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Florida physicians' reported use of AFIX-based strategies for human papillomavirus vaccination

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ABSTRACT

HPV vaccination rates in Florida are low. To increase rates, the CDC recommends clinics adhere to components of their evidence-based quality improvement program, AFIX (Assessment, Feedback, Incentives, and eXchange of information). We explored factors associated with engaging in HPV-specific AFIX-related activities. In 2016, we conducted a cross-sectional survey of a representative sample of 770 pediatric and family medicine physicians in Florida and assessed vaccination practices, clinic characteristics, and HPV-related knowledge. Data were analyzed in 2017. The primary outcome was whether physicians' clinics engaged in ≥1 AFIX activity. We stratified by physician specialty and developed multivariable models using a backward selection approach. Of the participants in the analytic sample (n = 340), 52% were male, 60% were White of any ethnicity, and 55% were non-Hispanic. Pediatricians and family medicine physicians differed on: years practicing medicine ($p < 0.001$), HPV-related knowledge ($p < 0.001$), and VFC provider status ($p < 0.001$), among others. Only 39% of physicians reported engaging in ≥1 AFIX activity. In the stratified multivariable model for pediatricians, AFIX activity was significantly associated with HPV-related knowledge (aOR = 1.33;95%CI = 1.08–1.63) and provider use of vaccine reminder prompts (aOR = 3.61;95%CI = 1.02–12.77). For family medicine physicians, HPV-related knowledge was significant (aOR = 1.57;95%CI = 1.20–2.05) as was majority race of patient population (non-Hispanic White vs. Other: aOR = 3.02;95%CI = 1.08–8.43), daily patient load (< 20 vs. 20–24: aOR = 9.05;95%CI = 2.72–30.10), and vaccine administration to male patients (aOR = 2.98;95%CI = 1.11–8.02). Fewer than half of Florida pediatric and family medicine physicians engaged in any AFIX activities. Future interventions to increase AFIX engagement should focus on implementing and evaluating AFIX activities in groups identified as having low engagement in AFIX activities.

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1. Introduction

Over 79 million people in the U.S. are currently infected with human papillomavirus (HPV), a virus that causes cervical, vaginal, vulvar, anal, penile, and oropharyngeal cancers as well as genital warts (Centers for Disease Control and Prevention, 2014). The nine-valent vaccine has the potential to prevent up to 90% of cervical cancers and 90% of genital warts (U.S. Food and Drug Administration, 2014). The Advisory Committee on Immunization Practices (ACIP) recommends two doses of the HPV vaccine for males and females ages 9–14 or three doses for males and females 15–26 (Meites et al., 2016). Despite the potential benefits of the vaccine and the ACIP recommendations, uptake remains disappointingly low with only 49.5% of girls and 37.5% of boys in the U.S. between 13 and 17 years of age being up-to-date on their HPV vaccinations in 2016 based on current ACIP guidelines (Walker et al., 2017). Vaccination rates in Florida are even lower for both girls (46.4%) and boys (34.5%) (Walker et al., 2017). This is particularly concerning because Florida also has some of the highest rates of HPV-related disease including oropharyngeal and cervical cancers (Viens et al., 2016).

In an effort to increase pediatric vaccination rates, the Centers for Disease Control and Prevention (CDC) created a quality improvement program: **A**ssessment, **F**eedback, **I**ncentives, and e**X**change of information (AFIX) (Centers for Disease Control and Prevention, 2017). AFIX is a widely accepted strategy for improving childhood vaccination rates (Smulian et al., 2016) and is a promising approach for increasing HPV vaccine coverage among adolescents (Gilkey et al., 2014). Additionally, recent data show healthcare providers who did receive an AFIX visit from the health department have positive attitudes with regard to these visits including high scores on ease of understanding, convenience, helpfulness, and facilitation (Calo et al., 2018). The AFIX approach incorporates four key strategies that have been shown to reliably improve providers' immunization service delivery and raise vaccination coverage levels: (1) assessing the providers' vaccination coverage levels; (2) giving the providers feedback of results of the assessment as well as strategies to improve vaccine delivery; (3) providing incentives to reward improved vaccination rates; and (4) exchanging information through continued follow-up with providers to both monitor and support progress (Centers for Disease Control and Prevention, 2017). AFIX uses an “assessment and feedback” approach in which state and local health departments deliver vaccine quality improvement consultations to providers, with a particular focus on providers who are a part of the Vaccines for Children (VFC) federal low cost vaccination program (Centers for Disease Control and Prevention, 2017). While AFIX encounters are usually administered by health departments to the clinics, the present study is extending the utilization of these quality improvement initiatives to examine provider-reported integration of the AFIX-based strategies specific to HPV vaccination in their clinics, regardless of whether an AFIX visit occurred in the clinic.

Previous research demonstrates that the use of AFIX-based strategies, such as informing providers of their vaccination coverage, increases vaccination rates (Gilkey et al., 2014; Calo et al., 2018). Therefore, the present study aimed to identify characteristics associated with low usage of these evidence-based strategies in order to identify potential targets for future interventions. The objective of the present study was to assess Florida primary care physicians' report of HPV-specific quality improvement activities aligned with the CDC's AFIX program and determine factors associated with use of AFIX to identify potential areas for future intervention efforts.

2. Methods

2.1. Sample

As part of an ongoing study assessing Florida-based primary care physicians' experiences with HPV vaccination recommendation in clinical practice, we conducted two cross-sectional surveys of primary care physicians in Florida. Results of the first survey, completed in 2014, were focused on physician recommendation of HPV vaccination for adolescent and young adult boys, and have been previously published (Scherr et al., 2016; Vadaparampil et al., 2016). Here we present results from the second survey, conducted in 2016 and analyzed in 2017, which was focused on identifying multi-level targets for intervention strategies to improve HPV vaccination rates. Specifically, identifying factors associated with low usage of HPV-specific AFIX-based strategies. The study received ethical approval by the Institutional Review Board. Participants were recruited from the American Medical Association (AMA) Physician Masterfile, a database of all licensed U.S. physicians (Freed et al., 2006). We did not recruit physicians who: 1) were trainees, 2) were locum tenens, 3) reported their major professional activity was non-patient care, 4) were ≥65 years of age, as the AMA Masterfile has been shown to have a significant lag in updating retired physicians (Kletke, 2004), and 5) listed a post office box for their address (precluding use of FedEx mailing). Florida-based pediatric and family medicine physicians were sampled based on their proportional representation in the Florida physician primary care workforce and randomly selected from the AMA Masterfile (Vadaparampil et al., 2016). We selected only one physician per group practice and if a provider indicated they did not provide care to either males or females between the ages of 9 and 26 they were excluded from analyses. This study was granted a waiver of documentation of informed consent based on the following criteria: 1) the only record linking the subject and the research is the consent document and the principal risk would be potential harm resulting from a breach of confidentiality; and 2) the research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the research context.

Over the course of two months, our study team mailed one original and up to two reminder surveys to our sample. Physicians were given the option to either mail their completed paper survey back to our study team or respond via an online link included in the cover letter that accompanied the mailed survey. To increase our survey response rate, representatives from the Florida Chapter of the American Academy of Pediatrics (FCAAP) and the Florida Academy of Family Physicians (FAFP) also sent two emails to their respective membership informing them about our study and the importance of their participation.

2.2. Measures

The survey was developed using previously validated items where possible (Vadaparampil et al., 2011; Kahn et al., 2005; Riedesel et al., 2005; Kahn et al., 2007; Daley et al., 2006; Malo et al., 2014; Vadaparampil et al., 2014; Allison et al., 2013). The final 41-item survey assessed three domains: physician characteristics, general clinic characteristics, and vaccine-specific characteristics. Physician characteristics included demographic information, specialty, state of residency training, and HPV knowledge. General clinic characteristics included practice size and location, and demographic characteristics of the patient population. Knowledge was measured using 11-items regarding HPV infection, disease, vaccination, and guidelines from various organizations (including the World Health Organization and ACIP). One point was awarded for each correct response and correct responses were summed to crease a knowledge score (range: 0–11). For a full list of variables assessed, see Table 1. Vaccine-specific characteristics included whether they administer the vaccine to male and female patients; are a VFC provider; whether they use reminder prompts and how many different prompts they use; and if they have a vaccine coordinator in their office.

A series of questions assessed whether the physician's clinic used AFIX-based strategies related to HPV vaccination, regardless of whether these activities were the result of a health department visit or not, with at least one question assessing each of the AFIX constructs. **A**ssessment