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Cervical cancer, human papillomavirus (HPV), and HPV vaccination: Exploring gendered perspectives, knowledge, attitudes, and cultural taboos among Mexican American adults

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Abstract

Background—Gendered perspectives may be particularly important in shaping norms and values around HPV and HPV vaccination, as previous research suggests that sexuality taboos (e.g., promiscuity) may contribute to low perceived risk among adolescent and young adult Hispanic females. However, research to date focuses primarily on Hispanic mothers, adolescent females, and women of HPV vaccine eligible age. Hispanic father’s perspectives are relatively unknown despite father’s important role in shaping norms for their female children.

Objective—To close this gap, this study examines gendered perspectives in knowledge, beliefs, and attitudes about HPV and HPV vaccination from Hispanic parents (mothers and fathers), women of vaccine eligible age (18–26 years old), and women eligible for Pap Test screening (>26 years old) living in two counties along the Texas-Mexico border.

Design—We conducted eight focus groups. Research staff transcribed audio recordings verbatim and uploaded them into Atlas(ti) 5.0 for analysis. The research team analysed the data for content, meaning, patterns and themes using the constant comparison approach.

Results—Perspectives were highly gendered. Women’s (all groups combined) beliefs focused on misconceptions around how the HPV virus is contracted (e.g., toilet surfaces). Women also linked HPV-related sexual risk to adultery and indiscretion of male partners. Fathers (men) were more

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likely to link risk to female promiscuity. Fathers also worried that HPV vaccination might increase promiscuity. All groups believe that HPV vaccination is a way to protect Hispanic females in the face of beliefs around sexual behaviour and risk of contracting HPV.

Conclusion—Results suggest gendered differences in risk beliefs concerning HPV among Hispanics living along the Texas-Mexico border. Researchers can use these findings to address barriers to HPV vaccination, as well as to create culturally appropriate prevention messages that may help reduce disparities in HPV among Hispanic women.

Background

Two strains of HPV (HPV 16 or 18) cause 66% of all cervical cancers (Petrosky et al. 2015). The links between HPV and cervical cancer are particularly important among Hispanic women, as a clear disparity in cervical cancer exists between white and Hispanic women in the United States (U.S.). Hispanic women have the highest cervical cancer incidence rate of any racial/ethnic group in the U.S. (American Cancer Society 2015), and the incidence rate is about 44% higher among Hispanic women compared to non-Hispanic white women (American Cancer Society 2015). Even among Hispanic women, there are more pronounced cervical cancer disparities in certain areas of the country. For example, in the Texas-Mexico border counties of Hidalgo and Cameron, Hispanic women have higher cervical cancer incidence (12 vs. 8/100,000) and mortality (4 vs. 3/100,000) rates compared to Hispanic women nationally (Howlader et al. 2015, Texas Cancer Registry 2014a, b).

U.S. Hispanic women's underuse of two primary modes (Papanicolaou or Pap smear screening and HPV vaccination including bivalent, quadrivalent, and 9-valent vaccines) of cervical cancer prevention may lead to these disparities in incidence and mortality (Petrosky et al. 2015). Although these two forms of prevention exist, Hispanic females underutilize both. For example, U.S. Hispanic women have lower screening rates (75.7 vs. 80.3/100,000) when compared to Non-Hispanic white women (Centers for Disease Control and Prevention 2014a), and are even lower among uninsured U.S. Hispanic women among whom 64% reported a recent test (American Cancer Society 2015). The underuse of Pap test screening services by Hispanic women may be due to both individual (e.g., lack of knowledge regarding cervical cancer and its prevention, attitudes/beliefs such as morality/virtue, fatalism and fear) (Mann et al. 2015, Chavez et al. 2001) and system level barriers (e.g., unequal access to health insurance, lack of cultural/linguistic appropriate health care, illegal or undocumented immigrant status) (Nuño et al. 2011).

The Advisory Committee on Immunization Practices (ACIP) currently recommends the HPV vaccine for females aged 11–26 and males aged 11–21 (Petrosky et al. 2015). A smaller proportion of Hispanic females in Texas aged 13–17 compared to Hispanic girls nationwide receive 1 dose of the vaccine (55% vs. 66%) (Centers for Disease Control and Prevention 2014b) and fewer receive all three doses (39% vs. 47%) (Centers for Disease Control and Prevention 2014c). Disparities persist in Hispanic females aged 19–26, who are least likely to have received at least 1 dose of the HPV vaccine compared to all other racial and ethnic groups (Williams et al. 2017). Hispanic females living along the Texas-Mexico border also have lower HPV vaccine completion (34% vs. 39%) when compared to state

rates (Morales-Campos and Parra-Medina 2017). This proportion falls short of the Healthy People 2020 target of 80% of girls aged 13–15 receiving three doses (U.S. Department of Health and Human Services 2010). Moreover, Williams et al. (2017) state that young adult Hispanic women aged 19–26 years had lower vaccination rates (35.7%) compared with whites (44.7%). These HPV vaccination rates for adolescent and young adult Hispanic females indicate that Texas may be a state where HPV vaccine initiation and completion rates are lower than other states (Williams et al. 2017). A systematic review of the literature on barriers to HPV vaccination among U.S. adolescents identified the following barriers for underserved and disadvantaged people (Holman et al. 2014): limited HPV and HPV vaccine knowledge, distrust of the medical system, cultural factors, and immigration status. Studies among young adult Hispanic women have identified the following as reasons (Glenn et al. 2015, Luque et al. 2012, Williams et al. 2013) for not receiving the vaccination: low levels of HPV vaccine knowledge, concerns about safety of the vaccine, not being sexually active, a doctor not recommending the vaccine, already having HPV, and concerns about early sexual initiation. Along the Texas-Mexico border, barriers to vaccination reported by mothers included (Parra-Medina et al. 2015): inconvenient clinic hours for vaccination, lack of transportation to clinics, and out of pocket costs for those with private or employer-based insurance.

Parental roles may also play a role in cervical cancer prevention. According to Morales-Campos (2013), mothers are crucial to vaccine uptake among Hispanic youth, and may be central in their child or children's consideration of health. Lechuga, Vera-Cala, and Martinez-Donate (2016) also noted that mothers worry that daughters may become sexually active following HPV vaccination, and that such worry was related to reduced vaccine uptake among daughters whose mothers held fears around sexual activity. However, both mothers and fathers are critical to belief formation in Hispanic culture (La Hoz 2005). In general, familia (family) is a principle value in Hispanic culture and family membership and a sense of belonging are critical (Dixon, Graber, and Brooks-Gunn 2008). The typical Latino family is often described as having strong familial ties and intense relationships, and parent-child relationships place value on respecting, obeying, and learning from parents (Harwood, Miller, and Irizarry 1995, Dixon, Graber, and Brooks-Gunn 2008). Moreover, a well-raised child is expected to be submissive and not challenge the father's rules (La Hoz 2005). However, it is unknown how the beliefs of fathers differ by gender or parental role. Moreover, despite numerous studies on the importance of and barriers to cervical cancer screening among Hispanics, researchers know far less about how beliefs vary between fathers and mothers. Thus, this study takes a combined, public health and sociocultural approach to consider two primary questions:

1. What are the gendered beliefs and attitudes around cervical cancer, HPV and HPV vaccination among Mexican and Mexican-American men and women living along the Texas-Mexico Border? and
2. What are similarities/differences between mothers and fathers beliefs who have HPV vaccine-eligible daughters?

We used a qualitative approach to explore gendered perspectives, sexual norms, misconceptions, and values among Mexican and Mexican-Americans in order to understand

how these beliefs may contribute to underutilization of HPV vaccination. We end by discussing implications for intervention and health behavior change in Hispanic populations.

Methods

Setting

Two counties along the Texas-Mexico border are Cameron and Hidalgo. Both have a bilingual (Spanish and English) population estimated at more than 1.2 million who have among the highest rates of poverty (C/H: 34%) and unemployment (C/H: 10%) in the nation (United States Census Bureau 2010b). Cameron County has a total population of 406,220 with 88.1% of the population being Hispanic (of these 80.5% identified as Mexican, 0.4% Caribbean, 0.7% Central or South American, and 6.4% Other) (United States Census Bureau 2010a), and the median household income being \$33,266 (United States Census Bureau 2010b). Hidalgo County has a total of population 774,769 with 90.6% of the population being Hispanic (of these 85.3% identified as Mexican, 0.4% Caribbean, 0.5% Central or South American, and 4.5% Other) (United States Census Bureau 2010c), and the median household income being \$34,782 (United States Census Bureau 2010b).

Sample and Recruitment

Our qualitative substudy was part of larger study testing the feasibility of promoting 1-800-4-CANCER using small-media about HPV vaccination for parents of 11–17 year olds and young women aged 18–26 distributed through partnerships with community organizations serving Hispanic communities in Hidalgo and Cameron counties on the Texas-Mexico border. For more details on the larger study, see Kreuter et al. (2012). We selected focus groups to collect data on our topic because they enable participants to discuss why they feel a certain way about the topic and go through their steps in making decisions (Bernard 2011). According to Bernard (2011), a qualitative approach to understanding decision-making provides understanding of how subjective actors, assumptions and values shape the decision process, as well as what cultural models exist before an individual feels they can sufficiently be convinced to act. It specifies connections, emotions, thought, attitudes and beliefs. All of these factors may play a crucial role in HPV decision making for parents and daughters.

Eligibility criteria for focus group participants included being a Hispanic man or woman, aged 18 or older, a parent of a girl aged 11–17 (only for mother and father groups), and residing in Hidalgo or Cameron counties. We conducted eight focus groups in Cameron and Hidalgo counties: two with fathers of girls ages 11–17 (n=15), two with mothers of girls ages 11–17 (n=21), two with young women 18–26 years old eligible for catchup vaccination (n=18), and two with women older than 26 years old (n=17).

Promotoras, or community health workers, from the local community and staff from a local university recruited participants by posting flyers at local community centers, health centers, and colleges. The flyers contained information about the study, dates and times of the focus groups, and a telephone number to call if persons were interested in participating. Staff held focus groups at a community center, health center, and local college. Moderators did not

collect demographic characteristics for participants and were the same gender as participants. Trained, bilingual moderators with experience in focus group methodology facilitated the discussions in either Spanish or bilingual English and Spanish, while a staff member took notes. Staff audio-recorded the discussion and then transcribed the recordings verbatim. Participants signed informed consent forms prior to the discussion and received \$20 as compensation. Focus groups lasted between 60–90 minutes and included six to 11 persons per group. The Committee for the Protection of Human Subjects (CPHS) at the University of Texas Health Sciences Center at Houston approved the study.

Procedures

The questions (Fernandez et al. 2009, Morales-Campos et al. 2013) in the focus group guides focused on participants' (Appendix 1): (1) awareness and knowledge of cervical cancer, HPV, and the HPV vaccine; and (2) behavior and behavioral intention for Pap test screening and HPV vaccination. During the discussion, the moderator first assessed participant's awareness, knowledge, beliefs, and attitudes about cervical cancer and HPV, he or she then provided a formal definition of cervical cancer, HPV, and the HPV vaccine (Appendix 2) to the group after participants contributed to the general discussion.

We then developed additional questions to explore the decision-making process regarding the HPV vaccine based on the HPV vaccine acceptability literature (Appendix 1). Only the guides for fathers, mothers, and women aged 18–26 included these questions. The guides also included a scenario about a fictitious parent or woman learning about the HPV vaccine, receiving a recommendation from their doctor for their daughter or themselves regarding the HPV vaccine, and the decision process involved in vaccinating. Other questions in the guides asked about how and where participants find health information on HPV, cervical cancer, and the HPV vaccine. Only the guide for women over 26 focused on Pap test screening.

After finalizing the questions in English, we developed the Spanish version of the focus group guides. Researchers translated the guide from English to Spanish then back translated it into English. Comparisons between the original and back-translated versions by research staff ensured the Spanish translated questions expressed the same meaning as the English questions.

Data Management and Analysis

The team borrowed from the grounded theory approach (Glaser and Strauss, 1967) to inductively form themes and sub themes by applying the constant comparison method as suggested by Strauss and Corbin (1990). We formed themes using an iterative coding process where the team used conceptual labels, or codes, to classify discrete concepts. Formation of each theme that derived from concepts was compared one against another. Various authors (Strauss and Corbin, 1990; Charmaz 1983, Bernard 2011) have described this analysis.

The team took several steps to ensure a thorough and rigorous analysis. First, the lead author (DMC) uploaded all transcripts in Atlas(ti) 5.0, a qualitative data analysis program. She and co-author, SAS, then independently read and re-read all the transcripts, and had an initial

meeting to discuss them. Based on the initial meeting, DMC and SAS formed a preliminary coding list. Two team members (DMC and SAS) independently coded each focus group transcript line by line using “open coding” (Bernard, 2011; Charmaz, 1983; Strauss and Corbin 1990). “Open coding” consisted of using salient, verbatim key words and phrases that emerged from the text to formally identify categories and concepts relevant to the primary research questions. Next, DMC and SAS formed themes (e.g., breaking down, examining, comparing, conceptualizing, and categorizing data) and iteratively compared to one another (e.g., making connections between categories) (Glaser and Strauss 1967). All team members convened biweekly to review the independent coding, share newly created codes and their meanings, and discuss emerging themes and patterns. Whenever any inconsistencies regarding coding occurred, the team discussed the inconsistency and reached consensus on recoding it. The team grouped all related codes under themes specific to an issue. We confirmed data saturation when participants brought up the same concept multiple times, in other words, we were no longer receiving information not previously noted (Glaser and Strauss 1967). The team then used frequencies of codes by focus group type to examine if patterns differed between the four types of focus groups. We then organized themes and described their relationships with one another based on patterns inferred from the data to provide a description of participant’s knowledge, awareness, and attitudes about the links between HPV and cervical cancer.

Results

Seventy-one individuals participated in the study and the majority were female. Our analyses indicated widespread misconceptions and lack of knowledge about HPV and cervical cancer risk. We first identified differences between parents, vaccine eligible women and, women older than 26. However, we found the differences most pronounced by gender, and observed relatively few thematic differences between groups of mothers, women 18–26, and women older than 26. Thus, we describe the following results primarily by gender (e.g., men refers to fathers) and women (e.g., women refers to all female focus groups combined). For direct quotes from women, we identified the woman as a mother, aged 18–26, or aged >26. The main themes from the focus group include cervical cancer knowledge and misconceptions; HPV awareness, knowledge, and misconceptions; HPV vaccination and the role of trust; beliefs about perceived HPV risk and sexual activity; and effects of HPV and HPV vaccine information messaging. We present the similarities and difference between mother and father beliefs under each theme. For a summary of these similarities and differences, refer to Table 1. We translated all Spanish quotes to English.

Cervical cancer knowledge and misconceptions

Knowledge of cervical cancer varied among all groups, and some groups held misconceptions about the causes and treatment of cervical cancer. Misconceptions among fathers (hereafter called men) included the belief that if a woman had cervical cancer it would require removal of her uterus (treatment). One man recognized cervical cancer as a woman’s health issue caused by a virus: ‘cervical cancer is a problem that has many women worried today that it can start with a very simple virus.’ While some men also perceived that both women and their daughters could get cervical cancer, another added that sexual activity

increased the possibility that a woman could develop cervical cancer (cause), but did not seem to understand that this was the primary cause. Although men also stated that cervical cancer occurred when women “did not protect themselves”, men may be unaware about HPV transmission and may erroneously believe that condoms or other birth control methods are effective at HPV prevention: ‘...generally women can get it but there is a higher probability if there are sexually active... All of a sudden if they don’t protect themselves well.’

Women’s knowledge about cervical cancer varied greatly among women. Some women had high levels of knowledge of cervical cancer. One woman indicated that cervical cancer might involve the removal of the uterus, whereas another stated if it is not treated, it can spread. Some women also accurately recognized the importance of Pap screening every year to detect cervical cancer in time: ‘we should prevent it by having Pap tests and doing annual exams for early detection. (Woman aged >26)’ Other women had a lack of knowledge of what caused cervical cancer and directly stated: ‘I don’t know too much...To actually know where it [cervical cancer] comes from, I really don’t know that. (Mother)’

Women also held misconceptions simultaneously mixed with correct information about cervical cancer. For example, while women correctly noted that, the Pap test could detect abnormal cell changes; one woman had the misconception that the Pap test involved drawing blood to detect cancer. Women also identified causes of cervical cancer such as heredity and sexual behaviors. Some women discussed how a family (mothers, grandmothers, uncles) history of cancer could cause it to develop: ‘cancer can...be... genetic. (Woman aged >26)’ They also indicated that having sex at an early age, having many partners, and a husband’s sexual affairs could cause cervical cancer. Finally, women also had misconceptions that cysts in the ovaries, remains of the fetus from incomplete induced abortions, trapped moisture, sitting on a dirty toilet seat, and hormone replacement therapy could cause cervical cancer.

HPV awareness, knowledge, and misconceptions

The majority of men had not heard of HPV, only two stated they had heard of HPV and knew it caused cervical cancer. We also found men’s knowledge mixed with misconceptions about HPV transmission. For example, some men had the impression that by only engaging in unprotected sex and having sexual relations with women, a person could get HPV: ‘I understood that it’s through women that one gets HPV.’ Although, men also had the misconception that only “promiscuous women” get HPV, they believed that both men and women could get HPV. One man also had the misconception that a Pap test detects HPV. Both men and women agreed that parents in their community did not believe their daughters could contract HPV: ‘Many parents hear what is going on, but...parents don’t believe it’s a threat.’

Women’s awareness of HPV varied. While some women had never heard of HPV, others indicated having some information about the virus. There was also a distinction between awareness and knowledge – some women had heard of HPV but did not know anything about the virus. One woman stated language barrier accounted for why there was a lack of HPV awareness in her family: ‘...my mom she only speaks Spanish. And it’s not really out there like in Mexico or the community where they only speak Spanish. Like my mom has no

clue about... she never told me about it... Like I'm gonna go home and tell her about this and she'll be like huh? (Woman aged 18–26)

The women with knowledge of HPV correctly stated the virus attacks the cervix, causes cancer, and is a sexually transmitted infection. However, some women had misconceptions regarding the transmission and treatment of HPV as associated with exposure to unsanitary environments (e.g. bathrooms). One woman had the belief that contact with unclean toilet seat could transmit HPV: 'I got scared when they told me that humidity allows the virus to grow and if one goes to the bathroom and the toilet is not clean the virus can be transmitted because of the humidity. (Woman >26)' While another stated that women with HPV would need to be on medication for the rest of her life to control it.

Even when women had a personal experience with HPV, they lacked information about the virus. One 18–26 year old woman shared she had friend who had HPV but she did not know any further information about it. Two 18–26 year old women also discussed receiving an HPV diagnosis during their pregnancy and had misinformation regarding HPV and the vaccine: 'When I was pregnant, when I delivered, they...they talked to me about [HPV vaccine] that I had HPV. But ... if I get [the vaccine], I can't prevent it [HPV]. (Woman aged 18–26)'

Beliefs about perceived HPV risk and sexual activity

Participants expressed the following beliefs about perceived HPV risk and sexual activity before the moderator provided a formal definition of HPV to all participants. Men believed that both men and women could get HPV; however, men linked their perceptions of promiscuity to women rather than both genders. For example, after being prompted by the moderator with the question 'Who are the people that get HPV?', one man stated, 'The ones that are very promiscuous.' After the man made this statement, the other men in the group laughed extensively, three men gave verbal agreement, and others in the group nodded their heads. Another man in a different group agreed: 'My understanding is women in general but when there is sexual activity there is higher possibility.'

While men believed that promiscuous women were at risk of HPV, their perceptions were generally that their own daughters were not at risk. In fact, males and females who were parents did not link perceptions of promiscuity to their own children. For example, after the moderator prompted with the question 'Do you believe the parents in your community believe their daughters could get HPV?' One man commented 'I don't believe they think about it. No.' Another man stated, 'and they have no interest in learning more. There are a lot of parents that can only listen to what is going on, but we don't have the motivation to learn more. We don't think it is a threat for us.' Both fathers and mothers agreed that parents in general do not think their daughters could contract HPV.

Women also discussed links between the causes of HPV and sexual activity but had more nuanced perceptions than the men, and included issues such as partner infidelity, unprotected sex, promiscuity, and initiating sex at an early age. One woman described how unprotected sex leads to HPV transmission: 'yes, it is like HIV... because if a man has HIV and has unprotected sex he gives it [to the] woman. (Woman aged 18–26)' Another woman stated

men where the primary cause for transmitting HPV, ‘men are the ones that transmit that. (Woman aged >26)’ Most women believed that anyone could get HPV, whereas others specifically believed it was those who had many partners and/or engaged in unprotected sex.

However, similar to men, women also did not perceive themselves at risk of HPV infection. While women discussed that sexual activity of girls puts them at risk for HPV, they also suggested that most parents in their community would not think their girls (daughters) would be at risk. Even among 18–26 year-old women, there was agreement of invulnerability to HPV infection. For example, women (aged 18–26) indicated that they did not perceive themselves at risk for cancer because they were not “sexually active with more than one person” or “hav[ing] unprotected sex”, and “monogamous and/or used protection”. Another woman (aged 18–26) also believed she was not at risk for HPV because ‘...my husband and I were both virgins before we got married. So even if it is a sexually transmitted disease, it’s just me and him and it’s going to be like that.’

HPV vaccination and the role of trust

In response to the HPV vaccine recommendation scenarios presented to only groups of fathers, mothers, and women aged 18–26, participants were willing to vaccinate their child (parents) or themselves (18–26). The moderator did not present these scenarios to women older than 26 years old, as they were no longer eligible to receive the HPV vaccine.

Men and women who were parents agreed that they would have their child vaccinated. Some participants expressed concern about the safety of the vaccination but concluded they would vaccinate their child if their provider assured it was both safe and effective. Women aged 18–26 also agreed that they would receive the vaccine if they knew the benefits and side effects of the vaccine, as illustrated by this statement. For example, one woman stated:

‘The only thing I have a concern is that the side effects aren’t really out there and they’re not telling you. I think that’s why many parents don’t want to expose their children, like...I mean, yeah, it’ll prevent the HPV, but will it have worst symptoms? So, I mean that would be the only thing that would keep me from getting it. (Woman aged 18–26)’

Despite these concerns about potential side effects, men and women identified cancer prevention as the key reason to give in the case of parents or receive in the case of young women the vaccination.

Participants also responded to questions about who is responsible for making healthcare decisions in a family. Participants generally answered that both parents were responsible for choosing to give the vaccine to their children, but identified mothers as being the most responsible for this decision. Men were particularly vocal about the increased role of the mother in making decisions about the vaccination. One man stated, ‘I believe...both mother and father [make the decision]. But there is more trust with the mother. [Daughters] tend to feel more shy with their fathers,’ while another man referred to the higher level of trust between a mother and daughter as a ‘tradition’ among Hispanics.

Participants also agreed that they trusted the recommendations of healthcare providers. Men and women acknowledged lacking understanding of HPV and the vaccination, specifically identifying physicians as well-informed sources of information whose recommendations they would follow. According to parents, providers would give them reliable guidance because of their established provider-patient relationship and the knowledge of their children's health needs. One man explained, '[I would talk with] the doctor because he knows my girl well since very little. All her nurses and her doctor will advise me best'. Other trusted sources of information about HPV and the vaccination identified by participants included Planned Parenthood, health brochures, and schools.

Effects of providing HPV and HPV vaccine information

To observe the impact of presenting HPV and HPV vaccine information, the moderator provided a formal definition of HPV and HPV vaccine to all participants. The moderator provided the definition after participants contributed to the general discussion regarding beliefs, knowledge, and attitudes about HPV and HPV vaccine. This way, we were able to observe and compare beliefs and attitudes about HPV before and after the information. In general, we observed that several beliefs and attitudes did not change before and after the moderator provided the formal definition. For example, men and women all discussed lacking awareness about the risks of HPV for themselves and members of their community. There was also consistent discussion regarding a lack of parent-child communication related to sex, its risks such as HPV infection, and the HPV vaccine as a form of prevention:

'How many of us (parents) tell our children what is a penis or a vagina? At least for me, my father never told me that because it was a different type of culture. Now our culture is different. It's not about telling my children 'be promiscuous and have sex' but instead 'take precautions.' Giving a girl a vaccine isn't telling her, now you are vaccinated, you can have sex. No, that vaccine is so she can have prevention when she decides to start a relationship. (Man)'

We also observed distinct differences before and after the definition from the moderator. As illustrated in Table 2, most participants were aware of HPV prior to the formal definition. However, their overall belief was overwhelmingly that promiscuous women are at greater risk of HPV infection. The vast majority of participants in all focus groups, including men and women shared this belief. Participants also discussed misconceptions about the risk and transmission of HPV prior to the formal definition, and did not discuss them after the moderator provided the definition. It is unclear if the absence of participants' misconceptions and discussion around promiscuity resulted from their increased knowledge or if participants still had their misconceptions but chose not to discuss them. However, participants' absence of discussion around misconceptions was consistent in each focus group and showed a distinct pattern of behavior and discussion where coding around misconceptions was missing after the moderator's formal explanation.

It is also important to note that after the moderator provided the formal definition, men and women still had concerns, ranging from side effects of the vaccine to its cost. For example, one man was concerned about vaccine safety saying (in English), 'I'd actually research or pros and cons of the vaccine itself. Is it safe? If it reacts different to different types of

people.’ Similarly, another man said that he would like information about side effects associated with the vaccine: ‘For me it would be the secondary effects that come from the vaccine. To find out what is good and bad that comes from it. The other would be if it causes some allergy to the person. And what would that be?’ Others emphasized cost, as illustrated by the following man:

I know there are vaccines... as one sees the news every time and they [vaccines] become pure controversial subjects as far as the application and about the cost... If I were the father of a woman and came to have the opportunity to take her [to get the vaccine], that will be my fear. How much does it cost? Because until now they have said that it’s an expensive immunization. Health is not cheap...

Additionally after the formal definition, and in all groups, participants also discussed the importance of cultural norms around female virtue, cultural taboos, and the impact of religious faith on screening and prevention efforts. For example, one man elaborated on persistent cultural taboos impeding screening by saying: ‘...most of the people living in this area are from a Hispanic culture that is more conservative, more fearful to get exams...or there are women who do not accept to have a gynecological examination in time...out of modesty of the type of culture we have lived...’ Another man discussed how religion also acts as barrier to screening: ...you can also say that it has a lot to do with our beliefs, faith, and the culture ...that is the problem...most Hispanics here go to church and show great faith in what they believe. Many times before going to a doctor, I think they are hoping that everything goes well and they prefer not to know anything and I think that is a big problem.

One 18–26 year-old woman also shared how religious beliefs of parents and norms regarding female virtue can impede prevention (vaccination) efforts: ‘...I hear that a lot of parents are like ‘No! Why is my daughter gonna need the shot to prevent STDs? My daughter’s not gonna have sex...my daughter is gonna be raised under the church.’ Other barriers discussed included lacking social and clinical resources in their communities, cost, and fear of HPV infection.

Discussion

In this study, we explored the gendered beliefs and attitudes around cervical cancer, HPV, and HPV vaccination among Mexican and Mexican American men (fathers) and women (mothers, aged 18–26, aged >26) living along the Texas-Mexico border. We discovered a highly complicated, multi-layered belief system around cervical cancer, HPV, and HPV vaccine. Surprisingly, we also found that between focus group types beliefs did not differ substantially; instead, misconceptions and sexual taboos differed by gender.

Men’s cervical cancer knowledge varied from non-existent to knowing treatment sometimes required removal of the uterus, and a virus causes it. Men also had misconceptions such as condoms/birth control methods could be effective at preventing HPV and conversely cervical cancer. Women in the focus groups had a similar range of cervical cancer knowledge compared to men, but women were able to expand more on its causes (e.g., heredity, early sexual debut, and spousal infidelity) and the importance of yearly Pap screening for early

detection of cervical cancer. They also held misconceptions regarding the causes of cervical cancer (e.g., remains of the fetus from incomplete induced abortions) when compared to men. Fernandez et al. (2009) reported different qualitative findings among Latino men and women living in the same area when assessing their cervical cancer knowledge and attitudes. For example, men never discussed cervical cancer whereas women discussed it, but had almost a complete lack of knowledge on the link between HPV, an abnormal Pap screening, and cervical cancer. Other qualitative studies (Vanslyke et al. 2008, Morales-Campos et al. 2013) with Latino women in New Mexico and Texas found similar results to ours.

Overall men in our study had not heard of HPV. Among the very few who had heard of HPV, they correctly identified that it causes cervical cancer, while others held misconceptions regarding HPV transmission (e.g., only promiscuous women get it and only by engaging in unprotected sex) and HPV detection (e.g., Pap tests detect HPV). These findings are consistent with other studies of Latino fathers (Kornfeld et al. 2013) and men (Reimer et al. 2014, Friedman and Sheppard 2007) but inconsistent with those from Fernandez et al. (2009) regarding the link between HPV and cancer. More women compared to men in our study had heard of HPV but overall women also had low levels of awareness. Reimer et al. (2014) report somewhat similar findings when examining ethnic and gender differences. The authors showed Hispanics and men had lower HPV awareness compared to whites and women, respectively. Women aware of HPV and with knowledge about it in our study had both correct information (e.g., virus attacks the cervix) and misconceptions regarding HPV transmission (e.g., unsanitary bathroom) and treatment (e.g., take medication for life). Other studies among Latino immigrants (Drewry, Garcés-Palacio, and Scarinci 2010), Latino mothers (Vanslyke et al. 2008, Bair et al. 2008, Moraros et al. 2006), parents (Davis et al. 2004, and young women (Marlow et al. 2009) have reported similar findings, whereas others have (Kepka, Ulrich, and Coronado 2012, Allen et al. 2010, Morales-Campos et al. 2013) reported moderate levels of awareness and knowledge among Latina women. One interesting finding among women aged 18–26 was that even after receiving an HPV diagnosis during pregnancy, the women still had misinformation regarding HPV and the vaccine. This suggests that physicians in the area may not be informing or effectively educating their Latina patients about HPV and the vaccine during prenatal visits, which is concerning given that having received education from a health provider is positively associated with increased Latina's HPV knowledge (Drewry, Garcés-Palacio, and Scarinci 2010).

Regarding beliefs about HPV risk and sexual activity, men believed that both men and women could get HPV; however, men linked their perceptions of promiscuity to *only* women rather than both genders. Another interesting finding was that despite this belief regarding promiscuity, men generally perceived their own daughters were *not* at risk for HPV, which is contradictory to Kornfeld's (2013) findings among Latino fathers. This perception from the men in our study may stem from their patriarchal beliefs and ideology, which centers on an unmarried daughter's virginity or a married daughter's fidelity to their spouse (Gutmann 2007, Chavez et al. 2001). Women compared to men had distinct perceptions regarding HPV risk and sexual activity (e.g., discussing male partner infidelity and early sexual onset of girls/women). These findings mirror other studies of Latina immigrants (Chavez et al. 2001, Martinez, Chavez, and Hubbell 1997) and racially/ethnically mixed adults (Friedman and Sheppard 2007), showing cultural beliefs about normative and non-normative behavior (e.g.,

promiscuous or engage in illicit sexual activities), including beliefs about morality and virtue influence their perceptions of women's HPV and cervical cancer risk. Despite the interesting finding that men and women in the study differed in how they linked their perceptions of promiscuity to gender (e.g., men = *only* women, women = *both* men and women), both men and women did not personally perceive themselves at risk for HPV infection. For example, women specifically acknowledged not engaging in risky sexual behaviors that would put them at risk for HPV infection and conversely not at risk for cervical cancer, which is similar to findings from studies of female African-American college students (Gerend and Magloire 2008). Our finding contradict Friedman and Sheppard's (2007) result that only married participants in their racially/ethnically mixed sample did not perceive themselves at risk for HPV infection. However, when we probed further we gathered that Latino men and women are willing to see themselves and other Latino women in their communities as at risk for contracting HPV when educated about the HPV risks. Moreover, individuals were willing to take on a family responsibility of prevention using open communication of risks, and following the care guidelines of their physicians.

Men and women both responded to the HPV vaccination scenarios that they would be willing to vaccinate their child (parents) or themselves (women aged 18–26), if they had vaccine safety and effectiveness information. Studies with parents (Friedman and Sheppard 2007, Kornfeld et al. 2013, Morales-Campos et al. 2013) and young women (Fernandez et al. 2010) substantiate these results. Both men and women also identified cancer prevention as the main motivation for giving (parents) or receiving (women 18–26) the HPV vaccination. Morales-Campos et al. (2013) found similar results among mothers, but adolescent females in their study focused more on HPV prevention as their primary reason for vaccination. Kornfeld et al.'s (2013) study with Latino fathers also showed their willingness to vaccinate their daughters but did not specify their motivation for doing so. In addition, while men and women agreed both parents have equal voice in deciding to vaccinate their child, men emphasized the role of the mother because of the greater trust between the mother-daughter dyad. While Morales-Campos and Parra-Medina (2017) substantiate the role of Latino mothers in their daughters' healthcare, Morales-Campos et al. (2013) indicates mother's believe a lack of trust and communication with their daughter's may put them at risk for HPV infection and cervical cancer. Both men and women also discussed the trust between the parent-healthcare provider dyad and viewing their provider as a reliable information source given their lack of knowledge on HPV and HPV vaccination, which systematic reviews on provider communication about HPV vaccination (Gilkey and McRee 2016) and summaries of the HPV vaccine literature regarding environmental factors (Fernandez et al. 2010) have substantiated.

Strengths and limitations

Our study has many strengths. In particular, the groups of individuals involved in the decision to vaccinate (mothers, fathers, women aged 18–26 and women aged >26) participated in the focus group discussions, therefore ensuring that the data encompassed the full spectrum of views. Additionally, all moderators were fully fluent in English and Spanish and came from sociocultural similar backgrounds as participants, fostering an environment

of comfort and familiarity during the sessions. Bilingual research team members transcribed and translated audio-recordings and assisted with analyzing the data.

Our findings may also have limitations due to the exploratory phase design of the study, failure to collect demographics on participants, and restricted region along the Texas-Mexico Border. Due to the exploratory nature of the study, the sample size was relatively small, but we achieved topic saturation (a measurement of repetition of subject matter between individuals to indicate researchers reached the data threshold) in our analysis of topics relating to knowledge awareness and misconceptions. We also did not collect demographic data on participants because it was not part of the exploratory design of the study. Instead, we used census data to provide a description of the Mexican or Mexican American men and women living in the area. Our data is not generalizable to all Latino communities, but researchers' should use the findings as an important addition to the kinds of factors to address before providing information about HPV to Latino parents and families.

Conclusion

Cultural attitudes and beliefs may contribute to the underutilization of HPV vaccination and Pap test screening among Mexican and Mexican-American women on the Texas-Mexico border. Given the complexity of these perceptions, it is imperative to take these attitudes and beliefs into consideration when developing interventions to increase vaccination rates. Through this study, the views and beliefs expressed by participants provided valuable insight about knowledge and misconceptions that may ultimately address barriers to HPV and cervical cancer prevention. Our findings may help to inform public health strategies that target the elimination of cervical cancer health disparities in Texas-Mexico border area.

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Appendix 1. Focus Group Guide Questions

Participants asked about knowledge of cervical cancer

- 1 What do you know about cervical cancer?
- 2 How would you describe cervical cancer to a friend or family member?
- 3 What causes cervical cancer?
- 4 Who do you all think gets cervical cancer?
- 5 Do you all think [your daughters/young women your age] could get cervical cancer?

Participants asked about awareness, knowledge, and perceived risk about HPV

- 6 What is HPV?
- 7 How would you explain HPV to a friend or family member?
- 8 Who do you think gets HPV?
- 9 Do you all think [your daughters/young women your age] could get HPV?

Moderator read brief description of HPV.

Participants asked about Pap tests and vaccines

- 10 In general, do you think young women are more likely to have abnormal Pap test? Why?
- 11 What do you know about vaccines?
- 12 What are your feelings about giving your daughter vaccines? Why?

Participants asked about awareness, knowledge, and attitudes/beliefs about HPV vaccine

- 13 What do you know about the HPV vaccine?
- 14 What are your feelings about giving your daughter the HPV vaccine? Why?

- PROBE: Would you be worried that if give your daughter the vaccine it will make her think it's OK to have sex?

10 What are your feelings about [getting/giving your daughters] the HPV vaccine?

Moderator read brief description of HPV vaccine.

11 What have you heard in your community about the HPV vaccine?

12 What have you heard in the media (TV, radio) about the HPV vaccine?

Participants asked HPV vaccine scenario question.

Parents:

Isabel (Jose) takes her (his) daughter to the doctor for her check-up, and the doctor asks Isabel (Jose) if she (he) wants her (his) daughter to receive the HPV vaccine.

- If you were Isabel (Jose), would you choose to vaccinate your daughter? Why?
- What information do you think you would need to know in order to make a decision?
- What concerns, if any, do you think you would have about giving your daughter the vaccine?

Young Women: Isabel goes to the doctor for her check-up and the doctor asks Isabel if she wants to get the HPV vaccine.

- If you were Isabel, would you choose to be vaccinated? Why?
 - What information do you think you would need to know in order to make a decision?
 - What concerns, if any, do you think you would have about getting the vaccine?
 - What kind of behaviors do you think make someone like Isabel more likely to get HPV?
-

NOTE: Brackets [...] show wording differences between parents' and young womens' focus group guides.

Appendix 2. Focus Group Guide Moderator Descriptions

During Discussion	<p>Participants asked about awareness, knowledge, and perceived risk about HPV</p> <p>Moderator read brief description of HPV:</p> <ul style="list-style-type: none"> • HPV is a sexually transmitted infection • 4 out of 5 women will be exposed to it at some time during their lives • While most HPV infections are temporary and women do not have any symptoms, some types of HPV infections cause an abnormal pap test, which might lead to cervical cancer if not treated. • HPV can also affect men and in rare cases can cause cancer of the anus and penis. <p>Moderator read brief description of HPV vaccine:</p> <ul style="list-style-type: none"> • Researchers have developed a vaccine for certain types of HPV. • It will help to prevent women/girls from getting HPV and cervical cancer. • It will not treat or cure women/girls who already have HPV.
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	<ul style="list-style-type: none">• It does not replace the need for a Pap test.
After Discussion	Participants given opportunity to ask questions and provided with resource sheet on cervical cancer, HPV, and the HPV vaccine

Key Messages

1. Mexican and Mexican-American men and women living along the Texas-Mexico border have a complicated, multi-layered belief system around HPV and cervical cancer that may suggest a wide range of awareness of HPV, coupled with misconceptions, cultural taboos about sexuality, and a low perceived risk for HPV infection.
2. Although the literature indicates beliefs about morality and virtue may influence Latino women's use of preventive services (Pap test and vaccination), our findings suggest these beliefs may not be an obstacle to accessing preventive services after a family member receives HPV risk and vaccination education (e.g., fathers were emphatic about promiscuity but willing to have their daughter's vaccinated).
3. Our results point to the need for development of clear information about HPV targeted to the specific needs of the Latino community, namely values concerning disease, sexuality, and promiscuity may be essential to the design and implementation of preventive interventions for HPV and cervical cancer.

Table 1

Summary of similarities/differences between mothers and fathers beliefs who have HPV vaccine-eligible daughters by themes

Mothers/Women [*]	Fathers/Men [%]
<i>Cervical cancer knowledge and misconceptions</i>	
Some women had high levels of cervical cancer knowledge. They stated cervical cancer might involve the removal of the uterus and Pap tests prevent it by detecting it early. Women also listed having sex at an early age, having many partners, and a husband's sexual affairs could cause cervical cancer.	Note: Our analysis did not document codes for cervical cancer knowledge among male groups.
Misconceptions for causes of cervical cancer among women included cysts in the ovaries, remains of the fetus from incomplete induced abortions, trapped moisture, sitting on a dirty toilet seat, and hormone replacement therapy could cause cervical cancer.	Misconceptions among fathers included equating a cervical cancer with removal of a woman's uterus, sexual activity increased the possibility that a woman could develop cervical cancer, and cervical cancer occurred when women "did not protect themselves".
<i>HPV awareness, knowledge, and misconceptions</i>	
Some women had never heard of HPV, while others indicated having some information about the virus. There was also a distinction between awareness and knowledge – some women had heard of HPV but did not know anything about the virus. The women with knowledge of HPV correctly stated the virus attacks the cervix, causes cancer, and is a sexually transmitted infection	The majority of men had not heard of HPV, only two stated they had heard of HPV and knew it caused cervical cancer. Men erroneously believed that condoms or other birth control methods are effective at HPV prevention.
Some women had misconceptions regarding the transmission and treatment of HPV as associated with exposure to unsanitary environments.	Men had the misconception that only "promiscuous women" get HPV.
<i>Beliefs about perceived HPV risk and sexual activity</i>	
Most women believed that males and females could get HPV, whereas others specifically believed it was those who had many partners and/or engaged in unprotected sex. However, similar to men, women also did not perceive themselves at risk of HPV infection. While women discussed that sexual activity of girls puts them at risk for HPV, they also suggested that most parents in their community would not think their girls (daughters) would be at risk. Women also discussed links between the causes of HPV and sexual activity, which included issues such as (male) partner infidelity, unprotected sex, promiscuity, and initiating sex at an early age.	Men believed that both men and women could get HPV; however, men linked their perceptions of promiscuity to only women rather than both genders. Although men believed that promiscuous women were at risk of HPV, their perceptions were generally that their own daughters were not at risk. Men never discussed their own personal risk or that of men in general.
<i>HPV vaccination and the role of trust</i>	
Men and women who were parents agreed about the following points: <ul style="list-style-type: none"> • They would vaccinate their child. • Those that expressed concern about vaccine safety concluded they would vaccinate their child if their provider assured them it was both safe and effective. • They identified cancer prevention as the key reason to give the vaccine. • They believed both parents were responsible for choosing to give the vaccine to their children, but identified mothers as being the most responsible for this decision. • They acknowledged having a lack of understanding regarding HPV and the vaccination. Both identified physicians as well-informed sources of information whose recommendations they would follow. 	

^{*} relatively few thematic differences between groups of mothers, women 18–26, and women older than 26; thus we combined all female groups and refer to them as "women"

[%] we refer to fathers as "men", since differences were most pronounced by gender

Table 2

Codes Identified Before and After Formal Definition of the Moderator

<u>Only Before the Formal Definition</u>	<u>Only After the Formal Definition</u>	<u>Discussed Before <i>and</i> After the Formal Definition</u>
Awareness of HPV	Expressed Need for Information	Stated Confusion about HPV Risks
Concern about HPV	Importance of Religion	Correct Medical Definition of HPV
Daughters Discussed	Use of Social Services	Stated Lack of Awareness
Infidelity as Risk Factor	Cost	Risks of HPV Discussed
Stated Lack of Knowledge	Stated Cultural Norms/Taboos	Importance of Communication
Misconception of HPV	Barriers to Screening	Infection and Disease Discussed
Personal Experience with HPV	Fear	General HPV Knowledge
Promiscuity		Sexual Activity
Protected Sex		Causes of Illness
Unprotected sex		Links to Cervical Cancer
Worry		Questions Asked
		HPV Screening