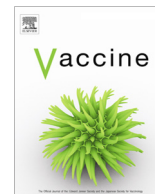


Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

Vaccine

journal homepage: www.elsevier.com/locate/vaccine

Associations of trust and healthcare provider advice with HPV vaccine acceptance among African American parents

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ARTICLE INFO

Article history:

Received 1 September 2016

Received in revised form 12 December 2016

Accepted 14 December 2016

Available online xxx

Keywords:

Human papillomavirus vaccines

African Americans

Directive counseling

Health knowledge, attitudes, practice

ABSTRACT

Objective: Healthcare providers (HCPs) are advised to give all parents a strong recommendation for HPV vaccination. However, it is possible that strong recommendations could be less effective at promoting vaccination among African Americans who on average have greater mistrust in the healthcare system. This study examines the associations of parental trust in HCPs and strength of HCP vaccination recommendation on HPV vaccine acceptance among African American parents.

Methods: Participants were recruited from an urban, academic medical center between July 2012 and July 2014. We surveyed 400 African American parents of children ages 10–12 years who were offered HPV vaccine by their HCPs to assess sociodemographic factors, vaccine beliefs, trust in HCPs, and the HPV vaccine recommendation received. Medical records were reviewed to determine vaccination receipt. **Results:** In multivariable analysis, children whose parents were “very strongly” recommended the HPV vaccine had over four times higher odds of vaccine receipt compared with those whose parents were “not very strongly” recommended the vaccine. Having a parent with “a lot of” versus “none” or only “some” trust in HCPs was associated with over twice the odds of receiving HPV vaccine. Very strong HCP recommendations were associated with higher odds of vaccination among all subgroups, including those with more negative baseline attitudes toward HPV vaccine and those with lower levels of trust. Adding the variables strength of HCP recommendation and parental trust in HCPs to a multivariable model already adjusted for sociodemographic factors and parental vaccine beliefs improved the pseudo R^2 from 0.52 to 0.55.

Conclusions: Among participants, receiving a strong vaccine recommendation and having a higher level of trust in HCPs were associated with higher odds of HPV vaccination, but did not add much to the predictive value of a model that already adjusted for baseline personal beliefs and sociodemographic factors.

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1. Introduction

Racial disparities in cervical cancer morbidity and mortality have persisted over the last decade [1]. Cervical cancer is diagnosed 30% more frequently in African American women, who die nearly twice as frequently of cervical cancer as white women.

Abbreviations: CDC, Centers for Disease Control and Prevention; HCP, Healthcare provider; HPV, Human papillomavirus.

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Given that human papillomavirus (HPV) vaccination protects against up to roughly 81% of cases of invasive cervical cancer (as well as 74% of all invasive HPV-associated cancers) [2–5], achieving a high HPV vaccination coverage level could help eliminate cervical cancer health disparities. Nonetheless, complete coverage with three vaccine doses in the United States are low among all 13–17 year old girls (41.9%) and boys (28.1%) and among African American girls (40.8%) and boys (26.0%) [6].

The Centers for Disease Control and Prevention (CDC) stresses the importance of a strong healthcare provider (HCP) recommendation for HPV vaccination with suggested standard language to be used in discussions [7]. Nonetheless, some studies suggest that vaccination counseling should be tailored to each parent's beliefs

<http://dx.doi.org/10.1016/j.vaccine.2016.12.045>

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and perspectives. In two recent studies, exposing people to CDC-based information counterintuitively reduced intention to vaccinate among those with pre-existing negative attitudes toward vaccination [8,9]. Qualitative research suggests trust in the HCP promotes parental vaccine acceptance [10–12].

Cultural issues affecting health beliefs may be different for African Americans compared with Americans of other races. African American parents may have greater concern that accepting new vaccines for their children could be exposing them to medical experimentation [12–15]. In 2007, Washington, DC became one of the first jurisdictions in the country to pass an HPV vaccine school mandate (with an opt out clause) [16,17]. The legislation was initially condemned in the *Washington Post* as a paternalistic mandate imposed by white legislators on African American girls and was likened, inaccurately, to the Tuskegee syphilis experiment [18]. This example illustrates how strong HPV vaccine legislation may be perceived as oppressive and discriminatory. It is not clear whether strong HPV vaccination recommendations delivered by individual HCPs could also be perceived negatively among some African American parents. It is also unclear whether the outcome depends on trust in the recommending HCP. The current study examined the dual associations of parental trust in HCPs for vaccine advice and strength of HCP vaccination recommendation with HPV vaccine acceptance among African American parents.

2. Materials and methods

This study protocol was approved by the Children's National Medical Center Institutional Review Board.

2.1. Participants and setting

Between July 2012 to July 2014, 400 participants were recruited from the waiting rooms of the pediatric and adolescent health centers within an academic teaching hospital in Washington, DC. The health centers report about 40,000 annual encounters from a patient population that is 78% African American and 83% publically insured. Participants' children were treated by 26 attending physicians, 4 adolescent medicine fellows, 8 nurse practitioners, and 51 pediatric residents (hereafter referred to collectively as HCPs) who ordered vaccines and provided all vaccination counseling (i.e., no standing orders). Prior to beginning study enrollment, HCPs were informed about the study via email and at one of six study information sessions. All HCPs had previously been informed of CDC best practices regarding immunization recommendations. In none of the study-specific sessions were HCPs instructed to change their practices with respect to recommending immunizations.

Participants were self-identified African American, English-speaking parents or legal guardians (hereafter referred to collectively as parents) of children 10–12 years old who had not previously received HPV vaccine and were offered the vaccine at that healthcare encounter. Age criteria included children recommended for routine receipt of HPV vaccine (11–12 years) [5], as well as 10 year old children because some HCPs in the practice routinely offered HPV vaccine starting at age 10. Parents were excluded if their children had any medical contraindications to HPV vaccination.

2.2. Survey administration

Research staff previewed appointment schedules for children meeting age criteria. They obtained written informed consent from eligible, interested parents. Study refusers were asked for basic demographic information. Upon survey completion, participants were given a copy of the HPV Vaccine Information Statement

(VIS), the factsheet “Vaccine Safety: The Facts” developed by the American Academy of Pediatrics, and a \$10 grocery store gift card.

2.3. Survey

Items included in the current analysis were part of an orally administered survey designed to assess social influences on HPV vaccination decision-making. The survey consisted of two parts. Part one was administered prior to the HCP encounter. It assessed sociodemographic characteristics (respondent's age, gender, highest educational attainment, history of vaccine refusal, whether older children had received HPV vaccine in the past, and child's age, gender, and whether the child was overdue for other vaccinations), parental trust in different sources of vaccine advice (including “your child's doctors, nurses or other healthcare providers,” “websites from doctor groups like the American Academy of Pediatrics,” and “government websites like the Centers for Disease Control and Prevention, also called the CDC”), and attitude toward HPV vaccine. Response options for items assessing trust in sources of vaccine advice were “not at all,” “some,” and “a lot.” For the item assessing trust in HCPs, “not at all” and “some” responses were combined in multivariate analysis due to a very low frequency of “not at all” responses.

Items assessing attitude toward HPV vaccination were adapted from a previously validated scale of vaccine beliefs [19]. The six items were modified slightly to address parental respondents and to specify HPV vaccine (e.g., “Vaccines are good for your health” was changed to “The HPV vaccine is good for my child's health”). We added a seventh item, “African Americans are being targeted for HPV vaccine while it is still somewhat experimental” to assess frequency of this potential concern. Response options ascertained level of agreement (1 = “strongly disagree” to 5 = “strongly agree,” with anti-vaccine statements reverse coded). A summary pro-vaccine beliefs score was calculated as the mean of the seven items' responses and included in multivariate analysis.

The second part of the survey was administered after the HCP encounter to verify that HPV vaccine was offered that day, and to assess each participant's impression of how strongly the HCP recommended HPV vaccination (“not very strongly,” “somewhat strongly,” and “very strongly”), as well as overall impression of the HCP (1 = “worst” and 10 = “best”). After the encounter, each child's medical record was reviewed to determine prior vaccination status and whether HPV vaccine was received that day. We also noted the encounter type (well or sick), the healthcare provider's level of training and his/her race.

2.4. Statistical analysis

Only respondents whose children were offered the HPV vaccine that day were included in these analyses. All analyses were performed in Stata v13.1 [20]. Initial bivariate statistics were derived using Student's *t*, Wilcoxon rank-sum, chi-square and Fisher's exact tests. Multivariable logistic regression models were created to examine the relationship of the two predictor variables of interest, parental trust in the HCP and strength of provider's HPV vaccination recommendation, to the outcome, HPV vaccine receipt by the child. Potential covariates were checked for collinearity using Pearson correlation coefficients (PCCs), and for independence using variable inflation factors (VIFs). Two variables, trust in government websites and trust in websites from doctors' groups for vaccine advice, were highly collinear (PCC = 0.69), so the variable, trust in websites from doctors' groups, was dropped. Final models included adjustment for parental age and education, child's age and gender, parental trust in government websites, parental pro-vaccine beliefs score and encounter type. Models treated HCP as a random effect using the *xtlogit* command. PCC for model variables ranged from

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