



## Exploring HPV vaccine hesitant parents' perspectives on decision-making and motivators for vaccination



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### ABSTRACT

**Introduction:** The human papillomavirus (HPV) vaccine is highly effective at preventing HPV-associated cancers in both males and females, yet vaccination rates remain sub-optimal in part due to vaccine hesitancy. This study sought to assess which strategies vaccine-hesitant parents perceive as most likely to motivate them to vaccinate their children against HPV.

**Methods:** In 2021, we recruited parents with children ages 10–17 years old who were not vaccinated against HPV and who felt unsure or hesitant about their decision to vaccinate their child. Participants were recruited through an online patient portal within a single institution. A screening survey assessed for vaccine hesitancy. Semi-structured interviews focused on HPV vaccine decision-making, motivators, and potential strategies to improve vaccination rates in hesitant parents. Audio recordings were transcribed and analyzed via a combination of deductive and inductive codes.

**Results and Discussion:** A total of twenty-two vaccine-hesitant parents were interviewed. The major themes identified were a lack of confidence in vaccine decision-making, a desire for more information, and dissatisfaction with provider encounters. Parents reported that their hesitancy was driven by concerns about safety and necessity, often based on negative anecdotal reports. Although pediatricians were the most often cited source of vaccine information, many parents were dissatisfied with the encounters they had regarding the vaccine. Parents expressed a desire for detailed information on both the benefits and risks of the vaccine, and resources that allowed them to actively participate in vaccine discussions with providers. Suggested modes of delivery for this information included in-depth pediatrician discussions, written materials provided by pediatricians, and facilitation tools, such as a list of questions to help parents prepare for pediatrician visits. Thus, strategies that empower parents to feel informed and confident in their decision to vaccinate their children could be useful in motivating vaccine-hesitant parents to vaccinate their children against HPV.

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### Introduction

The human papillomavirus (HPV) vaccine is a highly effective preventative measure against HPV-associated cancers in both males and females. Although HPV vaccination rates throughout the United States have steadily increased over time, they are still low, with only 52 % of adolescent males and 57 % of adolescent females fully vaccinated [1]. Furthermore, approximately 60 % of parents of unvaccinated children say they do not intend to initiate

the HPV vaccine series [2–4]. Vaccine hesitancy, or the “reluctance or refusal to vaccinate despite the availability of vaccines” is classified by the World Health Organization as a top-ten major threat to public health and is a key contributor to HPV vaccine delay or refusal [5]. Vaccine hesitancy may be driven by factors such as concerns about vaccine safety and potential side effects [3,6–7], beliefs that the vaccine is unnecessary [6–7], and lack of knowledge about the vaccine [8]. Moreover, a recent analysis of parental data from 2019 suggests that there may be a spectrum of vaccine hesitancy along which the primary concern driving hesitancy varies [9].

Interventions to increase HPV vaccination rates have often focused on changes to pediatrician's practice with all parents, e.g., providing reminders to all parents or coaching providers to

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provide a presumptive recommendation, rather than approaching vaccine-hesitant parents differently [3,10–11]. While a large body of literature supports the provider recommendation as one of the most important factors influencing whether a parent chooses to vaccinate their child, a recent study suggests that vaccine-hesitant parents may respond variably to that intervention [9]. As the group of parents refusing vaccination gradually gets smaller, a more nuanced understanding of the needs of this group is warranted to improve vaccine uptake. Therefore, in this study, we sought to gain insight from HPV vaccine-hesitant parents to better understand their perspectives with regards to effective motivators and strategies to help improve vaccine acceptance. The results of this study could then be used to develop and implement feasible HPV vaccine interventions tailored and targeted to the needs of vaccine-hesitant parents.

## Methods

### Setting and participants

HPV vaccine-hesitant parents were recruited from Baltimore City and Baltimore County, Maryland, to participate in a brief screening survey and in-depth interview between February and June of 2021. Together, Baltimore City and Baltimore County encompass a diverse population in terms of race, socioeconomic status, and geography (ranging from urban, to suburban, to semi-rural). Though county-specific HPV vaccination rates in Maryland are not publicly available, cervical cancer incidence rates are consistently higher in Baltimore City compared to Baltimore County. Participants were recruited through MyChart, the Johns Hopkins Medicine online patient portal communication platform. Secure messages were sent to the accounts of children aged 10 to 17 (and therefore within the age range for vaccine eligibility) who had not yet been vaccinated against HPV. The message, accessible also to legal guardians and anyone with proxy access to the child's patient portal account, invited parents or legal guardians who were unsure, hesitant, or did not plan to have their child vaccinated to participate in a short online survey and provided them with an opportunity to participate in a subsequent virtual in-depth interview about HPV vaccination beliefs, decision-making, and motivational needs.

The MyChart message contained a link to the online survey hosted on Qualtrics (see Appendix A for survey questions). The survey included written consent and questions regarding the participants' socio-demographics, their child(ren)'s HPV vaccine history and intent to vaccinate, and a 9-item HPV vaccine hesitancy scale (VHS) [6]. Since our focus was on currently hesitant parents, individuals were included if their survey responses indicated that their child(ren) were not currently vaccinated for HPV, and that they were not planning to vaccinate their child(ren) against HPV [6]. However, in order to exclude parents who refused *all* vaccines for their children, participants who responded that they had not vaccinated their child(ren) against any vaccines required for school or recommended by their doctor were excluded. Additionally, individuals included for interviews were required to be from separate households. We utilized the VHS published by Szilagyi et al, an adaptation of the World Health Organization's VHS (first published 2015) to specifically assess HPV vaccine hesitancy in a US population [6,12]. All study procedures were approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

### Interview and guide

Eligible individuals were contacted by study staff to schedule an interview. Participants provided oral consent to semi-structured

interviews that lasted 45–60 min and were conducted virtually via two-way audio-visual connection (using Zoom platform). Interviews were conducted by one of two members of the study team with significant training and experience in qualitative research, with 1–2 members of the study team present to take notes and provide technical support, if needed. Participants who completed the survey received a \$25 electronic gift card; those who also completed the interview received an additional \$50 gift card.

Development of the interview guide was informed by the Social Ecological Model and existing research. [13] Specifically, the Social Ecological Model situates individuals within broader contexts: interpersonal networks (e.g., family, friends), organizational environments (e.g., healthcare systems), communities, and societies; these broad contexts guided the scope of our questioning. Parents with more than one child of vaccine-eligible age were asked to consider the child they were most vaccine hesitant about. Discussion topics included the child's vaccine history and the parents decision-making process for other childhood vaccines; beliefs about HPV and the HPV vaccine; sources of information about the vaccine; barriers to and motivators of vaccination. The discussion concluded by asking participants for feedback on several potential interventions to increase HPV vaccine uptake (e.g. physician presumptive recommendation; sources of vaccine information; disseminating information about other parents' practices) and their ideas for any additional strategies (see Appendix B for full interview guide).

### Data analysis

Descriptive statistics were used to describe the responses to the survey. Mean vaccine hesitancy scores were calculated for the study population using the validated 9-item VHS as described by Szilagyi et al [6]. VHS scores range from 1 to 5, with higher numbers representing greater hesitancy. Although there is no consensus VHS score that defines hesitancy, Szilagyi et al have shown a mean score of 3 or greater may reflect vaccine hesitancy [6]. Individual VHS scores were intended to provide a way to indicate range of participants' level of hesitancy, but were *not* used to determine if they were HPV vaccine hesitant or not, as vaccine hesitancy exists on a spectrum. All interviews were recorded and transcribed using anonymous identifiers. Notes were taken by one study team member (KM, MM, CC, or LF) and a memo briefly describing interview content and initial reactions was produced after each interview. Upon completion of the interviews, MM and KM reviewed the memos and transcripts and developed a draft of a coding instrument. The instrument included both inductive codes derived from the data and deductive themes and codes informed by the interview guide and pre-existing research. After a draft of the coding instrument was complete, MM and KM refined the themes and codes by applying them to three interviews. The full study team then reviewed the coding instrument and offered additional revisions. KM then coded the transcripts using Dedoose 9.0.17 [14], and MM reviewed the coded transcripts. The abbreviated coding instrument can be found in online Appendix C.

## Results

### Participant characteristics and HPV hesitancy

Overall, 1501 individuals were invited to participate in the study and 50 completed the survey. Of those, 31 were eligible to complete the interview and 22 interviews were completed. Most (77 %) of participants were female, 50 % were non-Hispanic White, and 36 % were Black/African American (Table 1). The mean vaccine hesitancy score was 3.1, indicating that overall, the population was vaccine hesitant. The vaccine hesitancy concerns on the VHS scale

**Table 1**  
Participant characteristics and hesitancy scores.

Characteristics	n	%
<b>Gender</b> (n = 22)		
Female	17	77.3 %
Male	5	22.3 %
<b>Race</b> (n = 22)		
Asian	1	4.6 %
Black/African American	8	36.4 %
White	11	50.0 %
White/Other	2	9.1 %
<b>Residence</b> (n = 22)		
Baltimore City	10	45.4 %
Baltimore County	12	54.6 %
<b>Median number of children ages 10–17 (range)</b>	2	[1–3]
<b>Gender of children ages 10–17</b>		
Female only	9	23.1 %
Male only	5	12.8 %
Female and male	8	36.4 %
<b>Household Income</b>		
\$25,000 - \$49,999	3	13.6 %
\$50,000 - \$99,999	5	12.8 %
\$100,000 - \$149,999	5	12.8 %
\$150,000 or greater	5	12.8 %
<b>Parent's highest educational degree</b>		
High school or equivalent	2	9.1 %
Bachelors degree	9	23.1 %
Post-graduate degree	11	50.0 %
<b>Age of Child(ren)</b> (n = 39)		
10–11	15	38.5 %
12–13	10	25.6 %
14–15	9	23.1 %
16–17	5	12.8 %
<b>Vaccine Hesitancy Score<sup>a</sup></b> (n = 22)		
Mean (standard deviation)	3.1 (0.66)	

a. A vaccine hesitancy score > 3.0 is considered to reflect vaccine hesitancy.

most often affirmed here related to the safety of the HPV vaccine, its side effects, and the perceived benefit of HPV vaccination on community health (see Appendix D for responses to VHS questions and mean scores for each question).

#### Parental knowledge of vaccines and HPV

Most participants reported that their children had received the standard childhood vaccines, typically because they were required to attend school or because they were “recommended by [the child’s] doctor,” although some opted to delay or “spread out” the timing of the vaccinations.

While parents were aware of the routine immunization schedule for children, most had limited knowledge of when their child should receive the HPV vaccine, or the rationale for the recommended age range. Additionally, most parents had a basic understanding of HPV, such as that it is a sexually transmitted virus that can cause cancer in females; however, knowledge beyond these facts was limited. Few parents knew that HPV could cause cancer in males. Several acknowledged a lack of confidence in their knowledge, noting that they knew “very little.”

Parents reported learning about HPV and the HPV vaccine from multiple sources, but pediatricians were their primary source of information. Many participants noted that their initial introduction to the vaccine was from their child’s pediatrician. Some reported that they had “done [their] research,” and reported looking online. Other parents noted learning about the vaccine from advertisements and from friends or family members.

#### Parental barriers to vaccine acceptance

Parents reported multiple sources of vaccine hesitancy. Most notably, lack of confidence in their own knowledge about the vac-

cine, its benefits, and side effects was a consistent theme. This manifested in several ways.

**Concern about side effects.** Parents were primarily concerned about the potential of vaccine side effects. As one mother (VHS = 3.7) noted, “Once I heard some of the reactions that that people had had to that--to the HPV shot-- I just wasn’t comfortable with her getting it just yet.” However, many parents, while concerned about side effects, were unsure about exactly what the side effects might be or about the likelihood of them occurring.

*“I don’t know a whole lot about the vaccine. And I don’t remember the details of things that I’ve heard or what the, you know their problems were with the vaccine. I just remember reading a lot of things saying that they were worse or just as bad as what it’s trying to prevent.” -Mother, VHS = 4.1*

**Children perceived as not susceptible.** Some parents felt that their child was not susceptible to HPV, and consequently did not see the purpose of the vaccine. Parents believed that their child was too young to receive the vaccine at the recommended age, namely because they weren’t sexually active, or their religion promotes abstinence until marriage, thus eliminating the risk for contracting HPV. The vaccine was often perceived as an unnecessary risk for adolescents.

*“That’s where my concern is, like, if they’re not going to be exposed to the HPV virus, because they’re not sexually active, why do I want to put them in that position, and I guess that’s where a lot of my resistance is, is because of that piece.” -Mother, VHS = 2.8*

**Dissatisfaction with pediatrician encounters.** Finally, the encounter with the child’s pediatrician emerged as a third source of vaccine hesitancy. Many parents noted that they felt there was not enough time to talk about their concerns with the pediatrician. Parents often reported that their pediatricians had yet to bring up the HPV vaccine at a wellness visit, or pediatricians did not stress the importance of the HPV vaccination for their child.

*“[I am unsure about vaccinating my daughter] because it hasn’t been brought up. . . . Nothing really has been brought to our attention. It doesn’t seem like as of yet our pediatrician thinks that we should be pressing for it.” -Father, VHS = 2.7*

The lack of a strong provider recommendation left one parent feeling “really shocked.” Another parent wondered if he was supposed to have initiated the discussion with his provider.

Others noted that their encounter with the pediatrician regarding the vaccine was one-sided or felt judgmental. Parents noted that these discussions increased their resistance to accepting same-day HPV vaccination. One mother (VHS = 3.0) said that “the conversation was more of one where I felt we were being coerced into getting the vaccine versus being given information to make a good decision for us about getting the vaccine. . . . And I kind of felt like the pediatrician was alluding that I was a bad parent because I did not force my child to get that particular vaccine.”

And another mother (VHS = 2.8) noted, “Yes [I asked questions about the vaccine], but I get resistance. [. . .] when that happens, I just like, curl up and be like, “Okay, I’m not getting [it] today.”

#### Strategies to motivate vaccination

**Strengthening information communication.** A desire for more information emerged as critical for vaccine decision-making. Many parents felt unsure about the HPV vaccine simply because they felt they did not have enough information. For example, one mother (VHS = 2.2) noted, “I will admit that maybe some of that more anecdotal evidence is coloring my, my decision making. But I think that

with actual factual evidence that I could probably pretty easily be pushed over into the yes column.”

Parents noted wanting information to feel confident in their decision-making and know they were “mak[ing] the right decision.” As one father (VHS = 2.6) commented, “. . . I’m not an anti-Vaxxer, I’m just wanting to have enough information to make an opinion, decision.”

Parents wanted information on both the benefits of the vaccine as well as the potential side effects – or as one parent put it, “both sides.” For example, one mother noted “. . . there’s two sides to everything, and I know that when they say there’s no side effects, I don’t believe them.” (VHS = 4.1)

Many parents wanted this information to be detailed so that they could make an informed decision. Some parents mentioned wanting to know more about “how long the vaccine has been available,” “which organizations are promoting it,” the “short-term and long-term side effects of the vaccine,” and more detailed information on published research studies, such as “. . . what the studies have shown [. . .] taking different studies and what was right with them and what was wrong with them and like the study population that they looked at.”

However, a few parents did not desire more information and did not engage with information presented by providers. They often reported having done independent research online that sufficiently informed their decision.

“Honestly, I did not [review the pediatrician’s pamphlet] because I had already, you know, I had already made up my mind and I had already done, you know, research that I was comfortable with. So, I didn’t review it.” -Mother, VHS = 3.7

Optimizing the pediatrician encounter. Conversations with the pediatrician played an important role in how parents sought to obtain this information. Many wanted the pediatrician encounter to be “more of a discussion, if it were felt more like a discussion. If I had just been given the facts, information about the research that went into it the results of that research, what impact that had on study participants. Just information that basically would have helped. Just, just giving me information, and not making it feel like less of a judgment call.” (Mother, VHS = 3.0)

“I just feel like I need more like someone to tell me why I want this, what the data has been, this is how often, like, this is how many people we have vaccinated. . . . Our pediatrician does not have the time to like go through those numbers to me.” - Mother, VHS = 2.8

Although parents desired two-way, non-judgmental conversations with their pediatricians, many still wanted to know their pediatricians to strongly recommended the vaccine.

One participant noted, “I think if the pediatrician would have been more forceful about it and more was a forceful, more supportive, than I think that would have helped my decision a little bit more. The fact that even he or she were more laid back about it than that, so maybe this is not as important as the other ones.” (Father, VHS = 2.2) Another noted that, if their pediatrician had recommended it, they probably would have gotten their child vaccinated.

“. . . If it would have been suggested in the doctor’s office, I probably would have gone along with it. You know, I probably would have said yes, sure, because I think people tend to trust their physicians, especially she’s been their pediatrician since the day they popped out” -Mother, VHS = 3.0

Several parents felt the HPV vaccine should be recommended just like any other vaccine. One noted, “. . . I just think that the pediatrician should have it should be part of their normal routine. it should be part of a routine associated with, ‘Hey, here’s all the vaccinations your child’s going to get.’” -Father, VHS = 3.7

To facilitate this conversation, many parents felt that being provided with a list of questions to ask about the vaccine would be useful. One very hesitant mother noted that this could hopefully help her guide the conversation in a way she wanted.

“. . . sometimes you don’t know what to ask. . . but sometimes you do want to feel like your voice is valid. . . Your concerns are real. I think you know, everybody [is] trying to do the best they can you know to make an informed decision, but yeah, I think a list of questions will be great. In summary, I guess, provide more possibility of potential for a real conversation.” -Mother, VHS = 4.6

Others noted that having a list of questions could help them remember what to ask about.

“I would imagine most parents are rushing around. They get in there, and they sort of forget everything that were your concerns, and so I think if you had a list of questions that was provided and then you would make you think about the things that you’ve maybe but you had other questions, right, but it would be like a good trigger for that. I think that’s excellent actually.” - Mother, VHS = 2.6

Discussion with other parents. When asked whether discussion with other parents or knowing whether other parents vaccinated their own children would encourage parents to vaccinate their children against HPV, responses were very polarized. Several parents liked this idea to gauge vaccination levels within their community, discuss concerns with parents who share similar cultural or religious backgrounds, and hear more details about potential vaccine side effects.

“Yes, parent testimonials would be very important to me to know. Both sides are the ones that had side effects, ones that have had some complications, and then the ones that have had success in their complications, that’s what I want to hear that from.” - Father, VHS = 2.9

Others supported this idea but noted that hearing from the parents they trust or who share feelings of hesitancy would have the greatest impact.

“Understanding that people that are hesitant, you know, understanding why they’re hesitant, and having somebody that maybe has felt the same way or something, almost like an empathy talk. [. . .] You know, just sharing like post vaccine stories, you know. I think that for us would be helpful.” -Mother, VHS = 2.6

When asked about the best mode of delivery for a discussion with other parents, many participants stated that any “natural conversation” that “doesn’t feel overproduced” would be best. There was variation among parents on whether in-person or virtual delivery would be most impactful.

However, others felt that hearing from other parents would not influence their decision-making.

“I’m kind of an independent thinker. So, I mean, I hear from other parents. I know what other parents do, but I’m still going to do what I think is best for my kids.” -Mother, VHS = 2.8

Both those who felt that hearing from other parents would, or would not, impact their decision making note that it would be useful to hear from parents with a range of experiences, including parents who had decided to delay or spread out vaccinating their children.

Vaccination at alternative sites. On-site vaccination either at a school or pharmacy for most parents was *not* a preferred method for HPV vaccination. Parents reported that they would potentially do this as a second choice or an alternative when offices are closed due to the COVID-19 pandemic, but parents generally did not con-

sider getting to the pediatrician's office as a barrier and wanted to be physically present for the vaccination. Some of this related to concern over side effects.

*"I probably wouldn't get vaccinated outside the pediatrician's office... I don't think a school or any setting outside of a doctor's office would be appropriate."* -Father, VHS = 2.7

Another mother (VHS = 2.4) noted that her child *"is very fearful of needles"* and knew that her pediatrician's office was able to be *"patient"* in administering the vaccine.

### Impact of Covid-19 on HPV vaccine uptake

Although not the main focus of this study, several participants organically mentioned that the COVID-19 vaccine impacted the way they approached HPV vaccination. One parent (VHS = 3.0) stated that, *"until COVID I really never questioned getting my kids vaccinated."* Additionally, compared to the COVID-19 vaccine, the HPV vaccine has been FDA-approved for much longer, which caused some parents to rethink how the age of the HPV vaccine should influence their decision-making.

*"I think it probably comes down to the newness of the [HPV] vaccination, okay. You know, I mean it's interesting because that being said, my husband and I are both fully vaccinated against COVID, and, you know, absolutely willing to get [daughter] vaccinated, when she becomes eligible so. But this particular vaccination to me it's, it's just it seems that it's so new, and we don't have a lengthy sample size from which to draw, but obviously, you know, maybe we do."* -Mother, VHS = 2.2

COVID-19 increased attention to composition of vaccines and their overall safety; however, one participant recognized that most of her skepticism with the COVID-19, and similarly, the HPV vaccine, stemmed from a lack of knowledge.

*"I was the first one, yelling up and down, I'm not getting vaccinated for COVID, you know, and looking at all the pages and, 'Oh, they didn't take enough time to research it,' until I was educated like-wait a minute, here's already been previous research on these types of viruses [...] So really just I think my hesitancy is from the HPV [vaccine] is not being educated about it."* -Mother, VHS = 3.0

### Discussion

This study examined the range of perspectives that HPV vaccine hesitant parents have about vaccine decision-making and explored potential strategies to help improve vaccine acceptability and uptake in the hesitant population. Parents' lack of confidence in their own vaccine knowledge was a key driver of hesitancy. Often, concerns were fueled by hearing negative anecdotal reports about side effects and compounded by a belief that their child was not susceptible to HPV. Many felt dissatisfied by encounters with their child's pediatrician and desired additional time for an in-depth discussion of the vaccine's benefits and potential harms. Correspondingly, many parents desired detailed information delivered in a non-judgmental, supportive way with their child's pediatrician to empower them to feel confident in their decision to vaccinate. We identified a spectrum of hesitancy both reflected by the vaccine hesitancy scores and the parents' responses; while some simply wanted a strong provider recommendation, others wanted an in-depth discussion, and still others had researched the vaccine (often online) and were not open to considering it. Many parents were interested in reviewing a list of questions to guide the conversation with the pediatrician. Overall, receiving information from sources other than the pediatrician (e.g., other parents) or vaccinating at

sites other than the pediatrician's office were not favored. These findings indicate that more information – in particular, information on both the risks and benefits of vaccination provided by pediatricians – could instill confidence in some vaccine hesitant parents. We extend on prior research by focusing on the unique challenges and opinions endorsed by vaccine hesitant parents – a distinct population that will require a targeted approach to significantly impact vaccine uptake rates.

Since the HPV vaccine's approval in 2006, parents have consistently reported concerns about the vaccine's safety and side effects as a top driver for lack of vaccination [4,15]. The parents in our study expressed these same concerns, even while recognizing they often stemmed from poor-quality information sources such as non-specific anecdotes of negative side effects they had heard from other parents or read about online. Ultimately, parents wanted to feel confident about the decision to vaccinate their children against HPV but reported these anecdotes about side effects could lead them to have lingering doubts that prevented them from feeling confident. Exposure to negative social media content about the vaccine has been reported to adversely affect the impact of the provider's recommendation [16]. Providers need to know how to address this negative information with hesitant parents. A recent study found that a video easing parents' concerns about vaccine side effects lowered parental hesitancy, while a video encouraging vaccination did not affect it [17]. The parents in our study suggest pediatricians engage them in a respectful and open way, and be ready to have a direct, honest and factual conversation about the positives and negatives of the vaccine. In a previous study, vaccine-hesitant mothers have expressed wanting detailed information – such as including dates of approval and statistics on safety and efficacy – to feel comfortable agreeing to vaccinate their child [16]. As most parents expressed the pediatrician as their most trusted source of vaccine information, providers need to be prepared to discuss all vaccine information, including misinformation and disinformation, in a respectful way to engender the trust of vaccine-hesitant parents.

The optimal way to deliver vaccine information that is both acceptable to parents and feasible in a busy clinical setting is not known. Many parents in our study felt that being provided informational resources and tools would increase their confidence in vaccine decision-making. Our study and others suggest that hesitant parents want more information, not less, and to thoroughly understand that information in order to feel empowered to vaccinate their child [18–19]. A recent cluster-randomized study found that vaccine hesitant parents viewed fact sheets about the vaccine favorably; notably, these fact sheets were distinct from the CDC-issued vaccine information statements, as they were customized to the clinics in the study and were more visually engaging [18,20]). Interestingly, hesitant parents in those studies and ours were interested in reviewing this information ahead of the visit and in being provided with a list of potential questions to prepare them for the discussion with their provider [16,18]. However, none of the hesitant parents interviewed in the randomized trial utilized a customized informational website made available prior to the visit, indicating parents may be less likely to utilize and interact with resources sent ahead of the visit [21]. Moreover, sending parents information about the HPV vaccine (alone) ahead of the visit would single it out as unique and different from other vaccines, which could have an undesired effect. Studies demonstrating the success of announcement and presumptive approaches to vaccination could suggest that singling out the vaccine as different is counterproductive; in our study, one parent reported that treating the vaccine differently made them more hesitant about the vaccine [22]. On the other hand, these tools could motivate a more efficient yet meaningful conversation between parent and provider. Given this, interventions that focus on empowering vaccine hesitant par-



ents with the tools they need to feel confident about their decision should be a priority. Future studies could incorporate vaccine hesitant parents' perspectives into the development of educational or informational tools to specifically target their concerns.

Optimizing the patient-provider interaction is likely key to helping vaccine-hesitant parents choose vaccination. Many parents in our study were dissatisfied with the interaction with their provider, expressing feeling that their questions were not welcome or respected. This is consistent with other research that has also identified dissatisfaction with the pediatrician encounter as a driver of hesitancy [23]. Many parents wanted a strong recommendation, but they also desired the opportunity to ask questions and time to have their concerns addressed in a non-judgmental or coercive way. While announcement and presumptive approaches are more effective than participatory communication for addressing hesitancy, they may not be sufficient for some hesitant parents [22]. Motivational interviewing, a collaborative communication style for guided conversations about motivations for and commitment to change, is one technique that could help address this [24]. A recent cluster randomized trial examining communication training of providers found that vaccine-hesitant parents viewed the motivational interviewing techniques favorably [18]. Reno et al (2019) also found that motivational interviewing, coupled with a fact sheet, was helpful in motivating vaccination among hesitant parents [19]. However, motivational interviewing has been criticized for being time consuming and impractical [25]. Having resources available in advance for hesitant parents to review could help save time in the clinic. Future studies should expand on these findings and examine the impact of assessing parents' hesitancy ahead of the visit to help guide the parent-provider interaction. Moreover, our results, and others, suggest that a focus on developing tools for parents to facilitate the parent-provider interaction has the potential for larger impact than strategies that do not address this interaction, such as reminder-recall or on-site interventions.

The strengths of this study include the inclusion of a racially diverse group of parents from urban, suburban, and rural areas of Maryland. We also used a validated scale to assess the levels of hesitancy amongst the participants; though some parents' scores were below the published cut-off of 3 to reflect hesitancy, [6] their qualitative responses reflected hesitancy. With this range of hesitant parents, we were able to gain in-depth information from this diverse group of parents. Our study was limited by its recruitment methods: though both electronic and community-based recruitment methods were initially employed, all participants came via response through the electronic medical record system, likely due to restricted in-person activities during this portion of the COVID-19 pandemic. Thus, despite increasing use of the patient portal for communication during the pandemic (more than 85% of patients have an active account), patients who were not signed up for the online portal were not included in the sample. Additionally, this recruitment method and the monetary compensation could have resulted in selection bias as to which parents chose to participate. Due to the nature of the populations from which we recruited, Black and non-Hispanic white parents were well-represented in the sample; however, Hispanic and Asian/Pacific Islander parents were underrepresented. Thus, there could be differences in hesitancy based on race/ethnicity that did not emerge in this study. Moreover, while our sample size is sufficiently large to infer information power and achieve thematic saturation in the entire group [26–27], it was not sufficiently large to allow for cross-comparison of themes by parental sub-groups such as race, child's gender, county, or urban/rurality. Larger studies could explore differences in reasons for HPV vaccine hesitancy by these factors in order to tailor interventions to address hesitancy. We included parents of a wide age range of children to obtain a

breadth of perspectives; however, we were not able to capture the impact of child age on parental perspectives.

## Conclusion

Findings from this study indicate that parents who are hesitant about the HPV vaccine want detailed, comprehensive information about the vaccine and a platform to discuss this information with their pediatrician in order to increase their confidence in their decision-making. The optimal approach may differ by level of hesitancy and other parent/child characteristics. Future interventions should develop non-judgmental, well-rounded and tailored communications that instill parents with the confidence to make informed decisions when choosing whether or not to vaccinate their child.

## Data availability

The authors do not have permission to share data.

## 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.

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## Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jvacx.2022.100231>.

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