

HPV Knowledge and Vaccine Acceptance in an Uninsured Hispanic Population in Providence, RI

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ABSTRACT

The Food and Drug Administration has approved two human papillomavirus (HPV) vaccines for use by men and women in the United States. The vaccines not only protect against HPV infection, but also reduce the risk of cervical cancer in women. Despite the widespread availability of these vaccines, vulnerable populations such as those with low incomes have been reported to have limited access to and knowledge about HPV vaccines. In order to evaluate and improve HPV vaccination uptake in a population of uninsured, low-income Spanish-speaking individuals attending a free clinic in Rhode Island, we administered a questionnaire regarding knowledge, attitudes, and practices (KAP) and performed an education intervention. We found that knowledge of HPV infection and cervical cancer among the patients sampled was low when comparing Hispanics to non-Hispanics (47.2%, 85.7%, respectively) but willingness to vaccinate oneself or one's child was very high after a brief video-based intervention.

KEYWORDS: HPV, HPV vaccine, Hispanic, Uninsured, Free Clinic

INTRODUCTION

HPV is the most common sexually transmitted infection (STI) in the United States (US).¹ Lifetime risk of acquiring at least one HPV strain is above 50% in sexually active individuals. More than 100 strains of HPV have been identified, 40 of which can infect the genital region, thereby causing genital warts and malignancies such as cervical cancer. In the US, an estimated 26,000 cancers are attributed to HPV, and of these, 18,000 occur in women, most commonly as cervical cancers, but also as cancer of the anus, vulva, oropharynx, and vagina; the remaining 8,000 cases occur in men as oropharyngeal, anal, and penile cancers.² Often, HPV-infected cells are shed within one to two years of onset of infection, thus minimizing the rate of cancer conversion. In 10% of cases, however, the infection can reach the basal layer of cervical tissue and become precancerous or malignant.³

Seventy percent of cervical cancer cases are caused by two strains of HPV: Types 16 and 18.¹ In 2006 and 2009, the Food and Drug Administration approved two highly-effective prophylactic vaccines for females aged nine to twenty-six or nine

to twenty-five: Gardasil (Merck) and Cervarix (GlaxoSmith-Kline), respectively. Both vaccines protect against types 16 and 18, but Gardasil, which also received FDA approval for use in males ages nine to twenty-six, also protects against HPV types 6 and 11, the cause of over 90% of genital warts.

The practice of HPV vaccination has significantly reduced the prevalence of HPV infection in the United States. In a study taking place between 2003 and 2010, the incidence of infection among young women, aged 14-19 years old, decreased by 56% from 477 infections in 2003-2006 to 217 infections in 2007-2010.⁴ While vaccination is critical in preventing the spread of disease, vaccines can only be effective if accepted and easily available to the population at risk of acquiring disease. One impediment to vaccine uptake is lack of knowledge. Currently, members of at-risk populations (individuals from impoverished and underserved communities) often report low awareness regarding the widespread availability of the HPV vaccine.⁵

In this study, we evaluated the gaps in knowledge of HPV vaccination among low-income, uninsured, and a predominantly Hispanic patient population at a free clinic in Rhode Island through a questionnaire and administered a brief video intervention. The purpose of the questionnaire was to evaluate their knowledge of HPV, HPV vaccination, and cervical cancer and their related attitudes and practices, while the intervention was designed to improve patient health literacy on HPV and inform them of vaccine availability. We found that self-identified Hispanics in our study reported lower rates of STIs, less knowledge of HPV and its link to cervical cancer, and equal willingness to be vaccinated or to vaccinate their children, as compared to non-Hispanic individuals who participated in this study. In addition, we identified a high rate of autonomy with regard to vaccination among all participants who were eligible for vaccination.

METHODS

Study Population

One hundred participants over the age of 17 were recruited between May 2012 and June 2013 from Clinica Esperanza/Hope Clinic (CEHC), a free, urban primary care clinic in Providence, RI. In addition to the primary care clinic, CEHC operates a free walk-in clinic to unaffiliated patients from the surrounding community. CEHC serves a predominantly Hispanic cohort of 2,000 low-income patients, all of whom

are uninsured and most of whom do not speak English as their first language. Seventy-nine percent of CEHC patients are Central and South American immigrants, and 80% of patients at CEHC report having an annual household income of less than \$25,000. During the study period, the CEHC population was 67% Hispanic, slightly less than 10% Non-Hispanic White, 8% African American and 67% female.

Study Design

This study protocol was approved by the University of Rhode Island Institutional Review Board. Over a 13-month period, survey administrators (JC, FK, ML, and MR) approached CEHC patients in the clinic's waiting room. These patients were either continuing-care patients or walk-in clients. Patients were recruited at random, and provided either written or verbal informed consent in their preferred language (Spanish or English). Participants anonymously completed an online (computer-based) or paper-based version of the survey in their preferred language in one of the clinic's private rooms. Participants watched a video about HPV and HPV vaccines in English or Spanish midway through the interview. The two-part survey included pre- and post-intervention sections separated by an educational video.

The pre-intervention survey ascertained information regarding participant demographics, sexual history, gynecological history, and incidence and knowledge of STIs, including HPV. Immediately following their completion of the pre-intervention section of the survey, participants viewed a video about HPV and cervical cancer. After watching the brief video ("Cervical Cancer: What is Human Papilloma Virus? (HPV)" by HealthiNation [English] or "Vacuna contra el VPH" by Leopoldo Vasquez Matute [Spanish]), regarding HPV and cervical cancer, study participants completed the post-intervention section of the survey, which addressed the study participants' knowledge of the HPV virus and of cervical cancer. Study participants were also asked if they had previously been vaccinated against any diseases, including HPV, and their attitude and willingness to vaccinate against HPV. After completing the survey, study participants were given a \$10 grocery gift card and (for those participants who were eligible for vaccination), the option to file an application for a free Gardasil vaccine.

Statistical Methods

Descriptive statistics were calculated for all relevant variables. Differences in means between groups were tested using two-tailed t-tests assuming equal variance between two independent samples (significant values are indicated in the data tables with bold font and underline). Study coordinators also used chi square and Fisher's exact test to test for differences in proportions when applicable. The data were analyzed with IBM SPSS Statistics v22.

RESULTS

Demographic Characteristics of the Participants

As shown in Table 1, a greater number of women than men participated in this research study (66% female, 34% male). Thirty-one percent of participants reported their race to be White, 7% Black/African American, 3% Asian, 2% Native Hawaiian/other Pacific Islander, and 57% Other; 73% reported their ethnicity (separate from race) as being Hispanic. The mean age of participants was 39.6 years ($SD = 13.4$). Of the 90% of individuals who reported information regarding their level of education, 73% of participants reported having completed at least high school. This population did not differ significantly from the overall clinic population.

Gynecological Health Information, Knowledge, and Practices

The survey also contained information regarding age of first

Table 1. Demographic and sexual history characteristics

	Total (N = 100)	Female (N = 66)	Male (N = 34)	Hispanic (N = 72)	Non-Hispanic (N = 28)
Age (Mean Years \pm SD)	39.6 \pm 13.4	39.2 \pm 13.5	40.4 \pm 13.3	40.2 \pm 12.9	38.0 \pm 14.8
Marital Status (%) Married)	27.0%	24.0%	32.4%	27.8%	25.0%
Highest Education					
Any Education	90.0%	93.9%	82.4%	88.9%	92.9%
Completed High School	56.2%	51.6%	64.3%	60.3%	46.2%
Some College	10.1%	11.3%	7.1%	9.5%	11.5%
Completed College	31.5%	33.9%	25.0%	28.6%	38.5%
Completed Graduate School	2.2%	1.6%	3.6%	1.6%	3.9%
Sexual Debut					
No Sexual Relations	8.0%	9.2%	6.1%	5.7%	14.3%
Age of Sexual Debut (Mean Years \pm SD)*	18.6 \pm 3.9	19.1 \pm 4.0 (59)	17.7 \pm 3.2	18.7 \pm 3.9	18.9 \pm 3.6 (24)
< 15 Years*	5.6%	3.4%	9.7%	7.6%	0.0%
Between 15 and 18 Years*	55.5%	54.2%	58.1%	53.0%	62.5%
> 18 Years*	38.9%	42.4%	32.4%	39.4%	37.5%
(Lifetime) Sexual Partners (Number \pm SD)*	4.2 \pm 3.7	3.3 \pm 2.7	6.1 \pm 4.4	3.6 \pm 2.8	5.5 \pm 4.8
Ever Experienced Forced Sexual Relations*	9.0%	13.6%	0.0%	5.6%	17.9%
Ever Exchanged Sex for Something	4.0%	6.1%	0.0%	5.6%	0.0%
Money**	50.0%	50.0%	0.0%	50.0%	0.0%
Food**	25.0%	25.0%	0.0%	25.0%	0.0%
Other**	25.0%	25.0%	0.0%	25.0%	0.0%

Note: Number of respondents for questions with response rates below 90% is reported in parentheses next to the corresponding value. *Of those who reported any sexual relations. **Of those who reported ever exchanging sex for something.

menstruation, first gynecological examination, and general knowledge of Pap smears (Pap tests). The average age of first menstruation was reported as 12.9 years ($SD = 1.7$). Of the 51 women who reported having had a gynecological exam, the average age for their first Pap smear was 24.9 years ($SD = 8.4$). Twelve of the female participants (19.1%) of those who answered this question reported never having been to or having seen a gynecologist, their ages ranging from 20 to 51 years. Nearly 10% of female survey respondents reported that they did not know what a Pap test was. There were no differences between Hispanic and non-Hispanic participants for any of these topics.

Knowledge of Sexually Transmitted Infections, HPV, and Cervical Cancer

As shown in Table 2, 87% of participants reported knowledge of sexually transmitted infections (STIs), while 77% reported an understanding of how to protect against such infections. A greater percentage (29.2%) of Hispanics was not aware of measures that could be taken to protect against STIs as compared to non-Hispanics (7.2%). With respect to their knowledge of where to test for STIs, 64% of participants knew where to get an STI exam. Among the 64%, a greater number of females and a greater number of non-Hispanics compared to Hispanics knew where to receive testing (75.4% females, 44.1% males; and 54.9% Hispanics, 89.3% non-Hispanics). When female participants were asked if they knew where to receive cervical cancer screening, 25.8% responded that they did not know where to receive this test. In addition, 31.8% of respondents indicated never having been screened for the disease.

When participants were asked to describe their knowledge of HPV, a greater proportion of Hispanics than non-Hispanics

Table 2. Knowledge regarding STIs, safe sex practices, HPV, and cervical cancer

	Total (N = 100)	Female (N = 66)	Male (N = 34)	Hispanic (N = 72)	Non-Hispanic (N = 28)
Sexually Transmitted Infections (STI)					
Knows what an STI is	87.0%	89.4%	82.4%	87.5%	85.7%
Knows how to protect against an STI	77.0%	78.8%	73.5%	70.8%	92.9%
Knows where to get an STI exam	64.0%	75.4%	44.1%	54.9%	89.3%
Has had an STI	8.0%	7.8%	9.1%	4.4%	17.9%
Don't know	12.0%	10.9%	15.2%	17.4%	0.0%
Safe Sex Practices					
Uses protection during sex	51.0%	50.0%	65.6%	56.7%	52.0% (25)
Knows what "contraception" means	85.0%	93.6%	79.4%	84.5%	92.6%
Have spoken to, or plans to speak to children about safe sex (N = answered)	49.0%	84.6% (39)	72.7% (22)	76.6% (47)	92.9% (14)
Human Papillomavirus (HPV)					
Knows HPV is an STI	58.0%	62.1%	50.0%	47.2%	85.7%
Knows that HPV can affect					
Women	86.0%	95.1%	84.9%	91.0%	92.6%
Men	74.0%	82.3% (55)	83.9%	83.6% (61)	92.0% (25)
Adolescent girls	73.0%	90.9% (55)	79.3% (29)	88.7% (62)	81.8% (22)
Adolescent boys	63.0%	80.4% (51)	78.6% (28)	81.0% (58)	76.2% (21)
Cervical Cancer					
Knows HPV can cause cervical cancer	81.0%	81.8%	79.4%	83.3%	75.0%
Don't know	16.0%	13.6%	20.6%	16.7%	14.3%
Knows cervical cancer can cause death in women	78.0%	78.5%	79.4%	80.3%	75.0%
Don't know	20.0%	12.3%	17.7%	15.5%	10.7%
Knows where to get tested for cervical cancer	62.0%	74.2%	38.3%	56.9%	75.0%
Has been tested for cervical cancer*	--	68.2%	--	68.8% (48)	66.7% (18)

Note: Number of respondents for questions with response rates below 90% is reported in parentheses next to the corresponding value. *Among female participants.

Table 3. Attitudes toward and decision-making regarding the HPV vaccine

	Total (N = 100)	Female (N = 66)	Male (N = 34)	Hispanic (N = 72)	Non-Hispanic (N = 28)
Ever received a vaccination					
Willing to receive HPV vaccine	93.2% (73)	89.8% (49)	91.7% (24)	90.4% (52)	90.5% (21)
Willing to vaccinate child(ren) against HPV	97.3% (75)	96.1% (51)	100% (24)	96.4% (55)	100% (20)
Preferred contact method to receive information about vaccination appointments					
Phone Call	69.0%	69.7%	67.7%	76.3%	50.0%
Email	17.0%	12.1%	26.5%	15.3%	21.4%
Text Message	9.0%	7.6%	11.8%	9.7%	7.1%
Letter	13.0%	12.1%	14.7%	9.7%	21.4%
Other	9.0%	13.6%	0.0%	6.9%	14.3%
HPV Vaccination Decision-Making					
Would decide autonomously to receive vaccine	96.0%	97.0%	94.1%	97.2%	96.4%
Would decide autonomously to vaccinate child(ren)	78.0%	78.8%	76.5%	76.4%	82.1%

Note: Number of respondents for questions with response rates below 90% is reported in parentheses next to the corresponding value.

were unaware of HPV (62.8% vs. 14.3%, respectively). While 24.3% of Hispanics reported knowing one or more causes of cervical cancer, 53.6% of non-Hispanics specified knowing one or more causes of cervical cancer.

Risk Factors for Sexually Transmitted Infections

Ninety percent of study participants reported being sexually active, with about 20% of participants having six or more sexual partners since their first sexual encounter. Of these 90 sexually active participants, 51% reported using a method of contraception during sexual activity (50% females, 65.6% males). Only eight individuals reported having been infected with an STI and 12 participants were not aware of whether or not they have ever been infected with an STI. There were no statistical differences between men, women, Hispanic, and non-Hispanic participants for any of these topics.

This study also sought to evaluate participants' attitudes toward discussing safe sexual practices with their children. Forty-nine percent of participants indicated they have previously spoken with their children, or are planning to do so. Fewer Hispanics (76.6%) than non-Hispanics (92.3%) reported having plans to speak with their children about STIs.

Willingness and Autonomy Associated with Vaccination against HPV

As seen in Table 3, 48% of study participants reported having been previously vaccinated against a variety of diseases such as hepatitis, flu, tetanus, and varicella. Of the 73 individuals who responded during the post-intervention portion of the survey concerning HPV vaccination, 68 (93%) expressed a willingness to receive the HPV vaccine. Hispanic and Non-Hispanic participants were equally willing to be vaccinated (>90%, both groups).

Since many of the study participants were older than the appropriate age for HPV vaccination, study participants were also asked if they would be willing to vaccinate their children against HPV; 97.3% (100% male, 96.1% female) indicated they would be agreeable to vaccinating their children against the disease. Nearly all study participants (96%) indicated they would autonomously decide whether to receive the HPV vaccine. The same study participants noted that, with respect to their children, 22% would allow their children to make the decision autonomously.

DISCUSSION

When compared to the non-Hispanic study participants in this survey and intervention, Hispanics reported a lower incidence of knowledge of HPV, causes of cervical cancer, locations for STI testing, and methods for protection against these infections. This is consistent with published studies and reflects a need for increased education of low-income Hispanics, particularly since they are at increased risk for cervical cancer.^{2,5} Also consistent with the published literature regarding cervical cancer, Pap testing, HPV, and the association between HPV and cervical cancer among patients of Hispanic origin, we confirmed that Hispanic study participants had more limited knowledge of HPV and cervical cancer than non-Hispanics.⁶ Hispanic survey participants were also less likely to know where to get tested for cervical cancer.

Possible explanations for this lack of awareness and for lack of Pap screening for some members of our population include limited access to healthcare, due to lack of insurance and under-utilization of preventative care services.⁷ In addition, lack of HPV and cervical cancer awareness may be attributed to cultural norms that have been reported to limit the exchange of information about sexual health topics between Hispanic individuals, their families, their peers, and their healthcare providers.⁸ In our study, Hispanics reported they were less likely than non-Hispanics to discuss STIs with their children. Research suggests Hispanics are more likely to experience fear, anxiety, and stigma when discussing sexual health topics.^{6,9} These fears, in addition to other more commonly reported factors such as access to health care, may contribute to the increased incidence of later-stage diagnosis of cervical cancer, and therefore, higher mortality rates in Hispanic women.²

FUTURE DIRECTIONS

We found important deficiencies in knowledge of HPV and its link to cervical cancer among Hispanic patients attending our free clinic for uninsured patients, and limited knowledge about sites where STI and pap testing could be performed. In order to address this disparity, we believe that it will be important to encourage healthcare providers, locally and nationally, to encourage providers serving predominantly Hispanic populations to discuss HPV and cancer risk, reinforce the need for Pap tests, and recommend HPV vaccination for eligible patients. It is notable that fully 14.2% of adolescent health providers fail to recommend the HPV vaccine to adolescent girls despite administering other vaccinations.¹⁰ Studies have also shown a positive correlation between provider encouragement and vaccine acceptance in Hispanics and other ethnic minorities.^{11,12,13}

Thus, in addition to determining whether populations of patients are aware of and interested in receiving the HPV vaccine, in future studies, we will examine whether healthcare providers for low-income, uninsured populations require additional education pertaining to HPV and its linkage to cervical cancer. Since we already provide access to gynecological exams and Pap and HPV screening at our clinic, recommending the vaccine to members of the Hispanic community who qualify for vaccination is an important intervention that is likely to have a significant impact on cervical cancer outcomes in this at-risk population.

In order to improve HPV vaccination uptake, we plan to implement two means of improving access: patient education and provider reinforcement (a "push-pull" intervention). In addition, CEHC will continue to provide free access to Pap smears and free vaccinations to eligible patients who are interested in the HPV vaccine. These methods are consistent with our overall approach to improving health care outcomes in the uninsured, predominantly Spanish-speaking populations that we serve.^{14,15,16} We look forward to

redressing the knowledge, attitudes, and practices problems related to HPV vaccination and sexual health that were identified in the course of this survey.

Acknowledgements

We are grateful to the University of Rhode Island Undergraduate Research Initiative Grant and the Blue Cross and Blue Shield Association for providing funding/donations for the provision of participant incentives. We are also thankful to our funders, donors, and in-kind supporters (RI Department of Health, City of Providence, Blue Cross Blue Shield Rhode Island, BankRI, Rhode Island Foundation, Lifespan, and American Communities Trust) for assisting our volunteers with improving access to healthcare for uninsured Rhode Islanders.

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Disclosures

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