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Ohio Appalachia public health department personnel: Human papillomavirus (HPV) vaccine availability, and acceptance and concerns among parents of male and female adolescents

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Abstract

Public health departments (n=48) serving the 32 counties of Ohio Appalachia were contacted to determine human papillomavirus (HPV) vaccine availability and to assess patient and parental attitudes, perceived barriers, and decisional differences about vaccination for male and female adolescents. Nurses or nursing supervisors in 46 of 48 health departments agreed to participate with 45 (97.8%) reporting that HPV vaccines were available for males and females. HPV vaccination barriers reported most frequently were lack of knowledge about the vaccines, concerns about potential side effects, the newness of the HPV vaccines, and parents believing their children were not sexually active or were too young to receive an HPV vaccine. Provider reports of the primary differences in the acceptability of an HPV vaccine among parents of males compared to the parents of females were lack of awareness that an HPV vaccine was available for males, not understanding why the vaccine should be given to males, and fear of vaccination increasing sexual promiscuity among female adolescents. Half of the health departments (n=24) reported that parents of females were more receptive toward HPV vaccination, 16 health departments reported no difference in acceptability based on gender of the child, and 5 health departments reported that parents of males were more receptive. This study suggests that there are different informational needs of males and females and parents of male and female children when making an informed decision about HPV vaccination. Findings highlight content to include in strategies to increase HPV vaccination rates among Appalachia Ohio residents.

Keywords

HPV vaccines; cervical cancer; health care disparities; adolescent; Appalachian region

1.1 Background

Human papillomavirus (HPV) is a common sexually transmitted infection in the United States (U.S.), with estimated prevalence rates of 42.5% for females (age 14-59 years) and 53.1% for males (age 18-70 years) who report having sex only with females [1,2]. Persistent infection with oncogenic HPV types 16 and 18 are responsible for greater than 70% of cervical cancers, while nononcogenic HPV types 6 and 11 cause greater than 90% of genital

warts [3-5]. Additionally, HPV types 16 and 18 are associated with anal, penile, vaginal, vulvar, and oropharyngeal cancers [6].

Females living in Appalachia Ohio have elevated cervical cancer incidence and mortality rates compared to females living in the U.S. and compared to females in other Appalachian states (10.6 per 100,000 in Ohio Appalachia vs. 7.8 per 100,000 in non-Appalachian Ohio) [7-11]. Reasons for the increased cervical cancer rates are numerous, complex, and may include many levels included in the Social Determinants of Health conceptual model [12, 13]. For example, reasons may include individual risk factors (e.g. risky sexual activities), social relationships (e.g. provider-patient communication), social/physical context (e.g. access to resources), institutions (e.g. health care system), and social conditions (e.g. culture, social norms) [14-18].

In June 2006, the U.S. Food and Drug Administration (FDA) approved a quadrivalent HPV vaccine for females aged 9-26 years to protect against HPV types 6, 11, 16, and 18 [19]. A bivalent HPV vaccine, against HPV types 16 and 18, became available for females in 2009 [20]. The FDA expanded approval of the quadrivalent HPV vaccine for males aged 9-26 years in October 2009 [21]. The Advisory Committee on Immunization Practices (ACIP) recommends administration of an HPV vaccine for females to reduce cervical, vaginal, vulvar, and anal cancers and genital warts [22]. Initially the ACIP provided a permissive (non-routine) recommendation of the quadrivalent HPV vaccine for males, however, in October 2011; ACIP modified its recommendation to include routine HPV vaccination for males to reduce genital warts and anal cancer [23]. HPV vaccines are available at no cost for individuals (aged <18 years) who are uninsured or meet eligible criteria for the publically-funded Vaccines for Children (VFC) Program. Nationally, approximately half (48.7%) of females (ages 13-17 years) have received an initial dose of an HPV vaccine by 2010, however, the rate of vaccine uptake has decreased since 2007 [24]. Additionally, among females interviewed at least 24 weeks after their first HPV vaccine dose, only two-thirds (69.6%) completed the three dose series [24]. HPV vaccine initiation and completion rates in Ohio are similar to U.S. rates [24]. Data about males are limited, however, a national sample of parents of males (age 11-17 years) reported HPV vaccine uptake to be approximately 2% about one year after FDA approval [25].

In rural regions like Appalachia, public health departments are a vital healthcare source for preventive care [26]. In addition, while about half of primary care offices nationwide participate in the VFC program, non-participating offices often refer their patients to public health departments [27]. In our previous study of public health departments in seven Appalachian states (2008), we found the HPV vaccine was: available (although sometimes limited to VFC program participants); recommended by providers; and about 25-30% of age-eligible females had received the initial dose [28].

1.2 Research Questions

Given the HPV-associated cancer health disparities among Appalachian residents, and with the permissive recommendation of the HPV vaccine for males at the time of the current study, we wanted to update information regarding the demand, availability, recommendation, and barriers of HPV vaccination for males and females in Appalachia Ohio. Furthermore, we were interested if providers in public health departments noticed any similarities or differences among the decision making of parents of males versus parents of females and if they noticed a change for HPV vaccine-related issues for females. Even though the current study was conducted only in Appalachia Ohio as compared to the previous study among seven Appalachian states, we thought this snapshot of HPV vaccine-

related behaviors is important to document and will be useful in developing culturally-appropriate interventions to improve HPV vaccination rates.

2.1 Design and Sample

This study was conducted among the 32 counties in Ohio designated as Appalachia [29]. Health departments located in these counties were identified on the Ohio Department of Health's (ODH) website in July 2011 [30]. A member of the research team (BRO) called each health department during July and August 2011 to arrange a telephone interview with the person most knowledgeable about HPV vaccines. The study was approved by the Institutional Review Board of The Ohio State University.

During initial calls to the 50 health departments (18 city and 32 county), it was discovered that two city health departments had closed and are not included in this report. Among the 48 existing health departments, personnel from four health departments did not respond to several telephone contact attempts and were visited in person to arrange an interview. Personnel in two health departments (1 city and 1 county) completed the interview at the time of the in-person visit. The remaining two city health departments agreed to complete a telephone interview in the future, but were unavailable after subsequent contact attempts. Individuals verbally agreed to participate in the study prior to starting the interview.

2.2 Measures

The semi-structured questionnaire used was slightly modified from a previous study focusing on HPV vaccination for females [28]. The questionnaire included closed-ended questions regarding HPV vaccine availability, patient demand, provider recommendation, cost, and educational materials available to patients. Additionally, the questionnaire included open-ended questions about HPV vaccine barriers and differences about the acceptability of HPV vaccination among parents of males and females. The interviews were completed in approximately 20 minutes, allowing time for discussion. No incentive was provided to participants for completing the interview.

2.3 Analytic Strategy

Question responses were manually entered into an electronic version of the questionnaire, transferred to a database and checked for accuracy using double data entry. SPSS version 19 statistical software was used to calculate summary statistics (means, standard deviations, percentages). Responses to open-ended questions were categorized based on shared themes by a research team member (BRO). Using these established categories, the research team (BRO, MLK) independently coded the responses, reviewed differences, and reached a consensus [31].

3. Results

Forty-six (32 county and 14 city) of the 48 public health departments actively serving Ohio Appalachia residents participated in this study, for a 95.8% response rate. Participants included 24 (52.2%) public health/immunization nurses, 21 (45.6%) directors of public health nursing, and one (2.2%) public health supervisor. Among these health departments, the most frequently reported reason for adolescents (9-17 years of age) seeking medical care was for vaccinations. Among the participating health departments, one city health department reported not offering HPV vaccines and referred patients to the county health department located nearby. The 45 health departments offering HPV vaccines are the basis for this report.

Thirty-nine (86.7%) of the health departments offered only the quadrivalent vaccine, while six (13.3%) health departments offered both the quadrivalent and bivalent HPV vaccines. Additionally, only one city health department reported that their supply of HPV vaccines did not meet demand, citing their status as a city health department as the source of their inadequate supply. Among the health departments offering HPV vaccinations, 34 (75.6%) reported that patients or parents of patients requested the vaccine. In most health departments offering HPV vaccines (n=44, 97.8%), providers reported recommending HPV vaccination to patients or parents of patients. Providers recommended HPV vaccination beginning at ages 9 to 14 years in 9 (20%) health departments and beginning at ages 9 to 11 years in 36 (80.0%) health departments. Participants also reported that providers in ten (22.2%) health departments recommended HPV vaccination to individuals older than age eighteen.

In response to the question “Of all the females and males, age 9 to 26 years of age who come to your health department, what percent do you think have received the first dose of an HPV vaccine?”, estimations ranged from 1-95%. Thirty (66.7%) health departments reported that less than 50% of the adolescents had received the initial dose of an HPV vaccine. Participants estimated that adolescents completing the three dose vaccine series ranged from 20-100%, with 31 (68.9%) health departments reported that approximately 75-100% completed the three dose series.

Health departments reported 15 barriers to HPV vaccination among patients or parents of patients (Table 1). The most common barriers reported according to the nurses were lack of knowledge about HPV vaccines (n=25), concerns about vaccine side effects (n=17), the newness of HPV vaccines (n=16), parents believing their children are not sexually active and/or too young (n=16), and negative publicity from media channels or community members (n=10).

Participants reported eight differences about the acceptability of HPV vaccines among parents of males compared to parents of females (Table 2). The most common differences were lack of awareness that the HPV vaccine was available for males (n=20), not understanding why HPV vaccination is recommended for males (n=16), parents of females voiced concern that HPV vaccination may cause sexual promiscuity (n=8), and females have more information about HPV vaccines because the vaccines have been available for females for a longer period of time (n=6). Providers from 24 health departments reported that parents of females were more receptive toward HPV vaccination, 16 providers reported no difference in HPV vaccine acceptability among parents of females and males, and 5 providers reported that parents of males were more receptive.

All health departments provided HPV vaccines free to individuals qualifying for the VFC program; however, there was an administration fee for each dose in 35 (77.8%) health departments. This fee ranged from \$3 to \$20 per HPV vaccine dose administered, with an average of \$7.50. However, many health departments waived this fee if the patient was unable to pay. Twenty-five (55.6%) health departments did not offer the HPV vaccine to individuals who did not qualify for the VFC Program. For non-VFC program participants, the cost of HPV vaccination ranged from \$0 to \$187 per dose. Among the 20 health departments offering HPV vaccines to non-VFC program participants, 14 (73.7%) offered assistance, using a sliding scale or by assisting patients with applying to a pharmaceutical company's patient assistance program. Additionally, four (8.9%) health departments reported that the HPV vaccines were provided to females and males younger than 18 years without parental permission.

To improve completion rates for the HPV vaccine series, 42 (93.3%) health departments used some type of reminder system for the 2nd and 3rd dose. The most frequent types of reminder systems used were mailed reminders (n=30, 66.7%), telephone calls (n=17; 37.8%), and appointment cards provided to the patient at the time of their first dose (n=15; 33.3%).

All health departments offering HPV vaccines reported having at least one type of educational brochure available for patients and/or parents. The educational brochures use most often were developed by pharmaceutical companies (n=34), the CDC (n=30), or ODH (n=5).

4. Discussion

HPV vaccination is one prevention strategy that has potential to reduce cancer disparities and is available in public health departments throughout Appalachia Ohio. This finding is comparable to our previous study among health departments located in Appalachia, despite three additional counties being designated as part of Appalachia Ohio by the Appalachian Regional Commission in the intervening years. The mean estimated percent of patients initiating HPV vaccination reported by the Appalachia Ohio health department personnel increased from 24.1% in 2008 to 41.5%. This is surprising since the current study includes female and male patients compared to the previous study of only female patients. This estimated increase may be a result of over-reporting or due to parents bringing in their children for other vaccinations because of the ODH mandate for vaccinating seventh graders against tetanus, diphtheria, and acellular pertussis (Tdap) prior to the 2010 school year [32]. Unsolicited, many participants in the current study reported initiating HPV vaccination when patients received other school mandated vaccines. Likewise, the increase in HPV vaccine initiation likely represents an estimation of the increase in vaccine coverage among females, since estimated HPV vaccination coverage among males is low in the U.S. [25].

The increase in estimated HPV vaccine initiation rates is tempered by an estimated decrease in completion of the HPV vaccine series, about 90% in 2008 and now estimated to be 73% on average. The reduced HPV vaccine completion rate may reflect patients initiating HPV vaccination while presenting for their required vaccines and failing to return to complete the series or other unidentified reasons.

Participants reported a high HPV vaccine recommendation rate (97.8%) of male and female patients compared to a national survey of primary care physicians with a recommendation rate of 34.6% to 52.7% for females [33]. The increased HPV vaccine recommendation rate in the current study could result from many factors including the known increased cervical cancer rates among females in Appalachia Ohio, patient-level characteristics (e.g. risky sexual behaviors), differences in recommending practices, organizational policy differences, reporting biases, or other factors. Since provider recommendation is an important predictor of vaccination, the true nature of what is communicated during patient/parent-provider discussions is important for future study [34].

Despite the availability and recommendations reported by personnel in these health departments, HPV vaccine uptake remains similar to the national average [24]. Therefore, the HPV vaccine barriers among this population are important if the potential of HPV vaccination to reduce cancer disparities is to be realized. The main barriers to HPV vaccination in this study are similar to previous reports among residents of Appalachia Ohio and among females and males in the U.S. [35-43]. Participants in this study identified potential vaccine side effects, the newness of the vaccines, parents' perceptions that their children are not sexually active or too young, and not having enough information about the

vaccines as the primary barriers to HPV vaccination. Male patients and parents of males may need additional information as well, with many health departments indicating that parents of males were not aware that an HPV vaccine was available for males or why the vaccine should be given to males. Although provider recommendation remains the most important facilitator to increase HPV vaccination rates, it has been noted that the complexity of explaining the benefits of the HPV vaccine to male patients might dissuade practitioners from recommending the vaccine to male patients [42]. The change in ACIP recommendation to routine may assist in reducing the complexity discussing the HPV vaccine with male patients. However, the differences between parents of males and parents of females reported regarding the perceived severity of diseases caused by vaccine preventable HPV remain a potentially significant barrier. The findings in this study are in agreement with the findings of a recent study comparing differences among mothers of sons and daughters that found that parents of males did not perceive their child to be at risk for HPV, perceived the HPV vaccine to be too new and expressed concerns about side effects [44]. Therefore, additional educational tools and intervention strategies need to be developed to assist males and parents of males with making an informed vaccination decision.

Previous studies among females have reported cost as a significant barrier to HPV vaccination, especially among older females not covered by the VFC program [35-37]. Although most health department patients are eligible to receive HPV vaccination for no cost through the VFC program, 77.8% (35 of 45) of the health departments reported charging an administrative fee for the vaccine. On average, the administrative fee among the health departments was \$7.50 per dose, however, during strained economic times even this small cost may be a barrier to complete the HPV vaccine series (most departments waived the administration fee for VFC eligible patients, if necessary). In addition, even though only 20 of the 45 health departments offered HPV vaccines for individuals not eligible for the VFC program, the average cost (\$80) of each HPV vaccine dose may prevent vaccination among individuals not eligible for the VFC program. The primary availability of the HPV vaccines only for individuals eligible for the VFC program and financial assistance provided to others may explain why cost as a barrier to vaccination was only reported by four health departments in this study.

Appalachia Ohio health departments reported the main differences in the decision making of parents of males compared to parents of females about HPV vaccines were: lack of awareness and understanding about HPV vaccination for males; less concern about the association of the vaccine with sexual promiscuity; and less concern about associated health consequences among males. Although these differences have been previously reported among males and parents of males [25, 41-43], this is the first report, to our knowledge among public health departments in Appalachia, a region with significant cancer health disparities. These differences could provide a basis for future intervention for parents of males and females. By reducing gender specific barriers and leveraging current knowledge differences, public health providers can increase vaccination rates.

The strengths of this study include: a questionnaire that was used in a previous study of HPV vaccine acceptability among public health departments in seven Appalachian states; the interviews were conducted by one research team member for consistency, and a high response rate (95.8%) among Appalachia Ohio health departments.

4.1 Limitations

This study has several limitations. The participants in this study provided an estimation of the number of requests for HPV vaccines, HPV vaccine initiation and completion rates, provider recommendation patterns, HPV vaccine barriers, and patient cost information. Although the participants in this study were likely to know their population best, this method

may be less accurate than if the requested data was prospectively collected by the health departments. This study was conducted when ACIP provided permissive recommendations for the HPV vaccine for males. In person interviews were used for two health departments who did not respond to initial telephone calls. These interviews were, however, were conducted by the same person using the same script, likely limiting differences in responses from different interview methods. The generalizability of the results is limited by conducting the study among health departments serving only Appalachia Ohio. It is possible that the patients using health departments in Appalachia Ohio are different than patients using health departments in other Appalachian states or in public health departments not located in Appalachia. Finally, the experiences of health department personnel may differ from those of providers in other types of primary care practices because many patients enter health departments seeking vaccines, possibly priming them to receive other vaccinations including HPV vaccination.

4.2 Conclusions

HPV vaccination is available for Appalachia Ohio residents and future educational tools and interventions aimed at increasing HPV vaccination should consider the barriers reported by the public health department nurses participating in this study. Additionally, these findings suggest that parents of males and parents of females may have different informational needs and may respond to different messages when making an informed decision about HPV vaccination for their children.

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Table 1

HPV vaccine barriers reported by Appalachia Ohio Health Department personnel (n=45)

Barriers	Health Departments n (%)
Lack of knowledge	25 (55.6)
Concern about side effects	17 (37.8)
New vaccine	16 (35.6)
Children are not sexually active or too young	16 (35.6)
Negative publicity from the media or community members	10 (22.2)
Vaccine may cause sexual promiscuity	7 (15.6)
There are too many vaccines and the HPV vaccine is not mandatory	7 (15.6)
Difficulty discussing vaccine with children due to HPV being a sexually transmitted infection	6 (13.3)
Vaccine series completion	4 (8.9)
Cost of the vaccine (among individuals not eligible for VFC program)	4 (8.9)
Child disagrees with getting shots (pain associated with injection)	3 (6.7)
Lack of time and/or transportation to bring child in to complete the vaccine series	3 (6.7)
Religious beliefs	2 (4.4)
Cancer does not run in my family	1 (2.2)
Cannot get the HPV vaccine without parental permission (<18 years old)	1 (2.2)

Table 2

HPV vaccine decision making: Differences among parents of male and female adolescents reported by Ohio Appalachia Health Departments (n=45)^a

Differences	Health Departments n (%)
Parents are unaware that the HPV vaccine is for males	20 (44.4)
Parents lack knowledge of why males should receive the HPV vaccine	16 (35.6)
Parents of females are concerned about sexual promiscuity because their child is not sexually active	8 (17.8)
More information is available for females since the vaccine has been offered longer to females	6 (13.3)
Parents of males perceive less severe health consequences (e.g. genital warts)	5 (11.1)
Cervical cancer is a serious disease	3 (6.7)
Parents aware of the HPV vaccine for males but concerned that the vaccine is new for males	3 (6.7)
Parents are afraid of reproductive consequences for female children	3 (6.7)

^aResponses to the open ended question: "Do you notice any differences between the decision making of parents of girls versus the parents of boys about the HPV vaccine?"