. These variables include social and economic conditions as well as behavioral norms and cultural constraints. Creative, innovative, and target-specific communication strategies are needed to address the barriers that impact vaccine acceptance and adoption in specific priority populations. These strategies will be most effective if formative research addresses social, cultural, ethnic, and economic barriers as well as the variable of gendered knowledge and compliance with vaccine recommendations.

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