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Beth I. Schwartz
Thomas Jefferson University

Merissa Maccani
Thomas Jefferson University

Shalini Bansal
Thomas Jefferson University

Meghan Gannon
Thomas Jefferson University

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Parental perceptions of the HPV vaccine for prevention of anogenital and oropharyngeal cancers



Beth I. Schwartz^{a,b,*}, Merissa Maccani^a, Shalini Bansal^a, Meghan Gannon^a

^a Department of Obstetrics and Gynecology, Sidney Kimmel Medical College at Thomas Jefferson University, Philadelphia, PA, USA

^b Division of Adolescent Medicine and Pediatric Gynecology, Nemours Children's Health, Wilmington, DE, USA

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ABSTRACT

Background and Objectives: Human papillomavirus (HPV) is implicated in the development of both anogenital and oropharyngeal cancers. Although HPV vaccination prevents the majority of anogenital and head and neck cancers (HNC), vaccination rates remain low, especially among males. Known barriers to vaccination are knowledge gaps and vaccine acceptability. The objective of this study is to explore parental knowledge, perceptions, and decision-making processes about HPV and HPV vaccination for both anogenital and HNC.

Methods: This qualitative study recruited parents of children and adolescents aged 8–18 to participate in semi-structured telephone interviews. Data were analyzed using thematic analyses, informed by an inductive approach.

Results: A total of 31 parents participated in the study. Six themes emerged: 1) knowledge about HPV vaccines, 2) perceptions and attitudes toward cancers, 3) role of child's sex in HPV vaccination, 4) decision-making processes around HPV vaccination, 5) communication with health care providers about HPV vaccines, and 6) influence of social networks. There were significant knowledge gaps about the vaccine's indications and effects, especially for males and HNC prevention. Parents had concerns related to risks of the HPV vaccine. They cited pediatricians as important sources of information about vaccination and critical to their decision-making.

Conclusions: This study identified many parental knowledge gaps related to HPV vaccination, with information about males, HNC prevention, and risks particularly lacking. As parents identified pediatricians as the most important sources of information regarding HPV vaccination, this should empower pediatricians to educate families about this important preventive health measure, with a focus on addressing concerns about vaccine risks.

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1. Introduction

Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States (US) [1]. HPV is implicated in the development of both anogenital and oropharyngeal cancers and is responsible for more than 90% of cervical and anal cancers, 60% to 70% of vulvar and vaginal cancers, and 70% to 80% of head and neck cancers (HNC) in the US [1–5]. HPV-related cancers are on the rise, and the prevalence of HNC now surpasses cervical cancer [2]. While there was a reduction in cervical cancer

from 1999 to 2015, there was an increase in oropharyngeal cancer during this time, which was more pronounced in males than females [3].

Vaccination against HPV has been available in the US since 2006. It is very effective for the prevention of cervical, vulvar, vaginal, and anal cancers, as well as genital warts [6–8]. It is recommended by the US Centers for Disease Control for all females and males aged 9 to 26, with routine administration suggested at ages 11 to 12 [4]. The indications were expanded in 2020 to include HNC prevention [5]. Despite evidence that HPV vaccination prevents 90% of anogenital cancers and is thought to prevent a large percentage of HNC [1,6,7,9,10], vaccination rates remain low compared with other recommended age-concordant vaccines [11]. Although vaccine uptake has increased over time, with 51% of adolescents fully up-to-date in 2018 and 75% receiving one or more dose in 2020, these rates are significantly lower than for other

Abbreviations: HNC, head and neck cancers; HPV, human papillomavirus; US, United States.

* Corresponding author at: Department of Obstetrics and Gynecology, Thomas Jefferson University, 833 Chestnut St., 1st Floor, Philadelphia, PA 19107, USA.

E-mail address: beth.schwartz@jefferson.edu (B.I. Schwartz).

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vaccines (89%–92%) [12,13]. Vaccine initiation increases with age, with a peak at 16, long after the recommended age of initiation. Male vaccination rates have increased over time and are ahead of females at age 13, but these gains are lost by 14 with significant differences at 17, when 66% of females are up-to-date with vaccination compared with only 50% of males. This leads to overall lower vaccine completion for males.

Barriers to HPV vaccination include knowledge gaps and vaccine acceptability, which are even more pronounced for males and for HNC [14–19]. Given the paucity of knowledge and perceptions of the HPV vaccine for HNC prevention, further research about this topic among parents of older children and adolescents is key. The objective of this study is to explore parental knowledge and perceptions about HPV and HPV vaccination for both anogenital and HNC. The specific aims were to: 1) describe parental knowledge of the relationship between HPV and both anogenital and oropharyngeal cancers and perceptions and attitudes around HPV vaccination, 2) understand decision-making processes and parental intentions to vaccinate their children, and 3) assess differences in knowledge, beliefs, and vaccination intentions for parents of male versus female children.

2. Methods

2.1. Participants

Parents of children and adolescents aged 8 to 18 were recruited using convenience sampling. Study flyers were posted at two sites: 1) primary care and adolescent medicine practices in both urban and suburban locations of a tertiary-care children’s hospital and 2) an obstetrics and gynecology practice in an urban academic hospital. Interested individuals contacted study investigators, who confirmed eligibility, explained the study, and obtained written informed consent. This study was approved by both the Nemours Children’s Health and Thomas Jefferson University Institutional Review Boards.

2.2. Data collection

Study visits were conducted by telephone between February 2021 and March 2022. After participants completed the study visit, they were compensated for their time with a \$50 gift card.

2.2.1. Demographic survey

At the beginning of the study visit, demographic data were collected, including gender identity; race; ethnicity; insurance status; education history; employment status; and number, age, and sex of children. Data were recorded in an electronic database.

2.2.2. Interviews

Interviews were conducted by three interviewers (MG, SB, MM), utilizing an interview guide (Appendix 1) that was developed by study investigators (BIS, MG). Participants were asked about their knowledge and perceptions of HPV and the HPV vaccine, benefits and risks of HPV vaccination, as well as the decision-making processes around vaccinating children, including where they receive information about the HPV vaccine and about communication with their child’s pediatrician regarding HPV vaccination. Participants were also questioned over communication with their social networks.

2.3. Data analysis

2.3.1. Demographic survey

Descriptive statistical analysis of the demographic data with frequency counts and percentages for categorical variables and

means and standard deviation for continuous variables was performed using IBM SPSS Statistics for Windows, version 27 (IBM Corp., Armonk, NY, USA).

2.3.2. Interviews

Interviews were recorded and transcribed by a HIPAA-compliant transcription service and imported into NVivo qualitative analysis software (NVivo Version 12, QSR International Pty Ltd). Qualitative data were analyzed using thematic analyses [20,21], informed by an inductive approach to the participant’s subjectively reported experience. An interdisciplinary team of coders (MG, SB, MM) reviewed the primary data using open coding procedures. Through an iterative process of identifying and refining codes, a codebook was developed and applied to the data. The first five transcripts were coded by all coders to establish an inter-coder reliability of $\kappa = 0.95$ (pooled Cohen’s Kappa coefficient). Following this, the transcripts were divided equally among the coding team.

Coded data were then organized into emergent key themes, with identification of representative direct quotes to substantiate each theme. Results are reported in compliance with Consolidated Criteria for Reporting Qualitative Research (COREQ) Guidelines [22]. Two methods were utilized to validate the findings: 1) presentation of findings to two participants to confirm, challenge, or refine assertions, and 2) presentation of findings to the study team to review the data and debrief. The two participants to whom study findings were presented were chosen randomly from all participants and had demographic profiles similar to that of the average demographics of the aggregate sample. Theoretical saturation was achieved at the point at which no new codes or themes were identified in the data [23].

3. Results

A total of 34 individuals expressed interest in the study, and 31 consented and completed enrollment. The majority of participants self-reported as female (93%), Caucasian (58%), and non-Hispanic (85%); held a bachelor’s or graduate degree (74%); and had private insurance (74%). Participants reported having on average two children. Demographic details are presented in Table 1.

Interview data were organized into six themes: 1) knowledge about HPV vaccines, 2) perceptions of and attitudes toward

Table 1
Demographics of study participants.

Characteristic	N = 31
Gender	
Male	2 (6.5)
Female	28 (93.3)
Prefer not to disclose	1 (3.2)
Race	
African American	12 (38.7)
Caucasian	18 (58.1)
Other	1 (3.2)
Ethnicity	
Hispanic	5 (16.1)
Non-Hispanic	26 (84.9)
Education	
High school	8 (25.8)
Bachelor Degree	14 (45.2)
Graduate Degree	9 (29.0)
Insurance	
Public	8 (25.8)
Private	23 (74.2)
Mean (SD) number of children	2.4 (1.13)
Mean (SD) number of adolescent children	1.58 (0.91)

Data are presented as N (%), unless otherwise specified.

anogenital and oropharyngeal cancers, 3) role of the child’s sex in HPV vaccination, 4) decision-making processes toward vaccinating children and adolescents with the HPV vaccine, 5) communication with health care providers around HPV vaccination, and 6) influence of social networks (Table 2). Thematic saturation was reached by the 23rd interview.

3.1. Knowledge about HPV vaccines

There were significant knowledge gaps about indications for HPV vaccination. Participants reported a wide array of indications, including prevention against influenza, colds, chicken

pox, measles, diabetes, and sexually transmitted infections. While there was also misinformation around the age at which the HPV vaccine is indicated, with some participants stating infants or young children, most were aware that it is for children and adolescents aged 9 to 12. Despite many parents knowing that the HPV vaccine is intended to protect against cervical cancer, most were unaware what cancers it prevents in males. Most parents did not mention protection against HNC. Participants revealed uncertainty about the potential risks of the HPV vaccine and the differences in benefits and risks for males and females. While only one parent was concerned over increased sexual behavior, many were worried about risks to

Table 2
Themes related to parental knowledge and beliefs around HPV vaccination with representative quotes.

Theme	Supportive quotes
Knowledge about HPV Vaccine	<ul style="list-style-type: none"> ● I am embarrassed to say I don't have a really great understanding of it. But my understanding is it prevents sexually transmitted disease. -Participant 7 ● The only benefit that I really know is about prevention for cervical cancer because I really didn't know much more about it. -P10 ● Well, the benefits are you won't get HPV, so you won't have the risk of getting cancer or the warts, things like that. I mean, I don't really know so much about the side effects, but I think the good outweighs the bad. -P24 ● I mean, I know that they're claiming it doesn't cause fertility issues, but if my daughter in the future has trouble having, conceiving, then, yeah. I'm probably definitely going to blame it on this. -P4
Perceptions of and Attitude Toward Anogenital and Oropharyngeal Cancers	<ul style="list-style-type: none"> ● I feel as though cancer is cancer, whether it's non-genital or genital, it's still cancer at the end of the day. -P17 ● It said something about head and neck cancers, which I knew nothing about. Other than that my understanding was that it was a prevention for HPV, which could then become cervical cancer ... I guess it doesn't make total sense since boys don't have a cervix but that there was some cancer prevention factor that was indicated for both genders. -P19
Role of Child's Gender in HPV Vaccination	<ul style="list-style-type: none"> ● I could be completely wrong, but I thought it's different in boys and girls, and girls before boys. I guess around puberty time, whenever that hits, 12 to 14, I guess ... then boys will be after that. -P8 ● [And do you feel like there would be any risks or benefits that are more applicable to girls versus boys?] If we're talking about infertility, then that would be one. But yeah. I believe for them it's not so much that you can't get pregnant, it's more like will you remain pregnant? You know what I mean? -P13 ● Actually, it's funny because I never thought about it really ... I mean, my other one only just turned 10 so no one's brought it up for him and that's my only boy, so it's ... actually never occurred to me that he would get it ... I don't see any difference if it prevents stuff either way, you know? If that makes sense. -P30
Decision-Making Processes Toward Vaccinating Children and Adolescents with the HPV Vaccine	<ul style="list-style-type: none"> ● I mean, I definitely think it's a vaccine that we don't know enough about in terms of ... it doesn't seem like it's been a vaccine that has been required for a really long time. I feel like it's one of the newer ones. Again, I'm guessing that it's been 10 years, but I don't ... I think it is something that I would want to read some medical data online, I would want to talk to my pediatrician and find out is there any side effects, what's the percentage of people getting, how is this going to help them, what's going to happen if they don't get it. -P20 ● If the doctor suggested, and if I feel like it's okay. If I got it, then they can get it. If I never got it before it, they can't get it. -P27
Communication with Health Care Provider Around HPV Vaccination	<ul style="list-style-type: none"> ● That last appointment they brought it up, and I was unprepared for any of it. And it was the middle of COVID. I'm like, "I can't even make a decision about this right now. I need to research this." Not that I was going to say no, but more so like, "Oh, god, another big decision." ... He did say she is scheduled for HPV vaccine. And then I was just like, "What? She's 9. I'm not ready for this." I feel like I'm educated and ready for a lot of stuff and like to read up on it. And I didn't expect it. But he didn't provide me any of that. -P21 ● I can see if my child was at an age where she was sexually active, but as an 11 year old, that's obviously not the case. And I just thought it was probably premature to even have that conversation. I felt vulnerable in that conversation, because it was presented to me ... she didn't say this, but it was almost the connotation that, well, if you don't get it, you don't really care about your child. Now, if I had come into the visit as more aware of what HPV, well, I know what an HPV is, but as far as the vaccine and the benefits of it, then I think I would've been better prepared to have that conversation. -P28
Influence of Social Networks	<ul style="list-style-type: none"> ● I have siblings who have daughters and I remember at least one or two occasions, as their kids are getting older, they're all about the same age, "Hey, what do you think about this? Is this something that you guys did for your girls?" Or "The doctor told us that so-and-so is getting this next time. I don't remember getting that." Yeah, family. Outside of that, no. It didn't come up. -P2 ● So, actually last year my sister had called me because her daughter, her pediatrician brought it up to her about her daughter getting it, and she was like, "Hey, did you do it with your child?" I said, "No, I didn't, but I didn't feel comfortable with it, that's something you'll have to decide if you feel comfortable with it. I know people that have had it done and I've heard mixed reviews of some people saying that they had trouble ... and I had other people say they had no issues at all." ... [My sister] said, "Hey, what did you do?" And I said, "I didn't, but I'm not going to tell you not to. That's a decision you have to make for your child." And she opted to get it. -P5 ● I really don't base my judgment based off of whatever people are seeing or the media. I usually listen to the doctors and then I do my own research, but I'm all for vaccinations. -P12

females' future fertility. Similarly, they spoke about how they perceived a lack of information or discussion around the risks of HPV vaccination.

3.2. Perceptions of and attitudes toward anogenital and oropharyngeal cancers

Parents generally reported minimal knowledge that the HPV vaccine prevents oropharyngeal cancers. When prompted to think about prevention of HNC in addition to anogenital cancers, most said that “*cancer is cancer*” and that the type of cancer would not influence their decision to vaccinate. Questioned further about this, many felt that understanding long-term side effects, particularly in females, was more important to their decision-making process than knowledge of additional preventive effects against HNC. However, knowledge about the vaccine's effects on HNC did influence the decision to vaccinate against HPV for parents of male adolescents.

3.3. Role of child's sex in HPV vaccination

While parents felt that their child's sex would not influence their decision to vaccinate against HPV, they articulated how it would factor into how they would frame discussions with their children. For example, one participant noted that sex would influence how they talked about the risks and benefits of the vaccine to their child. Parents mentioned that the vaccine was developed for females but is now indicated for males and how they perceived that it was generally discussed more in relation to females than males. Participants perceived the HPV vaccine to prevent more aggressive cancers in females and that it could prevent females from “*getting the disease*” and males from “*giving the disease*” to females. Lastly, some parents mentioned the possible risk of future fertility problems related to HPV vaccination with daughters only, with no mention of male infertility.

3.4. Decision-making processes toward vaccinating children and adolescents with the HPV vaccine

Parents generally felt favorably about the HPV vaccine, with most reporting that it would have been helpful for them to have received the vaccine as a child or adolescent. Knowledge of the HPV vaccine's protection against HNC influenced decision-making among parents with sons, as did a parent having lived experience or a close social tie with someone who had HPV or cancer. Parents discussed consideration of how the HPV vaccine was not mandatory relative to other vaccines required for their children. Parents who reported feeling hesitant about vaccination talked about needing more research for “*newer*” vaccines, including information on risks and long-term side effects.

Parents spoke about the sources of information they relied on for vaccine decision-making. These included health care providers, the Internet (e.g., CDC website), social media, members of their social network who had HPV or whose children received the HPV vaccine, clinical guidelines, commercials, scientists, and medical textbooks. While the HPV vaccine was perceived as “*newer*,” subjects did not report reviewing any different or unique resources compared with resources they rely on for other pediatric vaccines. Several participants discussed a general mistrust of the media over accuracy of information, noting they would not rely on the media for information about the vaccine to inform their own decision-making.

3.5. Communication with health care providers around HPV vaccination

Parents reported that discussions with their child's pediatrician around the HPV vaccine were brief, perceiving that providers often assumed that parents were informed about the HPV vaccine and “*on board*” with vaccination. Discussions around the vaccine included the indication for the vaccine, the age the vaccine is recommended, its benefits and risks, and utilization of a handout or pamphlet. Noting the pamphlet was not used as a conversation facilitator, parents spoke about how it was generally vague and lacked the information they were seeking (i.e., clinical trial data, long-term data). Pamphlets were reported not to be helpful among those who had already decided to vaccinate their children. Two participants requested more visual learning aids, such as videos while waiting for the provider in the exam room. Overall, however, most participants reported that this conversation with their child's pediatrician was critical toward decision-making around HPV vaccination and that they trusted guidance from their pediatric provider.

The word “*protect*” was often mentioned but in two different contexts. Those who favored the vaccine thought of it as *protecting* their child, while those who were vaccine hesitant wanted to *protect* their child against any adverse long-term side effects. Some participants felt that because the HPV vaccine was not mandatory, it was not “*well-vetted*,” leading to hesitation to consent to vaccination for their child.

3.6. Influence of social networks

The role of one's social network in regard to HPV vaccine decision-making was varied. Members of social networks that participants identified for discussions about the HPV vaccine were family, coworkers, friends, and teachers. The content of those discussions revolved around risks and benefits. For those who trusted others' opinions, they relied on what their social network members' experiences were with the HPV vaccine, if others' children had received the vaccine, or if they themselves had HPV. A few participants reported their mistrust of shared personal experiences on social media.

4. Discussion

This qualitative study sought to better understand parental knowledge, perceptions, and beliefs about HPV vaccination, especially with regard to males and HNC prevention. We found significant gaps in knowledge about the HPV vaccine's indication and effects, especially for males and for HNC prevention. These findings are similar to prior studies on knowledge gaps about HPV and HPV prevention among both adults and adolescents, although information related to adolescents and especially children is limited [24–26].

Our subjects were frequently unaware either that the vaccine is recommended for males or that it prevents development of cancer for males as well as females. This is similar to other studies, in which the most commonly cited reasons for why providers, adult males, and parents of adolescents decline the vaccine are the perceived lack of direct benefit [11,27,28]. Many men and parents of boys do not think that males have the same risks as females or believe that the main reason for vaccination is to protect female partners [29,30]. Studies show varying rates of parental intention to vaccinate their children, but support of HPV vaccination varies more widely among mothers of sons [31], with increased knowledge about the HPV vaccine, lower perceived odds of vaccine harms, and positive attitudes related to vaccines in general associ-

ated with increased intention to vaccinate sons among parents in Canada [32,33]. In addition, parents reported being less likely to remember physician recommendation to vaccinate their sons than daughters [34,35]. The lack of awareness and support of the vaccine's use for males results in decreased HPV vaccination rates. A systematic review of parents' uptake of HPV vaccination for their children found that the proportion of uptake was twice as high for female children as male [36]. This has long-term implications for acquisition and transmission of HPV and rates of related cancers.

Our study also noted low parental knowledge about the HPV vaccine's effects on HNC prevention. Both the pathogenesis and prevention of HNC are topics on which general awareness is known to be low. A systematic review noted overall low knowledge about the link between HPV and HNC in the general population [37]. Another study reported that only 34% of participants knew that having HPV increases the risk of mouth or throat cancer [38]. There are minimal data on awareness of the relationship between HPV and oropharyngeal cancers in adolescents. A study that explored differences in awareness of HPV across three countries found that more than half of adolescents were unaware of the role of HPV in the development of non-cervical cancers [39].

In terms of the HPV vaccine's effects on HNC, a systematic review on the acceptability of the HPV vaccine for males found that only one study commented on the vaccine's role in the prevention of HNC [31]. Limited research has sought to explore parental knowledge on this topic. A study of 267 parents of sons eligible to receive the HPV vaccine found that only 18% knew about the role of HPV in oropharyngeal cancer [40]. This has important implications for vaccine uptake, as a study of adolescents and their parents found that 78% of parents would be more receptive to HPV vaccination if they were given strong evidence that it prevents HNC [41]. Our findings further emphasize the importance of educating adolescents and their parents about the role of HPV in the development of oropharyngeal cancers and that of the HPV vaccine in preventing HNC.

In addition to the lack of knowledge about the vaccine's indications, especially for males and for HNC prevention, we found that parents' main concerns about the risks of the HPV vaccine were related to long-term side effects and future fertility. The perceived newness of the vaccine and concerns about safety have been raised by other studies [34,36,42,43]. Public health and advertising campaigns to increase HPV vaccination rates have typically focused on the benefits of vaccination and have not addressed the risks. Although the risks are known to be minimal [44], with no effects on fertility [45], parents in our study frequently cited these concerns and desire to protect their children when they were unsure or against vaccination. Protection was similarly cited by both parents and their male children in a prior qualitative study on decision-making around HPV vaccination, with parents feeling compelled to protect their children, while sons desired to protect their own health [46]. This information and the concept of protection should inform future provider counseling and public health campaigns to focus on the minimal risks associated with HPV vaccination, with an emphasis on reassurance about the lack of long-term side effects and effects on future fertility, instead of only focusing on benefits. A targeted public health campaign to address HPV vaccine misinformation was found to be effective in Denmark [47].

Another potential parental barrier to HPV vaccination is the lack of a direct health care provider recommendation [28,48,49],

whereas recommendation from a provider has been associated with vaccination [13,36]. Providers are less likely to recommend HPV vaccination to younger patients and more likely to recommend it to females than males [50]. We found that parents cited their children's health care providers as important sources of information about HPV vaccination and critical to their decision-making. Pediatricians may need increased education about the benefits of HPV vaccination for males and the expanded indication for HNC prevention. As parents in our study identified pediatricians as the most important source of information regarding HPV vaccination, this should empower pediatricians to educate patients and families about this important preventive health measure, with a focus on the expanded indications and addressing concerns about vaccine risks.

Strengths of this study are the qualitative, semi-structured nature of the interview, which addressed a wide range of topics related to HPV knowledge and vaccination, as well as inclusion of parents of the target age for HPV vaccination from both urban and suburban settings. Limitations include the high education level and prevalence of private insurance among the sample, which may make the results less generalizable, especially for populations that are known to be less knowledgeable and accepting of HPV vaccination. Subject recruitment via convenience sampling may introduce selection bias for participants. There is also the possibility of social desirability bias that resulted in participants expressing views around pediatric vaccination that they perceived as more socially acceptable.

5. Conclusion

The effectiveness of HPV vaccination for prevention of anogenital and oropharyngeal cancers in both males and females has been well established. Despite this, HPV vaccination rates are lower than for other age-concordant vaccines for many reasons, including lack of knowledge about its effects on HNC and perceived lack of benefit, especially in males. Barriers to the uptake of HPV vaccination have significant implications for young women and men's current and future health. Information from this study has the potential to increase overall uptake of HPV vaccination in children and adolescents by identifying specific gaps in knowledge among parents of children and adolescents related to male indications for vaccination, the role of HPV and HPV vaccination in head and neck cancers, the need to address concerns about vaccine risks, and the important role that pediatricians play in parental decision-making around HPV vaccination.

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Data availability

Data will be made available on request.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Interview guide.

Category	Example Questions
Perception/Knowledge of HPV Vaccine	<p>-Can you tell me about your understanding of what potential diseases/conditions the HPV vaccine is intended to prevent?</p> <p>-To your understanding, at what age is the HPV vaccine indicated for children/adolescents?</p> <p>-To your knowledge, do indications for the HPV vaccine differ between male and female adolescents?</p> <p>-Would your decision to vaccinate your child with the HPV vaccine differ if your child is a son or daughter? If so, tell me more about that and why your decision would be different.</p>
Communication with Provider about HPV Vaccine	<p>-Has the discussion around HPV vaccination come up between you and your child's pediatrician or other doctors?</p> <p>-If so, please tell me about what was discussed. What was the discussion like? How long was it? Did you have space for questions? If so, did you ask any?</p> <p>-Do you feel that the information was explained to you in a way you understood?</p> <p>-What types of cancer or other diseases were discussed that the HPV vaccination could help prevent?</p> <p><i>If mentions non-genital cancers:</i></p> <p>-Did that surprise you to hear HPV may help prevent non-genital cancers? Did that influence your decision to vaccinate/not vaccinate?</p> <p>-Would you be more likely to vaccinate your child against non-genital cancer than genital cancer?</p> <p>-Did this discussion influence your decision to vaccinate/not vaccinate your child with HPV vaccination?</p> <p>-Do you feel any differently about this if your child is a son or daughter? If so, tell me more about that and why your decision would be different.</p>

Appendix A (continued)

Category	Example Questions
Communication with Members of their Social Network about HPV	<p>-Have you talked with members of your social network (other parents, family, friends, neighbors, co-workers, etc.) about the HPV vaccination? If so, whom?</p> <p>-Did these discussions influence your decision to vaccinate/not vaccinate your child with HPV vaccination?</p> <p>-Do you trust others' opinions in informing your own regarding vaccination?</p> <p>-When you talk about the HPV vaccine with members of your social network, do you talk about your children in general or more exclusively about your daughters or sons?</p>
Sources of HPV Information	<p>-Where do you access information to inform your decision around vaccinations? (Members of social network, health care providers, cable news, internet, social media, newspaper, etc.)</p> <p>-What about the HPV vaccination?</p>
Perceived Benefits and Risks with HPV Vaccine	<p>-How do you feel about the HPV vaccination?</p> <p>-If you had been able to receive the HPV vaccination as a youth, do you feel it would have been beneficial to you?</p> <p>-To your understanding, what are the perceived benefits to your child receiving the HPV vaccination? What are its risks?</p> <p><i>If indicates they are concerned about increased risky sexual behavior in child due to receipt of HPV vaccination:</i></p> <p>-Tell me more about that; I want to make sure I understand your point of view. Is this something you would attribute to all adolescents as general belief, or a particular concern with your own child?</p> <p>-Do you feel there are certain benefits or risks more applicable to girls vs. boys? If so, tell me more about that.</p>

Appendix A (continued)

Category	Example Questions
Decision Making Processes around Vaccinating Children	-How do you come to decisions around vaccinating your child? -Have you known anyone with genital cancer? Have you known anyone with non-genital cancer? Have either of these experiences influenced your decision to vaccinate your child with the HPV vaccine? If so, how? -Was your decision to vaccinate against HPV different from your decision to vaccinate against other diseases? (TB, Polio, Chicken Pox, Mumps, Influenza, etc.)

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