

Low Human Papillomavirus (HPV) Vaccine Knowledge Among Latino Parents in Utah

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Abstract Latinas have the highest incidence of cervical cancer, yet Latino parents/guardians' knowledge about and willingness to have their children receive the human papillomavirus (HPV) vaccine is unknown. Latino parents/guardians (N = 67) of children aged 11–17 were recruited from two community organizations to complete a survey, including HPV vaccine knowledge, child's uptake, demographic characteristics, and acculturation. Descriptive statistics and correlates of parents' HPV knowledge and uptake were calculated using Chi square tests and multivariable logistic regression. Receipt of at least one dose of the HPV vaccine was moderate for daughters (49.1 %) and low for sons (23.4 %). Parents/guardians reported limited knowledge as the main barrier to vaccine receipt. Among parents/guardians with vaccinated daughters, 92.6 % did not know the vaccine requires three doses. Adjusting for

income, low-acculturated parents were more likely than high-acculturated parents to report inadequate information (OR 8.59, 95 % CI 2.11–34.92). Interventions addressing low knowledge and children's uptake of the HPV vaccine are needed among Latino parents/guardians.

Keywords HPV vaccine · Hispanic · Latino · Adolescent health

Introduction

Latinas have more than a 1.5-fold increased cervical cancer incidence and mortality compared to non-Hispanic White women in the United States (US) [1]; due in part, to their lower rates of Papanicolaou (Pap) testing for cervical cancer screening [2]. In 2006, the Centers for Disease Control and Prevention Advisory Committee on Immunization Practices recommended girls ages 11–12 years receive a routine three-dose human papillomavirus (HPV) vaccine against two oncogenic HPV types (16 and 18) that cause about 70 % of cervical cancer cases. The committee also recommended females ages 13–26 years receive “catch-up” vaccinations as the vaccine is most effective if received prior to the onset of sexual activity [3]. In 2011, the HPV vaccine was also approved and recommended for males aged 11–21 years [4].

Despite this new opportunity for cervical cancer prevention, uptake of the HPV vaccine is suboptimal among age-eligible adolescents and young adults in the US. For example, in Utah, initiation of the HPV vaccine among teens is similar to the US average at 54 %, but completion of the 3 dose series is the lowest in the nation at 41.8 % (US average is 70.7 %) [5]. Low levels of awareness and knowledge about HPV and the HPV vaccine have been

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documented among Latinos, and may contribute to low vaccination levels [6–8]. Furthermore, less acculturated Latino parents with limited English language proficiency may be less likely to access comprehensible educational materials related to cervical cancer, HPV and the HPV vaccine. We surveyed Latino parents of children who were eligible for the HPV vaccine to explore factors related to the HPV vaccine knowledge, interest, and uptake among Latinos in Utah.

Methods

This study took place from August to October 2013, in Salt Lake City, Utah, where Latinos are the fastest growing minority population, comprising about 22 % of the population [9]. This research was approved by the University of Utah Institutional Review Board.

Participants

A convenience sample, recruited by two organizations (Alliance Community Services and Comunidades Unidas), consisted of Spanish-speaking Latino parents/guardians of children ages 11–17 years old ($N = 67$). Participants were recruited in-person and through flyers at local health fairs to participate in a focus group and survey about HPV vaccination ($N = 52$). Focus groups were finalized when thematic saturation was reached. An additional 15 participants were recruited to complete the survey to reach an adequate sample size. Prior to the study, we determined that two group samples sizes of at least $N1 = 32$ and $N2 = 35$ for low and high acculturation using a two-group Chi square test at the two-sided 0.05 significance level would have 85 % power to distinguish between 20 and 55 % with the correct HPV vaccine knowledge answer or between 20 and 55 % for confirmed HPV vaccination receipt.

Each participant signed a Spanish-language IRB approved document of consent.

Data Collection

Participants completed a 38-item self-administered survey of factors related to the HPV vaccination [6]. A Spanish-speaking Latina facilitator read survey questions aloud in Spanish, and was available to answer questions for those who also participated in the focus groups. Those who did not participate in the focus groups had access to a Spanish-speaking facilitator. Participants marked responses to close-ended questions on a printed survey and received a gift card for participating in the focus group/survey (\$25) or survey only (\$10).

Measures

The social ecological framework (SEF) served as the conceptual framework for this study. The SEF considers how multiple levels of social-ecological influence impact behavioral and health-related outcomes. Levels of social-ecological influence include internal and external elements: intrapersonal, interpersonal, community and policy levels of the SEF [10]. Therefore, the survey assessed sociodemographic characteristics of parents, intrapersonal, and interpersonal factors. Intrapersonal factors measured parent's knowledge and awareness about cervical cancer, HPV, and the HPV vaccine. Interpersonal factors included communication with medical providers, sources of health information, and social support. We measured daughter(s) and son(s) receipt of the HPV vaccine, including how many doses they had received. Sociodemographic characteristics included household income ($< \$20,000$; $\$20,000$ – $\$34,999$; $\geq \$35,000$) and education ($<$ high school, high school graduate, some college/trade/technical school, \geq college graduate).

Acculturation Outcome

We used Marin et al.'s [11] validated five-item acculturation scale to assess parents' level of acculturation. The sum of these responses was divided by five to obtain an acculturation score for each participant (Cronbach $\alpha = 80.4$). Acculturation was classified as a binary variable for high versus low (≥ 2 vs. < 2) level of acculturation [6].

Analysis

Descriptive statistics were generated for demographic characteristics of the participants. Chi square tests were used to compare differences in interpersonal and intrapersonal factors related to the HPV vaccine by acculturation. Planned exploratory analyses were performed to assess the impact of acculturation on knowledge and uptake of the HPV vaccine. In the exploratory analyses, three separate multivariable logistic regression analyses were performed for each intrapersonal and interpersonal factor adjusted for potential confounding factors: household income and parental age. STATA 12.0 was used for all statistical analyses (College Station, TX, USA).

Results

Mean age of parents/guardians was 42.9 years (SD 7.8, range 29–67). In Table 1, the majority of our participants were born in Mexico (71.2 %), yet most had lived in the US for 15 years or more (61.2 %). All participants were

Table 1 Demographic characteristics by acculturation level

| | Total (N = 67) | | Low acculturation (n = 32) | | High acculturation (n = 35) | | p value |
|--|-------------------|------|-------------------------------|------|--------------------------------|------|---------|
| | N | % | N | % | N | % | |
| Parents age | | | | | | | |
| 18–39 | 19 | 28.8 | 8 | 25.8 | 11 | 31.4 | 0.438 |
| 40–49 | 33 | 50.0 | 18 | 58.1 | 15 | 42.9 | |
| ≥50 | 14 | 21.2 | 5 | 16.1 | 9 | 25.7 | |
| Gender | | | | | | | |
| Male | 7 | 10.4 | 3 | 9.4 | 4 | 11.4 | 0.784 |
| Female | 60 | 89.6 | 29 | 90.6 | 31 | 88.6 | |
| Education | | | | | | | |
| <High school | 19 | 31.1 | 12 | 44.4 | 7 | 20.6 | 0.255 |
| High school graduate | 13 | 21.3 | 5 | 18.5 | 8 | 23.5 | |
| Some college/trade/technical school | 17 | 27.9 | 6 | 22.2 | 11 | 32.3 | |
| ≥College graduate | 12 | 19.7 | 4 | 14.8 | 8 | 23.5 | |
| Income | | | | | | | |
| <\$20,000 | 23 | 35.9 | 12 | 38.7 | 11 | 33.3 | 0.477 |
| \$20,000–34,999 | 22 | 34.4 | 12 | 38.7 | 10 | 30.3 | |
| ≥\$35,000 | 19 | 29.7 | 7 | 22.6 | 12 | 36.4 | |
| Parent’s birthplace | | | | | | | |
| Mexico | 47 | 71.2 | 25 | 80.7 | 22 | 62.9 | 0.111 |
| Other | 19 | 28.8 | 6 | 19.3 | 13 | 37.1 | |
| Years living in the US | | | | | | | |
| 0–14 | 26 | 38.8 | 14 | 43.7 | 12 | 34.3 | 0.427 |
| ≥15 | 41 | 61.2 | 18 | 56.3 | 23 | 65.7 | |
| Daughter received vaccine^a | | | | | | | |
| Yes | 27 | 49.1 | 13 | 56.5 | 14 | 43.7 | 0.350 |
| No | 28 | 50.9 | 10 | 43.5 | 18 | 56.2 | |
| Son received vaccine^a | | | | | | | |
| Yes | 11 | 23.4 | 8 | 33.3 | 3 | 13.0 | 0.101 |
| No | 36 | 76.6 | 16 | 66.7 | 20 | 87.0 | |

Parents age missing for n = 1; education missing for n = 6, income missing for n = 3, parent’s birthplace missing for n = 1, years living in the US missing for n = 2

^a Received at least one dose of the HPV vaccine, parents who did not know whether their child had received the HPV vaccine were excluded n = 9

Spanish speaking; with 52.3 % reporting that they used either little or no English in their home. Overall, 49.1 % (N = 27) of daughters and 23.4 % (N = 11) of sons had received at least one dose of the HPV vaccine (see Table 1).

Knowledge and Awareness of the HPV Vaccine

In three separate questions, over 77 % of parents had heard of cervical cancer, HPV, and the HPV vaccine, yet our sample had inadequate knowledge about the HPV vaccine. For example, 62.7 % of participants did not know the HPV vaccine requires three doses. Moreover, 92.6 % of parents who said their daughter had received the HPV vaccine did not know the vaccine requires three doses. Though knowledge of the HPV vaccine was low and some factors approached significance, there were no differences for

intrapersonal factors related to HPV and the HPV vaccine by level of acculturation. In exploratory analyses adjusting for household income, those with low acculturation had significantly reduced odds, OR 0.21 (95 % CI OR 0.05–0.86, p = 0.030) of knowing that most people have HPV at some point during their lives (Table 2) than those with high acculturation. There were no differences when adjusting for parent’s age.

Impact of Acculturation on Intended Receipt of the HPV Vaccine

In Table 3, the most common reasons parents reported for not vaccinating daughters were: lack of knowledge about the vaccine (32.3 %), concerns about side effects (30.7 %), and out-of-pocket costs (16.4 %). The most common reasons parents reported not vaccinating sons were: lack of

Table 2 HPV vaccine knowledge by level of acculturation (N = 67)

| | Unadjusted | | | | | | p value | Adjusted ^a | | |
|---------------------------------------|--------------|------|-------------------|------|--------------|------|---------|-----------------------|------------------|--------------|
| | Total sample | | Low acculturation | | Acculturated | | | OR | 95 % CI | p value |
| | N | % | N | % | N | % | | | | |
| Heard of cervical cancer ^b | | | | | | | | | | |
| Yes | 56 | 86.1 | 24 | 80.0 | 32 | 91.4 | 0.184 | 0.42 | 0.09–1.94 | 0.270 |
| No/don't know | 9 | 13.9 | 6 | 20.0 | 3 | 8.6 | | | | |
| Heard of HPV | | | | | | | | | | |
| Yes | 52 | 77.6 | 25 | 78.1 | 27 | 77.1 | 0.923 | 1.05 | 0.31–3.56 | 0.996 |
| No/don't know | 15 | 22.4 | 7 | 21.9 | 8 | 22.9 | | | | |
| Heard of HPV vaccine | | | | | | | | | | |
| Yes | 52 | 77.6 | 22 | 68.7 | 30 | 85.7 | 0.096 | 0.35 | 0.10–1.22 | 0.099 |
| No/don't know | 15 | 22.4 | 10 | 31.3 | 30 | 85.7 | | | | |
| Most people have HPV | | | | | | | | | | |
| Correct | 15 | 22.4 | 4 | 12.5 | 11 | 31.4 | 0.063 | 0.21 | 0.05–0.86 | 0.030 |
| Incorrect/don't know | 52 | 77.6 | 28 | 87.5 | 24 | 68.6 | | | | |
| Only one HPV injection | | | | | | | | | | |
| Correct | 25 | 37.3 | 12 | 37.5 | 13 | 37.1 | 0.976 | 1.16 | 0.40–3.33 | 0.788 |
| Incorrect/don't know | 42 | 62.7 | 20 | 62.5 | 22 | 62.9 | | | | |
| Woman can detect HPV | | | | | | | | | | |
| Correct | 16 | 24.2 | 7 | 21.9 | 9 | 26.5 | 0.663 | 0.84 | 0.26–2.71 | 0.771 |
| Incorrect/don't know | 50 | 75.8 | 25 | 78.1 | 25 | 73.5 | | | | |
| Man can detect HPV | | | | | | | | | | |
| Correct | 15 | 77.6 | 6 | 18.7 | 9 | 25.7 | 0.495 | 0.75 | 0.21–2.60 | 0.650 |
| Incorrect/don't know | 52 | 22.4 | 26 | 81.2 | 26 | 74.3 | | | | |
| Girls recommendation | | | | | | | | | | |
| Correct | 31 | 47.0 | 13 | 41.9 | 18 | 51.4 | 0.441 | 0.67 | 0.24–1.88 | 0.453 |
| Incorrect/don't know | 35 | 53.0 | 18 | 58.1 | 17 | 48.6 | | | | |
| Boys recommendation | | | | | | | | | | |
| Correct | 21 | 31.3 | 9 | 28.1 | 12 | 34.3 | 0.587 | 0.95 | 0.31–2.85 | 0.922 |
| Incorrect/don't know | 46 | 68.7 | 23 | 71.9 | 23 | 65.7 | | | | |

p values highlighted in bold are significant (p value < .05)

^a Adjusted for income

^b Heard of cervical cancer missing for N = 2

knowledge about the vaccine (36.8 %), side effects (28.1 %), and belief that the vaccine would promote sexual activity (15.8 %).

When adjusted for household income, those with low acculturation were four times more likely (OR 4.04, 95 % CI 1.06–15.44, $p = 0.041$) to report that their son was very or somewhat likely to receive the HPV vaccine in the next 12 months, than those with high acculturation (Table 3). Furthermore, those with low acculturation were more likely than those with high acculturation to report that concerns about side effects (OR 5.91, 95 % CI 1.37–25.43, $p = 0.017$) and a lack of information about the HPV vaccine (OR 8.59, 95 % CI 2.11–34.92, $p = 0.003$) were reasons for not vaccinating their sons (Table 3). Those with low acculturation had higher odds of needing more

information about the HPV vaccine than those with high acculturation after adjusting for parental age (OR 3.95, 95 % CI 1.06–14.68, $p = 0.040$, data not shown).

Discussion

To our knowledge, this is the first study of Latino parents that describes knowledge and awareness of the HPV vaccine by acculturation level and sociodemographic factors in Utah. Similar to prior studies of Latino populations in other areas of the US, we found that acculturation impacted the level of intended uptake of the HPV vaccine among eligible adolescents [12] and influenced knowledge about HPV and the HPV vaccine.

Table 3 Factors associated with intention to receive the HPV vaccine and reasons for not having the HPV vaccine

| | Unadjusted | | | | | | <i>p</i> value | Adjusted ^a | | |
|--|--------------|------|-------------------|-------------|--------------------|--------------|----------------|-----------------------|-------------------|----------------|
| | Total sample | | Low acculturation | | High acculturation | | | OR | 95 % CI | <i>p</i> value |
| | N | % | N | % | N | % | | | | |
| Intention to receive HPV vaccine in next 12 months, daughters | | | | | | | | | | |
| Very/somewhat likely | 22 | 51.2 | 11 | 55.0 | 11 | 47.8 | 0.639 | 1.88 | 0.52–6.76 | 0.334 |
| Not sure/unlikely | 21 | 48.8 | 9 | 45.0 | 12 | 52.2 | | | | |
| Intention to receive HPV vaccine in next 12 months, sons | | | | | | | | | | |
| Very/somewhat likely | 24 | 53.3 | 15 | 65.2 | 9 | 40.9 | 0.102 | 4.04 | 1.06–15.44 | 0.041 |
| Not sure/unlikely | 21 | 46.7 | 8 | 34.8 | 13 | 59.1 | | | | |
| Reasons for not vaccinating daughters | | | | | | | | | | |
| Need more information about the vaccine | | | | | | | | | | |
| Yes | 20 | 32.3 | 12 | 41.4 | 8 | 24.2 | 0.150 | 3.05 | 0.84–11.04 | 0.090 |
| No | 42 | 67.7 | 17 | 58.6 | 25 | 75.8 | | | | |
| Side effects | | | | | | | | | | |
| Yes | 19 | 30.7 | 9 | 31.0 | 10 | 30.3 | 0.950 | 1.30 | 0.41–4.11 | 0.651 |
| No | 43 | 69.3 | 20 | 69.0 | 23 | 69.7 | | | | |
| Costs | | | | | | | | | | |
| Yes | 10 | 16.4 | 3 | 10.7 | 7 | 21.2 | 0.270 | 0.56 | 0.12–2.55 | 0.456 |
| No | 51 | 83.6 | 25 | 89.3 | 26 | 78.8 | | | | |
| Not sexually active | | | | | | | | | | |
| Yes | 8 | 12.9 | 3 | 10.3 | 5 | 15.1 | 0.573 | 0.72 | 0.15–3.44 | 0.678 |
| No | 54 | 87.1 | 26 | 89.7 | 28 | 84.9 | | | | |
| Promote sexual activity | | | | | | | | | | |
| Yes | 5 | 8.1 | 2 | 6.9 | 3 | 9.1 | 0.752 | 1.26 | 0.16–10.03 | 0.826 |
| No | 57 | 91.9 | 27 | 93.1 | 30 | 90.9 | | | | |
| Unnecessary | | | | | | | | | | |
| Yes | 4 | 6.4 | 3 | 10.3 | 1 | 3.0 | 0.242 | 5.62 | 0.48–65.98 | 0.169 |
| No | 58 | 93.6 | 26 | 89.7 | 32 | 97.0 | | | | |
| No provider recommendation | | | | | | | | | | |
| Yes | 2 | 3.2 | 2 | 6.9 | 0 | 0.0 | 0.125 | * | * | * |
| No | 60 | 96.8 | 27 | 93.1 | 33 | 100.0 | | | | |
| Reasons for not vaccinating sons | | | | | | | | | | |
| Need more information about the vaccine | | | | | | | | | | |
| Yes | 21 | 36.8 | 16 | 57.1 | 5 | 17.2 | 0.002 | 8.59 | 2.11–34.92 | 0.003 |
| No | 36 | 63.2 | 12 | 42.9 | 24 | 82.8 | | | | |
| Side effects | | | | | | | | | | |
| Yes | 16 | 28.1 | 11 | 39.3 | 5 | 17.2 | 0.064 | 5.91 | 1.37–25.43 | 0.017 |
| No | 41 | 71.9 | 17 | 60.7 | 24 | 82.8 | | | | |
| Not sexually active | | | | | | | | | | |
| Yes | 9 | 15.8 | 5 | 17.9 | 4 | 13.8 | 0.674 | 1.53 | 0.35–6.75 | 0.575 |
| No | 48 | 84.2 | 23 | 82.1 | 25 | 86.2 | | | | |
| Costs | | | | | | | | | | |
| Yes | 8 | 14.0 | 3 | 10.7 | 5 | 17.2 | 0.478 | 0.91 | 0.17–4.86 | 0.914 |
| No | 49 | 86.0 | 25 | 89.3 | 24 | 82.8 | | | | |
| Unnecessary | | | | | | | | | | |
| Yes | 5 | 8.8 | 5 | 17.9 | 0 | 0.0 | 0.017 | * | * | * |
| No | 52 | 91.2 | 23 | 82.1 | 29 | 100.0 | | | | |
| Promote sexual activity | | | | | | | | | | |
| Yes | 5 | 8.8 | 3 | 10.7 | 2 | 6.9 | 0.610 | 1.70 | 0.25–11.45 | 0.586 |
| No | 52 | 91.2 | 25 | 89.3 | 27 | 93.1 | | | | |

Table 3 continued

| | Unadjusted | | | | | | <i>p</i> value | Adjusted ^a | | |
|----------------------------|--------------|------|-------------------|------|--------------------|-------|----------------|-----------------------|---------|----------------|
| | Total sample | | Low acculturation | | High acculturation | | | OR | 95 % CI | <i>p</i> value |
| | N | % | N | % | N | % | | | | |
| No provider recommendation | | | | | | | | | | |
| Yes | 1 | 1.7 | 1 | 3.6 | 0 | 0.0 | 0.305 | * | * | * |
| No | 56 | 98.2 | 27 | 96.4 | 29 | 100.0 | | | | |

p values highlighted in bold are significant (*p* value < .05)

* Omitted due to inadequate sample size

^a Adjusted for income

In light of the high prevalence of cervical cancer among Latinos, and the growing Latino population in Utah, the low level of knowledge among acculturated Latino parents found in this study mimics prior research [6–8] and merits immediate attention. Lack of comprehensible educational materials for Latino parents with lower levels of acculturation and English language proficiency may be one reason for this finding. Interventions with Latinos who have lower levels of acculturation and English language proficiency may need to incorporate culturally-targeted materials to promote the HPV vaccine for both daughters and sons. These interventions are needed to increase knowledge about the HPV vaccine among Latino parents, and thereby uptake of the HPV vaccine among Latino adolescents, and are imperative to reducing the burden of cervical cancer and other HPV-related negative health outcomes.

The Latino parents/guardians we surveyed indicated an advanced stage of action for vaccinating their sons in the next year, however these parents/guardians were concerned about side effects and felt they needed more information before having their child vaccinated. Lower acculturated parents/guardians had 8.5 times higher odds of reporting inadequate information about the HPV vaccine. Future interventions should take this into account.

Intent to vaccinate sons was lower among parents with higher levels of acculturation. One reason for this unexpected finding could be that views on vaccination morph as individuals spend more time in a community. For example, one study found high support for the HPV vaccine in Mexico [13], which is where the majority of our participants were born. However, HPV vaccination is a highly controversial topic in Salt Lake City, Utah where the study was conducted [14, 15]. It is possible that the more acculturated an individual becomes in a community the more their opinions regarding vaccination mirror the societal norms of that community. This is an area where additional research is needed.

Limitations of this study include the small sample size and the use of convenience sampling. As we did not access

medical records, vaccination receipt is based upon self-report. Also, parents who regularly participate in events hosted by the community organizations would be expected to have higher levels of awareness and knowledge suggesting that HPV knowledge and exposure among the Latino community may be even lower than what we found.

Conclusions

Populations that are at the greatest risk for invasive cervical cancer would likely benefit most from high HPV vaccine immunization coverage. Efforts to expand access to information on the HPV vaccine among Latino families may help improve uptake and completion of the vaccine among eligible adolescents.

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