

**WILLINGNESS TO RECEIVE HPV VACCINE FROM COMMUNITY PHARMACISTS: EXPLORING THE
PERSPECTIVES OF RURAL CAREGIVERS OF HPV VACCINE AGE ELIGIBLE CHILDREN**

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Abstract

Introduction: The United States aims to reach human papillomavirus (HPV) vaccine-induced herd immunity by having 80% of all age-eligible individuals complete the vaccine series. However, the US is far from reaching this goal, especially among rural, medically underserved populations. In these medically-underserved regions, pharmacies may serve as an additional location for HPV vaccination. Little is known about rural caregivers' willingness to have their HPV vaccine age-eligible children obtain this cancer-prevention resource from their local pharmacist.

Methods: Researchers conducted 26 in-depth interviews with rural caregivers of HPV vaccine age-eligible children to explore their willingness for pharmacist-administered HPV vaccination and analyzed interview data using an inductive qualitative content analyses approach.

Results: The majority of caregivers were unaware that pharmacists could offer adolescent vaccines. However, most were willing to allow their children to receive the vaccine from this non-traditional source. Most caregivers' concerns regarding vaccinations from pharmacists included necessitating proper pharmacist training and certifications to vaccinate against HPV as well as requiring the pharmacist to send vaccine records to the primary care doctor. Caregivers did not believe that having a pharmacist administer the HPV vaccine would affect their relationship with their primary care provider. In terms of health education about the HPV vaccine and about pharmacists' ability to vaccinate, caregivers preferred print health education resources and were interested in also receiving health information via social media.

Conclusion: This study highlighted ways to increase health education related to HPV vaccination and an alternative site to receive the HPV vaccine. Pharmacies may serve as an additional site to increase HPV vaccine initiation and completion.

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Introduction

Human Papillomavirus (HPV) causes over 30,000 cases of cancer in the U.S. per year.¹

Oncogenic HPV strains, most commonly Types 16 and 18, are responsible for the majority of HPV-related cancers which include roughly 70% of oropharyngeal, 91% of anal, 90% of cervical, 75% of vaginal, 69% of vulvar, 63% of penile cancers.¹ In rural regions of the U.S., incidence of HPV-related cancers, especially oropharyngeal cancer in both men and women is higher than the rest of the country.² Further, cervical cancer is higher in the rural South and Midwest.² Most of these cancers can be prevented by the timely completion of a 9-valent HPV vaccine series.^{1,3-5}

To reach herd immunity against HPV Types 16 and 18 (and other oncogenic and non-cancer causing strains), Healthy People 2020 aims to increase HPV vaccination to 80% for boys and girls.⁶ As of 2017, however, only 44.3% of boys and 53.1% of girls between ages 13-17 years old completed the HPV vaccine series nationwide.⁷ Rates of vaccine completion were lower in rural areas, as evidenced by being 10 percentage points lower in vaccination completion as compared to rural adolescents' urban counterparts, even after controlling for poverty.⁷ Studies have found that, among rural populations, the two greatest barriers to HPV vaccine uptake is lack of parental awareness of HPV and the HPV vaccine^{8,9} and also lack of a strong healthcare provider recommendation to receive the vaccine, resulting in missed clinical opportunities.^{9,10}

Traditionally, primary care providers (PCPs) such as pediatricians, family medicine physicians, nurse practitioners, and other nursing staff administer HPV vaccine doses. After individuals receive the first HPV vaccine dose from their PCP, they must return to their primary care clinic for additional doses. This places a burden on patients and their caregivers to schedule and attend additional, non-routine clinical visits.¹¹⁻¹³ However, PCPs are not the only providers who can administer the HPV vaccine. Pharmacists can administer additional vaccine doses,^{14,15} and pharmacies may be able to serve as additional HPV vaccination sites, especially in medically underserved regions.

The Presidents' Cancer Panel on Accelerating HPV Vaccine Uptake and the Pediatric Pharmacy Advocacy Group both recommend incorporating pharmacists to aid in HPV vaccine promotion, administration, and series completion.^{14,16} Pharmacists are trusted health care providers, cited as the second most-trusted health care professionals (after nurses)¹⁷ and community pharmacists are additionally cited as the most accessible providers. This in part is because pharmacies are more geographically dispersed than primary care clinics, offer more hours of availability, and appointments are not required to receive medical attention.¹⁸⁻²⁰ Receiving vaccines at a pharmacy may help overcome structural patient-level barriers (e.g. time, transportation, additional co-pays) to receiving HPV vaccine doses.²¹

Little is known about rural caregivers' willingness to have their adolescents receive vaccinations, particularly the HPV vaccine from their community pharmacists. Further, little is known about how receiving vaccines from a community pharmacist may impact caregivers' primary care-seeking behaviors for their adolescents.²² Therefore, this qualitative study seeks to explore rural caregivers' (of HPV vaccine age-eligible minors) perceptions of receiving the HPV vaccine from their local pharmacist.

Methods

After the study received IRB approval, participants were recruited using a variety of methods. Study recruitment flyers were emailed to Area Health Education Centers' listservs and to public libraries, asking the libraries to post the flyers on their community boards. Health fairs were attended and interviews for potential participants were scheduled. Participants who received the study flier called the first author's office phone to screen for eligibility and schedule a time for the in-depth interview.

Verbal informed consent was obtained from all study participants prior to conducting the in-depth interview. Interview discussions were guided by an in-depth interview guide to structure the discussion related to caregivers' perceptions of receiving adolescent vaccinations, particularly the HPV vaccine, with their community retail pharmacists. (See Table 1 for a list of the interview questions.) On average, interviews lasted 15 minutes. Based on their preference all participants were either emailed an e-gift card or mailed a physical gift card for \$20 as remuneration for their study participation.

Table 1: Interview Guide

Introduction:

Thank you for taking the time to take part in this interview. These interviews will be used to get a better understanding of what you think about the Human Papillomavirus (HPV) vaccine. If you have any questions about the vaccine, I would be happy to discuss more health information at the end of the interview. The purpose of this study is simply to explore your ideas and perceptions about the administration of the HPV vaccine.

We hope to use findings from this study in future work to help prevent cancer.

To start, I will ask you some questions about the Human Papillomavirus, called HPV for short.

- What have you heard about the virus HPV?
 - How and where did you find out this information?
- How do you think your child or children could be affected by HPV?

My next set of questions relate to the HPV vaccine.

- What have you heard about the HPV vaccine?
 - Where did you hear about it?
- Have your children received the HPV vaccine?
 - Who administered the vaccine?
 - Was it your pediatrician? Family care healthcare provider? A healthcare provider from your child's school? A different provider?
 - How many doses of the vaccine did your child receive?
 - Do you know if your child finished the vaccine series?
- What do you think influences people to have their children vaccinated against HPV?
- What may keep parents and caregivers from having their children vaccinated against HPV?
 - Is there anything else?
- If possible, would you be willing to have your child receive vaccines from your community pharmacist?
 - What would influence you to seek the vaccine with your pharmacist?
 - Do you think that if your child received vaccines (in general) from your community pharmacist that this would impact how often you see your child's primary care provider?

- What other information about the HPV vaccine would you like to share?
- If we were going to conduct a program to increase HPV vaccination understanding - including the role of the pharmacist - what should that look like?
 - What type of format would be most engaging? (e.g. flier, photo novella, iPad based animation, etc.)
 - What type of media channel would be best to send the message (e.g. distributed at health clinics, via social media, poster, etc.)
- Do you have any other recommendations for how best to share information about the HPV vaccine?

Thank you for taking the time to speak with me about your experiences and perceptions about the HPV vaccine. I certainly appreciate your valuable input. This ends our interview.

All interviews were audio-recorded on a digital recorder and then uploaded to a professional transcription company's website for verbatim transcription as the interviews were conducted. Upon receiving the interview transcripts, the typed files were compared to the audio MP3s to ensure transcription accuracy. Using an inductive approach,²³ the researchers separately read the same three interview transcripts (selected due to their differing perspectives) prior to meeting in person to create and pilot a draft coding guide. The coding guide included potential interview themes and definitions for each theme. These two research team members used the new coding guide to independently code three interview transcripts before meeting to compare codes. Whenever new themes emerged from the data (and later from new interview transcripts), the research team members alerted one another of the new code and recoded all interviews based on the emergence of the new code. This iterative approach increased the rigor of qualitative coding.²⁴ All coding discrepancies were identified and intercoder agreement was assessed using ATLAS.ti software, which generates a score used to assess research members' coding similarities.²⁵ Prior to continuing to code the interview data, the researchers met to discuss coding discrepancies and how to expand or change the codebook definitions to ensure coding clarity. The authors split the remaining interview transcripts, separately hand-coded them, and the coded transcripts were entered into ATLAS.ti software. Upon completing interview coding, the authors met periodically to discuss their results and to select representative quotes that illustrate interview themes.²⁴

Results

ATLAS.ti software found acceptable levels of agreement (Krippendorff $c^{\alpha}=0.805$) between the two researchers' coding behaviors.

Participant demographics can be found in Table 2.

Table 2: Participant Demographics

Participants (N=26)	
Sex	Female: 26
Age (years)	18-29: 3 30-49: 19 50-64: 4
Race	Black/African American: 1 Hispanic/Latino American: 3 Native American: 2 Black/Native American: 1 White Caucasian: 19
Education	Some high school: 3 High school graduate: 7 Some college: 6 Trade/technical/vocational training: 1 College graduate: 5 Postgraduate degree: 4
Employment	Full-time: 12 Part-time: 2 Not employed: 9 Retired: 1 Unable to work: 1 Other: 1
Income (dollars)	0 - 25,999: 7 26,000 - 51,999: 5 52,000 - 74,999: 8 More than 75,000: 3 Do not know: 2 Decline to say: 1
HPV vaccine behavior and intention	At least one child initiated the vaccine series: 11 Completed the vaccine series: 5 Unsure of vaccine completion, but sure of initiation: 4 Lacked clear response of initiation or completion: 2 Intention to vaccinate child against HPV: 1 Unsure/still deciding: 2 No intention to vaccinate child against HPV: 9

The research team conducted interviews until they reached data saturation, and after 26 interviews, they found that no new themes emerged from interview data.²⁶ See Table 2 for participants' demographic information and for HPV vaccine behavior. Themes that emerged from interview data include knowledge and awareness about the HPV vaccine, HPV vaccine behaviors and perceptions (which includes vaccine barriers and facilitators), attitudes related to pharmacists' administration of the HPV vaccine, and health education preferences. For the purpose of this paper, authors will focus on HPV vaccine barriers, willingness to receive a vaccine from a pharmacist, and ways this may impact caregivers' relationship with their child's primary care provider.

HPV Vaccine Barriers

The most commonly cited barrier to the HPV vaccine was fear of adverse reactions to the vaccine, a concern cited by eleven participants. One caregiver stated that she had read an article about cases where children have died after being vaccinated against HPV (Caregiver 16). Two caregivers reported that fear that vaccination can lead to the development of autism prevents caregivers from having their children vaccinated (in general).

"[There are] things in the vaccines that, in the long run, will harm them. I have one friend who thinks that's there is mercury in the vaccines, or that the government is doing unknown testing [on populations] through vaccines. And so, there are some interesting people out there that have their own ideas about what vaccinations do...like the MMR with autism." (Caregiver 11)

Another caregiver expressed distaste and lack of perceived need for all vaccines. This caregiver responded:

"I just don't like them (vaccines). I just don't care for them to have them just because of things I've read. And I grew up without hardly any of them [any vaccines]. And I got the measles and the mumps, and I survived." (Caregiver 9)

More often participants who lived in northern regions of the state described how their communities are religious and socially conservative. In these areas, they believed, the HPV vaccine is viewed as a resource that encourages children and adolescents to engage in premarital sex. One caregiver (Caregiver 14) even described that the HPV vaccine was nicknamed “the slut shot” in her community. Other parents did not perceive the need for their children to be vaccinated against HPV because they are not sexually active and will remain abstinent.

Attitudes Related to Pharmacists’ Administration of the HPV Vaccine

The majority (n=18) of participants were willing to have their child or children receive the HPV vaccine or other adolescent vaccinations from their community retail pharmacist. Caregivers described that this method of receiving adolescent vaccinations could be a more convenient method to receiving the vaccine as opposed to relying on their primary healthcare providers, alone, for their children’s vaccinations. There were various reasons why parents believed that this method of vaccine delivery is considered convenient. For one, caregivers would not have to schedule medical appointments with their primary care provider for their children to receive vaccines and vaccine booster doses

“Sometimes in certain instances, it [getting the vaccine from the community pharmacist] may be even more convenient because of appointments [not having to make or keep appointments]. You know, trying to get into, you know, the doctor, the pediatrician, it’s like I’m scheduling it two weeks out unless my kids are sick and then it’s like I could just take them to urgent care or something.”

(Caregiver 5)

Another described how taking their children to the pharmacist for vaccinations may be more cost-effective as opposed to obtaining the additional booster doses with their primary care provider. This additional visit may entail an additional copay; therefore, the participant believed, pharmacist-administrated vaccines may be more cost effective.

“For me it would most likely be cost: if they were charging me \$10.00 per vaccine at the pharmacy, and I have to pay a \$20.00 co-pay at the doctor’s office.”

(Caregiver 13).

Some parents also described how receiving vaccines from the local pharmacist may also relieve healthcare practitioners’ workload, making this form of vaccine administration more convenient for healthcare providers and for the community, as a whole.

“You know what? I don’t see any problem with that as long as they’re qualified for that, and it would make things run a lot smoother for our community, for our hospitals, because we’re a big tribe and it’s always packed in the doctor’s office, or the pharmacy, everyone’s waiting around, there’s a lot of people.” (Caregiver 4)

The most commonly reported stipulation to receiving the HPV vaccine from pharmacists (as opposed to primary care providers) related to pharmacists’ training and qualification to administer vaccines. One caregiver responded, “If I knew that they were qualified for it and had all the certifications and everything like that, yeah. I don’t see why not.” (Caregiver 10). Another caregiver described being open to having their children receive vaccine from pharmacists as long as they followed the necessary standard protocols to vaccine administration and reporting.

“As long as it’s done with the requirements that they would normally do at a doctor’s office... you know the cleanliness, the papers that need to be filled out, the records that need to be kept or whatever...” (Caregiver 17)

Six participants stated that they would not have their children receive the HPV vaccine with their pharmacist, preferring for their child’s primary care provider administer the vaccine. This was often due to their stronger relationship with their primary care provider. For example, a participant described her preference to get vaccines from her primary care provider “mostly because they know my family.” (Caregiver 6). Other caregivers expressed concerns that their children’s health records (with their primary care providers) may not be updated if another healthcare provider (other than the primary care provider) administered their child’s vaccines.

When asked how receiving adolescent vaccines would impact parents' primary-care seeking behaviors for their children, the majority of parents described that it would not impact their relationship with their primary care provider. One caregiver noted,

"No [it wouldn't affect how often we see our PCP]. We get care wherever we can, the cheapest way we can, and especially nowadays everything's recorded – especially vaccines – at least in the State of Arizona. So, I guess if it's not recorded, it's just the parents' responsibility to make sure they keep a record of it." (Caregiver 18)

Health Education Preferences

When asked about the best ways to disseminate information about the HPV vaccine and about pharmacists' ability to vaccinate, caregivers more often preferred receiving this information print fliers disseminated in various locations. More than half of all interview participants recommended creating brief information sheets about HPV to post at the local post office or to place in community members' mailboxes. They also recommended disseminating information about the HPV vaccine both at medical clinics as well as at pharmacies.

The other most commonly promoted health education channel for HPV vaccine information was the social media site Facebook.

"Most of the people here are on Facebook so, and some on Snapchat... I don't know if it was really like vaccines or anything, but I know that they do [advertise] health physicals, that they do all-day things to where you can come in and get all your physicals done, and stuff like that, and I know they do [promote] that on social media a lot." (Caregiver 12)

Additionally, participants described the use of Facebook pages for their community as places where they receive information about ongoing events in the community including health-related events.

“I would say that – yea, there is one for the city of (name of city), too. A general community Facebook page. I think that also would be another good idea of getting the word out there of the kind of like health – or what’d you say or kind of reminder.”

(Caregiver 22)

Other recommended avenues for health information is having healthcare providers at medical clinics or the health departments promote the vaccine, offering the vaccine at local health fairs, hosting a health forum, and engaging the local churches to help promote the vaccine. Other less commonly recommended health education channels included reaching out to community-based organizations to promote the vaccine, hosting radio shows about HPV and the vaccine, and using both billboards as well as newspapers to promote HPV vaccination. Caregivers’ main concerns about health education materials are that the information comes from a credible source, provides credible information, and highlights the advantages and disadvantages of the vaccine.

Discussion

In rural regions of the state, caregivers' most commonly cited barrier to the HPV vaccine was fear of adverse reactions to the vaccine. Specifically, caregivers feared that the HPV vaccine and other adolescent vaccine caused severe adverse reactions such as autism, contained harmful ingredients, and are used, experimentally, on children, common controversies related to the safety of vaccinations.²⁷ Caregivers were unaware that the most common side effects of the vaccine are common to all adolescent vaccines and medical procedures. These side effects include pain at site of injection, dizziness, fatigue, fever, and, less common, fainting.²⁸ They have received false information about vaccine safety largely from other caregivers via, more commonly, blogs, user-generated content. Blogs are not always the most credible and accurate sources of health information, although they may be perceived as credible sources of information.²⁹ One review study found that blogs, particularly those who present negative information about vaccines, contain incomplete information and lack scientific support such as cited references and a bibliography.³⁰ This points to the need for increasing caregivers' health information-seeking skills to be able to locate credible, unbiased health information online.

Additionally, caregivers cited the role that conservative religious faiths have on HPV vaccine-related stigma. Participants' religious faiths, particularly Mormonism, emphasizes the importance of sexual monogamy and waiting until marriage to commence sexual activity. Caregivers believed that their adolescent children will follow these ideals, thus making the HPV vaccine unnecessary. HPV vaccination, they believed, may possibly promote sexual debut prior to marriage.³¹ These myths about the HPV vaccine have previously been debunked, and past research has found that HPV vaccination does not, in fact, lead to premature sexual activity or promiscuity.^{32,33} Research conducted in the neighboring state of Utah recommends collaborating with religious leaders to increase HPV vaccine acceptability and reduce stigma of this cancer prevention resource.³⁴

Willingness for Children to Receive Pharmacist-administered HPV Vaccine

This study adds to current HPV vaccine literature by exploring rural caregivers' willingness to have their adolescent children receive vaccines, specifically the HPV vaccine, from community pharmacists. While most caregivers were unaware that pharmacists can vaccinate adolescents, they were willing to have their children obtain vaccines from this "non-traditional" site as long as pharmacists have received proper training to administer the vaccines. Similar to past research, caregivers were unaware that pharmacists and pharmacy interns, nationwide, can administer adolescent vaccines other than the flu shot.³⁵ They were also unaware that pharmacists' undergo training and certification prior to being able to administer vaccines.³⁶ According to Arizona State law (A.A.C. R4-23-411), pharmacists and pharmacy interns must complete trainings in vaccination administration and cardiopulmonary resuscitation before they are allowed to administer vaccines. This training program includes information related to responding to vaccine adverse events, record-keeping and reporting, vaccine administration, and immunology. This state law mandates pharmacists to submit an immunization record to a patient's primary care provider with 48 hours upon administering the vaccine. Pharmacists more often notify primary care providers via fax, and the immunization record provides the following information: name of vaccine, vaccine expiration date, vaccine dose, vaccine manufacturer lot number, and the professional information on the professional who administered the vaccine. Additionally, pharmacists' ability to vaccinate adolescents varies by patient age, state-by-state basis. In Arizona, for patients under age 13 years old, pharmacists can only administer the initial HPV vaccine dose with a prescription from a patient's primary care provider. Pharmacists may administer initial doses for all children over age 14, and they are allowed to offer vaccine booster doses for children of any age.³⁷ Although this law is in place, health education and communication is needed to promote the pharmacy as a location for adolescent vaccination. Future health education interventions can test methods of increasing awareness and acceptability of pharmacist-administered adolescent vaccination.

Convenience of Pharmacist-administered Vaccine

Caregivers' willingness to receive vaccinations from the pharmacy was due to their perception of this being a more *convenient* method of healthcare delivery. However, concepts of "convenience" related to how this healthcare model could save time and money. In terms of time, having an additional location (other than a primary care provider) administer the vaccine would serve as an additional healthcare venue where their children could receive the HPV vaccine. Having additional options could permit increased vaccination because, particularly in medically underserved regions, primary care providers and health departments often have long waiting periods for scheduling appointments and waiting lines in the clinic. This resonates with past rural health research that identified the following barriers to vaccination: travel distance, transportation problems, inability to take time off work, and limited provider networks in rural settings.³⁸ Caregivers also believed that the flexible hours of pharmacies (being open after working hours and on the weekends) could increase the likelihood of having their adolescent children vaccinated, particularly since this method of healthcare delivery would not require an appointment and because there may be shorter wait times at the pharmacy. A retrospective review of records from a community retail pharmacy between August 2011-July 2012 showed that pharmacists more often administered vaccinations during the evenings, weekends, and during holidays, all times in which primary care provider offices are less likely to be open.^{7,39}

Impact of Pharmacist-administered Vaccine on Relationship with Primary Care Provider

When asked how receiving a vaccine from a community retail pharmacist may impact caregivers' relationship with their PCPs, the vast majority of participants described how this would not impact their relationship with their PCP. Caregivers were concerned that pharmacists would not provide information or update patients' primary care providers on the pharmacy-provided vaccination.²² Again, however, based on Arizona state law, pharmacists are required to fax a vaccine information sheet to patients' primary care provider within 48 hours of vaccine administration. However, patients may have incomplete or incorrect information about their primary care providers, information that would affect their PCPs' ability to receive this information.

Since it has been shown that a strong provider recommendation increases vaccination uptake, primary care provider recommendation to get vaccines from pharmacists or providers' prescription to have the vaccine filled at a local pharmacy could increase vaccination.³⁵ Past research found that family medicine practitioners are more likely to support pharmacist administration of the HPV vaccine as compared to pediatricians, possibly due to their pre-existing collaborative relationship with prescribing medications for older adults as opposed to pediatric patients, alone.³⁶ Further, family medicine practitioners see the results and long term outcomes of persistent infection with HPV.³⁶ In this same study, pediatricians' main concerns about pharmacist-administered adolescent vaccinations were failure to report the vaccine administration to the primary care provider, reduced primary care providers' opportunities to screen adolescents for other health issues if they received vaccines outside of the primary care clinic, and not monitoring patients for post vaccination side effects.³⁶

Preferences for Health Education

In terms of information and content, caregivers in this study preferred to receive information from a reputable source. Further, they preferred information that is accurate, easy to understand, and content which provides a brief overview of the benefits and potential risks of the vaccine.⁴⁰

They preferred methods for receiving health information about the HPV vaccine and about pharmacist-administered HPV vaccination, caregivers living in rural areas of the state prefer receiving print information such as brochures and informational sheets. They recommended disseminating these information sheets in places such as the post office, particularly their post office boxes or community boards at the post office to ensure that community members could see this health information. They also believed this information should be disseminated at healthcare providers' offices and at pharmacies. Caregivers were also interested in receiving information via a website or through social media, particularly their Facebook community page.

Study Limitations

This qualitative interview study had a small final sample size of 26 respondents, but we reached information saturation in terms of large proportions of the respondents echoing similar, common themes. Despite recruiting from rural regions across the state of Arizona, the northern region of the state was more fully represented. This could have influenced the weight of the cited barriers to HPV vaccination since this region tends to be largely socially conservative and religious. Additionally, all of the respondents were women, but this is not completely unexpected since women are largely the caregivers of adolescents, especially in rural regions of the state.

Conclusion and Future Directions

Generally, caregivers of HPV vaccine age-eligible children living in rural and medically underserved areas are willing to have their children receive the HPV vaccine from their community pharmacists. This creates an additional avenue for HPV vaccination, particularly in medically underserved areas in which there are less primary care providers available. This healthcare delivery model was deemed more convenient based on the ability to save time and, potentially, money by offering this non-traditional location as a vaccination site. Based on interview data, pharmacy vaccination programs could be a viable and accepted way to increase the vaccination rates in these rural populations without influencing the ways that primary care is utilized for healthcare. Therefore, future research should involve testing an educational outreach program coupled with pharmacist-administered vaccines to increase HPV vaccination rates specifically in rural regions of Arizona, with hopes of eventually spreading the program's implementation across the US.

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