

Determinants of HPV Vaccination Uptake Among Adolescent Males
in Federally Qualified Healthcare Centers in the Seattle Area

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ABSTRACT

Determinants of HPV Vaccination Uptake Among Adolescent Males
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Purpose: To determine facilitators and barriers in Human Papilloma Virus (HPV) vaccination uptake among adolescent males in Federally Qualified Healthcare Centers (FQHCs) in the Seattle area.

Study Design: A qualitative study utilizing the Health Belief model conducted through individual interviews of parents, and providers, of 11-17 year old males in FQHCs in the Seattle area.

Methods: The study involved semi-structured individual interviews with 6 parents/guardians and 3 healthcare providers of 11-17 year old adolescent boys in a FQHC setting. The questions were aimed at determining the facilitators and barriers in the uptake of HPV vaccination in this particular population from the perspective of both the parents/guardians and the providers. The interviews were recorded and transcribed verbatim for coding. The coded data was analyzed to determine common themes among parents and providers separately.

Results: Several emergent themes related to HPV vaccine uptake were identified from the analyzed data from parent and provider interviews. The resulting themes included both barriers and facilitators to HPV vaccine uptake among 11-17 years old boys in FQHCs in the Seattle area. The themes involved parents, providers, healthcare system and health policy.

Recommendation

In the absence of a mandate for HPV vaccine as a requirement for school entry, lack of parental awareness and blind faith in providers by parents in FQHCs in the Seattle area, we suggest a strong providers' recommendation as a mean for improving HPV vaccination uptake in this particular population. We recommend a multifaceted intervention that involves providers/staff training to effectively deliver strong recommendation for HPV vaccination to parents and a reminder system to help providers/staff deliver that recommendation urgently and consistently at the recommended age..

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And thank you my Lord.

DEDICATION

I would like to dedicate this thesis to my children, my life!

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PROBLEM AND RATIONALE

Human papilloma virus (HPV) infection, the most commonly diagnosed Sexually Transmitted Disease (STD) in the United States, affects an estimated 79 million Americans (1 in 4), with 14 million new cases diagnosed each year among patients aged 15-59 years¹. Human papillomaviruses are species and tissue-specific DNA viruses that infect epithelial cells^{2,3} and cause ano-genital disease in males and females⁴. Out of more than 150 identified HPV types, there are approximately 40 that infect the lower female genital tract⁵. Approximately 15 HPV types that are known as carcinogenic, high-risk, or cancer-associated cause all cervical cancers worldwide⁵. Persistent viral infection with carcinogenic HPV genotypes are responsible for virtually all cancer of the cervix⁵⁻⁷. Many cancers of the anus and oropharynx in men and women, in addition to that of the vagina, vulva and penis, are attributable to carcinogenic HPV infections⁸⁻¹⁰. The carcinogenic genotypes of HPV16 and HPV18, which are targeted by all three available versions of the HPV vaccine, cause approximately 70 percent of all cervical cancers worldwide¹¹. Most cases of anal cancer are caused by the same HPV genotypes that cause cancer of the cervix⁴.

In the last twenty years, HPV related head and neck cancers, mostly in the oropharynx, have been identified as primarily associated with HPV16¹², which is also known to be carcinogenic at other sites^{13,14}. Despite a decrease in tobacco use, the incidence of oro-pharyngeal cancer has been rising¹². Cohort studies from the 1990's attributed approximately 50% of oro-pharyngeal cancers to HPV while the most recent studies suggest HPV association with 70 to 80 percent of oro-pharyngeal cancers in North America and Europe¹⁵. A significant increase in the incidence of oro-pharyngeal cancer in men at an earlier age in developed countries is consistent with the role of HPV in its causation¹⁶.

There has been a 225% increase in incidence of HPV positive oro-pharyngeal cancers from 1988 to 2004, and a 50% decline in HPV negative cancers for the same time period¹⁶. If this trend continues, the annual number of HPV positive oro-pharyngeal cancers is expected to surpass cervical cancer by 2020¹⁶. Despite compelling evidence of the association of HPV with cancer and an availability of safe and effective vaccines, low rates of HPV vaccine uptake among adolescent boys and girls has been reported on national as well as state levels¹⁷ as compared to other teenage vaccines. Data collected from 21,875 adolescents through the 2015 National Immunization Survey-Teen (NIS-Teen) during 2014–2015, as analyzed by the CDC, showed an increase in HPV coverage among adolescents aged 13–17 years as compared to the year 2014 for each HPV vaccine dose among both females and males. This included ≥ 1 HPV vaccine dose among males (from 41.7% to 49.8%), and an increase of ≥ 1 HPV vaccine dose among females (from 60.0% to 62.8%). The results also show an increase in ≥ 1 quadrivalent meningococcal conjugate vaccine dose (MenACWY) (from 79.3% to 81.3%)¹⁸. According to the same survey, the coverage with ≥ 3 doses of HPV vaccine also improved from year 2014 to 2015 among males (from 21.6% to 28.1%) and females (from 39.7% to 41.9%)¹⁸. The improvement rates are better for males as compared to females but are still significantly below the 2020 targets for both males and females.

HPV vaccine is currently mandated by law for school entry only in Rhode Island, Virginia and Washington, D.C. in the U.S.¹⁹ HPV vaccination, despite its role in cancer prevention, has been controversial due to political debate about individual rights and parental concerns related to its connection with diseases that are associated with sexual activity²⁰. Knowledge gaps among parents and a lack of adequate clinician recommendation have been implicated as two major reasons for low rates of HPV vaccination. Knowledge limitations among clinicians may be a reason for low

recommendation, especially among boys for whom the vaccination was approved just 5 years ago¹⁷. Although many interventions have been shown to be effective in increasing HPV uptake²¹, more research is needed to reach the Healthy People 2020 target of 80% vaccination rate for both boys and girls²².

High quality recommendations based on strength of providers' endorsement, patient education about cancer prevention and encouragement to receive same day vaccination have all been shown to increase the odds of HPV vaccine initiation by over nine times, and, of follow through, by over three times as compared to no recommendation at all²³. Low quality recommendations are modestly associated with improved HPV vaccine initiation but not with follow through²³. Vaccine refusal or delay was less often reported in recipients of high quality versus low quality recommendations²³. In addition to the quality of recommendation, the delivery method of recommendation has also been shown to affect HPV vaccine uptake rates²⁴. Initiation of providers' recommendation with "presumptive" announcements assuming that parents are ready to vaccinate, as opposed to "conversations" with open ended discussion, have shown clinically meaningful results in terms of parental vaccine acceptance^{25, 26}. Announcements can be statements such as: "Your son is due for this shot today" or "Your son has to get this shot today" as opposed to conversation "Do you want to get the shot for your son?" or "Are you doing the shot for your son today?" Effectiveness of announcements vs conversation has also been shown in relation to initiation of HPV vaccination among adolescents²⁴.

Provider recommendation is an intervention that has huge potential for improving HPV vaccination rates²⁴. Unfortunately, only one third of parents were shown to receive high quality recommendation for HPV vaccination²³. Provider training regarding HPV related education on

provider/parent communication could improve quality of recommendations, but only for those parents who actually receive those recommendations. A healthcare system intervention can potentially address the issue of missed HPV vaccination opportunity among eligible adolescents. A well defined reminder system for the providers to recommend HPV vaccine consistently and urgently to all boys at age 11-12 years old could help increase HPV uptake²⁷.

Disparity in HPV related cancers has been shown in Black, Hispanic and low income populations owing to the unique challenges faced by the medically underserved populations²⁸. Although NIS-Teen data shows relatively better rates of HPV vaccination among Black and Hispanic adolescents¹⁸, several studies have shown a continuing and significant trend of low vaccination rates among Black, Hispanic and low income and urban areas^{28, 29, 30, 31}. According to one study, some of the predictors of HPV vaccine initiation shared among female, male, Black and Hispanic adolescents include healthcare provider specialty (pediatrician vs. non pediatrician), clinic location or area, provider's age and specialty in addition to parent's mistrust of the provider and healthcare access issues³².

Site of service among various community centers in the same geographical area seems to be an important predictor for HPV vaccine uptake in the study cited above. A better understanding of the barriers and facilitators pertaining to the provider, parents, and the facility's location can potentially provide an insight into the problem of low uptake of HPV vaccine³². As shown by the NIS-Teen data and various studies around the nation, the HPV vaccination rates among boys are much lower than that of girls, and the need for further studies to improve HPV vaccination rates is reflected in 1B recommendation for boys as opposed to IA recommendation for girls by the CDC's Advisory Committee on Immunization Practices (ACIP) for delivery of HPV vaccines³³.

In the absence of routine screening for HPV related diseases in males, vaccination is the best preventive strategy for HPV related oro-pharyngeal and ano-genital cancers³⁴. The HPV vaccine is approved for the prevention of cervical, vulvar, vaginal and anal cancers in women, as well as anal cancers in men, but not yet approved for oro-pharyngeal cancers³⁵. A study presented at the American Society of Clinical Oncology meeting (2017) found that the HPV vaccine may reduce the prevalence of oral HPV infections in young adults by as much as 88 percent³⁵.

Despite free provision of HPV vaccine to all adolescents before 19 years of age in the state of Washington, the political controversy and a lack of mandate for school entry, calls for interventions that involve providers, parents/guardians and the healthcare system. Research is needed to explore factors that are associated with uptake of HPV vaccination among adolescent boys in FQHCs in the Seattle area to identify barriers that are unique to this specific community. A wide range of variation in rates of HPV uptake among multiple on-site studies points towards the uniqueness of patient demographics, healthcare and health provider characteristics at different sites. Investigating factors for HPV uptake at various sites in the Seattle area can assist in understanding the facilitating factors for HPV uptake, as well as the unique challenges faced by this particular population.

GENERAL OBJECTIVES

The general objective of this study was to identify barriers and facilitators for HPV vaccination uptake among boys 11-17 years old in FQHCs in the Seattle area. The study is vital in understanding the factors potentially responsible for a low rate of HPV vaccination among boys despite the association of HPV infection with various cancers among boys.

The study aimed at determining the factors responsible for HPV uptake among boys from a healthcare provider's perspective as well as to understand the possible gaps, barriers and challenges in HPV uptake among boys from a patient/parent perspective.

METHODS

Study Design

The study was conducted between December 2016 and July 2017 at three different participating FQHCs in the Seattle area. A qualitative study design was used to identify the barriers to and facilitators of HPV vaccination uptake in FQHCs in the Seattle area. Health Belief Model (HBM) was used to develop the conceptual framework and formulate interview questions for both parents and providers. Social psychologists Hochbaum, Rosenstock and Kegels who worked in the U.S. Public Health Services developed the Health Belief Model (HBM) in 1950s which was revised in 1988³⁶. The HBM being one of the earliest theories of health behavior remains to be one of the most widely used models in the field of behavioral research³⁷. The conceptual framework based on HBM is shown in Figure 1.

Inclusion and Exclusion Criteria

The inclusion criteria for parents/guardians included:

Parents/guardians of 11-17 year old males seen at FQHCs in the Seattle area who were physically and mentally able to give written informed consent and were able to speak and understand English and were willing to participate in the study.

The inclusion criteria for healthcare providers included:

Physicians or mid-level providers (Physician Assistant or nurse practitioners) of 11-17 year old boys seen at participating FQHCs and their willingness to participate in the study.

Recruitment and Consent process

Two methods of recruitment were offered to FQHCs to recruit patients for the study.

1. Flyers displayed at various locations in FQHCs
2. Recruitment in the waiting rooms of the FQHCs by the PI

Two of the FQHCs used method #1, and one of the centers used method #2 based on their preference. In the first method of recruitment, flyers, displaying information about the study and contact information of the PI, were provided to the clinics to display in the waiting areas, restrooms and exam rooms. The parents/guardians of 11-17 year old male patients contacted the investigator directly to schedule an interview appointment. For the second method of recruitment, the PI approached the parents/guardians directly in the waiting room of the FQHCs on their pre-scheduled clinic visits. They were asked about their interest in participation in the study and were provided the consent form to learn about the study before the formal consent process.

The FQHC's administration helped identify the healthcare providers at FQHCs who showed interest in the study and the PI contacted them via phone to recruit and screen them for eligibility. Written informed consent was presented and signed by parents/guardians who were willing to participate in the study. The PI reviewed the consent form with the parents and answered questions before consent was signed. The healthcare providers consented verbally prior to their participation in the study.

Data collection

The data was collected from individually conducted semi-structured interviews with five parents and three providers from three participating FQHCs. Owing to qualitative nature of the study design, open-ended questions were used to conduct parent and provider interviews. Some of the examples of interview questions have been provided in Appendix II, and the questions, but I could have been modified based on the situation. Clarifications and probes were used as appropriate and additional questions may have been added based on participants' responses and investigator's judgment.

Out of seven patients who consented for the study, two were excluded. One of them was excluded because the parent was not able to read English and the other one was excluded because her son was not seen at one of the participating FQHCs. The PI facilitated the content of the interview discussion and the responses were audio recorded and saved in a secure fashion. In addition to parent interviews, in-depth interviews were conducted with the providers at the participating FQHCs. The discussion aimed to understand the provider's perspective on barriers and facilitators of HPV vaccination among adolescent boys. The questions were open ended and based on the information gathered from literature searches, while utilizing the Health Belief Model as a guide in formulating the questions. The healthcare providers included physicians and mid-level providers. The responses from both the parent and provider interviews were taped and transcribed verbatim. The demographic information about the patient and provider was collected during the interview.

Data Analysis

The data collected from the audio-recorded interviews was transcribed verbatim in English. Two qualified researchers coded the data collected from the interviews. The PI coded the data first and assigned codes to all opinions, ideas and concepts presented in the transcribed interviews. A preliminary set of themes was created and saved in a code dictionary using the gathered information. Parent and provider interviews were coded separately and were assigned different codes. A total of five interviews were coded for the parents and three for the providers. The second coder assigned the already generated codes independently. The coding results were compared and contrasted through discussion and review of the transcribed interviews to ensure coding consistency. Related and similar codes were merged and renamed as needed. Themes were generated and organized into barriers and facilitators for HPV vaccination uptake. A

framework using emerged themes and their relationship to the HBM was constructed and is shown in Figure 2 and 3.

Strengths of Study Design

We included sites from different geographical locations in the Seattle area in order to get a better understanding of barriers as well as facilitators for HPV vaccine uptake. The study investigator moderated and conducted all interviews that ensured consistency of data quality and the degree of expertise of the interviewer/moderator. Coding of data performed by two independent coders added to the consistency and reliability of collected data. All three providers represented a diverse training including a family practitioner, a pediatrician and a nurse practitioner.

Ethical Issues

The consent process and interviews were conducted in closed and secure rooms to protect patient and provider privacy. The audio recordings were saved onto a password-protected computer. The parents disclosed no personal health information and the coding and analysis process was done anonymously.

Authorization and Approval of Ethics

The Institutional Review Board of University of Washington, and all three participating FQHCs approved all study procedures to ensure safety and confidentiality of patients.

(UW IRB ID: STUDY00000677).

Policy Impact Plan

There is much variation in rates of HPV vaccine uptake nationwide and points towards the unique demands, barriers and struggles faced at various locations. The study will provided an

insight into the factors that can facilitate HPV vaccination rates at FQHCs in the Seattle area. The results of the study will be released in the MPH thesis at the University of Washington.

RESULTS

A total of five parents and three providers consented and completed the study interview.

The parents included four mothers and one father of 11-17 year old males. The age of male children at the time of vaccination ranged from 11 to 13 years old. Three adolescents received HPV vaccination at the recommended age of 11-12 years; one at age 13 and another was unvaccinated at age 15. The participating healthcare providers included a mid-level provider, a pediatrician and a family physician.

Interview data for parents and providers was coded and analyzed separately. Themes were generated and categorized into facilitators and barriers to HPV vaccination uptake from the perspective of parents and providers. Emerged themes along with examples of quotes for each theme are summarized in Tables 1, 2, 3 and 4. The data revealed three barriers and three facilitators from parent interviews, and four barriers and two facilitators from provider interviews.

Barriers to HPV vaccination as emerged from parent interviews included lack of parental awareness, parents' blind faith in providers and providers' poor quality recommendation. (Table1). Barriers to HPV vaccination from provider interviews included: providers' poor quality recommendation, poor health services coordination, parents' hesitancy towards HPV vaccine and lack of mandate for school entry (Table 2).

Facilitators to HPV vaccination from parent interviews included: providers' good quality recommendation, good health services coordination and media (Table 3). The facilitators to

HPV vaccination from provider interviews included providers' good quality recommendation and good health services coordination (Table 4).

Barriers (Parents' perspective)

Theme I – *Lack of parental awareness*

Data from all five patients showed a general lack of awareness about HPV both in general and especially among boys. Mother of 15 years old unvaccinated son showed a complete lack of awareness about HPV disease and vaccination by stating:

“I don't know anything about HPV...We have been coming to this clinic since my son was born...No, I don't know HPV at all.”

Mother of a boy who was vaccinated at an appropriate age still had doubts about HPV related cancers:

“I didn't know anything about it but my husband said that a lot of people get it; males get it mostly in their mouth.... I am not sure if that's true.”

One of the mothers of a vaccinated son who was vaccinated beyond the recommended age window still thought that HPV vaccination was not a 'required thing' and showed more concern about spreading the disease to women than the risk of cancers HPV can cause among males:

“You know it is not a required thing... if he caught it and he was spreading it...chances of those women, they could get cancer....its super risky for women.”

Father of two vaccinated sons who got their shots at an appropriate age was still confused about the reason for getting his sons vaccinated when only women have ‘baby room’ inside them:

“The baby room inside, men don't have it, then why?... Actually I want to know why they (men) have to get (the) shot.”

Theme II – Parents' blind faith in providers

Parents have demonstrated blind faith in providers not only in getting their sons vaccinated against HPV, but also in not questioning or asking about HPV vaccination if it was not offered to their sons. One of the mothers of an unvaccinated son believed that the doctor’s office ‘always explained shots’:

“He is now 15 years old and she always explained the shots to me but she never explained HPV...We've had the same doctor since he was born....Yes, I would have had it for my son. Can he still get it now?”

Another mother of a vaccinated boy who had heard about HPV on television and from family and friends thought that she would have felt more rushed to get her son vaccinated if her provider told her earlier that HPV vaccination prevents cancer.

“She suggested that, to take it, to do it if we wanted to....if we would have known that it could have prevented a cancer we would have gotten the shot.... if we would have known it was you know, just a shot we should have gotten (earlier).”

Upon inquiry about what method of communication would be better for parents in terms of HPV recommendation, a mother of a vaccinated son responded by saying:

“I think briefly is better ... They don't want to spend more time there than they really have to.....Yea, I would trust him.”

A father of two vaccinated sons decided to participate in our study just to know the reason for his sons' HPV vaccination when they are 'men.' A lack of culturally appropriate communication between parents and providers was apparent from this case. In this example, the father showed his trust and rather blind faith in the provider by stating:

“I don't remember exactly but he recommended that they have to...Yes so I was very confused so I checked the Internet. In my country, usually, men doesn't get this...They are specialist. I am not a specialist. Just, I believe them.”

The mother of another boy mentioned a lack of open communication and blind trust in providers by parents:

“...maybe, ask more questions about it because, like I said I think a lot of parents don't, because, a doctor is a doctor...So I think they don't ask as many questions because it is a doctor...Whenever it was, whatever age they were supposed to start getting it, I believe I probably did.”

Theme III – Providers’ poor quality recommendation

Quality of a recommendation is determined by the strength of endorsement, urgency, consistency, and effective communication (announcement and education) between the parent and provider/staff.

The mother of a vaccinated son expressed her concern by delaying her son’s vaccination because of a weak endorsement and lack of communication regarding cancer risk associated with HPV:

“She suggested that, to take it, to do it if we wanted to...Maybe if I knew more about it then I wouldn't have felt not rushed, but because it was something like ‘ok it’s gonna be for his benefit, let’s do it...’”

Ineffective communication between parents and the provider’s office, and a lack of strong endorsement resulted in a delay of HPV vaccination as evident in this example:

“...but we got a little bit late. I’m not sure exactly. I think it was recommended at age 12 to 13 or something. He told me before, but I don't think I caught it right. I think we waited a while...You know it’s not a required thing and even required ones they don’t push on you.”

The father of two unvaccinated sons, who was not sure why his sons were vaccinated against HPV, suggested some ways to improve communication by stating:

“He recommended that they have to. But I thought this is only for women. Yes so I was very confused so I checked the Internet. In my country, usually, men doesn't get this. So when I saw the paper (thesis project flyer), actually I want to know why they have to get shot?...they have to explain about that or give us some paper.”

A mother compared written information about HPV with face-to-face communication during the interview, stating:

“Even though they give you pamphlets.. I think when you are speaking out of your mouth than on paper, it's, people understand.... I think maybe more, because lots of people don't even read it, they'll just take the papers and go about their way.”

Barriers (Providers' perspective)

Theme I – Providers' poor quality recommendation

Inconsistency in recommending HPV vaccination to both boys and girls was mentioned by one of the providers:

Interviewer: You consistently recommend HPV the same way as you recommend among girls?

Interviewee: I don't....they (both boys and girls) want next year, at 13, they want that, and my

gut feeling is, they're not going to be sexually active before that, I'm ok with it.... in that age group...

A primary care provider acknowledged the importance of presenting HPV vaccine as prevention against various cancers but still showed his concern about the stigma associated with HPV disease:

Interviewer: So what do you think, in your experience, announcements work better for patients or education...?

Interviewee: Well I think, in our world, I'd have to say education but you know, I think there's stigma about this..

Varying beliefs about HPV vaccination among healthcare providers was pointed out by a pediatrician at one of the participating FQHCs. She showed concern about providers who do not push HPV vaccine by stating:

"I know there are some people in (name of the clinic) that don't push HPV vaccine..."

In the presence of standing orders and medical assistants communicating with parents, there is a lack of awareness among parents about HPV disease, as mentioned by a pediatrician during the interview:

“They (parents) just know it’s a shot to prevent something, but they probably couldn’t tell you much about what it stands for, what it is, why you get it...” I

...don’t think they (medical assistants) do a lot of counseling about why vaccines are important...The MAs just do it (vaccination)...most of the time it happens before I am even there.”

A mid level provider described the role of MAs and lack of direct provider/parent communication:

“The MA announces that it’s due,.... if I’m running late, they’ll just do it even before I come in.”

Lack of provider involvement in HPV vaccine recommendation and education was noted when a mid level provider showed a lack of awareness about the recommended age for HPV vaccination at their clinic.:

Interviewer: What age do you usually recommend it at your clinic?

Interviewee: We should double check with the MAs ‘cause they are the ones who are looking into the computer system.

Lack of provider education related to HPV disease and cancer risk among boys was also apparent:

“And I’ve had a few parents who eventually will say, ‘I get you, (you) want to get it to protect your future wife someday’...”

Theme II – Poor health services coordination

A primary care physician raised concern about challenges in coordinating health services at his FQHC. A lack of reminder system for the providers to tract vaccine eligible children was thought to be due to limited funding in a resource limited FQHC:

“There’s no reminder..., I have to go and see..would have to be a designated staff person with grant dollars.”

Completion of the two to three dose series for HPV vaccine was brought up as another challenge. Children assigned to FQHCs who never showed up to the clinic or were not seen during the recommended age window for HPV missed an opportunity to be offered the vaccine.

*“Kids that are assigned to us, to a health plan but we’ve never seen...
it’s the challenge of getting multiple doses...”*

Two adolescent vaccines (Tdap and meningococcal) are delivered at 10 years of age at this particular clinic, which is before the recommended age of HPV vaccine although it can be administered as early as 9 years of age; contributing to why many children are not seen between age 11-12 years (recommended age for HPV vaccination) routinely. It was also pointed out that

due to the lack of mandate for HPV vaccine for school entry in the state of Washington, parents would not go to the clinic for a vaccine that is not required for school entry:

*“...and then the reality that we don’t see a lot of 11 year olds...
...unless there’s a school reason or program reason, they don’t come in for their vaccines...”
“If they’re here for well-child care, we always do it, but otherwise, things get missed, dose gets missed...”*

Lack of advertisement and public health campaigns for HPV vaccine due to ‘politics of sexuality’ was considered to be another reason affecting provision of health services:

“I don’t see much advertising, I don’t see public health campaigns, I don’t see billboards.”

A pediatrician at one of the FQHCs also mentioned the challenge of tracking the three dose series for HPV vaccine. She commented by saying:

“Now we’re going from three doses to two doses, so that’s another exciting thing is it’s easier to get it completed.”

A mid level provider at a FQHC indicated a lack of knowledge of HPV vaccination rates and feedback for the providers at her clinic:

Interviewer: ...what are the rates of HPV vaccination at your clinic or do you get data for it?

Interviewee: I don't know - That's a good question.

She showed surprise at nationwide low rates of HPV vaccination while confirming a lack of HPV related formal education and training for the providers:

"As far as I know we don't have any uniform training..."

Interviewer: ...like if we compare them with meningococcal vaccine...MMR or DPT, (HPV vaccination) rates really discouraging...

Interviewee: It's kind of surprising to me 'cause it makes me think, I don't know.

The provider acknowledged the importance of HPV related training and education. HPV vaccination being offered by MAs and lack of involvement of provider in direct parent education was also noted except in cases in which the vaccine was declined. A lack of a specific tracking system for children whose parents refused the HPV vaccine was also noted:

"But if I'm running late, they'll just do it even before I come in."

Interviewer: How does your clinic keep track of patients... a patient comes here and they refuse to get vaccinated, are they going to follow up with them?

Interviewee: Not specifically... It's (HPV education) definitely good. And even something really easy, like a one-page sheet, how to talk to patients or something like that.

Theme III – Parents' hesitancy towards the HPV vaccine

Offering three shots at a time to an adolescent was considered to be challenging, and priority given to other two vaccines over HPV was pointed out as a factor in parents' hesitancy towards HPV vaccine.

“But if a parent wants to prioritize other things especially because we got tetanus whooping cough booster, we've got meningitis vaccine, so you're potentially talking to a 10 year old about getting 3 shots today.”

The same provider also mentioned the challenge of bringing adolescents in for HPV vaccine stating:

“Unless there's a school reason or program reason, they don't come in for their vaccines.”

The pediatrician at another center raised a similar concern:

“Sometimes parents will come in and say, I only want the vaccines that are required for school... somehow they think that's more important.”

When asked about parent response to the HPV vaccine, the provider mentioned factors that can contribute to hesitancy towards the vaccine including culture, health literacy, education, ethnicity and lack of awareness about the vaccine recommendation for boys:

Interviewee: ..when you talk about HPV vaccination among boys, how do they respond?

Interviewer: Some know, I think it's a different speech in culture, in health, literacy, education, ethnicity, you get different answers. And it's not that long that we've recommended it for boys.

Offering a vaccine that is related to sexually transmitted diseases and its associated cancers was considered to be associated with stigma:

"I think there's a stigma about this."

The pediatrician thought that it might be easier to vaccinate kids if the HPV vaccine were offered even earlier with other childhood vaccines to avoid its perceived connection with sexual behavior and the stigma associated with it:

"Maybe it would be easier if it was just with other things (early childhood vaccines), when they're younger, but in general, it's just getting people away from the idea, oh, this is sexually transmitted."

Another reason mentioned for refusal of HPV vaccination was families with both parents working out of the house and those who had multiple children:

"If they've declined, and they're not just a vaccine refuser overall, some people who have multiple children, they've already decided that's very difficult."

The pediatrician acknowledged lack of parental education and awareness in this particular population:

“I think most people in my population don’t even know what HPV is. They have no clue.”

The same provider finds it easier to convince people to start HPV vaccine series at or close to the recommended age by offering two-dose option which needs to be completed between ages of 11 and 15.

“We have the 2-dose series, you have to get your first dose before your 15th birthday in order to qualify for that 2-dose series. So that helps me push people a little bit.”

Theme IV – Lack of mandate for school entry

A primary care provider at one of the participating FQHC strongly believes that the single most important factor in increasing HPV rates among adolescents is to get it mandated by law as a required vaccine for school entry:

“Interviewer: So in your opinion, like what could be, if I ask you what would be the best strategy (to increase HPV vaccination rates)?”

Interviewee: Requiring for school.

Interviewer: Mandating it?”

Interviewee: Mandating it”.

The provider further supported his belief in mandating the vaccine by law:

“Unless there’s a school reason or program reason, they don’t come in for their vaccines. But HPV is not required, so there’s no external pressure to have it done. I mean, if they’re here for Well-Child Care, we always do it, but otherwise, things get missed.”

The participating pediatrician agrees with the above by stating:

“Sometimes parents will come in and say, I only want the vaccines that are required for school... in the State of Washington, it’s free for everybody. But still, some people will come in and say, I only want the ones required for school... They’re only gonna do the things that schools require because somehow they think that’s more important.”

Facilitators (Parents’ perspective)

Theme I – Providers’ good quality recommendation

Although providers have claimed success with using standing orders and MAs delivering HPV vaccine without parent/provider interaction, there are parents who are concerned about vaccines as this mother who states:

“No, she has to explain it to me for me to get any vaccine, for me and my son. I have concerns about everything. I am concerned what they put in our food, I need to know what kind of stuff we are getting injected with”.

Another parent agrees with the same idea of education to understand the link of vaccine to cancer. She felt not rushed to get her son vaccinated until she was informed of the risk of HPV related cancers among boys:

“I think it would be better, kind of like an educational talk just because it was kind of something like ‘oh we are doing this now we’re recommending it’ so maybe if I knew more about it then I wouldn’t have felt not rushed...like if I have more of the facts and stuff instead of just like ‘hey let’s do it, you know, they offer it now for boys”.

Mother of a vaccinated son who received vaccine late because the quality of recommendation was not good enough to convince her to get the vaccine at the recommended age:

*“He told me before, but I don’t think I caught it right...
That was his new doctor...Yea, they tell you about it and then they give the pamphlet, he (son) read it, I was like, oh, you want to do that? He (son) said yes.
I mean, definitely, if they hadn’t given me any information on it and they just would’ve asked, I would’ve been like no. But since they gave the information and he made the decision, that definitely changed”.*

A strong recommendation in the form of announcement helps if parents have trust in their doctors. In spite of continued concern of the father of two sons about the justification for HPV vaccination in boys showed his trust in the provider:

“He recommended that they have to...They recommend that it is necessary. They are specialist. I am not a specialist. Just, I believe them”.

A mother suggests that a single strategy of recommending HPV vaccine might not be good for all parents but all of them should be given a chance to ask questions and should be encouraged to do so:

“But every person individually is different so it might not be good for one, it might be good for the other due to personal body. You know, so I think maybe they should give more detail, encourage the parents to, maybe, ask more questions about it because, like I said I think a lot of parents don't, because, a doctor is a doctor”.

Theme II –Good health services coordination

Overall all parents including the mother whose son missed HPV vaccination, showed satisfaction with scheduling and patient reminder at their respective FQHC. The importance of healthcare coordination can be seen in case of the mother whose 15 years old son received all vaccines that were offered and explained to her by the provider but did not get HPV vaccine because it was neither recommended to her son nor her daughter whose was 18 years old at the time of the interview.

“Because we’ve been coming here since he was born. He is now 15 years old and she always explained the shots to me but she never explained HPV...”

Interviewer: Did he get the meningococcal one, the one that is for meningitis?

Interviewee: Yes he got that

Interviewer: And he got all the other childhood vaccines?

Interviewee: Yes he did”.

One of the mothers showed satisfaction with the healthcare system coordination at her FQHC by commenting on the reminder system in general:

“Oh, super easy. I always get phone calls, letters, not emails yet but I get emails now. They make themselves really available”.

She found the clinic helpful in completing the three dose vaccine series for her son:

“I believe it was three sets and so they called me every time that it was time to do it. They called me to tell me they were on back order...they called when they got it and scheduled me”.

The mother also noted ease of scheduling appointments at the FQHC:

“we’re just so short on time, if I call them and if they can they’ll squeeze me in the same day”.

Another mother found the FQHC that her son goes to be good at reminding parents of vaccine appointments.

“Interviewer: So how convenient is the system at your clinic in terms of ease of scheduling and visit reminders?”

Interviewee: They’re really good about it”.

She also mentioned the flexibility of the FQHC in regards to the ease of scheduling appointments.

“But I’m sure if I hadn’t remembered, they would’ve called me”.

“They prefer that you have an appointment, you know, but I’m sure if you wanted to get a vaccine you could go”.

Father of two vaccinated sons showed no concerns about scheduling and reminders at his FQHC:

“Interviewer: Was it easy to get the visits scheduled Like for the first, second and third vaccines for your first son, is it easy at the clinic to get your visits scheduled?”

Interviewer: Do they remind you??

Interviewee: Yes”.

Here are the views of yet another satisfied mother:

“Oh, I love this clinic. I have been coming here for seven years, same doctor.

When I come in for an appointment for one of them, they would let me know and they look up their name and stuff whether they needed any shots that day.”

Interviewer: So did both of your sons get all three doses?

Interviewee: Yes.

Theme III – Media

Except for the mother of the unvaccinated boy all mothers learned about HPV for the first time on TV. Here are the responses from three mothers who learned about HPV for the time on TV:

First mother’s response:

“Interviewer: How did you learn about HPV vaccination?

Interviewee: I have seen it on TV..

I had seen it on TV so I kinda saw a little bit of what it was”

Second mother’s response:

“Interviewer: What was the first time in your life when you heard about HPV vaccination like was it through any kind of posters in the clinic or maybe on radio or TV?

Interviewee: I think it was on TV”.

Third mother’s response:

“Seen a lot of commercials on TV about it.

Interviewer: How did you learn about HPV vaccination, what was the first time ever that you learned about HPV vaccination for boys?”

“Interviewee: I wanna say TV, commercials....It was one of the local channels, some talking and saying, see mom or dad if you would have had gotten me the shot then I wouldn't be going through this now and it was boys. And I had pointed that out to my son so, the one that asked if it was just for girls”.

The father in our study used Internet to find information after two of his sons got vaccinated for HPV to learn the rationale behind vaccinated boys when they do not have a uterus, described as baby room in the interview.

“Yes so I was very confused so I checked the Internet”.

Facilitators (Providers’ perspective)

Theme I – Providers’ good quality recommendation

Providers’ belief on HPV vaccine was shown among all three participating providers. The primary care physician’s view was:

“I think it’s important for boys because it’s such a common sexually transmitted virus and it’s directly related to cancer”.

The pediatrician showed her belief in HPV vaccination by stating:

“I think that it’s exciting that it’s the first vaccine we’ve ever had that really prevents a type of cancer”.

The mid level provider also acknowledged the importance of HPV vaccine by saying:

“This vaccine is really amazing because it’s one of the only ones we know of that prevents cancer”.

All providers believed in presenting HPV vaccine in a non-sexualized way:

Primary care physician’s view:

“I think we’ve done a lot better job of presenting this in a non-sexualized type of way in terms of cancer prevention”.

Pediatrician’s view:

“I think that it’s exciting that it’s the first vaccine we’ve ever had that really prevents a type of cancer and I think that’s the way we need to market it to parents because almost everybody’s life has been touched by cancer in some way”.

Mid level provider’s view:

“With HPV I always feel like I have a better speech than the other ones because it prevents cancer”.

The primary care provider recognized the importance of direct parent/provider education

“Interviewer: What do you think, in your experience, announcements work better for patients or education works better for patients?”

“Interviewee: Well I think, in our world, I’d have to say education”.

The pediatrician stressed the importance of recommending HPV vaccine strongly at the recommended age to both boys and girls:

“I think it’s just as important for boys as it is for girls...

We start pushing the HPV vaccine at age eleven”.

then I strongly recommend it and I tell them why...”

Then she continued by discussing the importance of parent/provider communication:

“ I mean, I don’t miss a chance to discuss it,.....

So if they don’t get it(HPV vaccination) done ... and then I’ll talk to them.... The more they trust you the better luck you’re gonna have talking to them about vaccines”.

The mid level provider pointed out how she uses her HPV related education to convince parents to vaccinate their boys even when they are not sexually active at the time of HPV vaccination.

“I’ve had some parents ask me about vaccinating at an age when most kids are not sexually active) and what I say is just that we know the immune response is really good at this age”.

Theme II – Good health services coordination

Good health services coordination is important in improving HPV rates and the providers at each center discussed their efforts in this regard:

The primary care physician informed us of designated staff assigned for HPV vaccine promotion along with their collaboration with other organizations to train their staff to improve HPV vaccination rates:

“So in provider education we actually have one person kind of in-charge of vaccine related issues, a Medical Assistant”.

“Interviewer: And also collaborating with other associations...”

Interviewee: Yea, collaboration, yea”

“We’ve brought it (formal education and training regarding HPV) to our provider loops”.

The pediatrician’s response to the question regarding formal HPV related training and education is as follows:

“I’ve done tons of extra reading and extra training”.

The primary care physician’s office uses computer to keep track of vaccine deficiencies:

“Interviewer: So do you routinely offer HPV vaccination to eligible boys?”

Interviewee: We do, yea. It’s something that lights up as a vaccine deficiency when you go to our vaccine module at our health record, after age 9.

If they’re here for Well-Child Care, we always do it (HPV vaccination)”.

Offering HPV vaccine to parents while their sons were in clinic for checkup and for receiving other two adolescent vaccines were two strategies utilized at the pediatrician's office to avoid missed opportunity. The importance of follow up was also mentioned in case the parents wanted not to vaccinate on the same day:

“It's just more convenient for us to do it with the eleven year old other vaccines. If they're coming in here for a cold or they're coming for a checkup, we just say you're due for this vaccine today... If I can get them to do it the same day. sometimes people .. we'll come back and get it. I'll call them sometimes if they don't come back in the time”.

The mid level provider mentioned the importance of scheduling the vaccine visits to complete the series while parents were in the clinic to avoid missed doses:

“We keep track so we will make the next appointment at the time that they're here so they always have an upcoming one and then if they no-show then we try to call to reschedule”.

She also appreciated the need for feedback for the providers to keep track of their progress and sharing experiences with other providers in case of disparity in rates HPV vaccination among them.

“Interviewer: Do you think it would be a good idea that providers are given feedback on different vaccines that these are the rates at your clinic and what can be done.

Interviewee: Yea, definitely. If there's a disparity that's happening, it would be good to know about it 'cause then we can change what we're doing".

DISCUSSION

To our knowledge, ours is the first qualitative study involving both parent and provider's perspective in studying determinants of HPV vaccine uptake among boys in an FQHC setting in general and specifically in the Seattle area. Although NIS-Teen data shows relatively better rates of HPV vaccination among Black and Hispanic adolescents¹⁸, several studies have shown a continuing and significant trend of low vaccination rates among Black, Hispanic and low income and urban areas^{28, 29,30,31}. This points towards a need for a better understanding of specific factors related to HPV vaccine uptake in particular locations, healthcare provider environments and settings. Our study focused on medically underserved population of FQHCs in three different Seattle areas to better understand the facilitators of and barriers to HPV vaccination among boys. Our study reported barriers and facilitators to HPV vaccine among 11-17 years old boys in FQHC setting after a detailed study of the parent and provider interview as formative work towards developing recommendations that can focus on this particular population. Multiple studies have studied factors affecting HPV uptake among adolescents nationwide and come up with a multitude of barriers to HPV vaccine uptake³⁸. According to a systematic review, lack of awareness about HPV, low perceived susceptibility, an absence of healthcare provider's recommendation and cost of vaccine have been implicated in low HPV vaccine uptake among boys specifically³⁸.

Our study correlates with factors that have been investigated in various studies and enriches the literature with insight into determinants of HPV vaccination that are unique to FQHCs and their population. This qualitative study was conducted at three FQHCs, and each

one of them represented a chain of FQHCs across the Seattle area. Childhood vaccination rates per Health Resources and Services Administration (HRSA)³⁹ data shows differences among these FQHCs. For the purpose of description, we will call these three community centers in our study as FQHC #1, FQHC #2 and FQHC #3 representing their respective chains. The HRSA data from the year 2016 showed that the group of FQHCs represented by FQHC#1 and #2 in our study had way lower rates of childhood vaccination as compared to FQHC#3. Parent, provider, healthcare system, media and policy factors were noted to be responsible for HPV vaccine uptake among males across participating FQHCs according to our collected data.

The family practitioner at FQHC#1 demonstrated good knowledge about HPV related disease and its association with cancer but demonstrated a poor quality recommendation consisting of weak endorsement, inconsistent and a lack of urgency. A lack of direct parent provider communication and reliance on printed material for parent education was one of the concerns raised by a mother at this FQHC. The mother supported the idea of face-to-face communication between parents and providers who thought that most parents wouldn't even look at the printed material provided to them at the clinic. The provider showed understanding of HPV disease and its link to cancer but at the same time raised the issue of stigma involved in HPV related discussions with the parents.

Lack of a system to offer HPV vaccine with other two adolescent vaccines was another factor noted that resulted in missed opportunities to offer and deliver HPV vaccine. Offering HPV vaccine along with other two adolescent vaccines while parents are already in the clinic seems to be an important factor in improving HPV vaccine uptake by saving parents another visit to the clinic. A missing vaccine tracking system for the providers and no involvement of MAs in

tracking the multiple dose series of HPV vaccine due to lack of funding was another hurdle to the completion of HPV series at this participating FQHC. Gaps in health services coordination were noted with temporary shortage of vaccine and difficulty of scheduling visits for HPV vaccine series. A failure to schedule all doses of vaccine at the time of first encounter was pointed out by one of the parents whose son was seen at this FQHC and was vaccinated late and who had difficulty remembering the appointments.

A pediatrician interviewed at FQHC#2 advocated the use of HPV vaccination among boys with consistency, urgency and strong endorsement. Use of standing orders and HPV vaccine announcement by MAs as the initial mode of communication with noted at this provider's practice and had a system in place for delivering and tracking HPV vaccine. The provider seemed to be well educated about HPV disease and its related cancer and claimed to have received HPV related training from different sources. Out of the three parents interviewed at this FQHC one was never offered HPV vaccine for her 15-year-old son and 18-year-old daughter. The other two parents have had their sons vaccinated within the recommended age of 11-12 years of age. With multiple providers practicing at each FQHC, we anticipate that a provider who did not believe in HPV vaccine and failed to offer it to both her children saw these unvaccinated children. The parent claimed to be going to the same provider for her children's health care needs since their birth and both of them have had all other childhood and adolescent vaccines completed except for HPV vaccine. It was confirmed by the pediatrician at FQHC#2 that there are providers in their system that may not be recommending vaccine very strongly.

It is likely that recommendation for HPV vaccine is not a part of the healthcare system at FQHC#2, but depends on the provider's preference. A lack of uniform system and guidelines to be followed by all providers was found to be missing. Absence of feedback and accountability of

providers who fail to recommend HPV vaccination could be the underlying cause of this problem. Comparing data collected from participating providers we assume that the specialty of provider might have influenced the rates of HPV vaccination as shown in previous studies³². The pediatrician at FQHC #2 endorsed stronger recommendations as compared to a family practitioner at FQHC#1 who affirmed to weaker, inconsistency and late recommendations for HPV vaccine.

FQHC #3 had the highest childhood vaccination rate among participating FQHCs according to public data. A strong, consistent and timely recommendation was noted at this center with a well-coordinated health care system that ensured effective tracking and easy scheduling for HPV vaccine. The midlevel provider interviewed at this center showed some deficiencies in her knowledge and training about HPV vaccine. She did not seem to be directly involved in HPV vaccine promotion as evident by her lack of knowledge of the recommended age for HPV vaccine and rates of HPV vaccine at their clinic. The provider did show a surprise over a low rate of HPV vaccine nationwide as compared to other adolescent vaccines and endorsed no major issues with vaccine acceptance. MAs played a major role in initial announcement and by following standing orders to deliver HPV vaccine.

Despite high overall childhood vaccination rates at this center the father of two boys seen at this center showed a complete lack of awareness about HPV vaccine and denied any kind of education. He claimed to have never had received HPV related education neither in a written form nor did he have face-to-face communication with the provider. Based on our data from the provider at this center, HPV related training of providers was missing. Parental concerns even after getting two boys vaccinated at this FQHC against HPV were noted. HPV vaccination rates

at this center were almost perfect apparently due to parent's blind faith, provider's office offering strong recommendations, ease of vaccine delivery and scheduling.

We also noted involvement of MAs in delivering initial announcements and standing orders to be important participating factors in achieving high HPV vaccine rates. Despite all the facilitators and a high vaccination rate at this FQHC we still cannot deny the importance of accurate HPV related public knowledge and parent's satisfaction before they leave the center. Knowledge of HPV disease and its link to cancer is something that is not well understood and is faced with a multitude of controversies not only among parents but also providers.

Based on the information gathered during interviews, there appears to be a need for interventions at all levels including parents, providers, health system, media and policy. The importance of provider's involvement in promotion of HPV vaccination cannot be denied but it can also affect rates of HPV vaccination adversely if the provider is not recommending it at all, or if the strength of recommendation is weak. In a setting of FQHCs where parents generally have shown blind faith in their providers despite poor knowledge about HPV, a provider's strong recommendation seems to be a very important factor in increasing HPV vaccine uptake among boys.

A strong recommendation is determined by the strength of endorsement, urgency to deliver vaccine on the same day of recommendation, consistency of recommendation (avoiding risk-based approach), and effective communication in the form of announcement and/or education in a timely manner (within the recommended age range of 11-12 years) The providers have shown varying opinions and beliefs about HPV vaccination among boys that can result in missed opportunity and low vaccination rates.

The fact that some providers in FQHC#2 network, would “not push HPV vaccine” as mentioned by the provider at that center could potentially lead to lower HPV vaccination rates at this particular FQHC network.. All parents who were interviewed at three participating FQHCs, displayed a lack of awareness about HPV vaccine and disease to a varying degree, and expressed a need for some sort of HPV related education in the form of a flyer or face-to-face communication. Father of two HPV vaccinated sons although accepted the vaccine due to provider’s trust and the method of communication used at FQHC#3, showed a complete lack of education about HPV related cancer and disease among boys.

One of the concerns raised by all three providers was related to the stigma associated with HPV as a sexually transmitted disease and its effect on parent’s decision making and provider’s hesitancy to discuss it with parents. Although all providers raised the issue of stigma linked to HPV related discussions with parents, they also demonstrated an understanding of presenting HPV vaccine in a non-sexual manner. All three providers endorsed the importance of presenting HPV vaccine as a preventive measure against various cancers as opposed to a sexually transmitted disease.

The false perception of parents that HPV vaccine is related to and necessary only if their adolescents are sexually activity³⁹ is a barrier in HPV uptake. There has also been a debate among religious group who anticipate this vaccine to promote pre-marital sexual activity^{40,41}. These misconceptions and perceiving HPV vaccine as a potential gateway to earlier sexual contact and giving false impression of safety to teenagers are the factors that makes the discussion about HPV vaccine difficult and uncomfortable^{42,43}. On the other hand presenting HPV vaccine as a preventative measure against various cancers across both genders is essential to overcome this stigma and false beliefs⁴⁴. Presenting HPV vaccine at the recommended age as

a “preventive” measure against HPV related diseases and cancers is the fundamental key to overcoming the problem of stigma associated with HPV vaccine⁴⁴.

All subjects in our study supported the idea of vaccinating their sons against HPV and did not show concern about its link to sexual transmission and an early age of its administration. The reason could be that all parents who signed the consent either had their sons vaccinated or willing to get vaccinated if offered the vaccine. We might have had parents with concerns about the early age of administration for HPV vaccine and its perceived link to social stigma if we were able to enroll parents who declined HPV vaccine or who were hesitant to get it for their sons.

Another important way to reduce anxiety and concern of parents is by effectively communicating to parents regarding the immunologic response to HPV vaccine when administered at 11-12 years of age. Immune response to HPV has been demonstrated to be optimal at this age and explaining this to parents can help divert their attention from their perceived link with current sexual activity of their pre-teens. This has also been the rationale behind the new Advisory Committee on Immunization Practices (ACIP) new recommendation regarding administering of two instead of three doses of HPV vaccine if adolescents complete both doses between 9 and 14 years of age¹⁸.

Tracking of multiple series vaccines was presented as a challenge by both parents and providers. A reminder system for the providers/staff in the form of computer alerts could be helpful in avoiding missed opportunities and doses. Delivery of all three adolescent vaccines at one visit can help avoid an extra visit to the clinic for a vaccine that is not required for school entry. The provider at FQHC #1, with the lowest HPV vaccination rates among boys out of all three participating centers, admitted to offering the HPV vaccine inconsistently at age 10, when

they routinely offer two other adolescent vaccines. In the absence of school requirement for the HPV vaccine, and no scheduled well-child visits after receiving adolescent vaccines, offering all three vaccines together seems to be a reasonable decision.

Provider feedback on vaccination rates, sharing of experiences among various providers and their positive involvement in HPV vaccination related activities could help improve HPV vaccination rates. Television was the first exposure of HPV related awareness for three of the mothers of vaccinated sons. One father interviewed mentioned using the Internet to find answers about the HPV vaccine. The mother of unvaccinated children had not heard about HPV from any source. Media can play an important role in providing accurate information to parents, without associating HPV to sexuality, but linking it to the risk of various cancers associated with the virus.

Although parents saw commercials on television about HPV and discussed among friends and family, the final decision relied on their provider's recommendation, either in the form of written information in the case of two patients, announcement in one case and provider/parent communication in another. One of the mothers had heard about HPV, but did not feel rushed until she learned about HPV related cancers at the doctor's office. A lack of mandate was pointed out to be a major problem by two of the providers at FQHC#1 and FQHC#2. There is strong evidence supporting the fact that mandated vaccines for school entry increase their uptake.

At this early stage of HPV vaccine promotion among boys, in addition to improving health care system it is important to provide parents and providers with an accurate knowledge about HPV and its related cancers. It is important to use strategies that help deliver knowledge to public in an easy to understand fashion to ensure a positive and strong message going out in public. Until HPV related controversy regarding its link to sexuality, and issues of patient

autonomy are resolved, we must focus on parent, provider and health system interventions to achieve desirable rates of HPV vaccination among males in FQHCs in the Seattle area.

STUDY LIMITATIONS

Just like any other qualitative study, the purpose was not to test a hypothesis based on extensive data but rather to generate a hypothesis after in-depth interviews with parents/guardians and providers and our study was also faced with certain limitations. There is a chance for selection bias and disproportionate enrollment because participation in the study depended on consent by the parents, and we may not have been able to enroll some otherwise eligible parents. Parents declined due to time constraints, language barriers or were not comfortable participating in the study. In the absence of a translator, one parent who was willing to participate in the study was excluded due to her lack of ability to read English. Potentially other parents who were not able to speak or read English could have contributed to our data otherwise. We could probably have found more barriers to HPV vaccine uptake if we were able to interview more parents with unvaccinated boys, as four out of five participating parents have had their sons already vaccinated against HPV

RECOMMENDATION

There is no single factor that can improve the rate of HPV vaccination among boys in the FQHC setting in the Seattle area and we have noticed that each center had its own requirements and deficiencies that need to be addressed in order to achieve desirable results. In a FQHCs setting with a general parental lack of awareness and blind faith in providers, we recommend some intervention in general followed by interventions specific to each FQHC. General recommendations include improvement in provider's recommendation, good health services

coordination, more effective use of public media and change in health policy related to HPV vaccine mandate for school entry.

Provider training and education to improve the quality and frequency of recommendation through:

- A. Strong endorsement by stating that HPV is as required as any other vaccine even if it is not a required vaccine for school entry. Instead of asking patients if they want the vaccine for their boys, parents should be offered HPV vaccine through initial announcement assuming that parents already agree for their child to get the vaccine. This can be done by provider's statements such as "I strongly recommend" or "Your son is due for HPV vaccine" as opposed to asking them if they want the vaccine. This method of initial announcement is potentially going to give a perception to patients that HPV vaccine is as important as other adolescent vaccines and offered as a vaccine for cancer prevention will minimize the perception of stigma attached to it.
- B. Consistency of recommendation to males and females by avoiding risk based approach
- C. Urgency
- D. Timeliness (11-12 years of recommended age)
- E. Improving parent/provider communication by:
 - a) Starting the vaccine recommendation by announcement to the parents that their sons are due for a shot instead of starting the conversation about HPV related disease and cancer is a way of reducing perceived stigma. It can also give parents an impression that HPV vaccine is not any less important than other recommended vaccines.

- b) Following the announcement with parental education in the form of written information, or face to face communication, especially if parents are hesitant or want to know more about HPV diseases and the vaccine
- c) Offering HPV vaccine as cancer prevention as opposed to the focus on sexual transmission

Effective communication about HPV vaccine by linking it to cancer prevention and explaining the rationale for recommended age of 11-12 years for HPV vaccine would potentially reduce perceived stigma and increase HPV vaccine uptake among adolescents.

Better healthcare services coordination

- A. Standing orders for HPV vaccine
- B. Provider/staff reminders in the form of computer alerts to strongly recommend HPV vaccine to parents of all eligible males, at the recommended age, consistently and with urgency to avoid missed opportunities
- C. All three adolescent vaccines offered at can reduce the number of un-vaccinated males by saving them an additional appointment to the FQHC for a vaccine that is perceived as 'not required.'
- D. Provider feedback on vaccination rates and positive involvement in HPV vaccination related activities

Improvement in use of Media

- A. Effective use of media to educate general public by linking HPV vaccine with cancer prevention by sending stronger messages to parents regarding HPV vaccine among boys. This could be achieved by developing new ads and better communication regarding oro-

pharyngeal cancer risk among boys and the rationale of administering this vaccine at a young age.

Change in Policy

Efforts to get HPV vaccine mandated by law for school entry.

Although we cannot undermine the importance of health policy change and role of media in promoting HPV rates among boys in our selected population but until that is achieved we need to focus on factors that are related to parents, providers and health care system.

The recommendations are based on literature review as well as thorough study of data from interviews of parents and providers at each FQHC.

FIGURES AND TABLES

Figure 1. Conceptual diagram of factors affecting HPV vaccination uptake among males

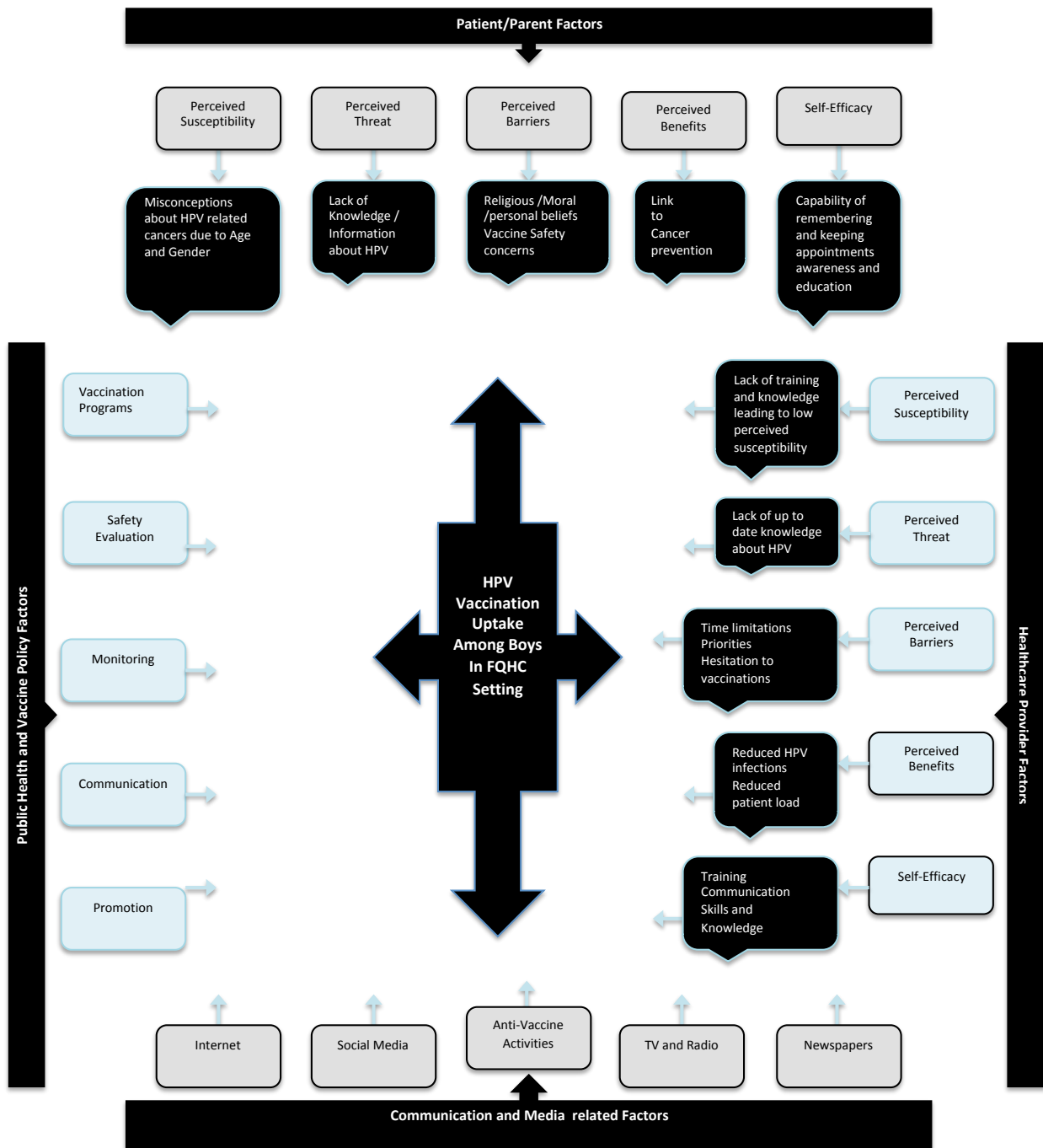


Figure 2. Framework of barriers to HPV Vaccination

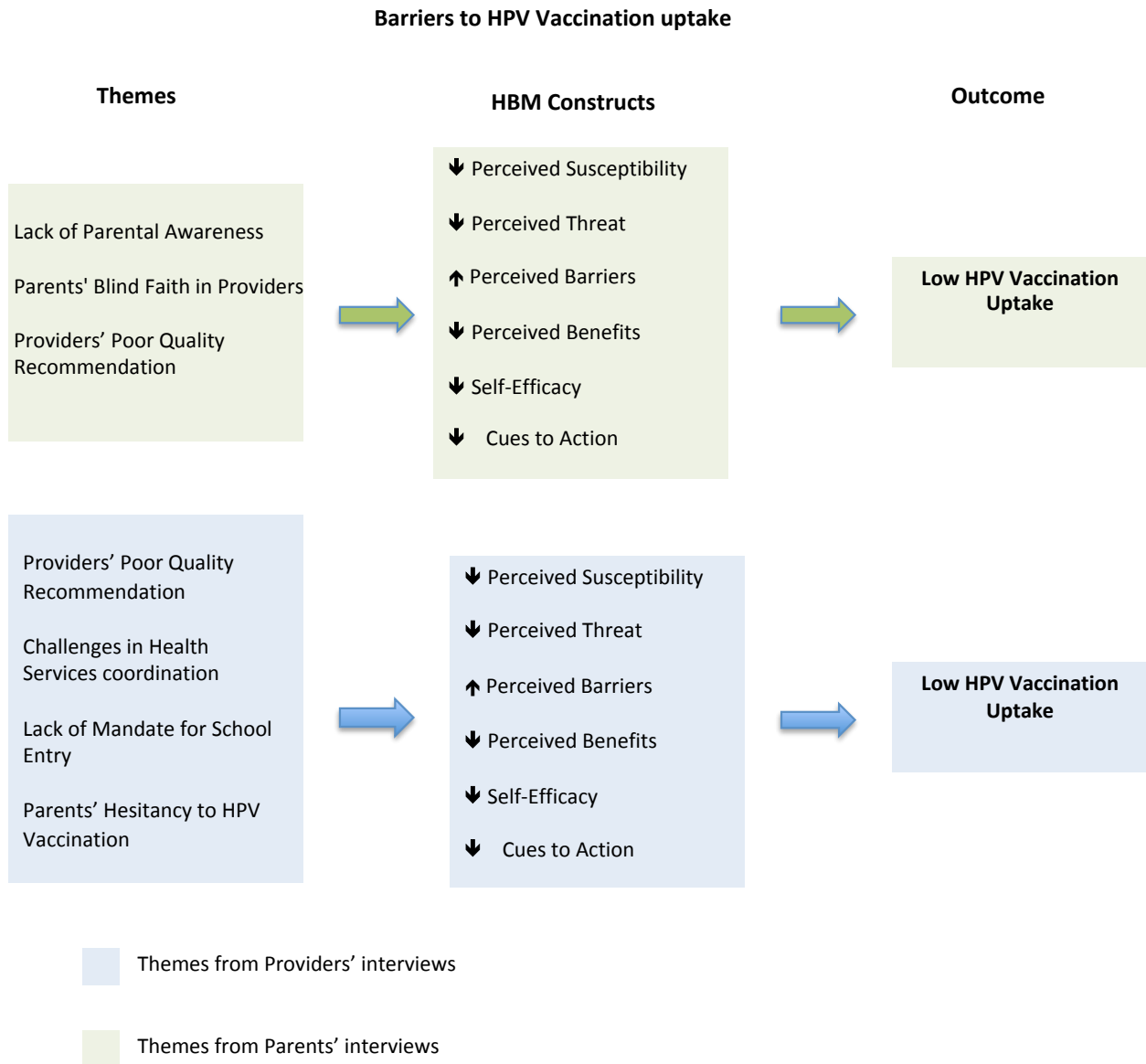


Figure 3. Framework of facilitators of HPV vaccination

Barriers to HPV Vaccination uptake

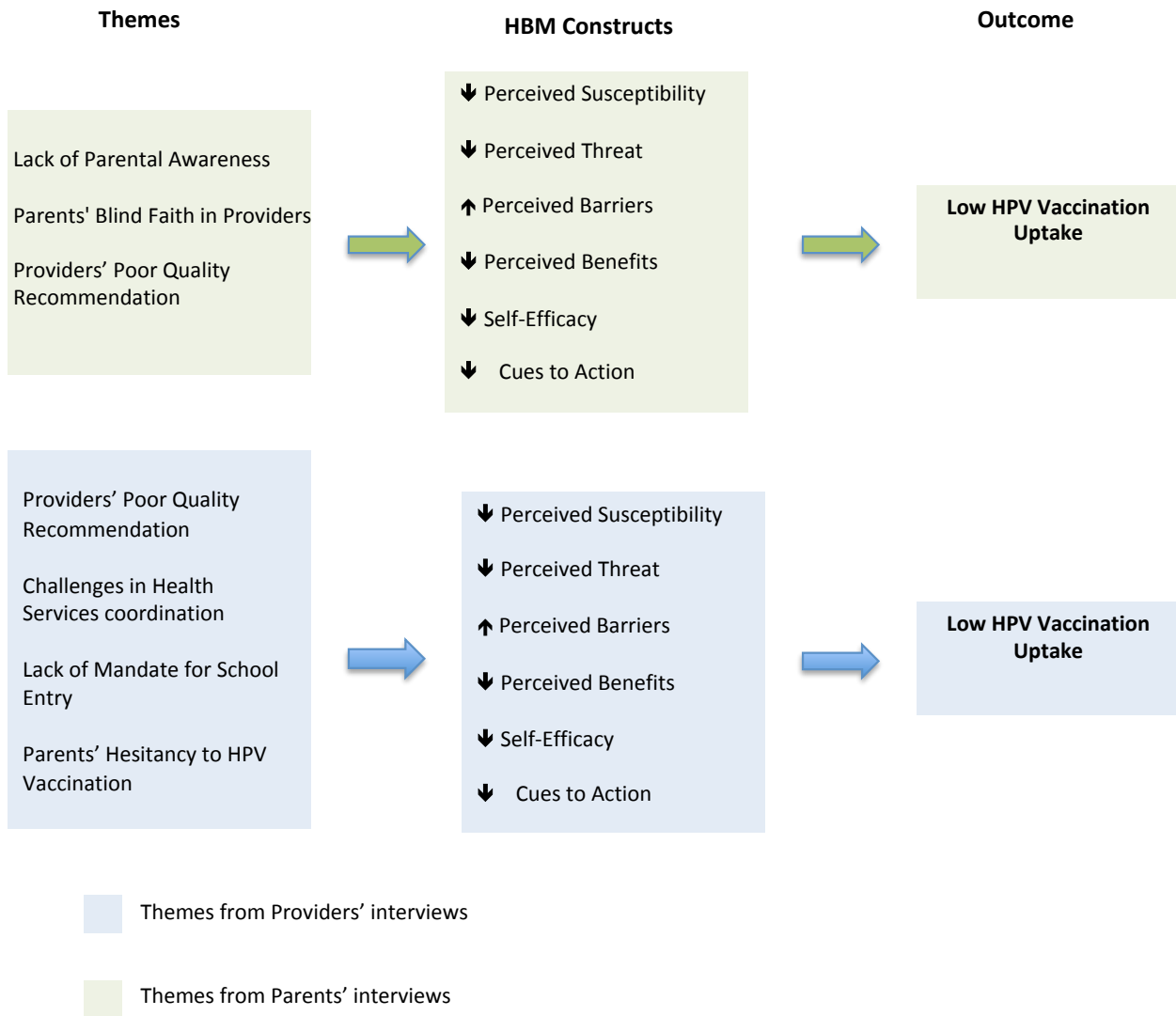


Table 1.

Barriers to HPV vaccination among males (Parents' Perspective)		
Theme	Examples of Themes	Parent
Lack of parental awareness	I don't know anything about HPV...We have been coming to this clinic since my son was born...No, I don't know HPV at all	Mother of an unvaccinated son
	I didn't know anything about it but my husband said that a lot of people get it, males get it mostly in their mouth.... I am not sure if that's true.	Parent of a vaccinated son
	You know it is not a required thing... if he caught it and he was spreading it...chance of those women, they could get cancer....it's super risky for women...it's more common cause of cancer in women than in men	Mother of a vaccinated son (vaccinated late)
	He recommended that they have to. But I thought this is only for women... It's not necessary here? Right?... She's (his wife) still confused about it. The baby room inside, men don't have it, then why?... Actually I want to know why they have to get shot..	Father of a vaccinated son (still unsure about HPV vaccination)
	I don't know too much about it.... off-hand, I don't know really too deep about it...don't know about infections or anything, no...Whenever it was, whatever age they were supposed to start getting it, I believe I probably did	Mother of a vaccinated son
Parents' blind faith in providers	He is now 15 years old and she always explained the shots to me but she never explained HPV...We've had the same doctor since he was born....Yes I would have had it for my son. Can he still get it now?	Mother of a 15 years old unvaccinated son
	She suggested that, to take it, to do it if we wanted to...if we would have known that it could have prevented a cancer we would have gotten the shot.... if we would have known it was you know, just a shot we should have gotten (earlier)	Mother of a vaccinated son
	I think briefly is better ... They don't want to spend more time there than they really have to....Yea, I would trust him	Mother of a vaccinated son (vaccinated late)
	I don't remember exactly but he recommended that they have to...Yes so I was very confused so I checked the internet. In my country, usually, men doesn't get this...They are specialist. I am not a specialist. Just, I believe them	Father of vaccinated son (still unsure about HPV vaccination)
	..maybe, ask more questions about it because, like I said I think a lot of parents don't, because, a doctor is a doctor...So I think they don't ask as many questions because it is a doctor....Whenever it was, whatever age they were supposed to start getting it, I believe I probably did	Mother of a vaccinated son
Providers' poor quality recommendation	No. She has not explained HPV at all... Yes, we have gotten all the other vaccines but we didn't get that, she did not explain about HPV to us...Yes I would have had it for my son. Can he still get it now? ... She (18 years old daughter) never got it (HPV vaccine) either.	Mother of a 15 years old unvaccinated son
	She suggested that, to take it, to do it if we wanted to...Maybe if I knew more about it then I wouldn't have felt not rushed, but because it was something like 'ok it's gonna be for his benefit, let's do it...'	Mother of a vaccinated son
	..but we got a little bit late. I'm not sure exactly. I think it was recommended at age 12 to 13 or something. He told me before, but I don't think I caught it right. I think we waited a while...You know it's not a required thing and even required ones they don't push on you..	Mother of a vaccinated son (vaccinated late)
	He recommended that they have to. But I thought this is only for women. Yes so I was very confused so I checked the internet. In my country, usually, men doesn't get this. So when I saw the paper (flyer for thesis project), actually I want to know why they have to get shot?...they have to explain about that or give us some paper..	Father of vaccinated son still unsure about HPV vaccination
	Even though they give you pamphlets.. I think when you are speaking out of your mouth than on paper, it's, people understand.... I think maybe more, because lots of people don't even read it, they'll just take the papers and go about their way...	Mother of a vaccinated son

Barriers to HPV vaccination among males (Providers' Perspective)		
Themes	Examples of Themes	Provider
Table 2. Providers' poor quality recommendation	Interviewer: You consistently recommend HPV the same way as you recommend among girls? Interviewee: I don't....they want next year, at13, they want that, and my gut feeling is, they're not going to be sexually active before that, I'm ok with it.... in that age group... Interviewer: So what do you think, in your experience, announcements work better for patients or education works better for patients? Interviewee: Well I think, in our world, I'd have to say education but you know, I think there's a stigma about this...	Provider
	I know there are some people in (name of the clinic) that don't push HPV vaccine... They (parents) just know it's a shot to prevent something, but they probably couldn't tell you much about what it stands for, what it is, why you get it... I don't think they (medical assistants) do a lot of counseling about why vaccines are important....The MAs just do it (vaccination)... most of the time it happens before I am even un there.	Provider
	What age do you usually recommend it at your clinic? Interviewee: We should double check with the MAs 'cause they are the ones who are looking into the computer system... And I've had a few parents who eventually will say, I get you want to get it to protect your future wife someday... the MA announces that it's due,.... if I'm running late, they'll just do it even before I come in.	Provider
Poor health services coordination	There's no reminder..., I have to go and see..would have to be a designated staff person with grant dollars.. It's the challenge of getting multiple doses... ...and then the reality that we don't see a lot of 11 year olds... Unless there's a school reason or program reason, they don't come in for their vaccines ... Kids that are assigned to us, to a health plan but we've never seen... I think there's just enough time and we usually help people... If they're here for Well-Child Care, we always do it, but otherwise, things get missed, dose gets missed... I don't see much advertising, I don't see public health campaigns, I don't see billboards	Provider
	...now we're going from three doses to two doses, so that's another exciting thing is it's easier to get it completed	Provider
	But if I'm running late, they'll just do it even before I come in..... Interviewer: ...what are the rates of HPV vaccination at your clinic or do you get data for it? Interviewee: I don't know - That's a good question. Interviewer: like if we compare them with meningococcal vaccine...MMR or DPT, (HPV vaccination) rates really discouraging... Interviewee: It's kind of surprising to me 'cause it makes me think, I don't know... Interviewer: How does your clinic keep track of patients... a patient comes here and they refuse to get vaccinated, are they going to follow up with them? Interviewee: Not specifically... As far as I know we don't have any uniform training... It's (HPV education) definitely good. And even something really easy, like a one-page sheet, how to talk to patients or something like that. Interviewer: What are the rates of HPV vaccination at your clinic? Interviewee: I don't know - That's a good question...	Provider
Lack of mandate for school entry	Unless there's a school reason or program reason, they don't come in for their vaccines. But HPV is not required, so there's no external pressure to have it done. I mean, if they're here for Well-Child Care, we always do it, but otherwise, things get missed.. Interviewer: So in your opinion, like what could be, if I ask you what would be the best strategy (to increase HPV vaccination rates)..? Interviewee: Requiring for school. Interviewer: Mandating it.	Provider
	Sometimes parents will come in and say, I only want the vaccines that are required for school. It is, in the State of Washington, it's free for everybody. But still, some people will come in and say, I only want the ones required for school. They're only gonna do the things that schools require because somehow they think that's more important...	
Parents hesitancy to HPV vaccination	But if a parent wants to prioritize other things especially because we got tetanus whooping cough booster, we've got meningitis vaccine, so you're potentially talking to a 10 year old about getting 3 shots today. Unless there's a school reason or program reason, they don't come in for their vaccines.. Interviewee: ..when you talk about HPV vaccination among boys, how do they respond?.. Interviewer: Some know, I think it's a different speech in culture, in health, literacy, education, ethnicity, you get different answers. And it's not that long that we've recommended it for boys. I think there's a stigma about this	Provider
	Sometimes parents will come in and say, I only want the vaccines that are required for school... somehow they think that's more important. If they've declined, and they're not just a vaccine refuser overall, some people who have multiple children, they've already decided that's very difficult.. I think most people in my population don't even know what HPV is. They have no clue.. Maybe it would be easier if it was just with other things, when they're younger (younger than 11-12 years), but in general, it's just getting people away from the idea, oh, this is sexually transmitted... We have the 2-dose series, you have to get your first dose before your 15th birthday in order to qualify for that 2-dose series. So that helps me push people a little bit	Provider
	Probably more commonly with boys, not knowing what it is. I think for all parents, oftentimes they're not really sure what it is Some parents are very protective of their kids and don't like the idea that we're protecting them from something that could be sexually transmitted.. I've never had a young man come in requesting it. So I do think there's probably a little bit of lack of education.. It's more challenging for me is that they're declining all vaccines	Provider

Table 3.

Facilitators to HPV vaccination among males (Parents' Perspective)		
Theme	Examples of Themes	Group
Provider's good quality recommendation	No, she has to explain it to me for me to get any vaccine, for me and my son. I have concerns about everything. I am concerned what they put in our food, I need to know what kind of stuff we are getting injected with.	Mother of a 15 years old unvaccinated son
	I think it would be better, kind of like an educational talk just because it was kind of something like 'oh we are doing this now we're recommending it' so maybe if I knew more about it then I wouldn't have felt not rushed...like if I have more of the facts and stuff instead of just like 'hey let's do it, you know, they offer it now for boys.'	Mother of a vaccinated son
	He told me before, but I don't think I caught it right,.... That was his new doctor...Yea, they tell you about it and then they give the pamphlet, he read it, I was like, oh, you want to do that? He (son) said yes. I mean, definitely, if they hadn't given me any information on it and they just would've asked I would've been like no. But since they gave the information and he made the decision, that definitely changed.	Mother of a vaccinated son (vaccinated late)
	He recommended that they have to...They recommend that it is necessary. They are specialist. I am not a specialist. Just, I believe them.	Father of vaccinated son still unsure about HPV vaccination
	But every person individually is different so it might not be good for one, it might be good for the other due to personal body. You know, so I think maybe they should give more detail, encourage the parents to, maybe, ask more questions about it because, like I said I think a lot of parents don't, because, a doctor is a doctor.	Mother of a vaccinated son
Good health services coordination	Because we've been coming here since he was born. He is now 15 years old and she always explained the shots to me but she never explained HPV... Interviewer: Did he get the meningococcal one, the one that is for meningitis? Interviewee: Yes he got that Interviewer: And he got all the other childhood vaccines and everything? Interviewee: Yes he did.	Mother of a 15 years old unvaccinated son
	Oh, super easy. I always get phone calls, letters, not emails yet but I get emails now. They make themselves really available. I believe it was three sets and so they called me every time that it was time to do it. They called me to tell me they were on back order...they called when they got it and scheduled me.we're just so short on time. If I call them and if they can they'll squeeze me in the same day.	Mother of a vaccinated son
	But I'm sure if I hadn't remembered, they would've called me They prefer that you have an appointment, you know, but I'm sure if you wanted to get a vaccine you could go. Interviewer: So how convenient is the system at your clinic in terms of ease of scheduling and visit reminders? Interviewee: They're really good about it.	Mother of a vaccinated son (vaccinated late)
	Was it easy to get the visits scheduled Like for the first, second and third vaccines for your first son, is it easy at the clinic to get your visits scheduled? Interviewer: Do they remind you?? Interviewee: Yes.	Father of vaccinated son still unsure about HPV vaccination
Media	Oh, I love this clinic. I have been coming here for seven years, same doctor. When I come in for an appointment for one of them, they would let me know and they look up their name and stuff whether they needed any shots that day. Interviewer: So did both of your sons get all three doses? Interviewee: Yes.	Mother of a vaccinated son
Media	Interviewer: How did you learn about HPV vaccination? Interviewee: I have seen it on TV.. I had seen it on TV so I kinda saw a little bit of what it was...	Parent
	Interviewer: What was the first time in your life when you heard about HPV vaccination like was it through any kind of posters in the clinic or maybe on radio or TV? Interviewee: I think it was on TV.	Mother of a vaccinated son (vaccinated late)
	Yes so I was very confused so I checked the internet	Father of vaccinated son still unsure about HPV vaccination
	Seen a lot of commercials on TV about it. Interviewer: How did you learn about HPV vaccination, what was the first time ever that you learned about HPV vaccination for boys? Interviewee: I wanna say TV, commercials...It was one of the local channels, some talking and saying, see mom or dad if you would have had gotten me the shot then I wouldn't be going through this now and it was boys. And I had pointed that out to my son so, the one that asked if it was just for girls..	Mother of a vaccinated son

Table 4.

Facilitators to HPV vaccination among males (Providers' Perspective)		
Theme	Examples of Themes	Group
Provider's Good quality recommendation	I think it's important for boys because it's such a common sexually transmitted virus and it's directly related to cancer Interviewer: What do you think, in your experience, announcements work better for patients or education works better for patients? Interviewee: Well I think, in our world, I'd have to say education... I think we've done a lot better job of presenting this in a non-sexualized type of way in terms of cancer prevention.	Provider
	I think that it's exciting that it's the first vaccine we've ever had that really prevents a type of cancer... I think it's just as important for boys as it is for girls... We start pushing the HPV vaccine at age eleven... So if they don't get it(HPV vaccination) done ... and then I'll talk to them...then I strongly recommend it and I tell them why... I mean, I don't miss a chance to discuss it,..... The more they trust you the better luck you're gonna have talking to them about vaccines.	Provider
	This vaccine is really amazing because it's one of the only ones we know of that prevents cancer With HPV I always feel like I have a better speech than the other ones because it prevents cancer, it can protect boys from certain forms of cancer too I've had some parents ask me about vaccinatinating at an age when most kids are not sexually active) and what I say is just that we know the immune response is really good at this age.	Provider
Good health services coordination	So in provider education we actually have one person kind of in-charge of vaccine related issues, a Medical Assistant Interviewer: And also collaborating with other associations... Interviewee: Yea, collaboration, yea. Interviewer: So do you routinely offer HPV vaccination to eligible boys? Interviewee: We do, yea. It's something that lights up as a vaccine deficiency when you go to our vaccine module at our health record, after age 9. If they're here for Well-Child Care, we always do it (HPV vaccination).... We've brought it (formal education and training regarding HPV) to our provider loops.	Provider
	It's just more convenient for us to do it with the eleven year old other vaccines. If they're coming in here for a cold or they're coming for a checkup, we just say you're due for this vaccine today.. So if they don't get it (HPV vaccination) done... and then I'll talk to them..... If I can get them to do it the same day.. sometimes people .. we'll come back and get it. I'll call them sometimes if they don't come back in the time... I've done tons of extra reading and extra training	Provider
	We keep track so we will make the next appointment at the time that they're here so they always have an upcoming one and then if they no-show then we try to call to reschedule... Interviewer: Do you think it would be a good idea that providers are given feedback on different vaccines that these are the rates at your clinic and what can be done. Interviewee: Yea, definitely. If there's a disparity that's happening, it would be good to know about it 'cause then we can change what we're doing.	Provider

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APPENDIX I*

Sample Questions for Parents

Questions on Perceived Susceptibility and Threat

What do you know about HPV infections among boys?

Why do you think HPV vaccine is or is not important for your child?

What do you know about HPV related cancers?

Do you know about the association of HPV with cancers of head and neck?

Questions on Perceived Barriers

How did you learn about HPV vaccination?

Why did you say ‘No’ to the vaccine?

What did you learn from your provider regarding HPV vaccination?

Do you have any concerns about safety or effectiveness of the vaccine?

What can the doctors, nurses or the clinic do in helping you make the decision about HPV

How convenient is the system at the clinic in terms of ease of scheduling and visit reminders?

Do you know that all three doses of HPV vaccine are available to your child at no cost?

Questions on Perceived Benefits

Do you know which diseases including various cancer, can HPV vaccine prevent?

Questions on Self-Efficacy

Do you need help on remembering and keeping appointments for the vaccine visits?

How easy is it to get to the center for vaccinations?

APPENDIX II*

Sample Questions for Healthcare Providers

Questions on Perceived Susceptibility and Threat

Do you think HPV vaccination is important for boys?

If yes, why?

What steps does your clinic take to improve HPV rates among boys?

Do you routinely offer HPV vaccination to eligible boys according to USPSTF recommendation?

Questions on Perceived Barriers

Do you have any concerns about safety or efficacy of HPV vaccination?

How easy is it to order HPV vaccination for your patients?

Do you think you have sufficient time at a routine visit to discuss about HPV vaccination?

How do patients respond to education about HPV among boys?

Question on Perceived Benefits

Do you think HPV vaccination is important for boys?

Do you think HPV vaccination will help reduce patient load at your clinic due to HPV related diseases?

Questions on Self-Efficacy

Do you think you need training/more information on HPV related head and neck cancer?