Published in final edited form as:

J Am Assoc Nurse Pract. 2018 July ; 30(7): 368–372. doi:10.1097/JXX.0000000000000064.

Importance of a team approach to recommending the human papillomavirus vaccination

Holly B. Fontenot, PhD, RN, WHNP-BC¹ [(Associate Professor)], Melanie L. Kornides, ScD, RN, FNP-BC² [(Research Fellow)], Annie-Laurie McRee, DrPH³ [(Assistant Professor)], and Melissa B. Gilkey, PhD⁴ [(Assistant Professor)]

¹WF Connell School of Nursing, Boston College, Chestnut Hill, Massachusetts,

²Department of Population Medicine, Harvard Medical School & Harvard Pilgrim Health Care Institute, Boston, Massachusetts,

³Department of Pediatrics, University of Minnesota, Minneapolis, Minnesota,

⁴Department of Health Behavior, University of North Carolina Gillings School of Global Public Health, Chapel Hill, North Carolina

Abstract

Background and purpose: Few studies have examined human papillomavirus (HPV) vaccine communication in the context of the health care team.

Methods: In 2016, the investigators conducted a national, online survey of U.S. parents who reported having discussed HPV vaccination with their adolescent's health care team. Multivariable logistic regression assessed associations between HPV vaccine initiation (\$1 dose) and having: 1) discussed HPV vaccination with multiple team members and 2) received congruent recommendations about HPV vaccination.

Conclusions: Of the 795 parents in the sample, about half (52%) reported discussing HPV vaccination with multiple team members, including nurse practitioners, nurses, and physicians. Most reported receiving congruent recommendations for (76%) or against (12%) HPV vaccination; few (12%) received mixed recommendations. Parents who discussed HPV vaccination with multiple team members had greater odds of series initiation (odds ratio [OR] = 2.34, 95% CI: 1.61–3.40), whereas those who received mixed versus congruent recommendations for HPV vaccination had lower odds of vaccination (OR = 0.56, 95% CI: 0.33–0.95).

Implications for practice: Findings suggest that a coordinated team approach to recommendations may encourage HPV vaccination. Nurse practitioners are well positioned to facilitate coordination efforts within their clinical practices.

Correspondence: Holly B. Fontenot, PhD, RN, WHNP-BC, WF Connell School of Nursing, Boston College, 140 Commonwealth Ave, Chestnut Hill, MA 02467. Tel: 617-552-1846; Fax: 617-552-0745; holly.fontenot@bc.edu.

Competing interests: The authors report no conflicts of interest.

Keywords

Adolescent health; human papillomavirus infections/prevention and control; human papillomavirus vaccine

Introduction

Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States (U.S.) and causes multiple cancers in men and women. Human papillomavirus vaccine has been available for first-line prevention of HPV-related diseases for over a decade, yet HPV vaccination coverage is not on target to meet national goals (U.S. Department of Health and Human Services, 2014). Coverage is especially low for men, younger adolescents, and those living in certain geographic areas (Reagan-Steiner et al., 2016). Research, primarily among physicians, has established health care providers' communication as a key determinant of vaccination uptake; youth who do, versus do not, receive a recommendation for HPV vaccination have 5 to 23 times the odds of being vaccinated (Bartlett & Peterson, 2011; Holman et al., 2014; Lau, Lin, & Flores, 2012; Rahman, Laz, McGrath, & Benson, 2014; Ylitalo, Lee, & Mehta, 2012). However, despite national guidelines for routine vaccination at ages 11 or 12 years (Reagan-Steiner et al., 2016), many physicians report that they do not strongly and consistently deliver HPV vaccine recommendations for their age-eligible patients (Daley et al., 2006; Gilkey, Malo, Shah, Hall, & Brewer, 2015; Gilkey et al., 2015; Lau et al., 2012; Malo et al., 2014; Vadaparampil et al., 2011, 2013, 2014).

Other health care team members, in addition to physicians, likely play an important role in recommending HPV vaccination, and yet to date, we have only a limited understanding of the role of nurse practitioners, nurses, and others or of how teams work together to counsel parents on this topic (Gilkey & McRee, 2016). In one recent study, over half of the physicians reported that at least one other health care team member, including a nurse practitioner, physician assistant, and/or nurse, discussed HPV vaccine or made the initial HPV vaccination recommendation (Malo et al., 2016). Little is known about how often parents speak with multiple health care team members about vaccination or whether all team members communicate similar messages about HPV vaccination. Using data from a national sample of parents of adolescents, this study sought to assess the following: 1) the prevalence of discussing HPV vaccination with multiple providers on an adolescent's health care team; 2) the prevalence of receiving a congruent recommendation for HPV vaccination during the health care visit; and 3) associations between these factors and HPV vaccine initiation. By considering a team approach to vaccine communication, this study provides novel data about possible roles for nurses and nurse practitioners in HPV vaccination, which currently is underexplored in vaccine research.

Methods

Participants and procedures

The investigators conducted a cross-sectional, national survey of parents of adolescents (aged 11–17 years) in September 2016. Participants were members of the Knowledge Panel, an online, nationally representative panel of 55,000 U.S. adults, maintained by the survey research company GfK for measurement of public opinion, attitudes, and behaviors. The panel was constructed through list-assisted address-based sampling with phone call follow-ups for nonresponsive households (GfK, 2016). Panelists received points exchangeable for small cash payments from the company as an incentive for completing surveys. Eligible participants were those who reported ever having discussed HPV vaccine with one or more members of their adolescent's health care team ($n = 795$). Electronic informed consent was obtained. The survey's response rate was 59% using AAPOR Formula 4 (The American Association for Public Opinion Research, 2016). The Institutional Review Board of Harvard Pilgrim Health Care Institute approved the study protocol. Additional details are reported elsewhere (Kornides, McRee, & Gilkey, 2018).

Measures and analysis

Demographics included information on parents (race/ ethnicity; educational attainment), adolescents (age at the time of first provider discussion about HPV vaccination; age at the time of survey; biologic sex), and households (annual income; geographic location). Age at the time of first discussion was subtracted from age at the time of survey to calculate time since first discussion about HPV vaccine.

The survey assessed parents' first experience talking with their adolescent's health care team about HPV vaccination. Parents reported if they discussed HPV vaccination with multiple members of the health care team (including physicians, nurse practitioners, physician assistants, nurses, and medical assistants). They also reported on the recommendation(s) received from the health care team. Responses were categorized to indicate whether parents received only recommendation(s) for HPV vaccination; only recommendation(s) against HPV vaccination; or recommendations both for and against HPV vaccination. The outcome measure was parents' self-report of adolescents' initiation of HPV vaccination (1 dose).

Descriptive statistics were used to characterize the sample. A multivariable logistic regression model assessed associations between HPV vaccine initiation and: 1) discussion with multiple team members and 2) recommendation(s) received from the health care team. The model adjusted for the following demographic variables associated with HPV vaccine initiation in bivariate analyses ($p < .10$): child age at the survey, time since first discussion about HPV vaccine, parent educational attainment, and parent race/ethnicity. Analyses were conducted using Stata 14.2 (College Station, TX), with statistical significance set at $p < .05$.

Results

The total sample included 795 parents reporting from all regions of the U.S. (Table 1). Over one-third of the parents had a high school degree or less, and most were non-Hispanic whites (68%), Hispanic (19%), or non-Hispanic blacks (9%). Parents reported on similar

proportions of adolescent children by sex (51% males) and age (mean:14.2, SD 1.9). About two-thirds (69%) of the adolescents had initiated HPV vaccination at the time of the survey.

Human papillomavirus vaccine discussions

About half of the parents (52%, $n = 410$) reported discussing HPV vaccination with more than one member of the adolescent's health care team during their initial discussion. Over three-quarters of the parents (76%, $n = 606$) reported receiving only recommendation(s) for HPV vaccination from the health care team. Fewer reported receiving only recommendation(s) against HPV vaccination (12%, $n = 92$) or reported receiving recommendations both for and against vaccination (12%, $n = 97$).

Associations with human papillomavirus vaccine initiation

In the multivariable model, parents who spoke with multiple team members had 2.34 ($p < .001$; 95% CI:1.61–3.40) times the adjusted odds of HPV vaccine initiation compared with parents who only spoke with one team member (Table 2). Parents who reported receiving only recommendation(s) against HPV vaccination or mixed recommendations (i.e., both for and against) had lower odds of HPV vaccine initiation (OR = 0.56 and OR = 0.44, respectively) as compared to parents who only received recommendation(s) for HPV vaccination.

Discussion and conclusion

Discussion

The importance of a physician's recommendation has been established as a key determinant of HPV vaccine uptake, but to date, few studies have sought to contextualize HPV vaccine communication within the broader health care team (Bartlett & Peterson, 2011; Holman et al., 2014; Lau et al., 2012; Rahman, Laz, McGrath, & Berenson, 2014; Reagan-Steiner et al., 2015). In this national study, we found that parents who discussed HPV vaccination with more than one health care team member had greater odds of vaccinating their child as compared to parents who only discussed it with one team member. In this way, our findings suggest that communication with other members of the health care team (nurses, medical assistants, and others) may be important for amplifying recommendations delivered by the primary care provider (physician, nurse practitioner, or physician assistant). About half of the parents in our sample reported discussing HPV vaccination with multiple health care team members. Although we were unable to differentiate by provider type, previous studies have found improved patient outcomes among primary care patients receiving care from multidisciplinary teams that included registered nurses (Fiscella, Mauksch, Bodenheimer, & Salas, 2017; Mundt, et al., 2016). Similarly, we believe that nurse practitioners are well positioned to lead future HPV vaccine communication initiatives that engage other providers and staff because of their advanced training in leadership, quality improvement, health delivery systems and practice-based inquiry improvement, and evidence-based practice (NONPF, 2017). Future research should explore this promising approach to improving coverage.

Similar to other studies (Gilkey & McRee, 2016; Gilkey, Malo, et al., 2015; Gilkey, Moss, et al., 2015; Malo et al., 2016), our findings suggest that improvement of HPV vaccine recommendations is needed to achieve Healthy People 2020 goals. In this national sample, nearly 1 in four parents of age-eligible children received a recommendation against vaccination from at least one team member. Previous research among health providers has noted barriers to HPV vaccine recommendation including the following: financial concerns, knowledge gaps, perceived parental concerns or negative attitudes toward vaccination, and preferences for vaccinating older and female adolescents (Holman et al, 2014). In addition, communication style and content may play a role in parental perception of the recommendation received. Provider ambivalence in vaccine recommendations, perception of parental hesitancy, and risk-based approaches to prescribing may all contribute to failure to provide strong and timely HPV vaccine recommendations (Henrikson, Tuzzio, Gilkey, & McRee, 2016; McRee, Gilkey, & Dempsey, 2014). Last, despite the low levels of incongruent recommendations for HPV vaccination (overall 12%), findings indicate that receiving these mixed messages from health care team members is potentially as detrimental to vaccine uptake as receiving only a recommendation against vaccination. This association further highlights the importance of interventions that engage the entire health care team.

This study is strengthened by a large national sample and the inclusion of novel questions about the influence of recommendations from multiple health care team members instead of physicians alone. Limitations include a cross-sectional design and parental report of communication and adolescents' HPV vaccination status. In addition, the survey did not assess the role of different provider types and their communication styles. As a result, we are limited in our understanding of the specific influences of nurse practitioners and nurses as compared to other types of health care providers. Future research should aim to identify the vaccine practices of these types of health care team members, as well as factors associated with their HPV vaccine communication and recommendations.

Conclusion and practice implications

Understanding the larger context of parent communication with multiple and diverse members of the health care team is important for increasing HPV vaccination coverage. Future research is needed to examine vaccine knowledge, beliefs, and communication behaviors of all members of the health care team including nurses and nurse practitioners. Having this foundational information is necessary to 1) ensure that all members give a congruent recommendation for HPV vaccination and 2) build effective vaccine communication interventions, considering parent and patient experience with multiple health care team members.

Health care practices should examine system-, team-, and provider-level approaches to providing multiple positive HPV vaccine recommendations at the same visit and over time. Health care teams should consider clinical in-service trainings to ensure that all members of the team are educated about HPV and HPV vaccination, as well as understand the importance of building a comprehensive communication strategy that promotes multiple opportunities to provide HPV vaccine recommendations to patients and families. Given their

transdisciplinary training and perspective, nurse practitioners are well positioned to lead these efforts and affect change in HPV vaccination rates in their practices.

Acknowledgments

Funding: This study was supported by a Grant from the National Cancer Institute (K22 CA186979 for Melissa B. Gilkey and L40 CA220702 for Melanie L. Kornides).

References

- Bartlett JA & Peterson JA (2011). The uptake of human papillomavirus (HPV) vaccine among adolescent females in the United States: A review of the literature. *J Sch Nurs*, 27, 434–446. [PubMed: 21750234]
- Daley M, Liddon N, Crane L, Beaty B, Barrow J, Babbel C, et al. (2006). A national survey of pediatrician knowledge and attitudes regarding human papilloma virus vaccination. *Pediatrics*, 118, 2280–2289. [PubMed: 17142510]
- Fiscella K, Mauksch L, Bodenheimer T, Salas E (2017). Improving care teams' functioning: Recommendations from team science. *Jt Comm J Qual Patient Saf*, 43, 361–368. [PubMed: 28648222]
- GfK. KnowledgePanel Design Summary. KnowledgePanel Overview. 2016 Retrieved from [http://www.knowledgenetworks.com/ganp/docs/KnowledgePanel\(R\)-Design-Summary.pdf](http://www.knowledgenetworks.com/ganp/docs/KnowledgePanel(R)-Design-Summary.pdf).
- Gilkey M, Malo T, Shah P, Hall M, & Brewer N (2015). Quality of physician communication about human papillomavirus vaccine: Findings from a national survey. *Cancer Epidemiology Biomarkers & Prevention*, 24, 1673–1677.
- Gilkey M, & McRee AL (2016). Provider communication about HPV vaccination: A systematic review. *Human Vaccines & Immunotherapeutics*, 12, 1454–1468.
- Gilkey M, Moss J, Coyne-Beasley T, Hall M, Shah P, & Brewer N (2015). Physician communication about adolescent vaccination: How is human papillomavirus vaccine different? *Preventive Medicine*, 77, 181–185.
- Henrikson NB, Tuzzio L, Gilkey MB, & McRee AL (2016). “You’re never really off time”: Healthcare providers’ interpretations of optimal timing for HPV vaccination. *Prague Medical Report*, 4, 94–97.
- Holman DM, Benard V, Roland KB, Watson M, Liddon N, & Stokley S (2014). Barriers to human papillomavirus vaccination among us adolescents: A systematic review of the literature. *JAMA Pediatrics*, 168, 76–82. [PubMed: 24276343]
- Kornides ML, McRee AL, & Gilkey MB (2018). Parents who decline HPV vaccination: Who later accepts and why? *Academic Pediatrics*, 2S, S37–S43.
- Lau M, Lin H, & Flores G (2012). Factors associated with human papillomavirus vaccine-series initiation and healthcare provider recommendation in us adolescent females: 2007 national survey of Children’s health. *Vaccine*, 30, 3112–3118. [PubMed: 22425179]
- Malo T, Ali K, Sutton S, Perkins R, Giuliano A, & Vadaparampil S (2016). The content and context of physicians’ communication with males about human papillomavirus vaccination. *Human Vaccines & Immunotherapeutics*, 12, 1511–1518. [PubMed: 26835599]
- Malo TL, Giuliano AR, Kahn JA, Zimet GD, Lee JH, Zhao X, Vadaparampil ST. (2014). Physicians’ human papillomavirus vaccine recommendations in the context of permissive guidelines for male patients: A national study. *Cancer Epidemiol Biomarkers Prev*, 23, 2126–2135. [PubMed: 25028456]
- McRee AL, Gilkey MB, & Dempsey AF (2014). HPV vaccine hesitancy: Findings from a statewide survey of healthcare providers. *J Pediatric Health Care*, 28, 541–549.
- Mundt MP, Agneessens F, Tuan WJ, Zakletskaia LI, Kamnetz SA, Gilchrist VJ (2016). Primary care team communication networks, team climate, quality of care, and medical costs for patients with diabetes: A cross-sectional study. *Int J Nurs Stud*, 58, 1–11. [PubMed: 27087293]
- NONPF. (2017). Nurse practitioner core competencies content. Retrieved from http://c.ymcdn.com/sites/www.nonpf.org/resource/resmgr/competencies/2017_NPCoreComps_with_Curric.pdf.

- Rahman M, Laz TH, McGrath CJ, & Berenson AB (2014). Provider recommendation mediates the relationship between parental human papillomavirus (HPV) vaccine awareness and HPV vaccine initiation and completion among 13- to 17-year-old us adolescent children. *Clinical Pediatrics* (Phila), 54, 371–375.
- Reagan-Steiner S, Yankey D, Jeyarajah J, Elam-Evans L, Curtis CR, MacNeil J, ... Singleton JA. (2016). National, regional, state, and selected local area vaccination coverage among adolescents aged 13–17 years- United States, 2015. *MMWR Morb Mort Wkly Rep*, 65, 850–858.
- The American Association for Public Opinion Research. (2016). Standard Definitions: Final dispositions of case codes and outcome rates for surveys. 9 Retrieved from [http://www.aapor.org/Standards-Ethics/Standard-Definitions-\(1\).aspx](http://www.aapor.org/Standards-Ethics/Standard-Definitions-(1).aspx).
- U.S. Department of Health and Human Services. (2014). *Healthy People 2020*. Washington, DC: Office of Disease Prevention and Health Promotion.
- Vadaparampil ST, Kahn JA, Salmon D, Lee JH, Quinn GP, Roetzheim R, ... Giuliano AR. (2011). Missed clinical opportunities: Provider recommendations for HPV vaccination for 11–12 year old girls are limited. *Vaccine*, 29, 8634–8641. [PubMed: 21924315]
- Vadaparampil ST, Malo TL, Kahn JA, Salmon DA, Lee JH, Quinn GP, ... Giuliano AR. (2014). Physicians' human papillomavirus vaccine recommendations, 2009 and 2011. *Am J Prev Med*, 46, 80–84. [PubMed: 24355675]
- Vadaparampil ST, Staras SA, Malo TL, Eddleton KZ, Christie J, Rodriguez M, ... Shenkman EA. (2013). Provider factors associated with disparities in human papillomavirus vaccination among low-income 9- to 17-year-old girls. *Cancer*, 119, 621–628. [PubMed: 23341308]
- Ylitalo KR, Lee H, & Mehta NK (2013). Health care provider recommendation, human papillomavirus vaccination, and race/ ethnicity in the US National Immunization Survey. *Am J Public Health*, 103, 164–169. [PubMed: 22698055]

Table 1.Sample characteristics ($n = 795$)

	<i>n</i> (%)
Child characteristics	
Sex	
Male	407(51)
Female	388 (49)
Age in years (mean, [SD])	14.2 (1.9)
Time in years from first HPV vaccine discussion (mean, [SD])	2.1 (1.6)
HPV vaccine initiation (>1 dose)	
No	245 (31)
Yes	550 (69)
Parent characteristics	
Educational attainment	
High school degree or less	311 (39)
Some college, no degree	192 (24)
College degree or more	292 (37)
Race/ethnicity	
Non-Hispanic white	538 (68)
Non-Hispanic black	70(9)
Hispanic	150(19)
Other	37(5)
Household characteristics	
Annual income	
<\$35,000	156 (20)
\$35,000–\$74,999	217(27)
\$75,000	422 (53)
Region in United States.	
Northeast	152(19)
Midwest	196 (25)
South	262 (33)
West	185 (23)

Note: HPV = human papillomavirus.

Table 2.

Correlates of HPV vaccine initiation

	HPV Vaccine Initiation (1 Dose)			
	<i>n/N</i>	%	OR	95% CI
Discussed HPV vaccine with multiple members of the health care team				
No	234/385	61	1	
Yes	316/410	77	2.34	1.61–3.40 [*]
Recommendation(s) received from the health care team				
For HPV vaccination only	440/606	73	1	
Against HPV vaccination only	45/92	49	0.44	0.27–0.72 ^{**}
Both for and against HPV vaccination	65/97	67	0.56	0.33–0.95 ^{***}

Note: Model adjusted for child's age, time (years) from first discussion, parent's educational attainment, parent's race/ethnicity. CI = confidence interval; HPV = human papillomavirus; OR = odds ratio.

^{*}
p < .001.

^{**}
p < .01.

^{***}
p < .05.