

Latino Parents' Awareness and Receipt of the HPV Vaccine for Sons and Daughters in a State with Low Three-Dose Completion

Deanna Kepka · Qian Ding · Julia Bodson ·
Echo L. Warner · Kathi Mooney

Published online: 9 January 2015
© Springer Science+Business Media New York 2015

Abstract Latinos suffer a disproportionate burden of human papillomavirus (HPV)-preventable cancers, yet uptake and completion of the HPV vaccine among Latinos is below recommendations. Reasons for low HPV vaccine uptake among Latinos in Utah are unknown. We surveyed Latino parents of HPV vaccine age-eligible adolescents ($N=118$). Univariable analyses identified sociodemographic characteristics associated with HPV vaccine awareness, interest, and uptake for daughter(s) and/or son(s) using chi-square tests or Fisher's exact tests. More parents who had lived in the USA for 15 years or more had vaccinated their daughter (43.6 vs. 32.5 %, $p=0.035$) compared to those living in the USA for shorter time periods. Parents born in Mexico reported their son had not received the HPV vaccine (74.6 vs. 58.3 %, $p=0.049$) more than those born elsewhere. Parents with Mexican birthplace and ancestry reported not knowing about the HPV vaccine as the main barrier to vaccinating daughters (47.1 vs. 5.9 %, $p=0.002$ for both) and sons (birthplace 38.3 vs. 10.3 %, $p=0.007$; ancestry 37.1 vs. 11.1 %, $p=0.013$) compared to those born or descending elsewhere. Non-acclimated parents with a son were more likely to report not knowing about the HPV vaccine as the main barrier to vaccine receipt (47.6 vs. 12.5 %, $p<0.001$). Our results focus on Latinos in an understudied region and complement prior research in other regions. This study may have implications

for designing culturally tailored interventions to improve uptake of the HPV vaccine among the growing population of Latinos in Utah, and other states in the Intermountain West.

Keywords Hispanic · Latino · Human papillomavirus · HPV vaccine

Introduction

Hispanic women suffer a disproportionate burden of cervical cancers, with a 1.5-fold increase in cervical cancer incidence and mortality compared to non-Hispanic whites [1]. Virtually, all cervical cancers are caused by the human papillomavirus (HPV), a virus so common that approximately 80 million Americans are currently infected [2]. In 2006, the Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices (ACIP) recommended a three-dose vaccine protecting against four HPV strains (two of which are responsible for about 70 % of cervical cancer cases) as a routine vaccination for girls ages 11–12 years and catch-up vaccination for young women ages 13–26 years. Five years later, ACIP recommended the same routine vaccination for boys and extended the catch-up vaccination to include young men ages 13–21 years [3].

Despite these recommendations, only 53.8 % of adolescents nationally have received at least one dose of the HPV, with particularly low uptake in the Intermountain West. [4] Among Hispanics, 62.9 % of adolescents have received at least one dose of the HPV vaccine, but only 35.5 % have completed the series. In Utah, completion of the HPV vaccine by adolescent females is the lowest in the USA (20.5 vs. 37.6 %) [5]. HPV vaccine uptake is lowest in the country for

D. Kepka · E. L. Warner (✉) · K. Mooney
College of Nursing, University of Utah, Salt Lake City, UT, USA
e-mail: echo.warner@hci.utah.edu

D. Kepka · J. Bodson · K. Mooney
Cancer Control and Population Sciences Department, Huntsman
Cancer Institute, 2000 Circle of Hope, Salt Lake City, UT 84112,
USA

Q. Ding
Study Design and Biostatistics Center, University of Utah School of
Medicine, Salt Lake City, UT, USA

adolescent boys (11.0 vs. 34.6 %), and completion of the vaccine series among boys is too low to be measured [5].

Latinos' low awareness about the HPV vaccine may contribute to lower vaccination levels in Utah, a state where the Hispanic population is rapidly growing [6]. Demographic factors that correlate with HPV awareness and uptake include race [6–9], family income [6–9], parents' education level [6, 9], insurance status [6, 8, 10, 11], and mother's age and marital status [6]. Little is known about factors related to HPV vaccine uptake among Latinos in Utah. We surveyed Latino parents of adolescents who were eligible for the HPV vaccine to explore demographic factors related to HPV vaccine awareness, interest, and uptake in Utah. Our results may have implications for designing culturally tailored cancer education interventions to improve HPV vaccination among Latinos.

Methods

This study occurred in Salt Lake City, Utah from August to October 2013 and was approved by the University of Utah Institutional Review Board.

Participants

A purposive sample of Latino parents or guardians was recruited by two organizations at local community events and health booths. Eligible participants had at least one child ages 11–17 years and could speak and read Spanish. Participants signed a Spanish-language consent and participated in a focus group and/or survey about HPV vaccination. This report focuses on results of the survey.

Data Collection

The printed 38-item survey of close-ended questions included intrapersonal and interpersonal factors related to HPV vaccination. A Spanish-speaking facilitator conducted the focus groups, read survey questions aloud in Spanish, and was available to answer questions. Participants received a gift card for participating: focus group and survey (\$25) or survey only (\$10).

Measures

The survey assessed sociodemographic, intrapersonal, and interpersonal factors [12]. Participants were asked if their daughter(s) and/or son(s) had received the HPV vaccine, how many doses of the HPV vaccine they received, and what the main barrier was to vaccinating their son or daughter. Sociodemographic characteristics included age, gender, marital status, education, household income, birthplace, years in the USA, ancestry, and acculturation (Table 1). Marin et al.'s

five-item acculturation scale (Cronbach's alpha=80.4) was used to develop a binary acculturation variable of acculturated vs. not acculturated (≥ 2 vs. < 2) [13, 14].

Statistical Analysis

Univariable analyses were performed to identify sociodemographic characteristics associated with receipt of the HPV vaccine for daughter(s) and/or son(s) in Table 1, and the main barrier to HPV vaccination for daughter(s) and/or son(s) was also analyzed. The main barrier parents selected for having their daughter(s) or son(s) vaccinated was that they did not know about the HPV vaccine, which we investigated as an outcome (did not know about the HPV vaccine vs. other, data not shown). Comparisons of categorical variables were made using chi-square tests or Fisher's exact tests, as appropriate. All tests were two-sided comparisons and were completed using Stata version 13.1. To avoid overfitting, in a situation where unreliable associations may be observed by having too many predictor variables in a model, multivariable regression analysis was not conducted.

Results

There were 118 parents who completed the survey, representing 108 daughters and 92 sons. Of these children and adolescents, 42.6 % of daughters and 20.7 % of sons had received the HPV vaccine. In Table 1, participants who had resided in the USA for ≥ 15 years were more likely to report their daughter had received the HPV vaccine than respondents who had lived in the USA for less than 15 years (43.6 vs 32.5 %, $p=0.035$). Parents born in Mexico reported their son had not received the HPV vaccine (74.6 vs. 58.3 %, $p=0.049$) more than those born elsewhere.

Univariate analysis assessed the main barrier parents reported for not vaccinating their daughter or son (not knowing about the HPV vaccine) by sociodemographic factors (data not shown). Participants born in Mexico were more likely to report that not knowing about the HPV vaccine was the main barrier to vaccinating their daughters (47.1 vs. 5.9 %, $p=0.002$) and sons (38.3 vs. 10.3 %, $p=0.007$) compared to those born elsewhere. Likewise, participants with Mexican ancestry were more likely to report that the main reason for not vaccinating their daughters (47.1 vs 5.9 %, $p=0.002$) and sons (37.1 vs 11.1 %, $p=0.013$) was because they did not know about the HPV vaccine as compared to participants whose parents who were not from Mexico. Lastly, parents with low acculturation were more likely to report that not knowing about the HPV vaccine was the main reason they would not vaccinate their sons (47.6 vs. 12.5 %, $p<0.001$) compared to acculturated parents.

Table 1 Parents' sociodemographic characteristics and associations of covariates with receipt of the HPV vaccine, by child's gender

	Total, <i>N</i> (%)	Daughter received HPV vaccine (<i>N</i> =108) ^a				Son received HPV vaccine (<i>N</i> =92) ^b			
		Yes (<i>N</i> =46)	No (<i>N</i> =52)	Don't know (<i>N</i> =10)	<i>p</i> value	Yes (<i>N</i> =19)	No (<i>N</i> =65)	Don't know (<i>N</i> =8)	<i>p</i> value
Age					0.482 ^d				0.531 ^d
18–39	41 (39.4)	16 (42.1)	21 (55.3)	1 (2.6)		4 (12.5)	26 (81.3)	2 (6.3)	
40–49	49 (47.1)	19 (40.4)	22 (46.8)	6 (12.8)		9 (25.7)	23 (65.7)	3 (8.6)	
≥50	14 (13.5)	5 (50.0)	5 (50.0)	0 (0)		3 (27.3)	8 (72.7)	0 (0)	
Gender					0.346 ^c				0.604 ^d
Male	18 (15.7)	5 (31.3)	8 (50.0)	3 (18.8)		4 (30.8)	8 (61.5)	1 (7.7)	
Female	97 (84.4)	38 (42.7)	44 (49.4)	7 (7.9)		14 (18.4)	56 (73.7)	6 (7.9)	
Marital status					0.521 ^c				0.379 ^d
Married	25 (21.7)	32 (39.0)	42 (51.2)	8 (9.8)		16 (21.9)	52 (71.2)	5 (6.9)	
Other	90 (78.3)	12 (52.2)	9 (39.1)	2 (8.7)		3 (17.7)	11 (64.7)	3 (17.7)	
Education					0.950 ^d				0.872 ^d
<High school	42 (39.6)	15 (38.5)	21 (53.9)	3 (7.7)		6 (16.2)	28 (75.7)	3 (8.1)	
≥High school	64 (60.4)	24 (41.4)	29 (50.0)	5 (8.6)		11 (22.9)	33 (68.8)	4 (8.3)	
Household income					0.961 ^d				0.784 ^d
<\$20,000	53 (47.3)	23 (48.9)	20 (42.6)	4 (8.5)		8 (19.1)	31 (73.8)	3 (7.1)	
\$20,000–\$35,000	34 (30.4)	12 (40.0)	15 (50.0)	3 (10.0)		5 (20.8)	16 (66.7)	3 (12.5)	
>\$35,000	25 (22.3)	11 (44.0)	12 (48.0)	2 (8.0)		6 (30.0)	13 (65.0)	1 (5.0)	
Birthplace					0.288 ^c				0.049 ^c
Mexico	81 (69.2)	28 (37.3)	40 (53.3)	7 (9.3)		14 (20.9)	50 (74.6)	3 (4.5)	
Other	36 (30.8)	17 (53.1)	12 (37.5)	3 (9.4)		5 (20.8)	14 (58.3)	5 (20.8)	
Years lived in the USA					0.035 ^c				0.484 ^d
0–14 years	46 (44.2)	13 (32.5)	26 (65.0)	1 (2.5)		5 (14.3)	28 (80.0)	2 (5.7)	
≥15 years	58 (55.8)	24 (43.6)	23 (41.8)	8 (14.6)		11 (23.9)	31 (67.4)	4 (8.7)	
Ancestry					0.784 ^c				0.165 ^d
Mexico	84 (72.4)	31 (39.7)	39 (50.0)	8 (10.3)		15 (21.4)	51 (72.9)	4 (5.7)	
Other	32 (27.6)	13 (46.4)	13 (46.4)	2 (7.1)		3 (15.0)	13 (65.0)	4 (20.0)	
Acculturation					0.274 ^c				0.621 ^d
Acculturated	59 (50.0)	24 (42.1)	30 (52.6)	3 (5.3)		7 (16.7)	32 (76.2)	3 (7.1)	
Not acculturated	59 (50.0)	22 (43.1)	22 (43.1)	7 (13.7)		12 (24.0)	33 (66.0)	5 (10.0)	

Italicized values represent statistical significance $p < 0.05$

^a $N = 10$ participants without a daughter ($n = 8$) or missing ($n = 2$) excluded. Receipt of HPV vaccine was defined as receipt of at least one dose. $N = 19$ daughters completed three doses

^b $N = 26$ participants without a son ($n = 23$) or missing ($n = 3$) were excluded. Receipt of HPV vaccine was defined as receipt of at least one dose. $N = 8$ sons completed three doses

^c Chi-square test

^d Fisher's exact test

Discussion

This study is one of the first to explore uptake and barriers to uptake of the HPV vaccine among Latino parents in Utah. Recently, Kepka et al. demonstrated low awareness of the HPV vaccine among Latino parents in Utah and showed that parents' acculturation levels impacted their HPV vaccine awareness, as well as their intent to vaccinate their children [15]. This study expands on prior research findings by

incorporating a larger sample size and focusing on Latinos in a geographically understudied area. This study provides further evidence that acculturation is associated with HPV vaccine awareness and that proxies of acculturation level (birthplace and number of years lived in the USA) impact children's receipt of the HPV vaccine. Furthermore, this study sheds light on the need for educational interventions and awareness campaigns of HPV vaccination that are targeted for Latino parents. These findings complement the growing

body of research about Latino populations in many areas of the USA, including many studies that show parents' educational attainment, birthplace, and acculturation level to be associated with parents' awareness about and children's receipt of the HPV vaccine [6, 9].

The low levels of HPV vaccine awareness among Latino parents of Mexican descent and ancestry in Utah are concerning given the high cervical cancer mortality rates of Hispanics in the USA [1]. Cancer education interventions among this population to increase awareness of the HPV vaccine are critical to improving HPV vaccine completion and thereby reducing the burden of cervical cancer among Latinos. Lack of culturally appropriate educational materials about the HPV vaccine may explain why Latino parents with less education and lower acculturation know little about the vaccine and chose not to vaccinate their children. Thus, HPV vaccine education interventions for the Latino community may benefit from incorporating culturally tailored materials at an accessible reading level. Parents born in Mexico were more likely to report not knowing about the HPV vaccine than parents born in other places. This may be due to the obvious heterogeneity of the Hispanic population. Since our participants were primarily born in Mexico, additional research is needed to further disaggregate data about Latinos to better discern which countries of origin are associated with higher levels of HPV vaccine awareness and uptake and which mediating factors may exist to explain these differences.

Limitations of this study include the relatively small sample size and the use of convenience sampling. The survey was administered only in Spanish, so we may lack important information about English-speaking Latinos in Utah. The parents included in our study may also have higher health literacy or may be more engaged in health prevention behaviors than the general Latino population as they were recruited at health events hosted by community partner organizations. As such, HPV vaccine exposure in the Latino community may be even lower than we found. Vaccination receipt is based on upon parent recall alone, which may have implications on accuracy. Finally, we did not collect data on mothers' cancer screening history, which has been associated with HPV vaccination among sons and daughters.

Hispanics bear a greater burden of cervical cancer mortality than do non-Hispanic Whites and would benefit from high HPV immunization coverage. However, Latinos in Utah who were born in Mexico and those with Mexican ancestry are more likely to report that the main barrier to vaccinating their son(s) and daughter(s) is not knowing about the HPV vaccine. Furthermore, parents who had lived in the USA for more than 15 years were more likely to have vaccinated their daughters than more recent immigrants. Thus, more targeted educational interventions should be developed for more recently migrated Mexican immigrants and their adolescents. Efforts to improve access to culturally and linguistically appropriate cancer

educational materials on the HPV vaccine may also further improve Latino parents' willingness to vaccinate their eligible adolescent children.

Acknowledgments We thank the participants for their important feedback. We acknowledge the staff at the Alliance Community Services and Comunidades Unidas for their help in participant recruitment and survey administration. We also thank Guadalupe Tovar at the Huntsman Cancer Hospital for facilitating the focus groups. This research was supported by a University of Utah College of Nursing, the Huntsman Cancer Institute Foundation, the Primary Children's Hospital Foundation, the Beaumont Foundation, and the National Center for Advancing Translational Sciences of the National Institutes of Health under Award Number 1ULTR001067. Support was also provided by the University of Utah Study Design and Biostatistics Center, with funding in part from the National Center for Research Resources and the National Center for Advancing Translational Sciences, National Institutes of Health, through Grant 8UL1TR000105 (formerly UL1RR025764). The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the National Institutes of Health or the Centers for Disease Control and Prevention.

Conflict of Interest The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

1. SEER Stat Fact Sheets: Cervix Uteri Cancer. 2014; <http://seer.cancer.gov/statfacts/html/cervix.html>. Accessed 16 Jul 2014
2. Centers for Disease Control and Prevention. Genital HPV infection—fact sheet. Atlanta (GA): CDC. Available from: <http://www.cdc.gov/std/HPV/STDFact-HPV.htm> Accessed 8 Oct 2014
3. Centers for Disease Control and Prevention. Recommendations on the Use of Quadrivalent Human Papillomavirus Vaccine in Males—Advisory Committee on Immunization Practices (ACIP), 2011. Available from: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6050a3.htm> Accessed 8 Oct 2014
4. Centers for Disease Control and Prevention: Estimated Vaccination Coverage with ≥ 1 Dose of HPV Vaccine Among Adolescents Aged 13–17 Years by Race/Ethnicity and by State and Selected Area—National Immunization Survey—Teen, United States, 2012
5. Centers for Disease Control and Prevention: National, Regional, State and Selected Local Area Vaccination Coverage Among Adolescents Aged 13–17 Years—United States, 2013. *MMWR*. July 25 2014;63(29):625–633. <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6329a4.htm>
6. Wisk LE, Allchin A, Witt WP (2014) Disparities in human papillomavirus vaccine awareness among US parents of preadolescents and adolescents. *Sexually Transm Dis* 41(2):117–122
7. Jeudin P, Liveright E, Del Carmen MG et al (2014) Race, ethnicity, and income factors impacting human papillomavirus vaccination rates. *Clin Ther* 36(1):24–37
8. Laz TH, Rahman M, Berenson AB (2013) Human papillomavirus vaccine uptake among 9–17 year old males in the United States: the National Health Interview Survey, 2010. *Hum Vacc Immunother* 9(4):874–878
9. Wong KY, Do YK (2012) Are there socioeconomic disparities in women having discussions on human papillomavirus vaccine with health care providers? *BMC Womens Health* 12:33

10. Fisher H, Trotter CL, Audrey S et al (2013) Inequalities in the uptake of human papillomavirus vaccination: a systematic review and meta-analysis. *Int J Epidemiol* 42(3):896–908
11. Liddon NC, Hood JE, Leichliter JS (2012) Intent to receive HPV vaccine and reasons for not vaccinating among unvaccinated adolescent and young women: findings from the 2006–2008 National Survey of Family Growth. *Vaccine* 30(16):2676–2682
12. Stokols D (1992) Establishing and maintaining healthy environments. Toward a social ecology of health promotion. *Am Psychol* 47(1):6–22
13. Kepka DL, Ulrich AK, Coronado GD (2012) Low knowledge of the three-dose HPV vaccine series among mothers of rural Hispanic adolescents. *J Health Care Poor Underserved* 23(2): 626–635
14. Marin G, Sabogal F, Vanoss-Marín B, Otero-Sabogal R, Perez-Stable E (1987) Development of a short acculturation scale for Hispanics. *Hisp J Behav Sci* 9(2):183–205
15. Kepka D, Warner EL, Kinney AY, et al (2014) Low human papillomavirus (HPV) vaccine knowledge among Latino parents in Utah. *J Immigr Minor Health*