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Awareness and Knowledge about Human Papillomavirus among Latina Immigrants

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Abstract

Objective—Few studies have examined associations with the public's awareness and knowledge of the human papillomavirus (HPV) among Latina immigrants. The primary purpose of this study was to assess HPV awareness and knowledge, while examining demographic and healthcare utilization associations.

Methods—From 2007–2009 as part of a larger randomized control trial, 543 Latina immigrants living in Birmingham, Alabama completed an interviewer-administered questionnaire.

Results—Only 47% of the participants were aware of HPV. Women aged 40–50 years were more likely to be aware of HPV than women 19 to 29 (odds ratio [OR] 2.54; 95% confidence interval [CI] 1.34, 4.78). Having a Pap smear in the past year was associated with awareness (OR 1.82; 95% CI 1.14, 2.90). Among those aware of HPV, the mean knowledge score was 7.5 out of 11. Deficiencies in knowledge were noted for vaccinations, genital warts, and the clearing of HPV without treatment. Multivariable analysis found a Pap smear in the past year (OR 4.10; 95% CI 1.93, 8.69), and number of HPV information sources (OR 1.38; 95% CI 1.09, 1.75) significantly associated with higher knowledge. Also, women aged 30 to 39 years and 40 to 50 were more likely to have higher HPV knowledge than those 19 to 29 (OR 2.64; 95% CI 1.35, 5.17 and OR 4.46; 95% CI 1.53, 12.98, respectively).

Conclusions—Less than half of the participants were aware of HPV. However, among those aware, knowledge scores were high. Age and having a Pap smear within the last year were associated with HPV awareness and knowledge.

Keywords

Human Papillomavirus (HPV); Cervical Cancer; Pap Smear; Latina Immigrants

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Introduction

Since the 1980s human papillomavirus (HPV) has been documented as the most common sexually transmitted infection in the world.[1-3] Infection estimates for sexually active women range from 20 to 80 percent, with over 6 million new infections annually and at least 90% of cervical carcinogenesis linked to HPV infection.[4,5] In spite of risk estimates for infection among sexually active women being upwards of 70% over a lifespan,[4,6] the public's awareness and understanding about HPV remains low.[7,8] The burden of infection coupled with the potential curability of cervical cancer, impel public health efforts to increase awareness and prevention.[9]

In a systematic review of 39 studies between 1992 and 2006, Klug et al found variation in HPV awareness scores from 13% to 93%. The knowledge scores were equally inconsistent with 5% to 42% of individuals understanding the association with genital warts.[10] More recent studies have seen increases in previous low levels of awareness with scores between 58% and 75%.[1] These recent increases in public awareness may be related to HPV advertising and mass communication campaigns.[1,11] While numerous studies have conducted population-based studies of HPV awareness and knowledge,[4,8,9,12-14] virtually no research has been done exclusively with Latina immigrants.

Latinas recently emerged as part of the largest racial ethnic minority population in the United States - a trend that is expected to continue well into the future. During the previous decade the southeastern United States experienced one of the highest growth rates for Latinos in the country, and Alabama had one of the fastest rates of Hispanic growth in this region.[15] Since the 1990s the size of this population in Alabama has more than tripled.[16]

Latinas residing in the United States have a 1.8 greater risk for developing cervical cancer than Whites. In 2009, the American Cancer Society found the probability of a Latina developing cancer of the uterine cervix was 1.16 (1 in 86) compared to almost half that probability in the general female population or 0.69 (1 in 145).[17-18]

Previous studies have documented higher rates of cervical cancer in Latina immigrants,[5] and higher mortality in Latin America.[19-24] Rates of cervical cancer in Latin America are more than four times what they are in the United States.[25] These findings indicate that newly arrived Latina immigrants may be at higher risk for cervical cancer. Of importance to this study are the documented higher rates of cervical cancer in the foreign-born Latina immigrant populations as compared to US-born Latinas.[26]

Moreover, Tortolero-Luna et al found Latinas two times more likely than African American women, and five times more likely than Whites, to display an association between HPV and high-grade squamous intraepithelial lesions.[27] Latinas found positive for HPV 16 and 18 displayed a 10-fold higher risk for high-grade squamous intraepithelial lesion than White women.[27]

Latina immigrants' risks increase due to potentially higher rates of HPV in their birth countries. In spite of a lower behavioral risk profile, Giuliano et al found Mexican immigrants to be significantly more likely to have an HPV infection than non-Latina Whites.[25] One of the first health promotion strategies for the reduction of HPV and subsequent cervical neoplasms in this vulnerable population is to enhance levels of awareness and knowledge.[20] Recent advances in screening and vaccination will not be effective unless health communication is extended to meet the needs of Latina immigrants and their families.[11,22] This article assesses Latina immigrants' HPV awareness and knowledge while determining potential associations to these measures with demographic and healthcare utilization variables.

Methods

Participants

This study took place between 2007 and 2009 as part of a larger group randomized controlled trial to evaluate the efficacy of a theory-based and culturally-relevant intervention focusing on primary (sexual risk reduction) and secondary (Pap smear) prevention of cervical cancer among Latina immigrants. Place of residence was the unit of randomization, and participants were approached at their homes, trailers, or apartments by trained recruiters. Upon meeting the inclusion criteria, and giving consent, interviewers administered the baseline questionnaire. Then, participants were randomized to intervention or control groups. The inclusion criteria included women aged 19 to 50 years, self-identified as Latina/Hispanic, immigrant, having had sexual intercourse in the past three months, currently having a partner, and having no personal history of cervical cancer.

Measures

Most of questions were developed directly in Spanish, and only translated into English for review by the Institutional Review Board. Participants were asked whether they had heard about HPV, specific questions related to infection, and responses were then compared for associations with other relevant independent variables outlined below.

Demographic Information—We collected data on age, education, years residing in the United States, and monthly household income. Age and time in the United States were first measured as continuous variables and then categorized for logistic regression analyses. Age was categorized in 10-year intervals and time in the United States was categorized into quartiles (Table 1).

Access to Health Care—Questions included health insurance coverage and usual source of health care in the United States. Public clinic (eg, health department, county hospital) and federally-funded clinics were grouped as one variable in the analysis. Emergency room was another variable and responses listing more than one source of care were listed as multiple sources. Attending a private clinic or hospital was another variable included in the analysis.

Pap Smear Frequency—Participants were asked the length of time since last Pap smear and whether this was done as part of a routine exam, related to follow-up for a condition, or other category.

Experience with Cancer—Participants were asked if they knew someone close who had survived cancer or knew of someone close to them who had died from cancer.

HPV Awareness—Participants were asked if they had ever heard of HPV. Possible responses to this question were yes, no, or don't know/not sure. For the purpose of these analyses HPV awareness was dichotomized into yes and no/don't know/not sure. Only those who responded positively for having heard of HPV were asked to complete the knowledge-related questions.

HPV Knowledge—Those participants that were aware of HPV were asked 11 true/false knowledge items regarding HPV prevalence, symptoms, complications, and prevention. For example, one of the statements was: "HPV can cause cervical cancer in women" (Table 2). Respondents were assessed for correctly answered true/false questions. We created a summary score with a point awarded for each correct answer. "Do not know" answers were assigned a score of 0. Therefore, women could score from 0 to 11; 0 if they did not answer any statements correctly and 11 if they answered all statements correctly. The mean HPV

knowledge score was 7.52 out of 11 (SD=1.94). We then dichotomized the score to facilitate analyses. Those who had a total score from 0 to 6 were categorized as having a low HPV knowledge score and those with a total score from 7 to 11 were categorized as having a high HPV knowledge score.

Source of Information about HPV—Participants aware of HPV were then asked where they had received information about HPV and were permitted to select multiple response categories. The number and type of sources were compared with knowledge scores.

Statistical Analysis

Data were first analyzed using descriptive and bivariate analysis. Bivariate analyses were done using Pearson X^2 and *t*-test. Two separate logistic regression analyses were performed to determine the odds of HPV awareness and HPV knowledge with regard to demographic and health care related variables. Variables that had $P<.10$ in unadjusted models were included in reduced models. Significance for variables in reduced models was set at $P<.05$. All data were analyzed using SPSS (version 16, SPSS, Inc., Chicago, Ill.).

Results

Characteristics of Study Population

The analyses included 543 women. The mean age of the study population was 31 years and the average number of years of living in the United States was 6.5 years. The majority of respondents were from Mexico (88.6%) followed by Central America (7.4%), and the remainder from South America and the Caribbean (4%). Only 7% of the participants reported having health insurance. Health service utilization was varied with almost 70% attending a public clinic, 15% using private medical care center, 10% having no regular source of health care, 3% using multiple sources, and 2% utilizing an emergency room. (Table 1)

HPV Awareness

Awareness was considered relatively low with less than half the sample (47%; *n*=254) having heard of HPV. In the unadjusted analyses age, time in the United States, regular source of health care, having a Pap smear within the last year, knowing someone close who has survived or died of cancer were significantly associated with HPV awareness. After adjusted analyses, having a close relative/friend who survived cancer was no longer associated with awareness (Table 3). Respondents aged 40 to 50 years were significantly more likely to be aware of HPV than women 19 to 29 (odds ratio [OR] 2.54; 95% confidence interval [CI] 1.34, 4.78). There was a statistically significant reduction of HPV awareness with increases in time in the United States (*P* for trend ≤.05). Also, women who had a Pap smear within the last year were more likely to be aware of HPV than women without a Pap smear within the last year (OR 1.82; 95% CI 1.14, 2.90).

HPV Knowledge

HPV knowledge was assessed only among participants aware of HPV (*n*=254). In general, participants scored high on the knowledge section with at least 73% of participants answering 7 of the 11 questions correctly. However, only 39% knew that a vaccine existed to prevent various strains of HPV and only 6% were aware that the virus may clear spontaneously without treatment (Table 2). Participant sources of information about HPV were: television commercial (69%), healthcare providers (60%), newspaper/magazine (60%), family member/friend (47%), television news (54%), school (27%) and internet (11%). Usually, participants reported acquiring HPV information from more than one

source. The number of sources that participants listed was: one source 14%, two sources 20%, three sources 23%, four sources 20%, five sources 14%, six sources 7%, and seven sources 3%.

In unadjusted analyses age, having a Pap smear within the last year, reason for last Pap smear, knowing someone close who has survived cancer, number of HPV information sources, getting HPV information from health care professionals, family or friends, newspapers or magazines, and from the internet were significantly associated with HPV knowledge. However, in adjusted analyses only age, having a Pap smear within the last year, number of HPV information sources, and getting HPV information from health care professionals (marginal significance) were statistically associated with HPV knowledge (Table 3). Women receiving a Pap smear in the past year had significantly higher knowledge scores than those who had not been screened in the past year (OR 4.1; 95% CI 1.93, 8.69). Also, women aged 30 to 39 and 40 to 50 years were more likely to have higher HPV knowledge than those 19 to 29 (OR 2.64; 95% CI 1.35, 5.17 and OR 4.46; 95% CI 1.53, 12.98, respectively).

Discussion

As the literature demonstrates, relatively recent immigrant Latina populations are potentially at higher risk for both cervical cancer and HPV infection. This survey administered in Birmingham, Alabama involved a relatively recent population of Latina immigrants. Our main findings were that HPV awareness is relatively low, associated with age, inversely associated with time in the United States, and associated with frequency of Pap smear. Those Latina immigrants aware of HPV answered correctly more than half of knowledge related questions, but had low scores related to vaccination, genital warts, and the spontaneous clearance of the HPV virus. In the multivariable analysis a Pap smear in the past year, number of HPV sources, and age were significantly associated with knowledge.

Compared to recent studies assessing HPV awareness, Latina immigrants in our study had relatively low levels of awareness with only 47% responding positively to the question, “Have you heard of HPV?” When compared to the Klug et al meta-analysis awareness was low.[10,28-29] For example, Hughes et al in 2009 found awareness to be 58% across seven studies with lower scores in minorities, adolescents, and low income groups.[28] Making comparisons with studies of this kind is complicated by the fact that immigrant populations were not sampled. One 2009 cross-sectional study of Spanish-speaking females contacting the National Cancer Institute found awareness of HPV at 65%.[30]

Previous research has shown numerous conceptual differences in the categorization of HPV awareness and knowledge. Studies have measured levels of awareness,[11,31-32] accuracy of knowledge,[4,13,33,34] and combined awareness and knowledge.[6,8,9,22,35,36] Only a few studies report accuracy of knowledge in respondents only after first being prompted by an awareness-related question.[1,12,37,38] This conceptual approach allowing only respondents aware of HPV to answer knowledge-related items provides a more valid assessment of knowledge accuracy. One of the few studies that measured the awareness and knowledge variables separately in a national study of women, found no common associations with both awareness and knowledge.[38]

Among the various sociodemographic variables examined, age, length of time in United States, and education were associated with awareness. Numerous previous studies have found strong relationships between educational levels and HPV awareness scores.[9,11,22,37,38] Low levels of HPV awareness in younger immigrants and those residing in the United States

for a longer time is difficult to interpret. Delayed rates of acculturation and differences in health services between origin and destination nations may account in part for our findings.

Knowledge scores are more difficult to compare with previous research due to the paucity of studies assessing awareness and then knowledge. Several studies found slightly lower mean knowledge scores of 7.8 out of 13 and 3.5 out of 6.0.[1,37] Gerend's research found similar knowledge deficiencies regarding the lack of treatment for HPV infection and misinformation about genital warts.[1] Baer et al sampled college students and found low levels of knowledge about transmission and prevalence.[12] We found knowledge scores to be relatively high when compared to the limited number of studies utilizing this methodology.

We found having a Pap test in the past year to be significantly associated with awareness and knowledge. Similar findings in non-Latina populations were reported, finding women who "engaged in a regular Pap test schedule" having significantly higher rates of awareness,[38] and women receiving a Pap test within one year having higher knowledge scores.[13] One explanation for these associations is the positive effect that establishing a frequent and routine Pap test has by creating an opportunity to discuss HPV related issues with healthcare providers. It is also plausible that Latina immigrants who seek out frequent Pap tests are more health conscious and educate themselves about HPV. Regardless, our findings indicate that regular Pap smear visits may be an opportunity to bolster knowledge. Kahn's study with adolescents demonstrates the benefit of effective healthcare provider communication during the Pap smear visit and positive effects on women's knowledge about HPV.[39]

Significant associations were found between the source of HPV information and increased knowledge scores. Latina immigrant's number of HPV sources listed and having received HPV information from a healthcare professional were both positively associated with knowledge. These findings demonstrate relationships between the type and number of sources as potentially influencing HPV knowledge. The association with healthcare provider reinforces previous research finding clinicians as highly respected sources of health information among Latinas.[40]

A limitation was that participants self-reported so issues related to bias and subjectivity may have influenced the results. A clear strength of this study was the large and exclusively Latina immigrant sample. This is one of the first studies to provide relevant information about HPV awareness and knowledge in a state with limited previous sexually transmitted infection and cancer related research among Latina immigrants. Additionally, the multivariable analysis using awareness and knowledge as separate dependent variables provided the ability to analyze each of these separately.

Our findings indicate that our study's Latina immigrants had low levels of HPV awareness compared to recent national population-based assessments. The fact that more than half of this sample was unaware of HPV is disconcerting considering their increased risk for HPV and cervical cancer. HPV knowledge scores appeared higher than previous studies using similar methodologies. However, there were marked deficiencies in knowledge about vaccines, ability to clear without treatment, and as a causative agent for genital warts. Low levels of awareness and knowledge may influence Latina's motivation to seek out regular screenings and in the uptake of the preventive measures.

Future research should determine strategies to enhance immigrant-provider communication, access and utilization of US health systems by immigrants, and sources of health communication that invoke understanding and action. Latina immigrants face multiple challenges in preventing cervical cancer and our findings reinforce the need to advance HPV awareness and prevention measures. Given the positive associations with Pap smears and

healthcare providers as sources of information, it is apparent that they remain prominent and crucial partners in prevention efforts with Latinas. Healthcare providers should integrate primary and secondary prevention messages for cervical cancer into routine screenings for Latina immigrants. Finally, the development of culturally and linguistically appropriate health communication services to convey critical points about HPV, will improve immigrant health.

Accurately assessing HPV awareness and knowledge in often marginalized immigrant populations provides public health practitioners and clinicians alike with baseline data for culturally-relevant preventive efforts. Much of the upcoming gains in prevention depend upon the public health and medical communities' ability to tailor interventions that prevent or reduce the transmission of HPV. The exponential growth of Latina immigrants in the Deep South underscores the need to better understand the dynamics of communicating key public health messages to this population.

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Table 1

Characteristics of participants by HPV awareness (*N*=543)

	All women *N*=543	HPV awareness		
		Yes (*n*=254)	No (*n*=289)	*P*
Age	30.7 ± 6.88	31.3 ± 7.02	30.1 ± 6.72	.035*
Time in the U.S. (years)	6.5 ± 4.38	6.0 ± 4.05	6.9 ± 4.61	.016*
Education (years)	8.8 ± 3.18	9.2 ± 3.27	8.4 ± 3.05	.003*
Number of children	2.3 ± 1.37	2.3 ± 1.44	2.3 ± 1.30	0.895
Monthly household Income	$1,749 ± 935	1,792 ± 899	1,711 ± 966	0.319
Having health insurance	38 (7.0%)	22 (8.7%)	16 (5.5%)	0.179
Usual source of care				.002*
Private clinic/doctor's office	83 (15.4%)	46 (18.3%)	37 (12.9%)	
Public clinic	377 (69.9%)	161 (63.9%)	216 (75.3%)	
Emergency room	11 (2.0%)	8 (3.2%)	3 (1.0%)	
Multiple sources	17 (3.2%)	14 (5.6%)	3 (1.0%)	
Do not go	51 (9.5%)	23 (9.1%)	28 (9.8%)	
Having a Pap smear within the last year	418 (77.3%)	205 (80.7%)	213 (74.2%)	0.072
Reason for last Pap smear				0.741
Regular check-up	402 (76.3%)	188 (75.5%)	214 (77.0%)	
Check on a problem	70 (13.3%)	36 (14.5%)	34 (12.2%)	
Other	55 (10.4%)	25 (10.0%)	30 (10.8%)	
Knowing someone close who has survived cancer	96 (17.7%)	55 (21.7%)	41 (14.2%)	.023*
Knowing someone close who has died of cancer	175 (32.2%)	101 (39.8%)	74 (25.6%)	<.0001*

Values are expressed as mean ± SD or *n* (%)

t-test for continuous variables and Pearson χ^2 for categorical variables.

* statistical significance with a $P \leq .05$

Table 2

Latina immigrant's awareness of HPV and accuracy of knowledge

Awareness of HPV	Aware	Unaware
Have you heard of HPV?	254 (47%)	289 (53%)
HPV Knowledge	Correct	Incorrect
HPV can cause cervical cancer in women	219 (87%)	34 (13%)
HPV can cause genital warts in women and men	151 (60%)	102 (40%)
A person can acquire HPV through sexual relationships	211 (83%)	42 (17%)
A person can be infected with HPV and not be aware of it	231 (91%)	22 (9%)
HPV can cause abnormal results on a Pap test	195 (77%)	58 (23%)
HPV can go away on its own without treatment	15 (6%)	238 (94%)
Many men and women have HPV	185 (73%)	68 (27%)
Birth control pills are protective against HPV infection	220 (87%)	33 (13%)
A vaccine can protect you from infection against types of HPV	99 (39%)	154 (61%)
Condoms protect against HPV infection	173 (68%)	80 (32%)
Men can transmit HPV	203 (80%)	50 (20%)

Values are expressed as *n* (%)

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Table 3

Logistic regression models of factors associated with HPV awareness and HPV knowledge-odds ratio (confidence interval)

	HPV awareness*		HPV knowledge†	
	Unadjusted model	**Reduced model‡**	**Unadjusted model**	**Reduced model‡**
Age				
19–29	1	1	1	1
30–39	1.19 (.83–1.71)	1.42 (.95–2.13)	1.62 (.90–2.93)	2.64 (1.35–5.17)
40–50	1.60 (.93–2.77)	2.54 (1.34–4.78)	2.67 (1.02–6.97)	4.46 (1.53–12.98)
Time in the U.S.				—
1st quartile (1–46 months)	1	1.0§	1	
2nd quartile (47–64 months)	.74 (.46–1.20)	.70 (.42–1.16)	.79 (.37–1.68)	
3rd quartile (65–96 months)	.66 (.41–1.06)	.56 (.33–.93)	.67 (.32–1.41)	
4th quartile (97–432 months)	.56 (.34–.92)	.38 (.22–.66)	1.08 (.47–2.51)	
Education	1.09 (1.03–1.15)	1.10 (1.03–1.16)	1.00 (.92–1.09)	—
Number of children	1.00 (.89–1.14)	—	1.13 (.92–1.38)	—
Monthly household income	1.00 (1.00–1.00)	—	1.00 (1.00–1.00)	—
Having health insurance	1.63 (.83–3.17)	—	1.85 (.60–5.67)	—
Usual source of care				—
Private clinic/doctor’s office	1	1	1	
Public clinic	.60 (.37–.97)	.59 (.36–.98)	1.04 (.50–2.15)	
Emergency room	2.15 (.53–8.66)	2.20 (.53–9.16)	1.18 (.21–6.63)	
Multiple sources	3.75 (1.00–14.05)	4.36 (1.13–16.83)	1.44 (.35–6.03)	
Do not go	.66 (.33–1.33)	.69 (.32–1.48)	.74 (.25–2.16)	
Having a Pap smear within the last year	1.45 (.97–2.19)	1.82 (1.14–2.90)	2.88 (1.50–5.49)	4.10 (1.93–8.69)
Reason for last Pap smear		—		—
Regular check-up	1		1	
Check on a problem	1.21 (.72–2.00)		3.48 (1.18–10.30)	
Other	.95 (.54–1.67)		.73 (.30–1.75)	
Knowing someone close who has survived cancer	1.67 (1.07–2.61)	—	2.00 (.95–4.24)	—
Knowing someone close who has died of cancer	1.92 (1.33–2.76)	1.58 (1.07–2.35)	1.21 (.69–2.14)	—
Number of HPV information sources	N/A	N/A	1.43 (1.18–1.74)	1.38 (1.09–1.75)

	HPV awareness*		HPV knowledge†	
	Unadjusted model	Reduced model‡	Unadjusted model	Reduced model‡
Getting HPV information from health care professional	N/A	N/A	3.07 (1.74–5.41)	1.96 (.99–3.88)
Getting HPV information from family or friends	N/A	N/A	1.64 (1.45–4.65)	—
Getting HPV information from newspapers or magazines	N/A	N/A	.61 (.94–2.86)	—
Getting HPV information from TV ad	N/A	N/A	1.47 (.82–2.63)	—
Getting HPV information from TV news	N/A	N/A	1.28 (.74–2.22)	—
Getting HPV information from the internet	N/A	N/A	3.47 (1.01–11.90)	—
Getting HPV information from school	N/A	N/A	1.03 (.55–1.90)	—

N/A: Questions asked only to those aware of HPV.

*Estimates derived from logistic regression analyses with those who have heard about HPV as the reference group.

†Estimates derived from logistic regression analyses with those with higher HPV knowledge scores as the reference group.

‡11 variables have $P<.05$.

§P for trend ≤.05.