

VACCINATING CHILDREN FOR THE HUMAN PAPILLOMAVIRUS (HPV):
PREDICTORS OF PARENTS VACCINATING THEIR CHILD AND PROVIDERS
RECOMMENDING A NEW LINGUISTICALLY AND CULTURALLY
TAILORED VIDEO INTERVENTION DESIGNED TO INCREASE
VACCINATION INITIATION AND COMPLETION

by

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ABSTRACT

VACCINATING CHILDREN FOR THE HUMAN PAPILLOMAVIRUS (HPV):
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The public health problem of ensuring that teens and preteens receive the HPV vaccination series justified this study, using a convenience sample (N=122) of parents, 68 of whom were English-speaking parents (ESP) and 54 were Spanish-speaking parents (SSP). Among ESP, 94.1% (n=64) were females and 5.9% (n=4) were males. Among SSP, 98.1% (n=53) were females and 1.9% (n=1) was male. The mean age for ESP (n=68) was 41.16 years (min=27, max=72, SD=6.72). The mean age for SSP (n=54) was 38.72 years (min=26, max=55, SD=7.31). About 44.1% (n=30) of ESP were Hispanic/Latino, and 98.1% (n=53) of SSP were Hispanic/Latino.

Using backward stepwise regression analysis, in the whole sample (N=122), significant predictors of parents being in an action or maintenance stage for making sure

their children received the HPV vaccination was predicted by: if child had received HPV vaccination ($\beta=1.714$, $SE_B=.599$, $p=.000$) and yearly household income ($\beta=.142$, $SE_B=.200$, $p=.007$) in a model accounting for 40.5% of the variance ($R^2=.420$, $AdjR^2=.405$).

This study determined that a linguistically and culturally tailored (i.e., in English or Spanish) video on HPV and HPV vaccination of preteens and teens served as a brief online e-health intervention that was associated with significant parental movement across the stages of change (i.e., from precontemplation or contemplation stage, to preparation stage) and increased self-efficacy for three key behaviors: (1) talking to a pediatrician or family practice medical provider about the Human papillomavirus (HPV) infection and the HPV vaccination for children; (2) making sure their preteen and teen children receive the HPV vaccination; and (3) making sure their preteen and teen children receive all required doses (e.g., at least two or three doses) of the HPV vaccination. Also, 89.5% (n=17) of healthcare providers recommended the video.

Qualitative data produced themes for recommending the video and improving it. Recommendations for an evaluation of the video intervention using a nationally representative sample are advanced, along with implications for widely disseminating and evaluating a new evidence-based approach codified in the video.

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For from him and through him and for him are all things.
To him be the glory forever! Amen.
Romans 11:36 NIV

A. C. V.

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Chapter I

INTRODUCTION

Human papillomavirus (HPV) infection is the most common sexually transmitted infection (STI) among women and men in the world (Newman et al., 2018). According to Tanveer (2017), HPV is a global health problem. There are more than 150 types of HPV and about 40 types are transmitted through sexual contact, infecting “the anogenital region and other mucosa sites of the body” (Dunne et al., 2014, p. 69). Thus, “most sexually active persons will acquire HPV in their lifetime” (p. 69).

According to Van Dyne et al. (2018), from 1999 to 2015, the incidence rates of HPV-associated cancers increased from 30,115 to 43,371 in the United States. According to the Centers for Disease Control and Prevention (CDC, 2017a), human papillomavirus (HPV) is the most common STI in the United States. An individual can be infected with the virus by having sexual contact with another infected person through vaginal, anal, or oral sex (CDC, 2017b). About 80 million people, or one in every four, have been infected with HPV, and most of the HPV infections occur among individuals in their late teens and early 20s (CDC, 2013; CDC 2017a). According to Bakir and Skarzynski (2015), “epidemiological calculations project that the majority of sexually active heterosexual males (90%) and females (85%) will be infected with HPV in their lifetimes” (p. 2). The CDC (2016d) states that approximately 14 million new cases of HPV infections are

reported each year, and half of these cases occur in persons between the ages of 15 and 24 years of age.

Approximately 38,793 HPV-associated cancers are diagnosed in the United States annually (CDC, 2016e). The number of reported HPV-associated cancer diagnoses were higher among women than among men, at 23,000 and 15,793, respectively. Scientists have identified over 120 HPV types (CDC, 2016d). More than 40 types of HPV may cause infection of the genital tract, while 90% of HPV infections are asymptomatic and usually disappear within 2 years (CDC, 2016a). However, persistent infection with oncogenic or high-risk HPV types can progress to HPV cancers, such as cancer of the cervix, vulva, vagina, penis, or anus (CDC, 2016b; Holman et al., 2014).

HPV accounts for 99% of all cervical cancer cases (CDC, 2016d; Kessels et al., 2012). It is estimated that 50% of cervical cancer cases worldwide are caused by HPV type 16, while HPV types 16 and 18 are responsible for 70% of cervical cancer diagnoses (CDC, 2016d). HPV has also been linked to some oropharyngeal cancers (CDC, 2016c). Non-oncogenic or low-risk HPV types 6 and 11 can cause 90% of genital warts and abnormal cervical cells (CDC, 2016d; Holman et al., 2014).

In 2015, data from cancer registries showed that the number of HPV-associated cancer diagnoses were higher among women than among men, at 24,432 (13.6%) and 18,939 (10.5%) per 100,000 persons, respectively (Van Dyne et al., 2018). The data also revealed that oropharyngeal squamous cell carcinoma (SCC) was the most common HPV-associated cancer, with 15,479 cases in men and 3,438 cases in women (Van Dyne et al., 2018).

Disparities in HPV infection among racial and ethnic groups have been well documented, showing that non-Hispanic Blacks and Hispanics have a higher prevalence of HPV infection compared to their counterpart non-Hispanic Whites (Lin et al., 2015). The incidence and mortality rates for each HPV-associated cancer vary by cancer type, sex, age, region, and racial and ethnic minority group (Burger et al., 2016; Van Dyne et al. 2018). Razzaghi et al. (2018) found large disparities in HPV-associated cancer by sex, race, and age, such that 5-year relative survival was higher among non-Hispanic White patients than non-Hispanic Black patients for all HPV-associated cancers and all age groups (p. 203).

Earlier data from 2013 revealed that Hispanic women had a higher prevalence rate of HPV-associated cervical cancer, followed by non-Hispanic Black women; mortality rates for cervical cancer were higher among non-Hispanic Black women (CDC, 2016f), often being diagnosed in an advanced stage (CDC, 2016g). Bakir and Skarzynski (2015) found that women “who are of Hispanic or Black heritage are 1.5-2 times more likely to develop cervical cancer than American women from other ethnic and racial backgrounds” (p. 2). Minority groups are not only affected by the burden of cervical cancer but are also disproportionately affected by other HPV-associated cancers. For instance, non-Hispanic Black men are more likely to be diagnosed with anal cancer than non-Hispanic White men, while Hispanic men report higher prevalence rates of penile cancer compared to non-Hispanic men (CDC, 2016g).

HPV Vaccination

In an effort to address the disparity gap in HPV infection, *Healthy People 2020* sought an 80% increase the proportion of females and males aged 13 to 15 years who complete the HPV vaccination series, with a baseline HPV status of 28.1% and 6.9%, respectively (U.S. Department of Health and Human Services [USDHHS], 2019). The U.S. Food and Drug Administration (FDA) has licensed three vaccines for use in the United States: Cervarix, Gardasil, and Gardasil 9 (Fontenot, Domush, & Zimet, 2015; Meites, Kempe, & Markowitz, 2016). The three vaccines are administered in a three-dose series at intervals of a range of 0, 1-2, and 6 months (Meites et al., 2016), meaning “1-2 months between dose 1 and 2 and 6 months between dose 1 and 3” (Wilson, Brown, Carmody, & Fogarty, 2015, p. 396). The 9vHPV vaccine can be administered in a two-dose series schedule for girls and boys from 9 to 14 years old (Meites et al., 2016).

The Advisory Committee on Immunization Practices (ACIP) recommends routine vaccination of all three HPV vaccines for girls from the ages 11 to 12 years, but the vaccination series can be initiated as early as 9 years of age (CDC, 2016a; Trogdon & Ahn, 2015). Catch-up vaccination is also recommended for girls and young females from ages 13 to 26 years who have not previously received the vaccine (Laz, Rahman, & Berenson, 2013; Trogdon & Ahn, 2015). The ACIP also recommends routine HPV vaccinations of the 4vHPV and 9vHPV vaccines for teen boys between the ages of 11 and 12 years, and through age 21 years for those who have not been previously vaccinated (CDC, 2016a). For specific individuals, such as men who have sex with men (MSM) and for young individuals with certain immunocompromised conditions (e.g., HIV), three doses of the HPV vaccine are administered, starting at age 9 years and

continuing through age 26 years, if not vaccinated previously (CDC, 2016a, 2016d, 2016h).

As vaccines are considered most effective when given to individuals before they become sexually active, it is recommended for preteens and teens to get vaccinated before they become sexually active (American College of Obstetricians and Gynecologists [ACOG], 2015; CDC, 2017c). Likewise, the vaccine has higher immunity response in preteens compared to older adolescents (CDC, 2015). However, teenagers are having sex at early ages, increasing their risk of exposure to one or more of the HPV types targeted by the HPV vaccines (CDC, 2017c). According to ACOG (2015), data indicated that one in three teenagers in ninth grade and two in three adolescents in twelfth grade have had sexual intercourse (ACOG, 2015). Based on the results from the 2015 Youth Risk Behavior Surveillance System (YRBSS), 41% of U.S. high school students reported having sexual intercourse and 30% reported having sex in the previous 3 months; of these, 43% did not use proper protection the last time they were sexually active (CDC, 2017g). Sexually active individuals can still benefit from receiving HPV vaccination (CDC, 2017c) because “prior sexual exposure to all vaccine types is unlikely” (ACOG, 2015, p. 2).

Racial and Gender Disparities in HPV Vaccination and Potential Factors

Despite the ACIP recommendations, HPV vaccine uptake and completion rates are lower than expected (Spencer, Brewer, Trogon, Wheeler, & Dusetzina, 2018). Data from the 2017 National Immunization Survey-Teen (NIS-Teen) showed that 66% of adolescents aged 13 to 17 years received at least one dose of the HPV vaccine, 69% of

girls and 63% of boys received their first dose of the HPV vaccine, and only 49% of teens completed all three recommended doses (Walker et al., 2018). Clearly, national HPV vaccination completion rates are far from meeting the *Healthy People 2020* target of 80% of adolescents aged 13 to 15 years (Katz et al., 2016; Rosen, Bishop, McDonald, Kahn, & Kreps, 2018).

Adolescent girls are more likely to be vaccinated than boys (CDC, 2017e). Data from the 2015 NIS-Teen showed that 6 out of 10 girls and 5 out of 10 boys had received at least one dose of the HPV vaccine (CDC, 2017e). Only about 43% of teens had completed all recommended doses of the HPV vaccine (CDC, 2017h). It is argued that delaying “completion of the series places adolescents at risk for acquiring HPV infection due to gaps in immunologic protection from the vaccine doses” (Wilson et al., 2015, p. 396).

According to Henry, Swiecki-Sikora, Stroup, Warner, and Kepka (2018), U.S. HPV vaccination rates vary by race/ethnicity and socioeconomic status. Research has shown that the “rates of HPV vaccine initiation and completion of the three-doses are lower among non-Hispanics compared to Hispanics and other racial minorities” (p. 2). Further, rates of HPV vaccine initiation and completion of the three-dose schedule are lower among “teens whose families are living below the poverty line compared to their counterparts living above the poverty line” (p. 2).

Further, several studies have documented disparities in HPV vaccination uptake and completion among racial and ethnic groups (Btoush, Brown, Fogarty, & Carmody, 2015; Burger et al., 2016; Jeudin, Liveright, Del Carmen, & Perkins, 2014; Nelson, Hughes, Oakes, Pankow, & Kulasingam, 2015; Okafor, Hu, & Cook, 2015; Wilson et al.,

2015). Fisher, Trotter, Audrey, MacDonald-Wallis, and Hickman (2013) conducted a systematic review and meta-analysis, finding that young African American females were less likely to initiate the HPV vaccine than young White females. Other studies have also reported that young Black females are less likely to initiate the HPV vaccine (Beavis & Levinson, 2016; Gelman et al., 2013; Kramer & Dunlop, 2012; Laz, Rahman, & Berenson, 2013; Lefkowitz, Kelly, Vasilenko, & Maggs, 2014).

Gelman et al. (2013) indicated that Hispanics born in the United States, foreign-born Hispanics as well as African Americans were less likely to initiate the HPV vaccination series. Pérez, Agénor, Gamarel, and Operario (2018) reported that after adjusting for healthcare factors, foreign-born men had lower odds of HPV vaccine initiation, while foreign-born women had lower odds of HPV vaccine initiation and completion than U.S.-born women and men. This suggests that immigrants may face barriers other than access to healthcare that contribute to lower HPV vaccine initiation than their U.S.-born counterparts. For example, “foreign-born Latinos have numerous barriers to healthcare, including language, transportation, and documentation status, both at the individual and family level” (p. 257). Also, there are those immigrants who “may not be familiar with navigating the U.S. healthcare system,” or lack knowledge of “U.S. preventive medical guidelines” (p. 257). Also, some immigrants may prioritize “treating symptoms rather than seeking regular preventive services” (p. 257). Yet, even here, those immigrants who “seek care, healthcare providers have the potential to increase HPV vaccine uptake, as healthcare provider recommendation has been associated with HPV vaccination” (p. 257).

Other studies have reported higher rates of the HPV vaccine initiation among African American and Hispanic adolescent girls than their White counterparts (Beavis & Levinson, 2016; Nelson et al., 2015; Okafor et al., 2015). Henry et al. (2018) explained that higher rates of HPV vaccine uptake among racial/ethnic minority groups (e.g., Non-Hispanic Black and Hispanics) living in low-income communities could be due in part to access to safety-net services which provide free or reduced cost vaccinations, or to the availability of long-term targeted interventions. Conversely, higher vaccination rates could be due to living among “co-ethnics in segregated areas with similar cultural norms that promote vaccination” (Henry et al., 2018, p. 2).

However, African American and Hispanic individuals continue to report lower rates of the HPV vaccine completion than those who are White (Beavis & Levinson, 2016; Jeudin et al., 2014; Nelson et al., 2015; Okafor et al., 2015). In this regard, Henry et al. (2018) indicated that economic difficulties and barriers related to access to healthcare among individuals living in low-income areas could also result in lower HPV vaccine uptake due to limited access to healthcare resources and preventive services. For example, language barriers and lack of awareness about the benefits of getting the HPV vaccine in racial/ethnic minority communities may result in lower screening rates. Henry et al. (2018) further stated that, given how “cancer prevention and screening activities are generally higher among high-income, more educated populations, conventional wisdom suggests that uptake for a recommended vaccine that protects against some cancers would also follow this trend” (p. 2).

According to Henry et al. (2018), HPV vaccine initiation was higher among girls living in communities with high rates of poverty, compared to those living in low-poverty

communities. Further, HPV vaccine initiation was higher among girls living in communities that were predominantly Hispanic or mixed-race, compared to girls living in predominately non-Hispanic White communities. The odds of HPV vaccine initiation were highest among older girls, girls with State Children's Health Insurance Program (SCHIP) or Medicaid insurance, girls with younger mothers, and girls whose mothers had lower educational attainment and income below the federal poverty level. Receiving a provider recommendation was one of the strongest factors associated with HPV vaccine initiation. Henry et al. (2018) also found that rates of HPV vaccine initiation were highest among Hispanic girls compared to non-Hispanic White, non-Hispanic Black, and other non-Hispanic race/ethnic groups. Results of the study showed that "racial-ethnic composition" and "population density were significantly associated with HPV vaccine initiation even after adjusting for individual-level factors" (p. 313).

Similar to findings with girls, Henry et al. (2018) also found that the odds of HPV vaccine initiation and completion varied by boys' race/ethnicity, depending on level of poverty and area of residence. For instance, the study results revealed that boys living in urban areas had higher odds of HPV vaccine initiation and completion than boys living in non-urban areas. Boys living in areas where the majority race/ethnicity were Hispanics had greater odds of HPV vaccine initiation than those boys living in areas where the majority were non-Hispanic Blacks and non-Hispanic Whites. The authors observed that the higher odds of HPV vaccine in urban areas and among racial/ethnic minorities living in high-poverty areas might be due to parental acceptability of HPV vaccine, greater proportion of providers recommending the vaccine, and parental accessibility to safety-net programs. Conversely, lower rates of HPV vaccine initiation among boys living in

areas with lower levels of poverty, “irrespective of race/ethnicity, is also likely to due to less parental support of HPV vaccination as compared to parents from lower-SES groups” (p. 11). It is also possible that non-Hispanic Whites are being exposed to “negative sentiment or vaccination safety concerns” and may not pursue vaccinating their sons (p. 11).

Patel and Berenson (2013) conducted a review on parental vaccine hesitancy and explained that parents who refused vaccination tended to be more educated, “have researched the topic extensively and overall show an interest in health-related issues” (p. 2650). Patel and Berenson further explained the “theory behind this observation,” wherein “educated parents are more often more likely to be have access to specific source of media, such as Internet, which may expose them to contradictory and possibly inaccurate information regarding the HPV vaccine” (p. 2650). Also, those “highly educated parents may feel more confident in their ability to interpret complex scientific and clinical health information, allowing then to ignore the advice of practitioners if contradiction exists” (p. 2650).

In addition, it is possible that providers in more affluent areas are non-adherent to the recommendation guidelines on routinely offering the HPV vaccine to parents for their children (Henry et al., 2018). On the other hand, acculturation may play a key role in HPV vaccination among Hispanics. For instance, Hispanics who live in low-income communities tend to have a lower level of acculturation and are more likely to accept HPV vaccine for the children, “which may account for the differences seen among Hispanics from low-income compared to Hispanics from wealthier areas” (p. 13).

Reasons for racial and ethnic disparities seen in HPV vaccine uptake and completion rates are multifactorial (Gelman et al., 2013; Liu, Kong, & Du, 2016). Henry et al. (2018) indicated that low rates of HPV vaccination are attributed, in part, to the following: low parental knowledge about HPV infection and HPV vaccine, lack of provider recommendations, missed opportunities, religious beliefs and cultural factors, the belief that vaccinating young children against sexually transmitted disease is not necessary, and the belief that vaccinating adolescents may promote sexual activity at a young age (Henry et al., 2018).

Others have cited individual-level factors—such as negative attitude toward the HPV vaccine (concern about vaccine efficacy and possible side effects); lack of knowledge about HPV infection; vaccine history (having received childhood immunization such as influenza, meningococcal positively predicts HPV vaccination); and lack of health insurance—as predictors of vaccination uptake and completion rates (de Casadevante, Cuesta, & Cantarero-Arévalo, 2015; Kessels et al., 2012; Okafor et al., 2015). According to Gelman et al. (2013), African Americans and Hispanics are less likely to have continuous health insurance or to have an annual doctor's visit in the previous year compared to their counterparts. A lack of trust toward healthcare facilities has been reported among Hispanic immigrants as well (Holman et al., 2014). Perceived risk for HPV infection is another personal-level factor influencing the decision of whether or not to vaccinate (Okafor et al., 2015). Beavis and Levinson (2016) found that among young women, low perceived HPV infection risk was cited as a reason for not getting the HPV vaccine.

Factors Related to HPV Vaccine Uptake

Previous studies have suggested that provider recommendation is an important predictor for HPV vaccine uptake in girls and boys (Gilkey, Malo, Shah, Hall, & Brewer, 2015; Kessels et al., 2012). Mohammed and colleagues (2017) found that maternal education is the strongest predictor of parental intent to vaccinate against HPV. In addition, mothers with a graduate degree, as well as non-Hispanic White parents, reported a lower intention to vaccinate their child (Mohammed, Vivian, Loux, & Arnold, 2017). Even though provider recommendation was an important predictor for HPV vaccine intention, “the effect was not as strong as maternal education and was stronger for boys than girls” (p. 3).

Interestingly, Lindley and colleagues (2016) reported an opposite finding, as provider recommendation was the most important predictor of vaccine intention among parents intending to vaccinate their boys and girls within the next year. Yet, Mohammed et al. (2017) found that provider recommendation was the strongest predictor of actual vaccine receipt rather than vaccine intention, suggesting that multiple factors influence vaccine intention versus action.

Parental sexual history of sexually transmitted diseases such as HPV-related disease was found to be associated with vaccine intention as well (Mohammed et al., 2017; Patel & Berenson, 2013). This may be due in part to parental understanding about the severity of HPV infection and the benefits associated with the HPV vaccine (Patel & Berenson, 2013).

According to Beavis and Levinson (2016), parents’ knowledge about the HPV vaccine in the United States is generally poor. Lack of knowledge about HPV infection

and the HPV vaccine have been associated with non-vaccine intention (Zimet, Rosberger, Fisher, Pérez, & Stupiansky, 2013) and vaccine incompleteness (Lindley et al., 2016). In fact, Lindley and colleagues (2016) found that “more than two-thirds of parents whose teens were not fully vaccinated reported they did not know how many shots are in the HPV vaccine series” (p. 1522). On the other hand, Walhart (2012) stated that increasing parental knowledge about HPV infection and its sequela will not always lead to increased vaccine acceptance.

Strategies aimed to increase HPV vaccine uptake and completion should consider the effect of parental attitudes and acceptance toward the HPV vaccine. This is important because the decision of whether or not to vaccinate an adolescent aged 18 years or younger is mainly influenced by his or her parent or caregiver (Choi, Eworuke, & Segal, 2016). Bakir and Skarzynski (2015) explained that parental hesitancy represents a barrier to HPV vaccination for children between the ages of 11 and 12 years. In fact, one study found that parents are three times more likely to start the HPV vaccination series in daughters between ages 16 and 18 years than their younger daughters ages 10 to 12 years (Garcini, Galvan, & Barnack-Tavlaris, 2012). It is evident that vaccination completion increases with age (Bakir & Skarzynski, 2015).

Shapiro et al. (2017) evaluated for parents (n=4,606) of school-aged children (aged 9 to 16) their attitudes, knowledge, and decision-making stage regarding HPV vaccination. Using a validated HPV vaccine knowledge and attitudes scales rooted in the Health Belief Model, the study also investigated parents' HPV adoption stage or decision-making stage, i.e., (1) *unaware stage* (parent unaware HPV vaccine could be given to child); (2) *unengaged stage* (parent never thought about vaccinating child);

(3) *undecided stage* (parent undecided about vaccinating child); (4) *decided not to vaccinate stage* (parent decided not to vaccinate child); (5) *decided to act/decided to vaccinate stage*; and (6) *acted/vaccinated child stage*. Only a “quarter of parents” were in the later stage or vaccinated child stage (p. 209). Meanwhile “parents of daughters, older children,” and those who had received a recommendation for HPV vaccination of their child from a medical provider “had decreased odds of being in an earlier stage,” such as unaware, unengaged or undecided stage, and so on (p. 209).

Shapiro et al. (2018) also assessed vaccine attitudes with validated scales, including the Vaccine Conspiracy Beliefs Scale and the Vaccine Hesitancy Scale (i.e., one subscale on vaccine hesitancy—lack of confidence, and one subscale on vaccine hesitancy—risks); they found that parents in the decided not to vaccinate stage had significantly greater odds of having vaccine conspiracy beliefs, as well as perceived harms from vaccines, lack of confidence, and risks. Of note, other research has found that “parents are less likely to vaccinate their child if they are not aware of, or do not know enough about, HPV vaccination,” or if they “believe that HPV vaccination can cause harm, or that vaccination is not accessible” or affordable (p. 203). Further, positive attitudes toward vaccines have been found to be linked to “HPV vaccine acceptance” (p. 203). Also, parental acceptance of vaccination has been shown to improve significantly where there is a “strong healthcare provider recommendation” (p. 204). Shapiro et al. (2018) also found that those parents “who received a HCP recommendation for HPV vaccination had lower odds of being unaware,” or unengaged, or undecided, or in the stage of decided not to vaccinate (p. 206).

Toward Interventions to Increase Vaccine Uptake: Role of Videos

Agénor, Pérez, Peitzmeier, and Borrero (2018) explained that tailored-education interventions, including alerts and reminders, can be used to help providers and parents of unvaccinated girls and young women to make an informed decision regarding HPV vaccination. Educational interventions should be tailored (e.g., be provided in multiple languages) and tested among non-Hispanic Black, Hispanic, and non-Hispanic Asian individuals in order to ensure the intervention's appropriateness and effectiveness for those from underserved groups (Agénor et al., 2018).

Tuong, Larsen, and Armstrong (2014) considered the impact of videos in modifying health behaviors, including 28 studies and 12,703 subjects in a systematic review of video studies. Findings showed that video "interventions were variably effective for modifying health behaviors depending on the target behaviors to be influenced," being less effective for influencing addiction behaviors (p. 219).

According to Tuong et al. (2014), the modification of health behaviors is crucial in preventing "many diseases that are associated with significant morbidity and mortality in the United States" (p. 219). Health information was discussed as involving "written pamphlets, videos, face to-face counseling, and web-based applications"; however, the "use of video as an educational medium offers several potential advantages" (Tuong et al., 2014, p. 219). Consider the many advantages cited by Tuong et al. (2014) below:

First, video interventions can be a less resource intensive means of delivering educational content. A study assessing the cost-effectiveness of a video-based human immunodeficiency virus (HIV) patient education program resulted in annual savings of US\$5,544,408 for 10,000 patients in averted HIV infections. Second, video interventions remove inconsistencies across educators and balance the presentation of information to provide more standardized education. Third, individuals with low health literacy are especially receptive to video-based

education. Finally, video-based education can be administered in many forms, such as videotape, digital video/versatile disc (DVD), downloadable media files, and streaming videos from certain Internet websites. In particular, educational videos delivered through video-sharing websites can quickly reach a broad audience via social media. (p. 219)

Findings showed that nine “video interventions resulted in significant changes in the targeted behaviors, such as breast self-examination, prostate cancer screening, sunscreen adherence, self-care in patients with heart failure, HIV testing, treatment compliance, and female condom use” (Tuong et al., 2014, p. 224). Recommendations covered how “video modeling may facilitate learning of new behaviors and can be an important consideration in the development of future video interventions” (p. 225).

Relying upon the value of video modeling of new behaviors, others have created e-health designed as a brief online intervention, using an avatar/cartoon video with the intention of impacting self-efficacy and readiness to engage in the targeted health behavior (Chung, 2013). For example, Chung (2013) targeted mother-child dyads who watched a cartoon video tailored to be culturally appropriate for African American mothers, while actors in the video modeled the behaviors of selecting more fruit and vegetables and increased engagement in physical activity. Others have created e-health with actors modeling prostate screening behaviors (Hall, 2018).

Statement of the Problem

The problem that this study addressed is the need to increase HPV vaccination initiation and completion for male and female preteens and teens (ages 9 to 18) by virtue of the dissertation accomplishing the following: (1) addressing parental hesitancy about HPV vaccination and supporting their decision making to initiate and complete HPV

vaccination of their children via exposure to an innovative linguistically and culturally tailored e-health cartoon video intervention on HPV vaccination; and (2) enhancing provider recommendations to parents to vaccinate preteens and teens by providing them the new tool of an innovative linguistically and culturally tailored e-health cartoon video on HPV vaccination, which they may choose to recommend to parents, augmenting their own recommendation to parents to pursue and complete HPV vaccination of children.

Purpose of the Study

Study # 1: Parents (English- or Spanish-Speaking)—Predictors of Parents Having Decided to Take Action to Vaccinate Child for HPV

The first purpose of the dissertation research (i.e., Study # 1) was to identify significant predictors of the *Study #1 dependent variable of parents being in an action or maintenance stage of change for having made the decision and taken action to ensure their child received the HPV vaccination—as measured before parents watched a linguistically and culturally tailored cartoon video.*

Study # 1: Parents (English or Spanish Speaking)—Cartoon Video as a Potential Linguistically and Culturally Tailored Brief Intervention

A second purpose of the dissertation research (Study #1) was to determine if a linguistically and culturally tailored (i.e., in English or Spanish) video on HPV and HPV vaccination of children can serve as a brief online e-health intervention that promotes significant parental movement across the *stages of change* (i.e., from a precontemplation or contemplation stage, to a preparation stage, as per the theory of Prochaska and DiClemente [1982]), and significantly increases *self-efficacy* (as per the theory of

Bandura [1977]) for *three key behaviors* of: (1) talking to a pediatrician or family practice medical provider about the Human papillomavirus (HPV) infection, and the HPV vaccination for children; (2) making sure their preteen and teen children receive the HPV vaccination; and (3) making sure their preteen and teen children receive all the required doses (e.g., at least 2 or 3 doses) of the HPV vaccination. This involved *a pre-video viewing versus post-video viewing comparison of parents' stage of change and self-efficacy each of these three key behaviors*. In addition, changes in knowledge were examined for parents from pre- to post-video viewing.

Study #2: Providers (Pediatricians or Family Practitioners)—Recommending the Cartoon Video to Parents or Not

A third purpose of the dissertation research (i.e., via Study #2) was to obtain the Study #2 dependent variable of pediatricians/family practitioners recommending (yes/no) the video to parents and/or other providers so they could share it with parents, in order to support parental decision making about initiating and completing HPV vaccination of their preteen and teen children (as per the Diffusion of Innovation Theory of Rogers [1995]).

Study #1 Research Questions

Study #1 With Parents

Given an online sample of parents (n=122) who responded to a social media campaign (i.e., “Go to <<https://tinyurl.com/HPV-Video-Study-English>> to take the Survey for Parents on HPV Vaccination for Children and rate a cartoon for a chance to

win 1 of 3 \$100 Amazon gift cards”) and complete the survey, Study #1 sought to answer the following research questions:

1-What are the parents’ demographic characteristics (i.e., selected English or Spanish survey and video, gender, age, race/ethnicity, US born or not, partner status, employment status, annual household income, level of education, type of medical insurance)?

Part I: Parent’s Basic Demographics (PARENTS-BD-10)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

2-What do parents report about their children (i.e., number of children ages 9 to 18, number of male and female children, child sexual orientation, type of medical insurance)?

Part II: About Your Children (AYC-4)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

3-Do parents report providers having talked to them about HPV and the HPV vaccination, and did the providers recommend the HPV vaccination for their child?

Part III: Parent Report on Provider Recommendation on HPV vaccination for Child (PARENT-R-PR-HPV-V-FC-2)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

4-Do parents report one or more of their children ever having received the HPV vaccination?

Part IV: Parent Report on HPV vaccination for Child (PARENT-R-HPV-V-FC-1)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

5-Do parents report one or more of their children ever having received the flu vaccination, and do they believe in the value of an annual (yearly) flu vaccination for their children?

Part V: Parent Report on HPV vaccination for Child (PARENT-R-FLU-V-FC-1)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

6-To what extent have parents been exposed to print or digital media providing information on the HPV vaccination for children?

Part VI: Parent Exposure to Print or Other Media or Information on HPV Vaccination for Children (PARENT-EPOMI-HPV-VFC-1)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

7-What is the parents' level of general HPV knowledge?

Part VII: HPV General Knowledge (HPV-G-K-23)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

8-What is the parents' level of HPV vaccine knowledge?

Part VIII: HPV Vaccine Knowledge Scale (HPV-V-K-S-11)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

9-What are the parents' general vaccine attitudes, including for (a) conspiracy beliefs, (b) vaccine hesitancy—lack of confidence, and (c) vaccine hesitancy—risks?

Part IX: General Vaccine Attitudes-Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks (GVA-CB-HLC-R-16)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

10-What are the parents' perceived barriers to their child completing the HPV vaccination series?

Part X: Parents' Perceived Barriers to Child's Completion of the HPV vaccination Series (PARENTS-PB-CC-HPV-VS-12)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

11-Pre-video viewing, what was the parents' knowledge of HPV, the prevalence of parents being in an action or maintenance stage for making sure their children received the HPV vaccination—as the Study #1 dependent variable—and their self-efficacy for doing this?

From Item # 4 of Part XII: Pre-Video Parents' HPV Knowledge and Stage of Change and Self-Efficacy for Talking to Provider and Child Receiving the HPV Vaccine (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

12-Was there a change in the parents' knowledge of HPV, as well as their stage of change and self-efficacy for three key behaviors [i.e., (1) talking to a pediatrician or family practice medical provider about the Human papillomavirus (HPV) infection, and the HPV vaccination for children; (2) making sure their children receive the HPV vaccination; and (3) making sure their children receive all the required doses (e.g., at least 2 or 3 doses) of the HPV vaccination] when comparing their pre-video viewing to post-video viewing mean scores?

Part XII: Pre-Video Parents' HPV Knowledge and Stage of Change and Self-Efficacy for Talking to Provider and Child Receiving the HPV Vaccine (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)

and

Part XIV: Post-Video Parents' HPV Knowledge and Stage of Change and Self-Efficacy for Talking to Provider and Child Receiving the HPV Vaccine (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)

Data Analysis Plan: Paired *t*-tests.

13-How do the parents rate the video cartoon?

Part XV: Rate the Video for Parent (RTV-PARENTS-2)

Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

14-Do the parents recommend the video cartoon to other parents?

Part XVI: Diffusion of Innovation using E-Health on HPV by Parents (DOF-UEH-HPV-PARENTS-1)

Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

15-Are there any significant differences between the responses of the English-speaking and Spanish-speaking parents on the study measures?

Data Analysis Plan: Independent *t*-tests

16-Controlling for social desirability, what are the significant predictors of parents being in an action or maintenance stage for making sure their children received the HPV vaccination—before the video—as the Study #1 dependent variable?

Data Analysis Plan: Backward stepwise regression.

Qualitative Portion of Study #1

17-How do parents respond when asked why they would or would not recommend the video, including any comments on the strengths and weaknesses of the video, or how could it be improved?

Part XVII: Qualitative Portion on Reasons for Recommending the E-Health Video or Not—For Parents (QP-RREHV-PARENTS-1)

Data Analysis Plan: Identification of emergent themes.

18-What additional thoughts or feelings do the parents share in reaction to the video and/or taking the survey?

Part XVIII: Qualitative Portion on Reasons to Study Participation by Parents (QP-RSP-PARENTS-1)

Data Analysis Plan: Identification of emergent themes

Study #2 Research Questions

Study #2 With Providers

Given an online sample of providers (n=19 pediatricians or family practitioners) who responded to a social media campaign (i.e., “Click <<https://tinyurl.com/HPV-Video-Study-For-Providers>> to take 10-12 min Survey for Pediatric & Family Practice Providers on HPV vaccination for preteens/teens & rate a cartoon for parents on HPV”) and complete the survey, Study #2 answered the following research questions:

1-What were the providers’ demographic and background characteristics (gender, age, race/ethnicity, US born or not, partner status, annual household income, status as a current job title, pediatric or family practitioner, work setting, years in current position pediatrics or family practice, years in health care)?

Part I: Provider’s Basic Demographics (PROVIDERS-BD-15)

Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

2-What was the providers’ (a) level of knowledge about the Human papillomavirus (HPV) infection, the available HPV vaccinations, and schedule for vaccinating preteen and teen boys and girls—and for the behavior of recommending within their medical practice to parents/guardians that they vaccinate their preteen and teen boys and girls for HPV—and, also their (b) stage of change, (c) self-efficacy, and (d) perception of barriers (e.g. time) experienced during a medical visit for doing this?

Part II: Pre-Video Providers’ Overall HPV Knowledge for Recommending HPV Vaccination to Parents for their Child—and Stage of Change, Self-efficacy, and Barriers (PRE-VIDEO-PROVIDERS-SOC-SE-B-4)

Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

3-How did the providers rate the quality of the cartoon video as a potential linguistically and culturally appropriate tool (i.e., available in English and Spanish) to support parents in their decision-making about whether or not they make sure their preteen or teen child receives the HPV vaccination series.

Part III: Rate the Video for Providers (RTV-PROVIDERS-1)

Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

4-Do the providers recommend the cartoon video for parents, or to other providers so they could share it with parents?

Part IV: Diffusion of Innovation using E-Health on HPV by Providers (DOF-UEH-HPV-PROVIDERS-1)

Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

Qualitative Portion of Study #2

5-How do the providers explain why they would or would not recommend the video to parents or other providers, including any comments on the strengths and weaknesses of the video, or how could it be improved?

Part V: Qualitative Portion on Reasons for Recommending the E-Health Video or not—for Providers (QP-RREHV-PROVIDERS-1)

Data Analysis Plan: Identification of emergent themes and categories

6-What additional thoughts or feelings do the providers share in response to watching the video and/or taking the survey?

Part VI: Qualitative Portion on Reactions to Study Participation by Providers (QP-RSP-PROVIDERS-1)

Data Analysis Plan: Identification of emergent themes and categories

Study Rationale

The rationale for the dissertation research is provided by several theories: the Health Belief Model (Rosenstock, 1974) for this study's focus on knowledge, beliefs/attitudes about taking action, and barriers to taking action; the Stages of Change from the Transtheoretical Model (Prochaska & DiClemente, 1982), such as for examining whether a study participant is in a precontemplation, contemplation, preparation, action, or maintenance stage for performing behaviors of focus (e.g., parents taking action to vaccinate their child for HPV or providers taking action to recommend the HPV vaccination to parents for vaccinating their child); Self-Efficacy from Social Cognitive Theory (Bandura, 1977), as in self-efficacy or confidence for performing behaviors of focus; and Diffusion of Innovation Theory (Rogers, 1995), as in parents or providers

recommending the video to other parents, thereby diffusing the innovation of educating about HPV via the brief intervention of a cartoon video.

Rationale for Study #1

Parents (English- or Spanish-Speaking)—Predictors of Parents Having Decided to Take Action to Vaccinate Child for HPV

More specifically, there is a rationale for Study #1 with parents seeking to identify: *significant predictors of the Study #1 dependent variable of parents being in an action or maintenance stage of change for having made the decision and taken action to ensure their child received the HPV vaccination (i.e., as per the theory of Prochaska and DiClemente [1982] on the stages of change)—as measured before parents watch a linguistically and culturally tailored cartoon video.* This rationale rests in the research of Shapiro et al. (2017) who examined parents' HPV adoption stage or decision-making stage, spanning the following: (1) unaware stage (parent unaware HPV vaccine could be given to child); (2) unengaged stage (parent never thought about vaccinating child); (3) undecided stage (parent undecided about vaccinating child); (4) decided not to vaccinate stage (parent decided not to vaccinate child), (5) decided to act/decided to vaccinate stage; and (6) acted/vaccinated child stage (p. 209).

Shapiro et al.'s (2018) Stage #5 (*decided to act/decided to vaccinate stage*) is the equivalent of a preparation stage in the Prochaska and DiClemente (1982) model, and their stage #6 (*acted/vaccinated child stage*) is the equivalent of the combined action and maintenance stages in the Prochaska and DiClemente model. This study seeking to identify significant predictors of parents being in an action or maintenance stage of change for having made the decision and taken action to ensure their child received the

HPV vaccination is justified. Shapiro et al. (2018) found that only a “quarter of parents” were in the later stage or vaccinated child stage (p. 209).

There is also a rationale for the selection of key independent variables in Study #1, including using validated HPV vaccine knowledge and attitudes scales rooted in the Health Belief Model, following the research of Shapiro et al. (2018) who focused on boys and girls aged 9 to 16 years. The present study emphasizes the need for HPV initiation and completion, starting with preteen children. The present study extends the age to 9 to 18 years, for those still under the care of their parents/guardians up to age 18 years, who may benefit from parental decision making to vaccinate their children with HPV. In support of this study’s age range of 9 to 18 years, others have indicated the vaccination series can be initiated as early as 9 years of age (CDC, 2016a; Trogon & Ahn, 2015); others have also recommended initiation and completion of the HPV vaccination series before youth become sexually active (ACOG, 2015; CDC, 2017c). Also, vaccination completion increases with age, further justifying this study’s focus on the age group 9 to 18 years (Bakir & Skarzynski, 2015).

Race/ethnicity is important to include, given that racial-ethnic minorities may face barriers to HPV vaccination that include language or lack of awareness, or may initiate HPV vaccination at higher rates in comparison to Whites (Henry et al., 2016). Also, research has found parental level of education (e.g., higher) is also important to explore, as is exposure to media and information on HPV, both of which might support ignoring provider advice to vaccinate with HPV (Patel & Berenson, 2013). On the other hand, lower levels of income might be associated with vaccination initiation (Henry et al., 2016). Insurance status is also relevant (Okafor et al., 2015). Vaccine history, as with

prior flu vaccinations, is also important to include (de Casadevante et al., 2015; Kessels, et al., 2012). There is also a rationale for investigating parental hesitancy as a potential barrier to HPV vaccination initiation (Bakir & Skarzynski, 2015; Shapiro et al., 2018). Moreover, HPV vaccination initiation and completion may be related to parental attitudes and acceptance toward the HPV vaccine (Choi et al., 2016). Another key variable included was provider recommendation to vaccinate children, as this has been found to be an important predictor for HPV vaccine intention and completion (Gilkey et al., 2015; Kessels et al., 2012; Mohammed et al., 2017).

Rationale for Study #1

Parents (English- or Spanish-Speaking)—Cartoon Video as a Potential Linguistically and Culturally Tailored Brief Intervention

There is also a rationale for evaluating a linguistically and culturally tailored cartoon video (i.e., parents can select the English or Spanish version) designed to serve as a brief online e-health intervention to increase HPV vaccination initiation and completion among parents, starting with their preteens and before sexual activity begins. This finds support in the work of Agénor et al. (2018), who recommended the use of tailored-education interventions in multiple languages in order to test for appropriateness and effectiveness with those from underserved groups. Also, Tuong et al. (2014) found evidence to support the advantages of videos for delivering health education content, including being less resource-intensive, removing inconsistencies across educators, balancing the presentation of information to provide more standardized education, and reaching a broad audience quickly via social media (p. 219). Also, others have found that an e-health video cartoon has positively impacted knowledge, stage of change, and self-

efficacy for engaging in health-related behavior when comparing pre-video to post-video viewing (e.g., Chung, 2013), providing a rationale for the present study.

Rationale for Study #2

Providers (Pediatricians or Family Practitioners)—Predictors of Recommending the Cartoon Video to Parents or Not

There is also a rationale for investigating significant predictors of the *Study #2 dependent variable of pediatricians/family practitioners recommending (yes versus no) the video to parents and/or other providers so they could share it with parents.*

Recommending the video to parents as a potential linguistically and culturally tailored tool to support parental decision making to initiate and complete vaccination of their preteen and teen children could further extend the important role of the provider.

Consider research by Pérez et al. (2016) showing that healthcare providers have the potential to increase HPV vaccine initiation and completion, including among immigrant Latinos. Further, a healthcare provider's recommendation has been associated with HPV vaccination and completion, as indicated by researchers (Gilkey et al., 2015; Kessels et al., 2012).

Delimitations

Study #1 was delimited to parents who are at least age 25, have at least one child between the ages of 9 and 18 years, and completed the entire survey.

Study #2 was delimited to providers who identify as pediatricians or family practitioners who have worked with patients within the past 6 months and completed the entire survey.

Limitations

For both Study #1 and Study #2, limitations included: the use of samples of convenience that access the survey via social media online, including the use of snowballing; the need for access to a computer with Internet service, creating bias; the risk of socially desirable responses, while a measure of social desirability was used so as to control for social desirability; the burden of time, especially for parents in Study #1, contributing to possible study dropout—and, also for busy pediatric and family medicine providers.

Conclusion

This chapter introduced the topic and provided an overview of HPV infection and HPV-associated diseases, HPV vaccine, and gender disparities in HPV vaccination, specifically highlighting factors associated with parental decision making on whether or not vaccinate their children against HPV at the recommended aged (11-12 years). It also introduced the purpose, research questions, and rationale of this study.

Chapter II provides a review of the literature relevant to this dissertation. Chapter III describes the methods of this study. Chapter IV includes the data analysis of this study. The dissertation concludes with Chapter V, offering a discussion of the study results, including implications and recommendations for future research.

Chapter II

REVIEW OF THE LITERATURE

This chapter provides a review of the literature covering the following topics: epidemiology of HPV infection; prevalence and incidence rates of HPV-associated cancers; HPV vaccination; disparities in HPV vaccination; individual-level factors influencing HPV vaccination; social determinants of HPV vaccination; provider recommendations for HPV vaccination; use of e-health to promote health behavior; and study's theoretical framework.

I-Epidemiology of HPV Infection

HPV was first discovered in skin cells in the 1950s and was classified into genotypes based on DNA sequence. In the 1980s, Harald zur Hausen demonstrated that oncogenic HPV types were responsible for cervical cancer. Per Lee and Garland (2017):

HPV16 and HPV18 are the commonest high-risk or oncogenic genotypes in cervical cancer and are responsible for approximately 50% of high-grade cervical dysplasias and 70% of cases of cervical cancer, the fourth most common cancer in females globally. Oncogenic HPVs cause almost 100% of cervical cancers, 90% of anal, 70% of vaginal, 40% of vulvar, 50% of penile and 13% to 72% of oropharyngeal cancers, and HPV16 predominates in all of these non-cervical HPV-related cancers. HPV6 and HPV11, which are classified as low-risk genotypes, cause 90% of genital warts as well as the rare but debilitating recurrent respiratory papillomatosis (RRP). (p. 3)

About 90% of HPV infections clear within 2 years without medical intervention (Zitkute & Bumbuliene, 2016). Although women and men are both carriers, HPV may be less likely to persist in men; “in men, the median time to clearance of any HPV infection is 5.9 months, with 75% of infections clearing within 12 months” (p. 1). Persistent HPV infection with high-risk HPV may progress to cancer in both genders.

HPV infection is the most common sexually transmitted infection (STI); sexually active individuals are likely to get HPV at least once in their lifetime. The risk of being infected also depends on virus pathways; genital HPV infections are contracted through sexual and skin-to-skin contact in the genital region, while infections responsible for oral or upper respiratory lesions are contracted via oral sex. HPV infections spread through heterosexual and homosexual relationships; gay and bisexual men are nearly 17 times more likely to develop anal cancer than men who only have sex with women. Alcohol abuse, long-term use of oral contraceptives, lack of male circumcision, and HIV infection are also associated with contracting HPV infection (Zitkute & Bumbuliene, 2016).

HPV prevalence among females has been positively associated with women’s estimated number of lifetime male partners, or not being aware of their partner’s sexual history or prior HPV infection. Sexual network characteristics that increase the risk of transmission include “larger network size, higher contact rates and the patterns of sexual mixing or partner choice” (Burchell, Winer, de Sanjosé, & Franco, 2006, p. 57). Lewis, Markowitz, Gargano, Steinau, and Unger (2017) evaluated genital HPV prevalence among sexually experienced individuals ages 14 to 59 years. Males, especially non-Hispanic Black men, reported higher prevalence of both any HPV and high-risk HPV, underscoring racial and ethnic disparities in infection rates (Lewis et al., 2017).

The prevalence of HPV infection also varies by age; sexually active adolescents and women under 25 years are at higher risk (Li & Xu, 2017). Over 40% of young women are infected with HPV within 2 years after first sexual activity. Due to biology, young women are not only more susceptible to HPV but also “more prone to persistent HPV infection and lasting damage” (Zitkute & Bumbuliene, 2016, p. 2). Older men are just as likely as younger men to be infected with HPV, perhaps because “men do not develop adequate immune responses to maintain protection” (Moscicki & Palefsky, 2011, p. 3). At all ages, HPV seroprevalence is lower among males (Moscicki & Palefsky, 2011).

Present-day tests allow for “more sensitive screening among women,” including co-testing with an HPV test and Pap smear every 5 years for low risk women ages 30 years and older (Pytynia, Dahlstrom, & Sturgis, 2014, p. 2). Sampling methods for HPV-DNA in men are more variable, have not been validated, and “there are difficulties associated with collecting cell specimens” (Burchell et al., 2006, p. 54). With an estimated global prevalence of genital HPV infection at 12% and a lifetime risk at 75%, greater attention is needed to risk factors and strategies to increase vaccination (Li & Xu, 2017).

Risk Factors for HPV Infection

Despite being the main risk factor for HPV, sexual behavior is often overlooked when explaining disparities in HPV-associated cancers. Individual-level factors related to infection include age of first sexual intercourse and lifetime number of sex partners. Evidence has suggested differences in these factors between racial and ethnic and socioeconomic status (SES) groups. Younger age of first sexual activity has been

strongly associated with riskier sexual behavior and increased risk of HPV infection; it has also been linked with Black race and low SES. Population-level factors include “sexual mixing patterns between risk groups and degree of partnership concurrency” (Brisson, Drolet, & Malagón, 2013, p.158). As Brisson et al. (2013) wrote:

Differences in population-level risk factors by race may explain why, in the United States, HPV prevalence is sixfold higher among blacks with one lifetime partner than among whites...whereas the prevalence is similar across racial/ethnic groups among individuals with six or more lifetime partners. (p. 159)

Racial and ethnic disparities in HPV infection have been documented; non-Hispanic Blacks have the highest prevalence of HPV, followed by Hispanic and non-Hispanic Whites. These disparities are not clearly understood, but “may be the result of differences in the structure of sexual networks” (p. 2). Lin et al. (2015) wrote:

Evidence has shown that sexual networks of black persons are more racially segregated and have higher rates of recurrent sexual partnerships as well as sexual mixing between high- and low-risk groups, which may facilitate the spread of STI within the community. Differences in country of birth in HPV infection among Hispanic populations have also been observed due to intragroup heterogeneity related to demographic variables and acculturation... (p. 3)

Tota, Chevarie-Davis, Richardson, and Franco (2011) explained that “HPV may also be transmitted during childbirth from the cervix of infected mothers to the oropharyngeal mucosa of their children” (p. 13). Multiparity, smoking, condom use, nutrition, viral load, and prior HPV infection are additional risk factors.

Treatment for HPV Infection

There is no specific medical treatment for HPV infection; treatments depend on the specific clinical manifestations, such as genital warts or abnormal cervical cell cytology. The annual estimated cost of HPV-related sequelae, “primarily for management of abnormal cervical cytology and treatment of cervical neoplasia,” is \$8 billion U.S.

dollars, which “exceeds the economic burden of any other sexually transmitted infection” except HIV (CDC, 2016d, pp. 177-178).

II-Prevalence and Incidence Rates of HPV-Associated Cancers

According to the CDC (2018a), nearly 42,700 HPV-associated cancers were diagnosed in the United States between 2011 and 2015. Of those, 24,400 cases occurred among women and 18,300 occurred among men, suggesting higher prevalence among women. Cervical cancer is the most prevalent HPV-associated cancer in women, while oropharyngeal cancers have become the most prevalent HPV-associated cancers in men. Oropharyngeal cancers were traditionally thought to be caused by tobacco and alcohol use, but recent data have indicated that nearly 70% of oropharyngeal cancers could be linked to HPV or a combination of cigarette smoking, alcohol use, and HPV (CDC, 2018a).

Trends in HPV-associated cancers have also changed. In 1999, cervical carcinoma was the most common HPV-associated cancer. From 1999 to 2015, there was a decrease in cervical carcinoma rates by 1.6% per year, while oropharyngeal SCC rates increased by 2.7% in men and 0.8% in women per year (Van Dyne et al., 2018). Oropharyngeal SCC is now the most common HPV-associated cancer in the United States, likely resulting from shifting sexual behaviors such as unprotected oral sex (Van Dyne et al., 2018). Regarding anogenital cancers, rates of anal and vulvar SCC have increased, while vaginal SCC has decreased, and penile SCC has remained stable (Van Dyne et al., 2018).

The decline in cervical cancer rates is likely the result of enhanced cancer screening. While rates of cervical carcinoma have decreased across racial and ethnic

groups, Hispanic and non-Hispanic Black women consistently have the highest incidence rates of cervical carcinoma. Higher rates of anal SCC have also been observed among Black men. Aside from cervical cancer, there is no screening recommendation for other HPV-associated cancers. Van Dyne et al. (2018) write:

The *Healthy People 2020* target for cervical cancer screening is 93%, however, in 2013 only 80.7% of women reported up-to-date cervical cancer screening, with lower rates noted among Asians, Hispanics, women aged 51-65 years, foreign-born, uninsured, and publicly insured women. (p. 665)

Therefore, “health care delivery needs of some groups are not fully met” (Van Dyne et al., 2018, para, 10).

Razzaghi et al. (2018) investigated variation in survival rates of invasive cancers based on participants’ demographics, finding large disparities in HPV-associated cancers by sex, race, and age. For most HPV-associated cancers, 5-year age-standardized relative survival decreased with advanced age at diagnosis. Non-Hispanic Whites comprised 83% of the study population, yet over 85% of the HPV-associated cancer types. Five-year relative survival was higher among non-Hispanic White patients than non-Hispanic Black patients for all HPV-associated cancers and all age groups. Men were more likely to die from anal SCCs and rectal SCCs than women. The greatest difference in survival rates among men and women was observed for rectal SCCs. According to Razzaghi et al., “HPV vaccination and improved access to screening and treatment, especially among groups that experience higher incidence and lower survival, may reduce disparities in survival from HPV-associated cancers” (p. 210).

III-HPV Vaccination

Vaccination is the optimal primary prevention strategy to reduce the burden of HPV-associated cancers (de Sanjosé, Temin, Garland, Eckert, & Arrossi, 2017). Three prophylactic HPV vaccines have been approved and recommended for use. The 2vHPV (bivalent) vaccine protects against HPV-types 16 and 18. The 4vHPV (quadrivalent) vaccine protects against HPV-types 6, 11, 16 and 18. The 9vHPV (nonavalent) vaccine protects against HPV-types 6, 11, 16, 18, 31, 33, 45, 52, and 58 (de Sanjosé et al., 2017). According to the CDC (2017g), “HPV vaccines have no therapeutic effect on HPV-related disease, nor on risk of progression to disease in persons already infected” (p. 5). The 4vHPV (Gardasil) and 9vHPV vaccines are licensed for females and males ages 9 to 26 years old, while the 2vHPV (Cervarix) is licensed for use only in females ages 9 to 25 years (CDC, 2017g).

The ACIP developed national recommendations for use of the HPV vaccine in the U.S. (CDC, 2017g). Routine HPV vaccination is now recommended for boys and girls ages 11 to 12 years and may be initiated as early as age 9 years. ACIP recommends vaccination for females through 26 years of age, and for males through 21 years of age, who were not appropriately vaccinated (CDC, 2017g). As an update, HPV vaccination may now be administered in a two-dose schedule (0 and 6 months) for those under 15 years, while a three-dose schedule is given to individuals who start the series at age 15 years or later (0, 1-2, and 6 months). The three-dose schedule is also recommended for individuals who are immunocompromised (Meites et al., 2016). The 9vHPV may be used to complete vaccination series initiated with 4vHPV or 2vHPV (CDC, 2017g).

Regarding special populations, the ACIP recommends routine vaccination at the age of 9 years for children who have been sexually abused or assaulted. For men who have sex with men (MSM), vaccination is the same “as for all men, . . . through age 26” (Mietes et al., 2016, p. 1407). HPV vaccination is also recommended for transgender individuals.

Vaccine Safety and Effectiveness

More than 100 million doses of HPV vaccines have been distributed in the United States. Following rigorous testing, vaccines are continuously monitored for safety and effectiveness (CDC, 2018b). The most common side effects of the HPV vaccine include fever, pain, redness or swelling at the site of the injection, headache, tiredness, nausea, and muscle or joint pain. Individuals are advised to sit or lie down for 15 minutes following vaccination to prevent fainting or fall-related injuries (CDC, 2018b).

Routine HPV vaccination is not recommended for pregnant women. If a woman becomes pregnant after starting the series, completion should be delayed; however, “inactivated vaccines like HPV do not affect the safety of breastfeeding for these women and their infants” (ACOG, 2017, p. 4).

HPV Vaccine and Herd Protection

Lewis and Markowitz (2018) assessed the impact of vaccination on type-specific HPV prevalence. Results showed that from 2011-2014, 4vHPV type prevalence decreased by 71% in females ages 14 to 19 years old, and by 34% in unvaccinated females ages 14 to 24 years. Study results suggest herd protection with more than one

dose coverage of 50% (Lewis & Markowitz, 2018). Ali et al. (2013) also found a significant decline in genital warts following debut of the 4vHPV vaccine. They wrote:

Less than 1% of women aged under 21 years...were found to have genital warts in 2011, compared with 10.5% in 2006 before vaccination programme started. By 2011, no genital warts were diagnosed in women aged under 21 who reported being vaccinated. A significant decline also occurred in genital diagnoses in 21-30 year old women...declining diagnoses, but to a lesser magnitude was seen in young heterosexual men. (p. 3)

The observed decline in genital warts among heterosexual men was likely due to herd protection (Ali et al., 2013).

It has been suggested that high vaccine coverage among girls is more cost-effective than lower coverage for males and females. Bloem and Ogbuanu (2017) argued that gender-neutral immunization “should be a country-level decision based on factors such as disease burden, local sexual behaviour patterns, equity concerns, programmatic implications, cost-effectiveness, and affordability” (p. 3). Because heterosexual men mostly benefit from herd protection related to female vaccination, MSM are less likely to benefit from this effect (Bloem & Ogbuanu, 2017). Vaccinating males not only decreases the incidence of HPV-associated disease, but also provides herd protection for the general population, with the potential to decrease morbidity and mortality (Beck & Budisalich, 2018). According to Han, Tarney, and Song (2017):

HPV vaccination may have a profound impact in the prevention of HPV-related cancers in both men and women as one serves as a silent host for the other, in addition to being a direct cause of anogenital and oropharyngeal cancers.... Only when vaccination coverage is significantly increased, progress will be made in eradicating most HPV-associated cancers in the USA. (p. 1131)

IV-Disparities in HPV Vaccination

Data from the 2016 NIS-Teen Survey revealed that the proportion of U.S. adolescents who completed the HPV vaccine before turning 13 was 16%, while 35% completed the vaccine series before turning 15; overall completion was 43% among 13- to 17-year-olds. These numbers are concerning, given that the HPV vaccine provides optimal protection before the onset of sexual activity. As 11% of females and 16% of males reported being sexually active by the age of 15, “there is the potential for HPV infection prior to vaccination” (Bednarczyk, Ellingson, & Omer, 2019, p. 3). Further, as HPV infection does not require penetrative sex, adolescents may be exposed “to HPV even if they do not consider themselves sexually active” (p. 3).

Bednarczyk et al. (2019) highlighted three main benefits of completing the HPV vaccine, including: (a) stronger immune response when given before the age of 15 years; (b) requires only two doses for completion prior to age 15 years, “reducing logistical barriers”; and (c) one of three vaccines recommended between the ages of 11 to 12 years, administered with meningococcal conjugate (MenACWY) and tetanus-diphtheria-acellular pertussis (Tdap) vaccines. Uptake and completion rates for HPV vaccination are lower than other childhood vaccines, with only half of adolescents up to date on the recommended doses (Walker et al., 2018). According to Bernstein, Bocchini, and the Committee on Infectious Diseases (2017):

There are distinct missed opportunities to administer adolescent vaccines, particularly HPV vaccine. If HPV vaccine had been administered during the same visit at which another recommended vaccine, such as Tdap, was given, the vaccination rate of 13-year-old girls born in 2000 for at least 1 dose of HPV vaccine would have been 91%. (pp. 2-3)

Currently, rates of HPV vaccination coverage do not meet the *Healthy People 2020* target of 80% for adolescents ages 13 to 15. This “warrants increased attention” (National Vaccine Advisory Committee, 2018, p. 545). Of note from the 2016 NIS:

- Lower HPV vaccination coverage among 17-year old males (58.6%) compared with females (72.7%);
- Lower coverage among non-Hispanic White adolescents (54.7%) compared with Hispanic (69.8%) and non-Hispanic Black (65.9%) adolescents;
- Lower coverage among adolescents living at or above the federal poverty level (70.2%); and
- Lower coverage among those living in rural (50.4%) compared with urban (65.9%) settings. (p. 545)

The causes of poor HPV vaccination coverage are multifactorial (National Vaccine Advisory Committee, 2018).

V-Individual-Level Factors

Parental acceptance of HPV vaccination is dependent on many factors, including individual knowledge and beliefs, perception of vaccine safety and effectiveness, family and cultural practices, ability to afford vaccination, and healthcare provider recommendation (Holman et al., 2014). Fontenot et al. (2015) explored parental attitudes about the 9vHPV vaccine among a national convenience sample of parents with both vaccinated and unvaccinated daughters. Parents in both groups reported less awareness that the vaccine was available for males and that HPV infection is responsible for cancers other than cervical cancer. Following the study, parents were in favor of the new vaccine, including those who previously did not intend to vaccinate. Fontenot et al. wrote:

Overwhelmingly, parents wanted their HCP to talk with them in person, provide written information, and utilize clear communication strategies. They also described wishing that HCP held information sessions at their offices and/or that their child’s school could also provide more written information... (p. 599)

Study findings suggest a need for promotion of the HPV vaccine, while identifying parents' concerns or varying beliefs based on their child's sex. Using data from the 2011 NIS-Teen, Burdette, Gordon-Jokinen, and Hill (2014) also found that parents of boys primarily delayed vaccination due to lack of provider recommendation. Johnson, Lin, Cabral, Kazis, and Katz (2017) called for "targeting the recommendations to address the unique concerns of caregivers of male and female teens" (p. 8).

In a U.S. national representative sample of mothers (n=2,446), Donahue, Hendrix, Sturm, and Zimet (2015) examined both characteristics of early initiators (receiving at least one dose prior to the target recommended age) and predictors of initiation among the target age group (11 years and up). They found older age to be a significant predictor of HPV vaccination, while

A significant higher percentage of initiators were females, belong to a racial/ethnic minority, had public health insurance or were uninsured, had an older sibling who received the HPV vaccine, received the flu vaccine during the most recent flu season, had visited a healthcare provider in the past year, and typically received healthcare...in a location other than a private office. (p. 893)

Many initiators also had mothers who received a provider recommendation; as the strength of provider recommendation increased, the predicted probability of vaccine initiation also increased across all ages. Healthcare provider recommendation more strongly impacted initiation by males, perhaps due to "the relative recency of the ACIP's routine recommendation for males...less awareness of the importance of male vaccination among providers as well as among parents of sons" (p. 897).

In a national representative sample (n=7,674) of diverse adults, Otanez and Torr (2018) investigated the effect of HPV knowledge and willingness to vaccinate among differing racial and ethnic groups. Results indicated that Hispanics were nearly 30% more

willing to vaccinate, while non-Hispanic Blacks were approximately 20% less willing to vaccinate than non-Hispanic Whites. Non-Hispanic Blacks and non-Hispanic Whites who mistrusted doctors were significantly less willing to vaccinate, while Hispanics who mistrusted doctors were more willing to vaccinate. Non-Hispanic Blacks were more likely to cite concerns about vaccine safety. According to Otanez and Torr (2018):

This is relevant for future education campaigns, as it suggests that the lower rates of vaccination, reflected in less favorable attitudes toward vaccination among Blacks, is not simply due to lack of knowledge.... Controlling for distrust does not eliminate the difference by race. (p. 1479)

Mistrust of doctors could potentially create ambivalence about vaccination; results showed that non-Hispanic Blacks were more likely to be unsure of their feelings about vaccination than other groups. More research is needed to develop culturally sensitive approaches enhancing patient-provider trust and rapport, “while highlighting safety and addressing concerns about vaccination” (Otanez & Torr, 2018, p. 1481).

Jeudin et al. (2014) explained that minority, immigrant, and non-English-speaking parents have reported lower knowledge of the HPV vaccine than English-speaking parents. They wrote, “parents with little knowledge about the benefits of vaccination may be less likely to advocate for themselves” (p. 31). Latina parents who knew where to get the vaccine were more likely to favor vaccination, and Latina parents who reported higher levels of American acculturation also reported more frequent provider recommendations. Common reasons for vaccine incompleteness among Latina and Black girls included less awareness about subsequent doses, lack of time, and finding times and convenient clinic locations. These issues were more common among those with “limited English proficiency or low health literacy, hold unskilled jobs with inflexible work hours, or have limited child options” (Jeudin et al., 2014, p. 31).

Kepka et al. (2018) also assessed sociodemographic barriers and facilitators among racially and ethnically caregivers (n=288) of children ages 11 to 17 years old. At least 20% of participants had their child vaccinated with at least one dose of the HPV vaccine. Race and ethnicity, years in the United States, and caregiver birthplace were significantly associated with HPV vaccination. Kepka et al. wrote, “each minority group will require a unique set of tailored intervention strategies,” while paying “particular attention to immigrants, regardless of how long they have lived in the United States” (p. 229). Indeed, research has demonstrated that HPV vaccination disparities between foreign-born and U.S.-born children disappear “after controlling for access-to-care, socioeconomic, and demographic characteristics” (Healy et al., 2018, p. 7). Thus, having “language-appropriate educational materials available for providers who primarily treat foreign-born populations, are needed” to address cultural dynamics in vaccination (p. 7).

VI-Social Determinants of HPV Vaccine Uptake

According to Thompson, Rosen, and Maness (2019), social determinants of health (SDOH) provide an innovative approach to identify and address health disparities. SDOH are conditions in which individuals are born, grow, live, work and age. In public health, “ignoring social level that impacts health is to ignore broad scale areas that may hamper or enhance efforts to individual behavior change” (p. 150). Thus, it is important to consider the multifaceted approach to HPV vaccine uptake and completion.

Thompson et al. (2019) assessed HPV vaccination among young men and women ages 18 to 26 years (n=3595) using data from the 2016 NIS. Results revealed that 45.7% of women and 14.5% of men had received the HPV vaccine. Education, English

language, social and community factors, and health/healthcare access were significantly associated with HPV vaccination, while economic factors were not. Women who were fluent in English were more than three times as likely to be vaccinated. As noted above, it is imperative to design linguistically and culturally tailored interventions (Thompson et al., 2019). It has been argued that interventions should focus on the benefits of the HPV vaccination among parents of minority children, while programs to improve HPV vaccine uptake among parents of higher SES are also needed (Burdette et al., 2014).

Recall from Chapter I that rates of HPV vaccine uptake and completion appeared to be higher among racial and ethnic minority adolescents living in disadvantaged neighborhoods. This could be due to distribution of safety-net services, including vaccination programs. Across six states, Pruitt and Schootman (2010) found that girls living in counties with lower SES were more likely to be vaccinated compared to girls living in states with lower SES. They wrote, “while girls in poorer states had overall lower odds, girls living in any state experienced higher odds of vaccination in higher poverty counties” (p. 5). Results at the county-level may be due to safety-net resources.

Tsui et al. (2013) found that neighborhood sociodemographic factors were not significantly associated with HPV vaccination after controlling for individual-level factors. In some cases, “neighborhood context may be less important than other factors such as mother’s awareness of HPV vaccine and adequate insurance coverage” (p. 6). Those living in less impoverished neighborhoods may lack access to healthcare clinics. Thus, access to public health insurance may serve as a proxy for access to affordable care. Tsui et al. revealed that the majority of Los Angeles neighborhoods with high HPV-associated cancer rates had a clinic within three miles of city center; individuals living in

poor suburban areas had to rely more on private providers' offices with providers who "face low reimbursement rates for vaccination" which is "shown to impact physician recommendation" (p. 2095). In a Midwestern study, Rutten et al. (2017) similarly found that area-level measures of SES were significantly associated with vaccination, even after controlling for individual-level factors. Such geographic factors "can inform efforts to target community and clinical interventions to improve access in areas characterized by greater need" (p. 538).

VII-Provider Recommendations for HPV Vaccination

Healy et al. (2018) found that among parents of unvaccinated children, lack of provider recommendation was the most common reason for not vaccinating. Johnson et al. (2017) found that provider recommendation increased vaccine initiation, but not always vaccine completion, "suggesting that other unmeasured factors may be driving series completion" (p. 6). Further research is needed in this regard.

Vadaparampil et al. (2011) used a nationally representative sample of family and obstetric providers (n=1,538) to assess recommendations for HPV vaccination. Results indicated that 34.6% of physicians "always" recommended the HPV vaccine to early adolescents (ages 11 to 12 years), 52.7% to middle adolescents (ages 13 to 17 years), and 50.2% to late adolescents (18 to 26 years), lacking compliance with ACIP guidelines to vaccinate by 11 to 12 years. Lack of recommendation to younger adolescents "represents a missed clinical opportunity to provide both individual and population level benefits" (p. 6). Regardless of age, pediatricians were most likely, and family practitioners were least likely, to recommend the vaccine.

Physician age was also significantly associated with vaccine recommendation. Physicians aged 40 to 49 years were more likely to recommend the vaccine, perhaps due to “a sufficient level of clinical autonomy, but...still open to adoption of new innovations and technologies” (Vadaparampil et al., 2011, p. 6). Physicians ages 25 to 39 years were likely to “always recommend” vaccination. It is possible that this “reflects greater emphasis on the importance of HPV in disease etiology in medical education for more recent graduates” (p. 4). Similarly, Warner et al. (2017) found that providers ages 30 to 39 years and over 50 years had less HPV-related knowledge than providers ages 40 to 49 years. They suggested “targeted opportunities for continuing education for these who have completed their medical or nursing training within the last 10 to 15 years” (p. 10).

Malo et al. (2014) examined vaccine recommendations among providers of male patients, finding that 10.8% of physicians always recommended the vaccine for early adolescents, 12.9% for middle adolescents, and 13.2% for late adolescents. Pediatricians and FPs did not frequently recommend the HPV vaccine. This is of concern as “males may transition to the care of family physicians as they move through adolescence” (p. 6). Physicians who self-identified as innovators and early adopters of ACIP guidelines were more like to always recommend the HPV vaccine. According to Malo et al. (2014):

Identifying and supporting innovators/early adopters may facilitate diffusion of male HPV vaccination, given these physicians are watched by colleagues as they test evidence-based changes (e.g., feasibility of implementing the new guidelines in clinical practice) and could influence other physicians’ support.... (p. 6)

Furthermore, the study found that variables such as patient payment method and race/ethnicity were associated with providers’ recommendation (Malo et al., 2014). As STI rates and HPV-associated cancers tend to be higher among minority groups, “recommendation practices may have reflected their recognition of and desire to reduce

these disparities,” particularly when serving a diverse patient population (p. 7). Similarly, Vadaparampil et al. (2011) found that physicians who self-identified as Hispanic/Latino were more likely to “always recommend” the vaccine. This is relevant given that Hispanic women have the highest incidence of cervical cancer. Hispanic providers tend to provide medical care to Hispanic patients; thus, “they may be more sensitized to the importance” (p. 6). Additional research is recommended.

Warner et al. (2017) studied demographic and practice characteristics of healthcare providers (n=254) in Utah, a state with low HPV vaccination rates. At the individual and interpersonal levels, provider specialty, practice type, and number of patients seen per day were associated with lower provider knowledge of HPV. For instance, FPs had higher HPV vaccination knowledge compared to pediatricians and nurse practitioners. Providers from university and primary care settings had higher HPV knowledge than those in private care and hospital settings. Providers who saw more than 15 patients per day reported higher HPV knowledge than peers with fewer patients. Providers who did not routinely provide vaccination or were not part of the VFC program also reported less knowledge (Warner et al., 2017). Size of practice, resources, and acuity of patients may impact provider knowledge and, in turn, comfort with recommendation. Additional barriers included personal beliefs that the vaccination was not a priority.

Allison et al. (2016) conducted a national provider survey regarding HPV vaccine administration practices. Results revealed that 99% of pediatricians and 87% of FPs administered the HPV vaccine to girls ages 11 to 18 years, while 98% of pediatricians and 81% of FPs administered the vaccine to boys ages 11 to 18 years (Allison et al., 2016). Consistent with prior findings, providers were more likely to strongly recommend

the vaccine to older children and to girls. The authors state that if “physicians do not discuss the vaccine, they have no opportunity to provide a strong recommendation” (p. 6). Lack of dialogue may relate to provider, not just parent, knowledge gaps. Indeed, providers may hesitate to discuss the HPV vaccine because they perceive that their patient population will return for future visits or are unlikely to engage in sexual activity. Promisingly, 88% of pediatricians and 67% of FPs reported that they were very likely to discuss the HPV vaccine in a future visit (Allison et al., 2016).

Gilkey et al. (2015) found that 73% of providers reported highly recommending the HPV vaccine to parents with children ages 11 to 12 years. However, providers were more likely to highly endorse other vaccines, as both pediatricians and FPs viewed the HPV vaccine more negatively than other childhood immunizations. Fewer than half of the providers reported discussing vaccination during sick visits in compliance with “practice guidelines which state that mild illnesses...do not constitute grounds for delaying vaccination” (p. 7). Recall from above that “providers’ communication is among the most important strategies for increasing HPV vaccine uptake in the U.S., where the vast majority of HPV vaccine doses are delivered in the context of primary care” (p. 2). Thus, attention to a variety of personal and structural factors is needed (Gilkey et al., 2015).

Structural Barriers to Recommendation

Factors such as cost, completing follow-up doses, and “infrequency of vaccinating at a regular well-child...visit” may impact provider recommendations (Warner et al., 2017, p. 8). Organizational guidelines may also be of concern. Gilkey and McRee (2016) found that many providers “perceived guidelines for HPV vaccine recommendation to be

complex and unclear” (p. 1463). Lack of school entry requirement for HPV vaccination was also identified as a barrier to obtaining parental support (Gilkey et al., 2015).

Providers in the Warner et al. (2017) study supported campaigns to inform parents about the “ubiquity of HPV infection in their community” and “the HPV vaccine as a cancer prevention mechanism,” as well as state policy changes, such as state financing of immunization programs (Warner et al., 2017, p. 10). According to Vadaparampil et al. (2011), VFC providers were more likely to recommend the vaccine:

VCF states (n=36) provide vaccines only for VFC providers choosing to enroll. Physicians who enroll as VFC providers may be responsible for maintaining separate vaccine stocks for VFC-eligible and non-eligible patients...providers willing to take on this responsibility may represent these groups with greater motivation to recommend vaccination...an intervention to increase physician’s participation in the VFC program will increase physician recommendation.... (p. 7)

Time is another significant factor. Dempsey et al. (2016) found that 43% of parents reported spending five or more minutes discussing the HPV vaccine with their child’s provider. In the Gilkey et al. (2015) study, providers similarly reported spending over 3 minutes talking about the HPV vaccine, almost twice as long as for Tdap. As a typical doctor’s visits usually lasts 20 minutes, dedicating a large amount of time to HPV-related concerns may create a time burden for providers.

Parent-Provider Dynamics and the Key Recommendation

A systematic review by Gilkey and McRee (2016) asserted that quality improvement strategies aimed at strengthening provider communication about HPV vaccination should emphasize the need to say HPV vaccination is important, recommend same-day vaccination, and deliver routine recommendations to all 11- and 12- years-olds. (p. 1464)

Across all studies, providers were more likely to initiate vaccine-related conversations with parents. Parents were more likely to accept a strong and unambiguous provider recommendation. Mothers were usually responsible for making the final decision regarding HPV vaccination, while provider guidance was sought in the case of parent-adolescent disagreement. Parents were less likely to refuse vaccination when a provider “avoided drawing special attention to it, and offered their strong endorsement,” normalizing it as one of several routine vaccines (p. 1462). Presenting the vaccine as optional resulted in higher parental hesitancy or delay (Gilkey & McRee, 2016).

Gilkey and McRee (2016) also found disparity-related barriers in communication; parents of African American and Hispanic adolescents less often received HPV recommendations than parents of non-Hispanic White adolescents. Parents of Hispanic adolescents with public insurance were less likely to report collaborative communication, “which adversely affected HPV vaccination coverage” (p. 1462). Providers were also less likely to engage non-English speaking parents in communication about HPV. Parents from minority groups and those with lower SES were less likely to feel engaged by providers, yet more likely to defer to providers’ recommendations. Thus, “eliminating communication disparities could raise coverage for these high priority population even higher” while fostering a sense of collaboration (p. 1464). Indeed, providers who used a collaborative approach, engaging parents and adolescents in the decision-making process, were more likely to initiate vaccination (Gilkey & McRee, 2016).

Dempsey et al. (2016) found that parents were more receptive to HPV-related communications such as “decision-making tools, pictures of preventable diseases, and a list frequently asked questions” (p. 1473). Gilkey and McRee similarly found that parents

and providers preferred brief written materials, as well as websites, “tailored to parents’ cultural background, language preference, and literacy level” (p. 1463). Providers also suggested the use of videos as a promising educational tool.

VIII-Use of E-Health to Promote Health Behavior

The number of Americans who use the internet as a source of health information has increased. In 2002, individuals who used the internet for healthcare information did it an average of three times every month; half of these individuals believed this information improved their self-care. Indeed, e-health provides a cost-effective source for the delivery of health promotion interventions (Evers, 2006). Computer-based programs have the capability to integrate a clinical approach, “which targets large population segments or an entire population” (p. 1). Interactive technologies are often more appealing to participants who want to receive personalized feedback in a more convenient way. The use of e-health promotion programs has the potential to optimize consistency of interventions, reduce personnel demands, improve interactivity and flexibility, automate data collection, and generate more honest responses from participants (Evers, 2006).

Indeed, e-health activities promote participant autonomy. Participants “can actively search for information and generate self-care abilities in a safe, supported, and favorable learning environment,” while autonomy for self-care may enhance self-efficacy (p. 246). Tsai and Liu (2015) evaluated the effects of a health promotion website designed for Taiwanese nurses, comparing nurses who received the e-health intervention and those who received a traditional learning handbook. Nurses who received e-health education significantly increased post-intervention in their Health-Promoting Lifestyle

total scores, as well as subscale scores in self-actualization, nutrition, and exercise. Compared to controls, nurses in the experimental group also showed significant post-intervention decreases in BMI. Thus, e-health education is an effective and accessible intervention for enhancing health promoting behavior among nurses (Tsai & Liu, 2015). Mackert, Champlin, Holton, Muñoz, and Damásio (2014) similarly found that e-health interventions offering audiovisual information were more appealing to participants than more traditional brochures, and argued that health communication theories should be utilized “to improve the efficacy of the interventions and outcomes of users” (p. 517).

Delivery of Tailored Video Health Education

According to the CDC (2016i), “the ideas people have about health, the languages they use, the health literacy skills they have, and the context in which they communicate about health reflect their cultures” (para. 1). Culture may be defined as membership in racial, ethnic, linguistic or geographical groups, or as a “collection of beliefs, values, customs, ways of thinking, communicating, and behaving specific to groups” (para. 2). Therefore, it is important to tailor health education interventions to bridge cultural differences. The National Culturally and Linguistically Appropriate Services (CLAS) Standards emphasize “effective, equitable, understandable and respectful quality care and services that are responsive to diverse cultural health beliefs and practices, preferred languages, health literacy and other communication needs” (CDC, 2016i, para. 9).

Kreuter, Strecher and Glassman (1999) defined tailored health education interventions “as any combination of strategies and information *intended to reach one specific person*, based on characteristics that are unique to that person, related to the outcome of interest, and *derived from an individual assessment*”; these are often more

motivational as individuals adopt and sustain behavior change (p. 277). Tailored messages may be delivered via video, audio, telephone, or internet. Computer-tailored health education is an effective strategy to convey comprehensive health promotion, disease prevention, and disease management information (Kreuter et al., 1999).

Wonggom, Du, Clark (2018) defined an avatar as “an icon or a figure that represents a person in a computer game, on an internet forum” (p. 2668). Avatar-based technology has been used in the management of chronic conditions, such as cancer, diabetes, depression, smoking cessation, and heart disease, and has been shown to improve patients’ knowledge, self-efficacy, self-care behaviors and quality of life. This technology also has demonstrated effectiveness in patients with low health literacy “because it is more engaging than printed education materials and it supports learning through the use of audio and visual aids” (p. 2668).

Lustria et al. (2013) conducted a meta-analysis to assess the impact of tailored web-based programs on health outcomes. Findings revealed that such interventions positively impacted behavioral outcomes. According to Lustria et al.:

A unique advantage of web-based delivery is the capacity to tailor interventions to target population characteristics (e.g., specific risk factors)...compared to interventions requiring face-to-face contact with health care providers, tailored web-based programs facilitate wider access and encourage self-care, which may improve efficacy and maintenance of gains over time. (p. 1061)

Healthy People 2020 strongly supports the development of innovative and interactive health communication technology “geared towards making health education and services more accessible and engaging to the public” (p. 1061).

Lustria et al. (2013) additionally found that tailored, web-based interventions were more successful when aimed at the general public’s disease prevention, and “did not

require support for complex tasks involved in chronic disease management,” such as among specific populations like those with chronic illness (p. 1061). It is important to recognize that some individuals may suffer from comorbid conditions that make participation in certain interventions more physically or mentally difficult. For instance, vision or mobility impairments may impact one’s ability to use computer equipment. These needs should be considered when developing e-health education interventions.

Such interventions should also weigh cultural considerations, as beliefs about health, disease, and treatment often vary across racial groups. Lustria et al. (2013) wrote:

individualism-collectivism, in addition to other cultural-related constructs (i.e., health locus of control or belief in who ultimately has responsibility for one’s health), play an important role in...health decision-making and health behavior and...explain some...variance in preferences for health messaging. (p. 1061)

Tailored web-based interventions targeting a single health behavior were not found to be significantly more efficacious than those targeting multiple health behaviors (Lustria et al., 2013).

Animated Avatar Videos and Health Behavior Change

Animated avatar videos provide a unique virtual learning space in which the avatar serves as a model for adopting healthy behaviors (Høybye, Vesterby, & Jørgensen, 2016). Avatar videos in e-health education may be more appealing to “patients who do not wish to watch realistic depictions of medical interventions,” and viewers may adopt behaviors that “resonates with the actual circumstance and conditions of patients’ everyday life” (pp. 2-3).

LeRouge, Dickhut, Lisetti, Sangameswaran, and Malasanos (2015) used animated avatars to address chronic weight management among adolescents. Avatars were human-

like representations of the user, who “controls the avatar’s actions or ‘tele-operates’ the avatar within the virtual environment” (p. 20). Virtual agents in the study represented teachers or coaches. Teen, parent, and provider participants expressed excitement for using avatars and virtual agents to assist with self-management of chronic conditions, while making self-care more enjoyable and motivating. Teens were receptive to receiving advice about health habits from their virtual agents, such as healthy food choices, and felt like active members of the care team. Further, the providers “viewed the knowledgeable virtual agent coach role as extension of the motivation and information provided in their interactions with teens” (LeRouge et al., 2015, p. 22). Family members endorsed the use of avatar agents as important social supports. These results encourage further research regarding avatar-based interventions among additional populations.

Canidate and Hart (2017) studied the ways in which health information consumers choose and design their avatars, such as whether participants preferred an avatar that resembled their own gender or ethnicity. Findings revealed that “the ethnicity of the user and the ethnicity of the avatar were found to have the strongest connection” (p. 5). Regardless of age and gender, the vast majority of users chose a White female avatar. Furthermore, “black participants *exposed to the low-diversity representation of Second Life* were shown to create more white-looking avatars as opposed to black participants *exposed to the high-diversity representation*” (p. 5). Results suggested that individuals who identified with their own chosen avatar may feel more empowered and motivated to adopt healthy behaviors (Candidate & Hart, 2017).

Chen, Todd, Amresh, Menon, and Szalacha (2018) evaluated a bilingual (English/Spanish) avatar intervention aimed to increase HPV vaccination among Latino

parents (n=46) of unvaccinated adolescents ages 11 to 17 years. Interviews were also conducted with healthcare providers regarding integration of the intervention into their clinical routine. The intervention was guided by a variety of health behavior theories with demonstrated use in adoption of HPV vaccination behavior (Chen et al., 2018). Results showed that 95% of participants reported intention to vaccinate their children, while 50% agreed to immediate vaccination. Most participants found the intervention to be culturally and linguistically appropriate, easy to understand, and easy to use. Different from some aforementioned studies, parents' intention to vaccinate did not differ by child's biological sex. Although the intervention was "not intended to be substitute for guidance from healthcare providers," it did motivate parents to seek HPV vaccination, while increasing knowledge, addressing myths, and providing resources (p. 5). The intervention also facilitated patient-provider communication. According to Chen et al. (2018):

Individuals who received tailored information are more likely to remember the customized messages, which can lead to desired behavioral changes. Tailored interactive, computers-based health education can be delivered in clinic settings when having discussions about health may be most relevant. As healthcare providers often find it challenging to provide HPV education in clinical settings due to the competing demands, our...intervention operated by parents while waiting for the health services offers an innovated and feasible approach. (p. 1)

Duncan-Carnesciali, Wallace, and Odlum (2018) assessed the effect of an e-health intervention on reducing barriers to accessing diabetes self-management education and evaluated perceptions of avatar-based technology among certified diabetes educators (CDE). They found that "age, ethnicity, and Arab/Middle Eastern, Asian, and White/European decent were significant predictors of high rating the quality of the video" (p. 223). Qualitative analysis revealed that sound quality, use of a cartoon, and simplicity of content were negatively perceived by CDEs, yet CDEs reported that they would

recommend the avatar video to their patients and colleagues. Thus, specific design and content factors must be considered when creating avatar-based education interventions.

Bedra, Wick, Brotman, and Finkelstein (2013) evaluated the feasibility and acceptance of a tablet-based interactive ileostomy education intervention. Results showed improved patient ileostomy knowledge and stoma care self-efficacy, with 100% of patients reporting that the tablet education was easy to use; 80% of patients expressed interest in using the tablet for future health education. Findings demonstrated that avatar-based ileostomy education “was a good supplement to ostomy nurse teaching,” with the majority of participants rating their learning experience as good or excellent (Bedra et al., 2013). As healthcare providers may experience a variety of patient education barriers, avatar video education supports and facilitates the delivery of important messages among diverse populations. It is fundamental to involve health consumers in the development and evaluation of these messages. Equally important is to translate animated avatars into different languages (Tongpeth, Du, & Clark, 2018).

Miller and Jensen (2014) explained how avatars and animation share common characteristics, in that both are computer-animated images. Avatars “are computer animations of a human or the projection people use to depict themselves” (p. 38). While animation is a “general activity of illustrating motion with an object, allowing educators to present an activity that would be difficult to read or demonstrate with a static picture” (p. 38). Thus, avatars are associated with, but not exclusive to, animation. Avatars may facilitate “social connection with another person” (p. 38).

IX-Theoretical Framework

Health Belief Model

According to Rosenstock (1974), the Health Belief Model (HBM) was developed to focus on disease prevention and screening for early detection of asymptomatic diseases. In order for an individual to take action to prevent disease, he or she must need to believe he or she is personally *susceptible* to a disease (e.g., individual risk of contracting a health condition) and that “the occurrence of the disease would have at least moderate *severity* on some component of his life” (p. 330). Degree of perceived seriousness may be based on emotional arousal (e.g., the individual thoughts and beliefs about the possible difficulties he or she would experience as a result of disease exposure). Also involved are the acceptance of one’s susceptibility to a disease, and the plan of action that would be *beneficial* to help reduce his or her susceptibility. Rosenstock wrote:

The person’s beliefs about the availability and effectiveness of various courses of action, and not the objective facts about the effectiveness of action, determine the course he will take. In turn, his beliefs in this area are undoubtedly influenced by the norms and pressures of social groups. (p. 331)

Cues to action are the necessary triggers needed for the individual to undertake the preferred path of action. These actions can be internal (e.g., perception of bodily states) or external (e.g., interpersonal interactions, the impact of the media communication). If an individual has low perceived susceptibility to or severity of disease, rather intense stimuli would be sufficient to trigger a response; with “high levels of perceived susceptibility and severity, even slight stimuli may be adequate” (p. 333).

The HBM construct has been applied (Reiter, Brewer, Gottlieb, McRee, & Smith, 2009) to HPV vaccination, as follows: (a) perceived susceptibility (parental perceived

likelihood of their children contracting HPV infection and HPV-associated diseases); (b) perceived severity (how severe the negative effects of HPV infection and HPV-associated diseases are believed to be); (c) perceived benefits (parental perceived belief that vaccinating their teen boy and girl will help reduce the risk or severity of HPV infection and HPV-associated diseases); (d) perceived barriers (any parental perceived obstacles preventing them from vaccinate their children, such as not knowing where to get the vaccine for their child, no convenient location, or lack of time to follow-up with dose series completion); and (e) cues to action, such as “situational factors prompting HPV vaccination, such as doctor’s recommendation” (Reiter et al., 2009, p. 2).

The Stages of Change

Prochaska and DiClemente (1982) provided the Transtheoretical Model (TTM); of particular interest are the stages of change (SOC), which describe “a process involving progress through a series of six stages” (Prochaska & Velicer, 1997, p. 38). In pre-contemplation, people are not intending to take action in the next 6 months. People may be in this stage for several reasons, including lack of knowledge about the consequences of their behavior, or loss of confidence in their ability to change. These individuals may avoid thinking about their high-risk behaviors and have been characterized as resistant to or not ready for health promotion programs (Prochaska & Velicer, 1997). Those in the contemplation stage are considering change in the next 6 months (Prochaska & Velicer, 1997). They are aware of the pros and cons of changing, but can experience ambivalence, which “can keep people stuck in this stage for long periods of time” (p. 39). Individuals in this stage are not ready to receive traditional action-oriented programs. In the preparation stage, however, individuals are planning to take action in the immediate

future and have a plan of action. Hence, individuals in this stage are ready to participate in traditional action-oriented programs. In the action stage, people have made specific behavior changes within the past 6 months. Maintenance is the last stage where “people are working to prevent relapse but do not apply change processes as frequently as do people in action” (p. 39). People in this stage are less tempted to relapse and more confident they can sustain their behavior change. Maintenance lasts from 6 months to about 5 years (Prochaska & Velicer, 1997).

According to Fernandez et al. (2013), the TTM is well-suited to assess motivation and decision making related to HPV vaccination. They wrote:

HPV vaccination is unique to other health behaviors because it lacks a traditional behavioral Maintenance stage and requires relatively little overt behavioral effort to reach the Action stage. Maintenance for HPV vaccination is effectively under biological control once the final dose of the vaccine is completed. (p. 302)

For the purposes of this study, the SOC were used to examine the behaviors of interest among English-speaking and Spanish-speaking parents as well as healthcare providers.

Social Cognitive Theory—Self-efficacy

A central concept is self-efficacy, as per Bandura (1991):

People’s beliefs in their efficacy influence the choices they make, their aspirations, how much effort they mobilize in a given endeavor, how long they persevere in the face of difficulties and setbacks, whether their thought patterns are self-hindering or self-aiding, the amount of stress their experience in coping with taxing environmental demands, and their vulnerability to depression. (p. 257)

Perceived self-efficacy can affect the choices made in behavioral goal setting. For instance, individuals are more likely to avoid threatening situations if they believe they do not possess the coping skills to overcome the threat. On the other hand, individuals are

more likely to engage in activities and behave with confidence when they “judge themselves capable of handling situations that would otherwise be intimidating” (Bandura, 1977, p. 194).

Bandura (1999) also found that individuals learn by observing the behaviors, and consequences of behaviors, performed by others. Observational learning enables individuals to generate knowledge and skills via modeling. Observational learning thus produces innovative behavior. Social diffusion of new styles of behavior consists of three functions: “acquisition of new knowledge, new ideas and practices,” adoption of determinants, and “the social networks that tie people to one another” (p. 26).

The construct of self-efficacy may best capture if parents feel sufficiently confident or empowered to discuss HPV and the HPV vaccine with providers, influencing the decision to vaccinate a child (Priest, Knowlden, & Sharma, 2015).

Diffusion of Innovation Theory

The acceptance of an innovation is dependent on social context and explains why often “interventions with minimal research support gain widespread acceptance” (Dingfelder & Mandell, 2011, p. 2). Diffusion occurs when a new practice, program, or policy is communicated over time within a system (Dingfelder & Mandell, 2011).

According to Haider and Kreps (2004), communicating a new innovation is both planned and spontaneous. Communication of messages about new ideas requires the creation and sharing of information among individuals to “reach mutual understanding” (p. 4).

Diffusion is “the process by which change occurs in the structure and function of a social system” (p. 4). Social change can occur due to the introduction of the invention, diffusion, and adoption or rejection of new ideas (Haider & Kreps, 2004).

According to the DOI, “people fall into one of five adopter categories that describe their rate of adoption of new behavior or belief” (Haider & Kreps, 2004, p. 5). Innovators are those first individuals who adopt a new innovation, while early adopters are educated but less able to cope with uncertainty compared to innovators. The early majority are more likely to adopt an innovation before the average person; this group constitutes one-third of the members of a system. The late majority adopt an innovation just after the early majority and also represent one-third of the system. Yet, late majority members often need peer-pressure in order to adopt a new idea. Similarly, laggards are suspicious of innovations. Adopter characteristics, personality variables, and communication behavior vary by level of education, social status, and SES, which “influence the rate at which a new innovation diffuses” (p. 5). When developing health education interventions, it is essential to identify and understand the key factors influencing the adoption or rejection of innovations (Haider & Kreps, 2004).

This study permits determining if parents (Study #1) and providers (Study #2) engage in diffusion of the innovation (i.e., recommend it to others or not) of teaching parents about HPV and HPV vaccination via a culturally and linguistically tailored e-health avatar video/cartoon.

Conclusion

This chapter provided a review of the literature, covering the following topics: epidemiology of HPV infection; prevalence and incidence rates of HPV-associated cancers; HPV vaccination; disparities in HPV vaccination; individual-level factors influencing HPV vaccination; social determinants of HPV vaccination; provider

recommendations for HPV vaccination; use of e-health to promote health behavior; and the study's theoretical framework.

Chapter III next provides a detailed description of the methodology used in the present study.

Chapter III

METHODS

This chapter provides a description of the methods and procedures used in this study. This includes an overview of study design and procedures, which include the recruitment of participants and a description of the development of the script and avatar video. The treatment of data including the analysis plan is also outlined.

Overview of Study Design and Procedures

The research used a cross-sectional design and mixed-methods approach (quantitative and qualitative) in this online investigation involving Study #1 with parents who chose to participate in English or Spanish and Study #2 with providers. According to Warner et al. (2017), mixed-method approaches “that combine qualitative and quantitative data sources provide a more complete description of a phenomenon than a single methodology approach alone” (p. 2).

IRB Approval

Study #1 and Study #2 received approval from the Institutional Review Board (IRB) of Teacher College, Columbia University before any data collection began. The IRB approval protocol number 19-172 was deemed exempt from review. See Appendix A (*IRB Approval Letter*).

Development of the Video Script and Cartoon

The animated avatar characters were created on <https://www.vyond.com/> (i.e., Vyond, formally known as GoAnimate) while ensuring they had features to match those of the racially and ethnically diverse parents for whom the video was created. Two animated avatar videos were made: one video for the English-speaking parents and the other video for the Spanish-speaking parents. Every step of video script creation and actual video development occurred under the supervision of Dr. Barbara Wallace, Director of the Research Group on Disparities in Health (RGDH) and Professor of Health Education, Department of Health and Behavior Studies at Teachers College, Columbia University. The content of the script was based on the existing literature, as per Chapter II, Review of Literature. Numerous drafts were reviewed and edited in a close process involving the Principal Investigator and Dr. Wallace. A final video script in English was produced (see Appendix I, *Video Script in English*).

Role of the Translator and Video Consultant

Dr. Monica Stanton-Koko, Assistant Professor of Health Science in the School of Health and Natural Sciences at Mercy College, served as translator of the study materials, including the survey and other recruitment materials and messages, and of the video script. The process included translation and back-translation. In addition, the principal investigator was able to review and make suggestions for alternative translations with a closer meaning, as the opportunity arose, given that her native language is Spanish. This was performed to ensure equivalency between the translated document and the original text. The result of this process appears in Appendix J, *Video Script in Spanish*.

Linguistically and Culturally Appropriate Video Production Team

Dr. Stanton-Koko also played the central role in gathering a team of two other adults and two preteen children—as the video cast of adult and child actors—so that the video was created by this team using the Vyond technology. This approach permitted including the team members’ natural voices. The video cast consisted of five animated avatar characters, including a female doctor, two parents, and two children (a 12-year-old girl and a boy who just turned 11 years old). The setting for the video was the doctor’s consultation room. The final video was deemed linguistically and culturally appropriate, while the study permitted parents to select watching the final video in English or Spanish. The avatar videos were launched through YouTube See Appendix K, *Screenshots of the Video*.

A link to the video was provided in Spanish and English for participants to choose from, as follows, while the link was embedded in the middle of the survey—between the pre- and post-video viewing measure:

English video: <https://youtu.be/0VagYrkvW0E> (5:07)

Spanish video: <https://youtu.be/dVtnSANVxsc> (6:25)

The English animated avatar video was 5:07 minutes long, while the Spanish version of the animated avatar video was 6:25 minutes long, given the nature of the typical translation process from English to Spanish.

Recruitment of Study Participants

A social media campaign was used to recruit participants for Study #1 and Study #2 using Facebook, Twitter, LinkedIn, email, Instagram, texting, and postings on other websites, while using core recruitment messages, as shown here.

Study #1 used the following core recruitment messages in English and Spanish, respectively:

GO TO <https://tinyurl.com/HPV-Video-English> if you have a child age 9-18, watch the video on the Human Papillomavirus (HPV), rate the video, & complete a survey for chance to win one of 3 \$100 Amazon gift cards [If you prefer taking the survey and watching the video in Spanish, then Go to <https://tinyurl.com/HPV-Video-Study-Spanish>]

☐

Vaya a <https://tinyurl.com/HPV-Video-Study-Spanish> si tiene un niño de 9 a 18 años de edad, mire el video sobre el virus del papiloma humano (VPH), califique el video y complete una encuesta para la oportunidad para ganar una de 3 tarjetas de regalo de Amazon de \$ 100 [Si usted prefiere tomar la encuesta y ver el video en inglés, vaya a <https://tinyurl.com/HPV-Video-Study-English>]

☐

Study # 2 used the following core recruitment message for providers:

CLICK <https://tinyurl.com/HPV-Video-Study-For-Providers> if U R a medical provider to youth ages 9-18, watch & rate an HPV video, & complete a survey-in just 10-12 minutes-for chance to win 1 of 3 \$100 Amazon gift cards

Incentives for participation in core recruitment messages. The use of the study incentive of having a 1 in 250 chance (i.e., original target goal for both Study #1 and 32 of N=250, respectively, which was not achieved) of winning one of three \$100 Amazon gift cards was codified in the core recruitment messages to enhance willingness to participate in the study. The uses of these core recruitment messages can be seen in all the following recruitment materials that were used in Study #1 or Study #2, respectively:

- Appendix B - *Study 1-Recruitment Emails*
- Appendix C - *Study 2-Recruitment Email*
- Appendix D - *Study 1-Text/Tweet*
- Appendix E - *Study 2-Text/Tweet*
- Appendix F - *Study 1-Recruitment Flyers*

Participants were invited to participate in the study via regular daily emails and posts on the various social media platforms. Also, the survey links were sent via text messaging. In addition, a flyer describing the study was disseminated in small businesses such as laundries, barbershops, beauty salons, bodegas, and faith-based organizations.

Participants who completed the survey were invited to share the study link with other parents via Facebook, email, text-messages, or twitter, thus employing a snowballing technique.

Healthcare providers were primarily recruited through emails sent to different healthcare institutions such as hospitals, family medicine practices, federally qualified health centers, and pediatric clinics. Healthcare institutions that received the email were invited to share the information about the opportunity to participate in the study with their providers, in particular those in pediatric or family medicine.

Following all of these procedures, subject recruitment and the online study took several weeks in the winter of 2019.

Inclusion/Exclusion Criteria Study #1

Participants were only included if they answered “yes” to the following questions to determine their eligibility for the study, and Spanish-speaking parents accessed a translated version of these questions:

- 1-Are you at least at least 25 years of age?
 Yes___ No___

2-Are you the parent/caregiver or legal guardian of at least ONE child between the ages of 9 and 18 years of age?

Yes___ No___

3-Are you able to read and understand English on a 12th grade level?

Yes___ No___

4-Are you able to devote about **35-40 minutes** to this study at this time—for a chance to win one of three \$100 Amazon gift cards?

Yes___ No___

5-More specifically, first, are you able to spend about **20-25 minutes** answering a set of questions?

Yes___ No___

6-Second, are you willing to spend **about 5 minutes** watching a cartoon video? This means using a computer with an Internet connection in a convenient location that will allow you to play the cartoon aloud?

Yes___ No___

7-Third, after you watch the cartoon, are you willing to rate it and answer a final set of questions for about another **5-10 minutes**?

Yes___ No___

If participants were not eligible, they received a message explaining why they were disqualified and that they could share the study link with other eligible parents.

Inclusion/Exclusion Criteria Study #2

Participants were asked the following questions and had to answer “yes” for study inclusion Study #2:

1-Are you a medical health care provider (e.g. physicians, physician assistants, nurse practitioners)? ___Yes ___No

2-Do you work in a pediatric or family care practice? ___Yes ___No

3-Have you had direct contact with patients within the past six months?
___Yes ___No

4-Are you at least 24 years of age?
___Yes ___No

5-Are you able to devote about **10-12 minutes** to this study at this time, including watching a 5-minute avatar/cartoon video and stating if you recommend it to other parents and providers?

Yes____ No____

If participants were not eligible, they received a message explaining why they were disqualified and that they could share the study link with their peers.

Other Study Procedures

Eligible participants from Study #1 and Study #2, who were interested in participating in this study, clicked on the survey link. After clicking on the survey link, participants read and signed the informed consent, as per their study, given these options:

- Appendix G - *Study 1-Informed Consent in English*
- Appendix H - *Study 1-Informed Consent in Spanish*
- Appendix H - *Study 2-Informed Consent*

Those eligible for study participation who completed the Informed Consent could proceed to the study survey, given these options:

- Appendix L - *Study 1-Survey in English*
- Appendix M - *Study 1-Survey in Spanish*
- Appendix N - *Study 2-Survey*

Video embedded in survey. Of note, located in between the pre-video viewing and post-video viewing surveys, the study video was embedded, whether in English or Spanish for parents in Study #1 or in English for providers in Study #2.

Prize Drawing

Upon completion of the survey, participants from Study #1 and Study #2 were directed to a “thank you” webpage where they were thanked for completing the study and were able to enter into a lottery where they had a chance to win one of three \$100 Amazon gift cards. In order to enter the lottery, participants had to enter their email

addresses into a database that was managed by Professor Wallace's RGDH Webmaster, Dr. Rupananda Misra. Participants were informed that the information they provided in the study was not linked to their email addresses, thus ensuring participants' confidentiality. Gift certificates were emailed to three participants who were randomly selected from the database. The gift certificates stated that participants had won the lottery as a result of their participation in this study.

Description of Study Participants

Study #1 Participants

The number of individuals who attempted to complete the study survey was 178. Of those, 98 were **English-speaking parents (ESP)** and 80 were **Spanish-speaking parents (SSP)**.

However, of the **original 178, only 68.5% (n=122) qualified** to participate in the study and provided Informed Consent to participate in the study, given the following eliminations of cases from the sample;

- **10** cases were eliminated as they were associated with 10 suspicious duplicate IP addresses
- **3** additional suspicious duplicate IP addresses were eliminated
- **43 cases of Study #1 non-completers** were eliminated for not having proceeded far enough into the survey to provide data for *Study #1 dependent variable of parents being in an action or maintenance stage of change for having made the decision and taken action to ensure their child received the HPV vaccination—as measured before parents watched a linguistically and culturally tailored cartoon video*. Of note, Study #1 dependent variable is a pre-video viewing question and does not depend on watching the video; hence, no eliminations of participants occurred due to not watching all or most of the video.

Thus, the Study #1 final sample size was N=122, including samples of **ESP n=68** and **SSP n=54**.

Comparison of Study #1 completers (n=122) to non-completers (n=43). A comparison of study completers (n=122) to study non-completers (n=43) using independent t-tests for all demographic variables showed that no comparisons were statistically significant.

Study #2 Participants

In Study #2, a total of 21 healthcare providers responded to the social media campaign and provided Informed Consent. Of those, 19 respondents completed the entire survey and watched the video. Hence, for Study #2, N=19 were providers in pediatrics or family medicine.

Description of the Research Instrumentation for Study #1

The Study #1 measure is called the Survey for Parents on HPV Vaccination for Children, while containing the parts described in this section.

Study #1—Survey Part I

The **Parent's Basic Demographics (PARENTS-BD-10)** was developed by Professor Barbara Wallace and is a common tool used by the Research Group on Disparities in Health (RGDH). The 10-item scale used in this study provided information about sociodemographic characteristics of parents, including gender, age, race and ethnicity, place of birth, residence, marital status, employment, income, education, and insurance status.

Study #1—Survey Part II

The **Part II: About Your Children (AYC-4)** is a new scale created by the Principal Investigator and her dissertation sponsor, Dr. Barbara Wallace, for use by the RGDH. It consists of a four-item scale which provided self-reported information from parents about their children. Information obtained included number of children between the ages of 9-18, child's gender, child preferred gender identity, and child insurance status.

Study #1—Survey Part III

The **Part III: Parent Report on Provider Recommendation on HPV Vaccination for Child (PARENT-R-PR-HPV-V-FC-2)** is a new scale created by the Principal Investigator and her dissertation sponsor, Dr. Barbara Wallace, for use by RGDH. This is a two-item scale and asks parents to respond whether medical providers such as pediatricians and/or family medicine practitioners ever talked to parents about the HPV infection and recommended the HPV vaccine to their child. Parents responses were rated “yes,” “no,” and “I’m not sure” and scored as a 0 or 1.

Study #1—Survey Part IV

The **Part IV: Parent Report on HPV vaccination for Child (PARENT-R-HPV-V-FC-2)** is a new two-item scale developed by the Principal Investigator to ask parents if their child ever received the HPV vaccine; it is rated “yes,” “no,” and “I’m not sure” and scored as a 0 or 1. If parents responded yes, they were asked to report the number of actual doses received. Responses were rated as “I’m not sure,” 1 dose, 2 doses, and 3 doses.

Study #1—Survey Part V

The **Part V: Parent Report on Flu Vaccination for Child (PARENT-R-FLU-V-FC-1)** is a new one-item scale developed by the Principal Investigator to assess if (a) one or more of the parents' children received the flu vaccination; and (b) parents believed in the value of an annual flu vaccination for their child. Responses were rated “yes,” “no,” and “I’m not sure” and scored as a 0 or 1.

Study #1—Survey Part VI

The **Part VI: Parent Exposure to Print or other Media or Information on HPV Vaccination for Children (PARENTEPOMI-HPV-VFC-1)** is a new one-item scale developed by the Principal Investigator to assess if parents ever read or watched a video or saw anything on television or on a social media platform or on the Internet about information related to HPV vaccination. Responses were scored (0 to 3) as follows:

- 0--No, no information at all
- 1--Yes, I was exposed to a very low amount of information
- 2--Yes, I was exposed to a low amount of information
- 3--Yes, I was exposed to a moderate amount of information

Study #1—Survey Part VII

The **Part VII: HPV General Knowledge (HPV-G-K-23)** was taken from the work of Perez et al. (2016), who demonstrated that an existing HPV general and HPV vaccine-specific knowledge scale was valid, reliable, and comprehensive, and could be used to measure HPV knowledge and change over time among parents of boys, in both English and French. This is a 25-item scale that showed high internal consistency ($\alpha > 0.87$) and good model fit. The forced-choice response categories included True/False/Don't know (scored 0) and True (scored 1).

The 25-item scale was reduced to 23 items in this Study #1, following Shapiro et al. (2018). Specifically, two items were dropped (“HPV usually does not need any treatment” and “HPV can cause herpes”), as they were also deleted from the Shapiro et al. study to improve the psychometric properties of the tool.

Study #1—Survey Part VIII

The **Part VIII: HPV Vaccine Knowledge Scale (HPV-V-K-S-11)** was also taken from Perez et al. (2016). The HPV-V-K-S is an 11-item scale that showed high internal consistency ($\alpha > 0.73$) and good model fit. As per Shapiro et al. (2018), in their study’s administration of the Vaccine Knowledge Scale, “vaccines” was changed to “vaccine” to make the measure consistently in the singular. Slight adaptations were also made to ensure the items were gender-neutral (rather than directed at parents of males only) and updated based on policy recommendations and current generation vaccines. Questions #10 and 11 that were specific to Canada were deleted and replaced with new items #10 and #11 in the present study. See Appendix L, *Study 31-Survey in English*.

Study #1—Survey Part IX

The **Part IX: General Vaccine Attitudes-Conspiracy Beliefs, and Hesitance due to Lack of Confidence or Risk (GVA-CB-HLC-R-16)** was taken from Shapiro et al. (2018), who sought to examine the validity of a Vaccine Conspiracy Belief Scale (VCBS) and determine if this scale was associated with parents’ willingness to vaccinate their sons against HPV. The Factor Analysis showed the VCBS is one-dimensional with high internal consistency ($\alpha > 0.937$). The construct validity of the VCBS was also

supported by a moderate relationship with the Conspiracy Mentality Questionnaire (CMQ) ($r=0.44$, $p<0.001$) (Shapiro et al., 2018).

One item from the original scale (“immunizing children is harmful and this fact is ‘covered up’”) was modified slightly in the Shapiro et al. (2016) study’s administration (to “negative vaccination effects are covered up”), as this was considered a double-barreled question. The designation “(R)” indicates items that were reverse-coded. Each of the three subscales, A, B, or C, is scored 1 to 5 as follows:

- 1=strongly disagree
- 2=disagree
- 3=somewhat disagree
- 4=neutral
- 5=somewhat agree
- 6=agree
- 7=strongly agree

Study #1—Survey Part X

The **Part X: Parent’s Perceived Barriers to Child’s Completion of the HPV Vaccination Series (PARENTS-PBCC-HPV-VS-12)** was developed based on the literature on barriers associated with HPV vaccination; it was created by the Principal Investigator and Professor Barbara Wallace for use by the RGDH. This new scale was designed to assess barriers or obstacles that parents experienced that prevented them from getting their children vaccinated against HPV. This was scored as a continuous scale from 0-12, where 0=no barriers and 12=highest barriers.

Study #1—Survey Part XI

The **Part XI: More about You (Social Desirability) (MAY-13)** was created by Crowne and Marlowe (1960) with the purpose to assess social desirability bias in

respondents, followed by the 13-item short form. The original Social Desirability scale consisted of a 33-item scale, with 18 items keyed as true and 15 false, “making a response set interpretation of scores highly improbable” (p. 350). Using Kuder-Richardson formula 20, the internal consistency coefficient for the scale was .88 and a test-retest correlation of .89. The short form of the original Social Desirability scale was used in this study.

Study #1—Survey Part XII

The **Part XII: Pre-Video Parents’ HPV Knowledge and Stage of Change and Self-Efficacy for Talking to Providers and Child Receiving the HPV Vaccine (PRE-V-PARENTSHPV-K-SOC-SE-FTP-CR-HPV-V-7)** is a standard scale used in studies conducted by the RGDH following the work of others (e.g., Chung, 2013), permitting self-ratings of participants’ stage of change and self-efficacy for performing specific behaviors, and the behaviors assessed are specific to the study, such as the behavior of talking to providers about HPV in this study.

For example, the present Study #1 inquired about three key talking behaviors of focus, for which stage of change and self-efficacy were measured: *(1) talking to a pediatrician or family practice medical provider about the Human papillomavirus (HPV) infection, and the HPV vaccination for children; (2) making sure their preteen and teen children receive the HPV vaccination; and (3) making sure their preteen and teen children receive all the required doses (e.g. at least 2 or 3 doses) of the HPV vaccination.* This involved a pre-video viewing versus post-video viewing comparison of parents’ stage of change and self-efficacy each of these three key behaviors.

The stage of change and self-efficacy scales typically produce very good to excellent internal consistency both pre- and post-video viewing—for those items measuring any study-specific behaviors of focus in that particular study. For example, consider the findings of Chung (2013) below; they show how the language of a Global score is often used, while subscales may also emerge.

1-Mom's Global Stage of Change, Knowledge, Self-efficacy, and Evaluation of Website for Four Behaviors Before E-Health Videos (M-SOC-K-SE-EWCV-F4B)	12	.951
2-Mom's Global Stage of Change, Knowledge, Self-efficacy, and Evaluation of Website for Four Behaviors After E-Health Videos (M-SOC-K-SE-EWCV-F4B)	12	.898
3-Stage of Change Before E-Health Videos Subscale	4	.855
4-Stage of Change After E-Health Video Subscale	4	.865
5-Self-efficacy Before E-Health Videos Subscale	4	.918
6-Self-efficacy After E-Health Videos Subscale	4	.861

Following Chung (2013), first parents were asked about their knowledge, using the following item and 6-option Likert scale as follows:

1-Please rate what you know, or your level of knowledge about the Human papillomavirus (HPV) infection HPV, and the HPV vaccination for children:

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

Next, parents were asked to rate themselves for each of the three key talking behaviors of interest, **first, for stages of changes**, and, **second, for self-efficacy**, while using the 6-option Likert scales shown below, respectively, each for stages of change and self-efficacy, as follows in a sample item:

Please rate yourself for the behavior of talking to a pediatrician or family practice medical provider about the Human papillomavirus (HPV) infection HPV, and the HPV vaccination for children – by checking what best describes you, below:

2-For doing this [**measure of stage of change**]

1 ___ I am not thinking of doing this behavior at all

(Score = **1-preparation stage**).

2 ___ I am thinking about doing this behavior.

(Score = **2-contemplation stage**).

3 ___ I am preparing to do this behavior.

(Score = **3-preparation stage**).

4 ___ I have been doing this behavior for less than six (6) months.

(Score = **4-action stage**).

5 ___ I have been doing this behavior for more than six (6) months up to many years.

(Score = **5-maintenance stage**).

___ I cannot answer because I do not know enough about the HPV vaccination.

3-And, for doing this I am [**measure of self-efficacy**]

1 ___ 0% confident 2 ___ 20% confident 3 ___ 40% confident

4 ___ 60% confident 5 ___ 80% confident 6 ___ 100% confident

___ I cannot answer, because I do not know enough about the HPV vaccination

Parents Watched Video

Upon completion of the pre-video viewing survey tools, parents were asked to click a link embedded in the survey and watch the video in English or Spanish:

Study #1—Survey Part XIII

The **Part XIII: Post-Video Viewing Adherence Survey for Providers (PVV-AS-PROVIDERS-1)** asked how much of the video they watched. Responses ranged from 0=none of the video to 3=all of the video.

Study #1—Survey Part XIV

The **Part XIV: Post-Video Parents' HPV Knowledge and Stage of Change and Self-Efficacy for Talking to Providers and Child Receiving the HPV Vaccine (PRE-V-PARENTSHPV-K-SOC-SE-FTP-CR-HPV-V-7)**. See the description under

Part XII. This is the same scale but for post-video. Paired t-tests were used to analyze the data from pre- to post-video viewing.

Study #1—Survey Part XV

The **Part XV: Rate the Video for Parents (RTV-PARENTS-2)** scale is a standard tool created by Professor Wallace for use by the RGDH in all video studies to assess the quality of video (e.g., Chung, 2013). Participants are asked to rate the video on a 6-point Likert-type, as follows:

Please think about the cartoon video you were asked to watch, and please rate the video:

1. I rate the video as follows:

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

___ I feel unable to rate the video - I was not able to watch all the video.

Study #1—Survey Part XVI

The **Part XVI: Diffusion of Innovation Using E-Health on HPV by Parents (DOF-UEH-HPV-PARENTS-1)** scale is a standard tool created by Professor Wallace for use by the RGDH in all video studies to assess the quality of video (e.g., Chung, 2013). Participants are asked whether or not they would recommend the video to other parents with children. Responses are scored as follow: 1=Yes to 0=No.

Study #1—Survey Part XVII

The **Part XVII: Qualitative Portion on Reasons for Recommending the E-Health or not—for Parents (QP-RREHV-PARENTS-1)** asked parents to explain why they would or would not recommend the video as follows:

1- Please explain why you would or would not recommend the video. Feel free to offer your comments on the strengths and weaknesses of the video, or how could it be improved.

___I feel unable to comment on the video – as I was not able to watch all the video

___I offer my comments on the video, as follows.

Study #1—Survey Part XVIII

This final survey part for parents, the **Qualitative Portion on Reactions to Study Participation** by parents, is a new question created by the Principal Investigator and her dissertation sponsor, Dr. Barbara Wallace, for use by the RGDH that simply asks:

1-What thoughts or feelings might you share in response to watching the video and/or taking this survey?

Description of the Research Instrumentation for Study #2

The Study #2 measure is called the *HPV Survey for Pediatric and Family Practice Providers*. See Appendix N, Study #2-Survey. Of note, some of the measures are the same as those discussed above yet adapted for providers. Hence, some details on the origin of the scale are not repeated here.

Study #2—Survey Part I

The **Part I: Provider’s Basic Demographics (PROVIDERS-BD-12)** is a common tool used by the RGDH, while questions were added which were specific to medical providers. The 12-item scale used in this study provided information about the sociodemographic characteristics of medical provider’s gender, age, race and ethnicity, residence, place of birth, marital status, employment, income, education attainment, types of practice, and number of years working in their practice.

Study #2—Survey Part II

The **Part II: Pre-Video Providers' Overall HPV Knowledge for Recommending HPV Vaccination to Parents for their Child—and Stage of Change, Self-efficacy, and Barriers (PRE-VIDEO-PROVIDERS-SOC-SE-B-4)** was created by the Principal Investigator and her dissertation sponsor, Dr. Barbara Wallace, for use by the RGDH. It is similar in structure and function to what was described earlier (**i.e., Part XII, above**) as a standard scale used in studies conducted by the RGDH following the work of others, such as Chung (2013). However, this scale allowed providers to rate themselves for **knowledge, stage of change, and barriers**, as shown below, including the associated Likert scales and scoring:

Knowledge Item: 1-Please rate what you know, or your level of knowledge about the Human papillomavirus (HPV) infection, the available HPV vaccinations, and the schedule for vaccinating preteen and teen boys and girls?

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

Stage of Change Item: Please rate yourself for the behavior of recommending within my medical practice to parents/guardians that they vaccinate their preteen and teen boys and girls for HPV—by checking what best describes you, below.
2-For doing this [**measure of stage of change**]

1_____I am not thinking of doing this behavior at all.

(Score = **1-preparation stage**).

2_____I am thinking about doing this behavior.

(Score = **2-contemplation stage**).

3_____I am preparing to do this behavior.

(Score = **3-preparation stage**).

4_____I have been doing this behavior for less than six (6) months.

(Score = **4-action stage**).

5_____I have been doing this behavior for more than six (6) months up to many years.

(Score = **5-maintenance stage**).

_____I cannot answer because I do not know enough about the HPV vaccination.

Self-Efficacy Item: 3-And, for doing this I am 1-6

0% confident 20% confident 40% confident
 60% confident 80% confident 100% confident
 I cannot answer because I do not know enough about the HPV vaccination.

Barriers Item: And, the degree of barriers I (e.g., time) experience in a medical visit for actually doing this is

(0) non-existent (none at all) (1) extremely low (2) very low (2) low
 (3) moderate (4) high (5) very high (6) extremely high

Providers Watched Video

After completing the above pre-video survey, the providers clicked a link and watched the e-health video in English for approximately 5 minutes.

Study #2—Survey Part III

The **Part III: Post-Video Viewing Adherence Survey for Provider (PVV-AS-PROVIDERS—1)** was discussed above under Study #1—Survey Part XIII.

Study #2—Survey Part IV

The **Part IV: Rate the Video for Providers (RTV-PROVIDERS-1)** asked to rate the cartoon as a potential linguistically and culturally appropriate tool to support parents in their decision making about whether or not to make sure their preteen or teen child receives the HPV vaccination series. It was rated the same as the version under Study #1—Survey Part XV.

Study #2—Survey Part V

The **Part V: Diffusion of Innovation using E-Health on HPV by Providers (DOF-UEH-HPV-PROVIDERS-1)** scale was treated as the dependent variable of the study, as pediatricians/family practitioners indicated whether they would recommend (yes/no) the video to parents and/or other providers so they could share it with parents. It was rated the same as the version under Study #1—Survey Part XVI.

1- Would you recommend this cartoon video for parents, or to other providers so they could share it with parents?
 1- __Yes _0- _No ___NA/Unable - I was not able to watch the video.

Study #2—Survey Parts VI and VII

The **Part VI: Evaluation—Qualitative Portion on Reactions to Study Participation by Providers (QP-RSP-PROVIDERS-1)**. The qualitative portion asked providers reasons for recommending the video and how the video can be improved.

Treatment of the Data

Data were downloaded from www.qualtrics.com to SPSS. The data were transferred and analyzed using SPSS 25.0.

Data Analysis Plan for Study #1 With Parents

Given an online sample of parents (n=122) who responded to a social media campaign (i.e., “Go to <https://tinyurl.com/HPV-Video-Study-English> to take the Survey for Parents on HPV Vaccination for Children and rate a cartoon for a chance to win 1 of 3 \$100 Amazon gift cards”) and complete the survey, Study #1 sought to answer the following research questions, using the data analysis plan indicated:

1-What are the parents' demographic characteristics (i.e., selected English or Spanish survey and video, gender, age, race/ethnicity, US born or not, partner status, employment status, annual household income, level of education, type of medical insurance)?

Part I: Parent's Basic Demographics (PARENTS-BD-10)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

2-What do parents report about their children (i.e., number of children ages 9 to 18, number of male and female children, child sexual orientation, type of medical insurance)?

Part II: About Your Children (AYC-4)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

3-Do parents report providers having talked to them about HPV and the HPV vaccination, and did the providers recommend the HPV vaccination for their child?

Part III: Parent Report on Provider Recommendation on HPV vaccination for Child (PARENT-R-PR-HPV-V-FC-2)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

4-Do parents report one or more of their children ever having received the HPV vaccination?

Part IV: Parent Report on HPV vaccination for Child (PARENT-R-HPV-V-FC-1)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

5-Do parents report one or more of their children ever having received the flu vaccination, and do they believe in the value of an annual (yearly) flu vaccination for their children?

Part V: Parent Report on HPV vaccination for Child (PARENT-R-FLU-V-FC-1)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

6-To what extent have parents been exposed to print or digital media providing information on the HPV vaccination for children?

Part VI: Parent Exposure to Print or Other Media or Information on HPV Vaccination for Children (PARENT-EPOMI-HPV-VFC-1)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

7-What is the parents' level of general HPV knowledge?

Part VII: HPV General Knowledge (HPV-G-K-23)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

8-What is the parents' level of HPV vaccine knowledge?

Part VIII: HPV Vaccine Knowledge Scale (HPV-V-K-S-11)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

9-What are the parents' general vaccine attitudes, including for (a) conspiracy beliefs, (b) vaccine hesitancy—lack of confidence, and (c) vaccine hesitancy—risks?

Part IX: General Vaccine Attitudes-Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks (GVA-CB-HLC-R-16)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

10-What are the parents' perceived barriers to their child completing the HPV vaccination series?

Part X: Parents' Perceived Barriers to Child's Completion of the HPV vaccination Series (PARENTS-PB-CC-HPV-VS-12)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

11-Pre-video viewing, what was the parents' knowledge of HPV, the prevalence of parents being in an action or maintenance stage for making sure their children received the HPV vaccination—as the Study #1 dependent variable—and their self-efficacy for doing this?

From Item # 4 of Part XII: Pre-Video Parents' HPV Knowledge and Stage of Change and Self-Efficacy for Talking to Provider and Child Receiving the HPV Vaccine (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

12-Was there a change in the parents' knowledge of HPV, as well as their stage of change and self-efficacy for three key behaviors [i.e. (1) talking to a pediatrician or family practice medical provider about the Human papillomavirus (HPV) infection, and the HPV vaccination for children; (2) making sure their children receive the HPV vaccination; and (3) making sure their children receive all the required doses (e.g. at least 2 or 3 doses) of the HPV vaccination] when comparing their pre-video viewing to post-video viewing mean scores?

Part XII: Pre-Video Parents' HPV Knowledge and Stage of Change and Self-Efficacy for Talking to Provider and Child Receiving the HPV Vaccine (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)

and

Part XIV: Post- Video Parents' HPV Knowledge and Stage of Change and Self-Efficacy for Talking to Provider and Child Receiving the HPV Vaccine (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)

Data Analysis Plan: *Paired t-tests.*

13-How do the parents rate the video cartoon?

Part XV: Rate the Video for Parent (RTV-PARENTS-2)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

14-Do the parents recommend the video cartoon to other parents?

Part XVI: Diffusion of Innovation using E-Health on HPV by Parents (DOF-UEH-HPV-PARENTS-1)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

15-Are there any significant differences between the responses of the English-speaking and Spanish-speaking parents on the study measures?

Data Analysis Plan: *Independent t-tests*

16-Controlling for social desirability, what are the significant predictors of parents being in an action or maintenance stage for making sure their children received the HPV vaccination—*before the video*—as the Study # 1 dependent variable?

Data Analysis Plan: *Backward stepwise regression*

Qualitative Portion of Study #1

17-How do parents respond when asked why they would or would not recommend the video, including any comments on the strengths and weaknesses of the video, or how could it be improved?

Part XVII: Qualitative Portion on Reasons for Recommending the E-Health Video or Not—For Parents (QP-RREHV-PARENTS-1)

Data Analysis Plan: *Identification of emergent themes*

18-What additional thoughts or feelings do the parents share in reaction to the video and/or taking the survey?

Part XVIII: Qualitative Portion on Reasons to Study Participation by Parents (QP-RSP-PARENTS-1)

Data Analysis Plan: *Identification of emergent themes*

Study #2 With Providers

Given an online sample of providers (n=19 pediatricians or family practitioners) who respond to a social media campaign (i.e. "Click <<https://tinyurl.com/HPV-Video-Study-For-Providers>> to take 10-12 min Survey for Pediatric & Family Practice

Providers on HPV vaccination for preteens/teens & rate a cartoon for parents on HPV”)

and complete the survey, Study #2 answered the following research questions.

Study #2 Research Questions

Study #2 With Providers

Given an online sample of providers (n=19 pediatricians or family practitioners) who respond to a social media campaign (i.e., “Click <<https://tinyurl.com/HPV-Video-Study-For-Providers>> to take 10-12 min Survey for Pediatric & Family Practice

Providers on HPV vaccination for preteens/teens & rate a cartoon for parents on HPV”)

and complete the survey, the study #2 answered the following research questions:

1-What were the providers’ demographic and background characteristics (gender, age, race/ethnicity, US born or not, partner status, annual household income, status as a current job title, pediatric or family practitioner, work setting, years in current position pediatrics or family practice, years in health care)?

Part I: Provider’s Basic Demographics (PROVIDERS-BD-15)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

2-What was the providers’ (a) level of knowledge about the Human papillomavirus (HPV) infection, the available HPV vaccinations, and schedule for vaccinating preteen and teen boys and girls—and for the behavior of recommending within their medical practice to parents/guardians that they vaccinate their preteen and teen boys and girls for HPV—and, also their (b) stage of change, (c) self-efficacy, and (d) perception of barriers (e.g. time) experienced during a medical visit for doing this?

Part II: Pre-Video Providers’ Overall HPV Knowledge for Recommending HPV Vaccination to Parents for their Child—and Stage of Change, Self-efficacy, and Barriers (PRE-VIDEO-PROVIDERS-SOC-SE-B-4)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

3-How did the providers rate the quality of the cartoon video as a potential linguistically and culturally appropriate tool (i.e., available in English and Spanish) to support parents in their decision-making about whether or not they make sure their preteen or teen child receives the HPV vaccination series.

Part III: Rate the Video for Providers (RTV-PROVIDERS-1)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

4-Do the providers recommend the cartoon video for parents, or to other providers so they could share it with parents?

Part IV: Diffusion of Innovation using E-Health on HPV by Providers (DOF-UEH-HPV-PROVIDERS-1)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

Qualitative Portion of Study #2

5-How do the providers explain why they would or would not recommend the video to parents or other providers, including any comments on the strengths and weaknesses of the video, or how could it be improved?

Part V: Qualitative Portion on Reasons for Recommending the E-Health Video or not—for Providers (QP-RREHV-PROVIDERS-1)

Data Analysis Plan: *Identification of emergent themes and categories*

6-What additional thoughts or feelings do the providers share in response to watching the video and/or taking the survey?

Part VI: Qualitative Portion on Reactions to Study Participation by Providers (QP-RSP-PROVIDERS-1)

Data Analysis Plan: *Identification of emergent themes and categories*

Qualitative Data Analysis Strategy

Regarding the analysis of qualitative data, the steps followed are outlined in Appendix O, *Qualitative Data Analysis Strategy*.

Conclusion

The chapter provided the methods used in this study, including the study design, procedures, and recruitment of participants. Also, this chapter described the study participants, research instrumentation, and treatment of the data and data analysis plan.

Chapter IV next describes the results of the study.

Chapter IV

RESULTS

This chapter provides the results of the data analysis for Study #1 and Study #2. The chapter is organized by research questions and includes a summary of the findings in tables.

Internal Consistency of Study Scales

The scales used in the study can be examined for the internal consistency—where appropriate, as shown in Appendix Q, *Internal Consistency of the Study Scales*.

Data Analysis Results by Study Question for Study #1

Results for Research Question #1

What are the parents' demographic characteristics (i.e., selected English or Spanish survey and video, gender, age, race/ethnicity, US born or not, partner status, employment status, annual household income, level of education, type of medical insurance)?

The whole sample consisted of 122 parents who provided electronic informed consent and completed the entire online survey. Of the whole sample (n=122), 68 were English-speaking parents (ESP) and 54 were Spanish-speaking parents (SSP). Thus, the convenience sample consisted of 122 of racially and ethnically diverse parents.

In the whole sample of parents (n=122), 95.9% (n=117) were females and only 4.1% (n=5) were males. Among ESP, 94.1% (n=64) were females and 5.9% (n=4) were males. Among SSP, 98.1% (n=53) were females and 1.9% (n=1) was male. The mean age for the whole sample (n=122) was 40.08 years (min=26, max=72, SD=7.06). The mean age for ESP (n=68) was 41.16 years (min=27, max=72, SD=6.72). The mean age for SSP (n=54) was 38.72 years (min=26, max=55, SD=7.31).

The mean household income distribution for the whole sample (n=122) was 4.09 (min=1, max=9, SD=1.95). The mean household income distribution for ESP (n=68) was 4.57 (min=1, max=9, SD=1.97) with the highest income ranging from \$40,000 to \$49,000 (30.9%, n=21). While the mean household income distribution for SSP (n=54) was 3.48 (min=1, max=7, SD=1.78), with the highest income ranging from \$20,000 to \$39,000 (27.8%, n=15).

The mean education for the whole sample (n=121) was 4.05 (min 1, max 9, SD=1.98). The mean education for the ESP (n=67) was 4.72 (min 1, max 9, SD=1.88). The mean education for the SSP (n=54) was 3.22 (min=1, max=7, SD=1.78).

Regarding employment status, 73.8% (n=90) of parents reported been employed, and of these 90 parents, 79.4% (n=54) were ESP and 66.7% (n=36) were SSP.

Private insurance plans were the most prevalent source of health coverage reported among ESP (58.8%, n=40) and SSP (31.5%, n=17), respectively. Of the 42.6% (n=52) parents who were born in the United States, 55.9% (n=38) were ESP and 25.9% (n=14) were SSP.

See Table 1.

S1. Table 1. Parents' Demographic Characteristics of Sample (PARENTS-BD-10) (N=122)

	N	%
Gender		
Whole Sample (N=122)		
Female	117	95.9
Male	5	4.1
English-Speaking Sample (N=68)		
Female	64	94.1
Male	4	5.9
Spanish-Speaking Sample (N=54)		
Female	53	98.1
Male	1	1.9
Age		
Whole Sample (N=122)		
<30	13	10.7
31-40	50	41
41-50	51	41.8
51-60	7	5.7
61-72	1	.8
<i>M whole=40.08, SD=7.06, Min=26, Max=72</i>		
English-Speaking Sample (N=68)		
<30	5	7.4
31-40	26	38.2
41-50	33	48.5
51-60	3	4.4
61-72	1	1.5
<i>M=41.16, SD=6.72, Min=27, Max=72</i>		
Spanish-Speaking Sample (N=54)		
<30	8	14.8
31-40	24	44.4
41-50	18	33.3
51-60	4	7.4
61-72	0	0
<i>M=38.72, SD=7.31, Min=26, Max=55</i>		
Household Annual Income		
Whole sample (N=122)		
1-Less than \$9,000	16	13.1
2-\$10,000 to \$19,000	14	11.5
3-\$20,000 to \$39,000	20	16.4
4-\$40,000 to \$49,000	9	7.4
5-\$50,000 to \$99,999	36	29.5
6-\$100,000 to \$199,999	15	12.3
7-\$200,000 to \$299,000	9	7.4
8-\$300,000 to \$399,000	1	.8
9-\$400,000 to \$499,000	2	1.6

M whole=4.09, SD=1.954, Min=1, Max=9

English-Speaking Sample (N=68)

1-Less than \$9,000	6	8.8
2-\$10,000 to \$19,000	7	10.3
3-\$20,000 to \$39,000	7	10.3
4-\$40,000 to \$49,000	6	8.8
5-\$50,000 to \$99,999	21	30.9
6-\$100,000 to \$199,999	11	16.2
7-\$200,000 to \$299,000	7	10.3
8-\$300,000 to \$399,000	1	1.5
9-\$400,000 to \$499,000	2	2.9

M=4.57, SD=1.972, Min=1, Max=9

Spanish-Speaking Sample (N=54)

1-Less than \$9,000	10	18.5
2-\$10,000 to \$19,000	7	13.0
3-\$20,000 to \$39,000	13	24.1
4-\$40,000 to \$49,000	3	5.6
5-\$50,000 to \$99,999	15	27.8
6-\$100,000 to \$199,999	4	7.4
7-\$200,000 to \$299,000	2	3.7
8-\$300,000 to \$399,000	0	0
9-\$400,000 to \$499,000	0	0

M=3.48, SD=1.78, Min=1, Max=7

Race/Ethnicity

Whole Sample (N=122)

1-Non-Hispanic Black	14	11.5
2- Non-Hispanic White	10	8.2
3-Hispanic/Latino	83	68.0
4-Asian	9	7.4
6-Native Hawaiian/Pacific Islander	1	.8
7- Arab American / Middle Eastern	1	.8
8- Native American/American Indian/Alaska Native	1	.8
9- Other group(s)	7	5.7

English-Speaking Sample (N=68)

1-Non-Hispanic Black	14	20.6
2- Non-Hispanic White	10	14.7
3-Hispanic/Latino	30	44.1
4-Asian	9	13.2
6-Native Hawaiian/Pacific Islander	1	1.5
7- Arab American/Middle Eastern	1	1.5
8- Native American/American Indian/Alaska Native	1	1.9
9- Other group(s)	7	10.3

Spanish-Speaking Sample (N=54)

1-Non-Hispanic Black	0	0
2- Non-Hispanic White	0	0
3-Hispanic/Latino	53	98.1
4-Asian	0	0
6-Native Hawaiian/Pacific Islander	0	0
7- Arab American/Middle Eastern	1	1.9
8- Native American/American Indian/Alaska Native	0	0
9- Other group(s)	0	0

Level of Education**Whole sample (N=121)**

1-Less than High-school	10	8.2
2-High school or high school equivalent (GED)	20	16.4
3-Some college or a Certificate Program	29	23.8
4-2-year college degree (Associate's)	7	5.7
5-4-year college degree (Bachelor's)	24	19.7
6-Master's degree	23	18.9
7- J.D. (Lawyer)	1	.8
8-Doctoral Degree (Ph.D., Ed.D.)	3	2.5
9-Medical Degree (M.D., D.D.S.)	4	3.3

M* whole=4.05, *SD*=1.98, *Min*=1, *Max*=9*English-Speaking Sample (N=67)**

1-Less than High-school	2	2.9
2-High school or high school equivalent (GED)	6	8.8
3-Some college or a Certificate Program	12	17.6
4-2-year college degree (Associate's)	6	8.8
5-4-year college degree (Bachelor's)	22	32.4
6-Master's degree	12	17.6
8-Doctoral Degree (Ph.D., Ed.D.)	3	4.4
9-Medical Degree (M.D., D.D.S.)	4	5.9

M*=4.72, *SD*=1.88, *Min*=1, *Max*=9*Spanish-Speaking Sample (N=54)**

1-Less than High-school	8	14.8
2-High school or high school equivalent (GED)	14	25.9
3-Some college or a Certificate Program	17	31.5
4-2-year college degree (Associate's)	1	1.9
5-4-year college degree (Bachelor's)	2	3.7
6-Master's degree	11	20.4
7-J.D. (Lawyer)	1	1.9
8-Doctoral Degree (Ph.D., Ed.D.)	0	0
9-Medical Degree (M.D., D.D.S.)	0	0

***M*=3.22, *SD*=1.78, *Min*=1, *Max*=7**

Employed**Whole Sample (N=122)**

Yes	90	73.8
No	13	10.7

English-Speaking Sample (N=68)

Yes	54	79.4
No	7	10.3

Spanish-Speaking Sample (N=54)

Yes	36	66.7
No	6	11.1

Marital status**Whole Sample (N=122)**

1-Single	19	15.6
2-Married	66	54.1
3-Separated	8	6.6
4-Divorced	17	13.9
5-Widowed	1	.8
6-In Domestic Partnership	4	3.3
7-Living with Significant Other	7	5.7

English-Speaking Sample (N=68)

1-Single	7	10.3
2-Married	40	58.8
3-Separated	4	5.9
4-Divorced	12	17.6
5-Widowed	1	1.5
6-In Domestic Partnership	2	2.9
7-Living with Significant Other	2	2.9

Spanish-Speaking Sample (N=54)

1-Single	12	22.2
2-Married	26	48.1
3-Separated	4	7.4
4-Divorced	5	9.3
5-Widowed	0	0
6-In Domestic Partnership	2	3.7
7-Living with Significant Other	5	9.3

Whole Sample (N=122)

1-Private insurance plan	57	46.7
2- HMO insurance	16	13.1
3-Medicaid	15	12.3
4-Medicare	10	8.2
5- Other insurance plan	7	5.7
6- None	22	18.0

English-Speaking Sample (N=68)

1-Private insurance plan	40	58.8
2- HMO insurance	6	8.8
3-Medicaid	7	10.3

4-Medicare	6	8.8
5- Other insurance plan	7	10.3
6- None	6	8.8
Spanish-Speaking Sample (N=54)		
1-Private insurance plan	17	31.5
2- HMO insurance	10	18.5
3-Medicaid	8	14.8
4-Medicare	4	7.4
5- Other insurance plan	0	0
6- None	16	29.6
Whole Sample (N=122)		
Yes	52	42.6
No	70	57.4
English-Speaking Sample (N=68)		
Yes	38	55.9
No	30	44.1
Spanish-Speaking Sample (N=54)		
Yes	14	25.9
No	40	74.1

Results for Research Question #2

What do parents report about their children (i.e., number of children ages 9 to 18, number of male and female children, child sexual orientation, type of medical insurance)?

The mean of children aged 9-18 for the whole sample (n=122) was 1.61 (min=1, max=4, SD=.765). The mean of children aged 9-18 for ESP (n=68) was 1.63 (min=1, max=4, SD=.710). The mean of children aged 9-18 for SSP (n=54) was 1.59 (min=1, max=4, SD=.836).

Some 90.2% (n=110) of the whole sample reported that 0 of their children were LGBTQ.

Also, 48.4% (n=59) of parents reported that their children had a private health insurance plan, and of those, 58.8% (n=40) were ESP and 35.2% (n=19) were SSP.

See Table 2.

S1. Table 2. Children Demographic Characteristics Reported by Parents (PARENTS-BD-10) (N=122)

	N	%
<i>What do parents report about the number of children aged 9 to 18?</i>		
Whole Sample (N=122)		
1-Child	65	53.3
2-Children	42	34.4
3-Children	12	9.8
4-Children	3	2.5
<i>M whole=1.61, SD=.765, Min=1, Max=4</i>		
English-Speaking Sample (N=68)		
1-Child	33	48.5
2-Children	28	41.2
3-Children	6	8.8
4-Children	1	1.5
<i>M=1.63, SD=.710, Min=1, Max=4</i>		
Spanish-Speaking Sample (N=54)		
1-Child	32	59.3
2-Children	14	25.9
3-Children	6	11.1
4-Children	2	3.7
<i>M=1.59, SD=.836, Min=1, Max=4</i>		
<i>What do parents report about the number of male and female children?</i>		
<i>Child's gender</i>		
Whole Sample of Female Children (N=122)		
0-Child	34	27.9
1-Child	65	53.3
2-Children	17	13.9
3-Children	6	4.9
<i>M whole=.96, SD=.786, Min=0, Max=3</i>		
Whole Sample of Male Children (N=122)		
0-Child	25	20.5
1-Child	59	48.4
2-Children	31	25.4
3-Children	5	4.1
4-Children	2	1.6
<i>M whole=1.18, SD=.863, Min=0, Max=4</i>		
English-Speaking Female Children (N=68)		
0-Child	19	27.9
1-Child	37	54.4
2-Children	9	13.2
3-Children	3	4.4
<i>M=.94, SD=.770, Min=0, Max=3</i>		
English-Speaking Male Children (N=68)		
0-Child	16	23.5
1-Child	35	51.5

2-Children	15	22.1
3-Children	2	2.9
<i>M=1.04, SD=.762, Min=0, Max=3</i>		
Spanish-Speaking Female Children (N=54)		
0-Child	15	27.8
1-Child	28	51.9
2-Children	8	14.8
3-Children	3	5.6
<i>M=.98, SD=.812, Min=0, Max=3</i>		
Spanish-Speaking Male Children (N=54)		
0-Child	9	16.7
1-Child	24	44.4
2-Children	16	29.6
3-Children	3	5.6
4-Children	2	3.7
<i>M=1.35, SD=.955, Min=0, Max=4</i>		
<i>What do parents report about their child sexual orientation?</i>		
<i>How Many are Heterosexual?</i>		
Whole Sample (N=117)		
0-Child	47	38.5
1-Child	25	20.5
2-Children	25	20.5
3-Children	16	13.1
4-Children	3	2.5
5-Children	1	.8
Missing	5	4.1
<i>M whole=1.20, SD=1.23, Min=0, Max=5</i>		
English-Speaking Sample (N=64)		
0-Child		
1-Child	22	32.4
2-Children	18	26.5
3-Children	16	23.5
4-Children	7	10.3
5-Children	1	1.5
Missing	4	5.9
<i>M=1.19, SD=1.13, Min=0, Max=5</i>		
Spanish-Speaking Sample (N=53)		
0-Child		
1-Child	25	46.3
2-Children	7	13.0
3-Children	9	16.7
4-Children	9	16.7
Missing	3	5.6
<i>M=1.21, SD=1.350, Min=0, Max=4</i>		
<i>How many of your children are LGBTQ?</i>		
Whole Sample (N=117)		

0-Child	110	90.2
1-Child	5	4.1
2-Children	1	.8
Missing	6	4.9
<i>M whole=.06, SD=.273, Min=0, Max=2</i>		
English-Speaking Sample (N=63)		
0-Child	57	83.8
1-Child	5	7.4
2-Children	1	1.5
Missing	5	7.4
<i>M=.11, SD=.364, Min=0, Max=2</i>		
Spanish-Speaking Sample (N=53)		
0-Child	53	98.1
Missing	1	1.9
<i>M=.00, SD=.000, Min=0, Max=0</i>		
<i>What do parents report about their children's type of medical insurance?</i>		
<i>Child's insurance status</i>		
Whole Sample (N=122)		
1-Private insurance plan	59	48.4
2- HMO insurance	21	17.2
3-Medicaid	31	25.4
4-Medicare	18	14.8
5- None	6	4.9
English-Speaking Sample (N=68)		
1-Private insurance plan	40	58.8
2- HMO insurance	10	14.7
3-Medicaid	14	20.6
4-Medicare	6	8.8
5-None	3	4.4
Spanish-Speaking Sample (N=54)		
1-Private insurance plan	19	35.2
2- HMO insurance	11	20.4
3-Medicaid	17	31.5
4-Medicare	12	22.2
5-None	3	5.6

Results for Research Question #3

Do parents report providers having talked to them about HPV and the HPV vaccination, and did the providers recommend the HPV vaccination for their child?

Some 62.3% (n=76) of parents reported that their child's healthcare provider talked to them about the HPV infection and the HPV vaccine. Among these 76 parents, 64.7% (n=44) were ESP and 59.3% (n=32) were SSP. Also, 55.9% (n=38) of ESP and 50% (n=27) SSP reported receiving a provider recommendation to vaccinate their child.

See Table 3.

S1. Table 3: Parent Report on Provider Recommending the HPV Vaccination for Child (PARENT-R-PR-HPV-V-FC-2) (N=122)

	N	%
<i>Do parents report providers having talked to them about HPV and the HPV vaccination?</i>		
Whole Sample (N=122)		
Yes	76	62.3
No	46	37.7
English-Speaking Sample (N=68)		
Yes	44	64.7
No	24	35.3
Spanish-Speaking Sample (N=54)		
Yes	32	59.3
No	22	40.7
<i>Parent reported on provider recommending the HPV vaccination for their child</i>		
Whole Sample (N=122)		
Yes	65	53.3
No	57	46.7
English-Speaking Sample (N=68)		
Yes	38	55.9
No	30	44.1
Spanish-Speaking Sample (N=54)		
Yes	27	50.0
No	27	50.0

Results for Research Question #4

Do parents report one or more of their children ever having received the HPV vaccination?

Some 38.5% (n=47) of parents reported that their child received one or more doses of the HPV vaccine. Of the 47 parents, 41.2% (n=28) were ESP and 35.2% (n=19) were SSP. Further, 9% (n=12) of parents reported their child received two doses, of these, 8.8% (n=6) were ESP and 11.1% (n=6) of SSP. Among 11% (n=9) of parents who reported their child received three doses, 11.8% (n=8) were ESP and 5.6% (n=3) of SSP.

See Table 4.

S1. Table 4. Parents Reported HPV Vaccination of One or More (PARENT-R-HPV-V-FC-1) (N=122)

	N	%
<i>Do parents report one or more of their children ever having received the HPV vaccination?</i>		
Whole Sample (N=122)		
Yes	47	38.5
No	75	61.5
English-Speaking Sample (N=68)		
Yes	28	41.2
No	40	58.8
Spanish-Speaking Sample (N=54)		
Yes	19	35.2
No	35	64.8
<i>For the HPV vaccination given to your child, please indicate how many doses your child received (i.e., returned to medical provider for dose or doses)</i>		
Whole Sample (N=122)		
1 dose	15	12.3
2 doses	12	9.8
3 doses	11	9.0
I'm not sure	9	7.4
English-Speaking Sample (N=68)		
1 dose	9	13.2
2 doses	6	8.8
3 doses	8	11.8
I'm not sure	5	7.4
Spanish-Speaking Sample (N=54)		
1 dose	6	11.1
2 doses	6	11.1
3 doses	3	5.6
I'm not sure	4	7.4

Results for Research Question #5

Do parents report one or more of their children ever having received the flu vaccination, and do they believe in the value of an annual (yearly) flu vaccination for their children?

For the whole sample, 86.1 % (n=105) of parents reported that their child received the flu vaccination. Of these 105 parents, 91.2% (n=62) were ESP and 79.6% (n=43) were SSP. Also, 52.9% (n=36) of ESP and 83.3% (n=45) of SSP indicated that they believe in the value of flu vaccination.

See Table 5.

S1. Table 5. Parents Reported One or More of Their Children Ever Having Received the Flu Vaccination (PARENT-R-FLU-V-FC-1) (N=122)

	N	%
<i>Do parents report one or more of their children ever having received the flu vaccination?</i>		
Whole Sample (N=122)		
Yes	105	86.1
No	17	13.9
English-Speaking Sample (N=68)		
Yes	62	91.2
No	6	8.8
Spanish-Speaking Sample (N=54)		
Yes	43	79.6
No	11	20.4
<i>Do parents believe in the value of an annual (yearly) flu vaccination for their children?</i>		
Whole Sample (N=122)		
Yes	81	66.4
No	41	33.6
English-Speaking Sample (N=68)		
Yes	36	52.9
No	32	47.1
Spanish-Speaking Sample (N=54)		
Yes	45	83.3
No	9	16.7

Results for Research Question #6

To what extent have parents been exposed to print or digital media providing information on the HPV vaccination for children?

The mean score for the whole sample (n=116) was 2.24 for exposed to a *very low amount of information* (min=0, max=5, SD=1.60). The mean score ESP (n=63) was 2.49 or exposed to a very low amount of information (min=0, max=5, SD=1.66). The mean score for SSP (n=54) was 1.94 or closest to being exposed to a very low amount of information (min=0, max=5, SD=1.45).

See Table 6.

S1. Table 6. Parents Reported Exposure to Print or Digital Media Information on HPV Vaccination (PARENT-EPOMI-HPV-VFC-1) (N=122)

	N	%
<i>To what extent have parents been exposed to print or digital media providing information on the HPV vaccination for children?</i>		
Whole Sample (N=122)		
<i>M whole=2.24, SD=1.60, Min=0, Max=5</i>		
English-Speaking (n=68) <i>M=2.49, SD=1.66, Min=0, Max=5</i>		
Spanish-Speaking (n=54) <i>M=1.94, SD=1.45, Min=0, Max=5</i>		
Whole Sample (N=122)		
1-No-no information at all	19	15.6
2-Yes, I was exposed to a very low amount of information	25	20.5
3-Yes, I was exposed to a low amount of information	20	16.4
4- Yes, I was exposed to a moderate amount of information	28	23.0
5- Yes, I was exposed to a large amount of information	9	7.4
6- Yes, I was exposed to a very large amount of information	15	12.3
7-Not Applicable - I'm not sure about this	6	4.9
English-Speaking Sample (N=68)		
1-No-no information at all	8	11.8
2-Yes, I was exposed to a very low amount of information	13	19.1

3-Yes, I was exposed to a low amount of information	10	14.7
4- Yes, I was exposed to a moderate amount of information	16	23.5
5- Yes, I was exposed to a large amount of information	4	5.9
6- Yes, I was exposed to a very large amount of information	12	17.6
7-Not Applicable - I'm not sure about this	5	7.4
Spanish-Speaking Sample (N=68)		
1-No-no information at all	11	20.4
2-Yes, I was exposed to a very low amount of information	12	22.2
3-Yes, I was exposed to a low amount of information	10	18.5
4- Yes, I was exposed to a moderate amount of information	12	22.2
5- Yes, I was exposed to a large amount of information	5	9.3
6- Yes, I was exposed to a very large amount of information	3	5.6
7-Not Applicable - I'm not sure about this	1	1.9

Results for Research Question #7

What is the parents' level of general HPV knowledge?

The mean score for the whole sample (n=122) was 12.05 (min=0, max=23, SD=6.79) for *moderate level of general HPV knowledge*.

See Table 7.

S1. Table 7. Whole Sample: Parents' HPV Vaccine Knowledge (HPV-G-K-23)
(N=122)

	N	%
<i>What is the parents' level of general HPV knowledge?</i>		
Whole Sample (N=122)		
<i>M whole=12.05, SD=6.79, Min=0, Max=23</i>		
English-Speaking (n=68) M=13.15, SD=6.63, Min=0, Max=23		
Spanish-Speaking (n=54) M=10.67, SD=6.79, Min=0, Max=23		
The 23 General HPV Knowledge Items		
<i>1-HPV is very rare</i>		
True	18	14.8
False	61	50.0
I Don't Know (missing)	43	35.2
<i>2-HPV always has visible signs or symptoms</i>		
True	21	17.2
False	58	47.5
I Don't Know (missing)	43	35.2
<i>3-HPV can cause cervical cancer</i>		
True	93	76.2
False	1	.8
I Don't Know (missing)	28	23.0
<i>4-HPV can be transmitted through genital skin-to-skin contact</i>		
True	70	57.4
False	14	11.5
I Don't Know (missing)	38	31.1
<i>5-There are many types of HPV</i>		
True	65	53.3
False	5	4.1
I Don't Know (missing)	52	42.6
<i>6-HPV can cause HIV/AIDS</i>		
True	12	9.8
False	53	43.4
I Don't Know (missing)	57	46.7
<i>7- HPV can be passed on during sexual intercourse</i>		
True	98	80.3
False	2	1.6
I Don't Know (missing)	22	18.0
<i>8-HPV can cause genital warts</i>		
True	77	63.1
False	3	2.5
I Don't Know (missing)	42	34.4
<i>9-Men cannot get HPV</i>		
True	18	14.8
False	76	62.3
I Don't Know (missing)	28	23

<i>10-Using condoms reduces the chances of HPV transmission</i>		
True	73	59.8
False	13	10.7
I Don't Know (missing)	36	29.5
<i>11-HPV can be cured with antibiotics</i>		
True	13	10.7
False	56	45.9
I Don't Know (missing)	53	43.4
<i>12-Having many sexual partners increases the risk of getting HPV</i>		
True	91	74.6
False	4	3.3
I Don't Know (missing)	27	22.1
<i>13-Most sexually active people will get HPV at some point in their lives</i>		
True	56	45.9
False	16	13.1
I Don't Know (missing)	50	41.0
<i>14-A person could have HPV for many years without knowing it</i>		
True	87	71.3
False	2	1.6
I Don't Know (missing)	33	27
<i>15-Having sex at an early age increases the risk of getting HPV</i>		
True	70	6.6
False	8	63.9
I Don't Know (missing)	44	36.1
<i>16-HPV can cause anal cancer</i>		
True	48	39.3
False	9	7.4
I Don't Know (missing)	65	53.3
<i>17-HPV is a bacterial infection</i>		
True	33	27
False	38	31.1
I Don't Know (missing)	51	41.8
<i>18-HPV can be transmitted through oral sex</i>		
True	59	48.4
False	9	55.7
I Don't Know (missing)	54	44.3
<i>19-HPV can cause cancer of the penis</i>		
True	46	37.7
False	9	7.4
I Don't Know (missing)	67	54.9
<i>20-HPV can be transmitted through anal sex</i>		
True	59	48.4
False	6	4.9
I Don't Know (missing)	57	46.7

21-HPV infections always lead to health problems

True	53	43.4
False	26	21.3
I Don't Know (missing)	43	35.2

22-HPV can cause oral cancer

True	55	45.1
False	8	6.6
I Don't Know (missing)	59	48.4

23-A person with no symptoms cannot transmit the HPV infection

True	23	18
False	55	45.1
I Don't Know (missing)	44	36.1

The mean score for HPV-G-K-23 for ESP (n=68) was 13.15 (min 0, max 23, SD 6.63) for *moderate level of general HPV knowledge*; and the mean score for HPV-G-K-23 for SSP (n= 54) was 10.67 (min=0, max=23, SD=6.79)—for *moderately low level of general HPV knowledge*.

See Table 8.

S1. Table 8. English-Speaking and Spanish-Speaking Parents' HPV Vaccine Knowledge (HPV-G-K-23) (N=122)

	N	%
What is the parents' level of general HPV knowledge?		
Whole Sample (N=122)		
<i>M whole=12.05, SD=6.785, Min=0, Max=23</i>		
English-Speaking (n=68) M=13.15, SD=6.629, Min=0, Max=23		
Spanish-Speaking (n=54) M=10.67, SD=6.785, Min=0, Max=23		
The 23 General HPV Knowledge Items		
1-HPV is very rare		
English-Speaking Sample (N=68)		
True	9	13.2
False	41	60.3
I Don't Know (missing)	18	26.5
Spanish-Speaking Sample (N=54)		
True	9	16.7
False	20	37.0
I Don't Know (missing)	25	46.3

2-HPV always has visible signs or symptoms**English-Speaking Sample (N=68)**

True	7	10.3
False	39	57.4
I Don't Know (missing)	22	32.4

Spanish-Speaking Sample (N=54)

True	14	25.9
False	19	35.2
I Don't Know (missing)	21	38.9

3-HPV can cause cervical cancer**English-Speaking Sample (N=68)**

True	54	79.4
False	1	1.5
I Don't Know (missing)	13	19.1

Spanish-Speaking Sample (N=54)

True	39	72.2
False (Blank)		
I Don't Know (missing)	15	27.8

4-HPV can be transmitted through genital skin-to-skin contact**English-Speaking Sample (N=68)**

True	38	55.9
False	11	16.2
I Don't Know (missing)	19	27.9

Spanish-Speaking Sample (N=54)

True	32	59.3
False	3	5.6
I Don't Know (missing)	19	35.2

5-There are many types of HPV**English-Speaking Sample (N=68)**

True	42	61.8
False	3	4.4
I Don't Know (missing)	23	33.8

Spanish-Speaking Sample (N=54)

True	23	42.6
False	2	3.7
I Don't Know (missing)	29	53.7

6-HPV can cause HIV/AIDS**English-Speaking Sample (N=68)**

True	7	10.3
False	31	45.6
I Don't Know (missing)	30	44.1

Spanish-Speaking Sample (N=54)

True	5	9.3
False	22	40.7
I Don't Know (missing)	27	50.0

7- HPV can be passed on during sexual intercourse**English-Speaking Sample (N=68)**

True	57	83.8
False	2	2.9
I Don't Know (missing)	9	13.2

Spanish-Speaking Sample (N=54)

True	41	75.9
False (Blank)		
I Don't Know (missing)	13	24.1

8-HPV can cause genital warts**English-Speaking Sample (N=68)**

True	42	61.8
False	2	2.9
I Don't Know (missing)	24	35.3

Spanish-Speaking Sample (N=54)

True	35	64.8
False	1	1.9
I Don't Know (missing)	18	33.3

9-Men cannot get HPV**English-Speaking Sample (N=68)**

True	7	10.3
False	49	72.1
I Don't Know (missing)	12	17.6

Spanish-Speaking Sample (N=54)

True	11	20.4
False	27	50.0
I Don't Know (missing)	16	29.6

10-Using condoms reduces the chances of HPV transmission**English-Speaking Sample (N=68)**

True	40	58.8
False	10	14.7
I Don't Know (missing)	18	26.5

Spanish-Speaking Sample (N=54)

True	33	61.1
False	3	5.6
I Don't Know (missing)	18	33.3

11-HPV can be cured with antibiotics**English-Speaking Sample (N=68)**

True	6	8.8
False	35	51.5
I Don't Know (missing)	27	39.7

Spanish-Speaking Sample (N=54)

True	7	13.0
False	21	38.9
I Don't Know (missing)	26	48.1

12-Having many sexual partners increases the risk of getting HPV**English-Speaking Sample (N=68)**

True	50	73.5
False	3	4.4
I Don't Know (missing)	15	22.1

Spanish-Speaking Sample (N=54)

True	41	75.9
False	1	1.9
I Don't Know (missing)	12	22.2

13-Most sexually active people will get HPV at some point in their lives**English-Speaking Sample (N=68)**

True	33	48.5
False	10	14.7
I Don't Know (missing)	25	36.8

Spanish-Speaking Sample (N=54)

True	23	42.6
False	6	11.1
I Don't Know (missing)	25	46.3

14-A person could have HPV for many years without knowing it**English-Speaking Sample (N=68)**

True	51	75.0
False	2	2.9
I Don't Know (missing)	15	22.1

Spanish-Speaking Sample (N=54)

True	36	66.7
False (Blank)		
I Don't Know (missing)	18	33.3

15-Having sex at an early age increases the risk of getting HPV**English-Speaking Sample (N=68)**

True	38	55.9
False	6	8.8
I Don't Know (missing)	24	35.3

Spanish-Speaking Sample (N=54)

True	32	59.3
False	2	3.7
I Don't Know (missing)	20	37.0

16-HPV can cause anal cancer**English-Speaking Sample (N=68)**

True	33	48.5
False	2	2.9
I Don't Know (missing)	33	48.5

Spanish-Speaking Sample (N=54)

True	15	27.8
False	7	13.0
I Don't Know (missing)	32	59.3

17-HPV is a bacterial infection**English-Speaking Sample (N=68)**

True	17	25.0
False	27	39.7
I Don't Know (missing)	24	35.3

Spanish-Speaking Sample (N=54)

True	16	29.6
False	11	20.4
I Don't Know (missing)	27	50.0

18-HPV can be transmitted through oral sex**English-Speaking Sample (N=68)**

True	38	55.9
False	5	7.4
I Don't Know (missing)	25	36.8

Spanish-Speaking Sample (N=54)

True	21	38.9
False	4	7.4
I Don't Know (missing)	29	53.7

19-HPV can cause cancer of the penis**English-Speaking Sample (N=68)**

True	27	39.7
False	5	7.4
I Don't Know (missing)	36	52.9

Spanish-Speaking Sample (N=54)

True	19	35.2
False	4	7.4
I Don't Know (missing)	31	57.4

20-HPV can be transmitted through anal sex**English-Speaking Sample (N=68)**

True	39	57.4
False	4	5.9
I Don't Know (missing)	25	36.8

Spanish-Speaking Sample (N=54)

True	20	37.0
False	2	3.7
I Don't Know (missing)	32	59.3

21-HPV infections always lead to health problems**English-Speaking Sample (N=68)**

True	27	39.7
False	17	25.0
I Don't Know (missing)	24	35.3

Spanish-Speaking Sample (N=54)

True	26	48.1
False	9	16.7
I Don't Know (missing)	19	35.2

22-HPV can cause oral cancer**English-Speaking Sample (N=68)**

True	36	52.9
False	4	5.9
I Don't Know (missing)	28	41.2

Spanish-Speaking Sample (N=54)

True	19	35.2
False	4	7.4
I Don't Know (missing)	31	57.4

23-A person with no symptoms cannot transmit the HPV infection**English-Speaking Sample (N=68)**

True	13	19.1
False	37	54.4
I Don't Know (missing)	18	26.5

Spanish-Speaking Sample (N=54)

True	10	18.5
False	18	33.3
I Don't Know (missing)	26	48.1

Results for Research Question #8**What is the parents' level of HPV vaccine knowledge?**

The mean score for the whole sample (n=122) was 5.50 (min=0, max=11, SD=3.43) for a *moderate level of HPV vaccine knowledge*.

See Table 9.

S1. Table 9. Whole Sample: HPV Vaccine Knowledge (HPV-V-K-S-11) (N=122)

	N	%
What is the parents' level of HPV vaccine knowledge?		
Whole Sample (N=122)		
<i>M whole=5.50, SD=3.43, Min=0, Max=11</i>		
English-Speaking (n=68) M=6.03, SD=3.21, Min=0, Max=11		
Spanish-Speaking (n=54) M=4.83, SD=3.61, Min=0, Max=11		
Parents' HPV Vaccine Knowledge		
1-The HPV vaccine requires at least 2 doses		
True	53	43.4
False	13	10.7
I Don't Know(missing)	56	45.9

<i>2-The HPV vaccines offers protection against all sexually transmitted infections</i>		
True	15	12.3
False	70	57.4
I Don't Know (missing)	37	30.3
<i>3-The HPV vaccines are most effective if given to people who've never had sex</i>		
True	55	45.1
False	17	13.9
I Don't Know (missing)	50	41.0
<i>4-Someone who has had the HPV vaccine cannot develop cervical cancer</i>		
True	11	9.0
False	55	45.1
I Don't Know (missing)	56	45.9
<i>5-The HPV vaccines offer protection against cervical cancers</i>		
True	65	53.3
False	16	13.1
I Don't Know (missing)	41	33.6
<i>6-The HPV vaccine offers protection against genital warts</i>		
True	51	41.8
False	23	18.9
I Don't Know (missing)	48	39.3
<i>7- Girls who have had an HPV vaccine do not need a Pap test when they are older</i>		
True	8	6.6
False	77	63.1
I Don't Know (missing)	37	30.3
<i>8- The HPV vaccine protects you from every type of HPV</i>		
True	20	16.4
False	46	37.7
I Don't Know (missing)	56	45.9
<i>9-You can cure HPV by getting the HPV vaccine</i>		
True	14	11.5
False	54	44.3
I Don't Know (missing)	54	44.3
<i>10-HPV vaccination is most effective when given to preteens and teens before they become sexually active</i>		
True	77	63.1
False	4	3.3
I Don't Know (missing)	41	33.6
<i>11-Sexually active individuals can still benefit from getting the HPV vaccines</i>		
True	68	55.7
False	7	5.7
I Don't Know (missing)	47	38.5

The mean score for the ESP sample's HPV vaccine knowledge (n=68) was 6.03 (min=0, max=11, SD=3.21) for *moderately high level of HPV vaccine knowledge*; the mean score for HPV-V-K-S-11 for SSP (n=54) was 4.83 (min=0, max=11, SD=3.61) for *a moderate level of HPV vaccine knowledge*.

See Table 10.

S1. Table 10. English-Speaking and Spanish-Speaking Parents' HPV Vaccine Knowledge (HPV-V-K-S-11) (N=122)

	N	%
What is the parents' level of HPV vaccine knowledge?		
Whole Sample (N=122)		
<i>M whole=5.50, SD=3.431, Min=0, Max=11</i>		
English-Speaking (n=68) M=6.03, SD=3.21, Min=0, Max=11		
Spanish-Speaking (n=54) M =6.29, SD=3.61, Min=0, Max=11		
Parents' HPV Vaccine Knowledge		
1-The HPV vaccine requires at least 2 doses		
English-Speaking Sample (N=68)		
True	29	42.6
False	8	11.8
I Don't Know(missing)	31	45.6
Spanish-Speaking Sample (N=54)		
True	24	44.4
False	5	9.3
I Don't Know(missing)	25	46.3
2-The HPV vaccines offers protection against all sexually transmitted infections		
English-Speaking Sample (N=68)		
True	11	16.2
False	41	60.3
I Don't Know (missing)	16	23.5
Spanish-Speaking Sample (N=54)		
True	4	7.4
False	29	53.7
I Don't Know (missing)	21	38.9
3-The HPV vaccines are most effective if given to people who've never had sex		
English-Speaking Sample (N=68)		
True	32	47.1
False	11	16.2
I Don't Know (missing)	25	36.8

Spanish-Speaking Sample (N=54)

True	23	42.6
False	6	11.1
I Don't Know (missing)	25	46.3

4-Someone who has had the HPV vaccine cannot develop cervical cancer**English-Speaking Sample (N=68)**

True	4	5.9
False	36	52.9
I Don't Know (missing)	28	41.2

Spanish-Speaking Sample (N=54)

True	7	13.0
False	19	35.2
I Don't Know (missing)	28	51.9

5-The HPV vaccines offer protection against cervical cancers**English-Speaking Sample (N=68)**

True	40	58.8
False	9	13.2
I Don't Know (missing)	19	27.9

Spanish-Speaking Sample (N=54)

True	25	46.3
False	7	13.0
I Don't Know (missing)	22	40.7

6-The HPV vaccine offers protection against genital warts**English-Speaking Sample (N=68)**

True	28	41.2
False	15	22.1
I Don't Know (missing)	25	36.8

Spanish-Speaking Sample (N=54)

True	23	42.6
False	8	14.8
I Don't Know (missing)	23	42.6

7- Girls who have had an HPV vaccine do not need a Pap test when they are older**English-Speaking Sample (N=68)**

True	3	4.4
False	50	73.5
I Don't Know (missing)	15	22.1

Spanish-Speaking Sample (N=54)

True	5	9.3
False	27	50.0
I Don't Know (missing)	22	40.7

8- The HPV vaccine protects you from every type of HPV**English-Speaking Sample (N=68)**

True	12	17.6
False	29	42.6
I Don't Know (missing)	27	39.7

Spanish-Speaking Sample (N=54)		
True	8	14.8
False	17	31.5
I Don't Know (missing)	29	53.7
9-You can cure HPV by getting the HPV vaccine		
English-Speaking Sample (N=68)		
True	8	11.8
False	35	51.5
I Don't Know (missing)	25	36.8
Spanish-Speaking Sample (N=54)		
True	6	11.1
False	19	35.2
I Don't Know (missing)	29	53.7
10-HPV vaccination is most effective when given to preteens and teens before they become sexually active		
English-Speaking Sample (N=68)		
True	49	72.1
False	2	2.9
I Don't Know (missing)	17	25.0
Spanish-Speaking Sample (N=54)		
True	28	51.9
False	2	3.7
I Don't Know (missing)	24	44.4
11-Sexually active individuals can still benefit from getting the HPV vaccines		
English-Speaking Sample (N=68)		
True	41	60.3
False	2	2.9
I Don't Know (missing)	25	36.8
Spanish-Speaking Sample (N=54)		
True	27	50.0
False	5	9.3
I Don't Know (missing)	22	40.7

Results for Research Question #9

What are the parents' general vaccine attitudes, including for (a) conspiracy beliefs, (b) vaccine hesitancy—lack of confidence, and (c) vaccine hesitancy—risks?

The mean score for **vaccine conspiracy beliefs** for the whole sample (n=122) was 3.82 or closest to neutral (min=1, max=7, SD=1.20). The mean score for **vaccine hesitancy—lack confidence** for the whole sample (n=122) was 2.76 or closest to somewhat disagree (min=1, max=7, SD=1.42). The mean score for **vaccine hesitancy—**

hesitancy—risks for the whole sample (n=122) was 4.48 or neutral (min=1, max=7, SD=1.37).

See Table 11.

S1. Table 11. Whole Sample: Parents' General Vaccine Attitudes, Conspiracy Beliefs, and Vaccine Hesitancy (GVA-CB-HLC-R-16) (N=122)

	N	%
<i>What are the parents' general vaccine attitudes, including for (a) conspiracy beliefs, (b) vaccine hesitancy—lack of confidence, and (c) vaccine hesitancy—risks?</i>		
Whole Sample (N=122)		
<i>M whole=3.82, SD=1.20, Min=1, Max=7</i>		
<i>English-Speaking (n=68) M=3.99, SD=1.24, Min=1, Max=7</i>		
<i>Spanish-Speaking (n=54) M =3.61, SD=1.13, Min=1, Max=6.29</i>		
(a) The 7 Vaccine Conspiracy Beliefs Items		
1- Vaccine safety data is often fabricated		
1-Strongly disagree	19	15.6
2-Disagree	14	11.5
3-Somewhat disagree	11	9.0
4-Neutral	53	43.4
5-Somewhat agree	15	12.3
6-Agree	7	5.7
7-Strongly agree	3	2.5
2- Negative vaccination effects are covered up		
1-Strongly disagree	13	10.7
2-Disagree	17	13.9
3-Somewhat disagree	12	9.8
4-Neutral	39	32.0
5-Somewhat agree	28	23.0
6-Agree	10	8.2
7-Strongly agree	3	2.5
3- Pharmaceutical companies cover up the dangers of vaccines		
1-Strongly disagree	16	13.1
2-Disagree	13	10.7
3-Somewhat disagree	6	4.9
4-Neutral	34	27.9
5-Somewhat agree	36	29.5
6-Agree	12	9.8
7-Strongly agree	5	4.1
4- People are deceived about vaccine efficacy		
1-Strongly disagree	12	9.8
2-Disagree	12	9.8
3-Somewhat disagree	7	5.7

4-Neutral	44	36.1
5-Somewhat agree	31	25.4
6-Agree	11	9.0
7-Strongly agree	5	4.1
5- Vaccine efficacy data is often fabricated		
1-Strongly disagree	12	9.8
2-Disagree	20	16.4
3-Somewhat disagree	7	5.7
4-Neutral	42	34.4
5-Somewhat agree	27	22.1
6-Agree	12	9.8
7-Strongly agree	2	1.6
6- People are deceived about vaccine safety		
1-Strongly disagree	8	6.6
2-Disagree	16	13.1
3-Somewhat disagree	10	8.2
4-Neutral	39	32.0
5-Somewhat agree	29	23.8
6-Agree	15	12.3
7-Strongly agree	5	4.1
7- The government is trying to cover up the link between vaccines and autism		
1-Strongly disagree	17	13.9
2-Disagree	13	10.7
3-Somewhat disagree	9	7.4
4-Neutral	56	45.9
5-Somewhat agree	15	12.3
6-Agree	8	6.6
7-Strongly agree	4	3.3
Whole Sample (N=122)		
<i>M whole=2.76, SD=1.42, Min=1, Max=7</i>		
English-Speaking (n=68) M=2.60, SD=1.27, Min=1, Max=7		
Spanish-Speaking (n=54) M =2.95, SD=1.59, Min=1, Max=7		

(b) - The 7 Vaccine Hesitancy-Lack of Confidence Items

1- Childhood vaccines are important for my child's health		
1-Strongly disagree	9	7.4
2-Disagree	4	3.3
3-Somewhat disagree	1	.8
4-Neutral	9	7.4
5-Somewhat agree	16	13.1
6-Agree	40	32.8
7-Strongly agree	43	35.2
2- Childhood vaccines are effective		
1-Strongly disagree	11	9.0
2-Disagree	2	1.6

3-Somewhat disagree	3	2.5
4-Neutral	12	9.8
5-Somewhat agree	17	13.9
6-Agree	53	43.4
7-Strongly agree	24	19.7
3- Having my child vaccinated is important for the health of others in my community		
1-Strongly disagree	11	9.0
2-Disagree	4	3.3
3-Somewhat disagree	4	3.3
4-Neutral	12	9.8
5-Somewhat agree	13	10.7
6-Agree	51	41.8
7-Strongly agree	27	22.1
4- All childhood vaccines offered by the government program in my community are beneficial		
1-Strongly disagree	6	4.9
2-Disagree	3	2.5
3-Somewhat disagree	9	7.4
4-Neutral	30	24.6
5-Somewhat agree	16	13.1
6-Agree	37	30.3
7-Strongly agree	21	17.2
5-The information I receive about vaccines from the vaccine program is reliable and trustworthy		
1-Strongly disagree	4	3.3
2-Disagree	3	2.5
3-Somewhat disagree	6	4.9
4-Neutral	34	27.9
5-Somewhat agree	29	23.8
6-Agree	33	27.0
7-Strongly agree	13	10.7
6- Getting vaccines is a good way to protect my child/children from disease		
1-Strongly disagree	8	6.6
2-Disagree	1	.8
3-Somewhat disagree	0	0
4-Neutral	14	15.6
5-Somewhat agree	19	41.0
6-Agree	50	24.6
7-Strongly agree	30	6.6
7- Generally I do what my doctor or health care provider recommends about vaccines for my child/children		
1-Strongly disagree	8	6.6
2-Disagree	4	3.3
3-Somewhat disagree	4	3.3
4-Neutral	14	11.5
5-Somewhat agree	19	15.6

6-Agree	48	39.3
7-Strongly agree	25	20.5
Whole Sample (N=122)		
<i>M whole=4.48, SD=1.37, Min=1, Max=7</i>		
English-Speaking (n=68) M=4.56, SD=1.42, Min=1, Max=7		
Spanish-Speaking (n=54) M =4.39, SD=1.31, Min=1.50, Max=7		

(c) - The 2 Vaccine Hesitancy—Hesitancy-Risks Items

1- I am concerned about serious adverse effects of vaccines

1-Strongly disagree	3	2.5
2-Disagree	12	9.8
3-Somewhat disagree	1	.8
4-Neutral	33	27.0
5-Somewhat agree	33	27.0
6-Agree	26	21.3
7-Strongly agree	14	11.5

2- New vaccines carry more risks than older vaccines

1-Strongly disagree	8	6.6
2-Disagree	11	9.0
3-Somewhat disagree	9	7.4
4-Neutral	50	41.0
5-Somewhat agree	17	13.9
6-Agree	18	14.8
7-Strongly agree	9	7.4

The mean score for **vaccine conspiracy beliefs** for ESP (n=68) was 3.99 for closest to neutral (min=1, max=7, SD=1.24) and the mean score for vaccine conspiracy beliefs for SSP (n=54) was 3.61 for somewhat disagree (min=1, max=6.29, SD=1.13). The mean score for **vaccine hesitancy–lack confidence** for ESP (n=68) was 2.60 or disagree (min=1, max=7, SD=1.27) and the mean score for vaccine hesitancy–lack of confidence for SSP (n=54) was 2.95 or closest to somewhat disagree (min=1, max=7, SD=1.59). The mean score for **vaccine hesitancy—risks** for ESP (n=68) was 4.56 for neutral (min=1, max=7, SD=1.42) and the mean score for vaccine hesitancy—risks for SSP (n=54) was 4.39 for neutral (min=1.50, max=7, SD=1.31).

See Table 12.

S1. Table 12. English-Speaking and Spanish-Speaking Parents' General Vaccine Attitudes, Conspiracy Beliefs, and Vaccine Hesitancy (GVA-CB-HLC-R-16) (N=122)

	N	%
What are the parents' general vaccine attitudes, including for (a) conspiracy beliefs, (b) vaccine hesitancy—lack of confidence, and (c) vaccine hesitancy—risks?		
Whole Sample (N=122)		
<i>M whole=3.82, SD=1.20, Min=1, Max=7</i>		
English-Speaking (n=68) M=3.99, SD=1.24, Min=1, Max=7		
Spanish-Speaking (n=54) M=3.61, SD=1.13, Min=1, Max=6.29		
(a) - The 7 Vaccine Conspiracy Beliefs Items		
<i>1- Vaccine safety data is often fabricated</i>		
English-Speaking Sample (N=68)		
1-Strongly disagree	8	11.8
2-Disagree	7	10.3
3-Somewhat disagree	7	10.3
4-Neutral	30	44.1
5-Somewhat agree	11	16.2
6-Agree	2	2.9
7-Strongly agree	3	4.4
Spanish-Speaking Sample (N=54)		
1-Strongly disagree	11	20.4
2-Disagree	7	13.0
3-Somewhat disagree	4	7.4
4-Neutral	23	42.6
5-Somewhat agree	4	7.4
6-Agree	5	9.3
7-Strongly agree	0	0
<i>2- Negative vaccination effects are covered up</i>		
English-Speaking Sample (N=68)		
1-Strongly disagree	5	7.4
2-Disagree	8	11.8
3-Somewhat disagree	5	7.4
4-Neutral	24	35.3
5-Somewhat agree	19	27.9
6-Agree	5	7.4
7-Strongly agree	2	2.9
Spanish-Speaking Sample (N=54)		
1-Strongly disagree	8	14.8
2-Disagree	9	16.7
3-Somewhat disagree	7	13.0
4-Neutral	15	27.8
5-Somewhat agree	9	16.7
6-Agree	5	9.3
7-Strongly agree	1	1.9

3- Pharmaceutical companies cover up the dangers of vaccines**English-Speaking Sample (N=68)**

1-Strongly disagree	5	7.4
2-Disagree	5	7.4
3-Somewhat disagree	3	4.4
4-Neutral	19	27.9
5-Somewhat agree	25	36.8
6-Agree	8	11.8
7-Strongly agree	3	4.4

Spanish-Speaking Sample (N=54)

1-Strongly disagree	11	20.4
2-Disagree	8	14.8
3-Somewhat disagree	3	5.6
4-Neutral	15	27.8
5-Somewhat agree	11	20.4
6-Agree	4	7.4
7-Strongly agree	2	3.7

4- People are deceived about vaccine efficacy**English-Speaking Sample (N=68)**

1-Strongly disagree	6	8.8
2-Disagree	4	5.9
3-Somewhat disagree	3	4.4
4-Neutral	24	35.3
5-Somewhat agree	20	29.4
6-Agree	7	10.3
7-Strongly agree	4	5.9

Spanish-Speaking Sample (N=54)

1-Strongly disagree	6	11.1
2-Disagree	8	14.8
3-Somewhat disagree	4	7.4
4-Neutral	20	37.0
5-Somewhat agree	11	20.4
6-Agree	4	7.4
7-Strongly agree	1	1.9

5- Vaccine efficacy data is often fabricated**English-Speaking Sample (N=68)**

1-Strongly disagree	7	10.3
2-Disagree	10	14.7
3-Somewhat disagree	3	4.4
4-Neutral	21	30.9
5-Somewhat agree	17	25.0
6-Agree	8	11.8
7-Strongly agree	2	2.9

Spanish-Speaking Sample (N=54)

1-Strongly disagree	5	9.3
2-Disagree	10	18.5
3-Somewhat disagree	4	7.4
4-Neutral	21	38.9
5-Somewhat agree	10	18.5
6-Agree	4	7.4
7-Strongly agree	0	0

6- People are deceived about vaccine safety**English-Speaking Sample (N=68)**

1-Strongly disagree	6	8.8
2-Disagree	7	10.3
3-Somewhat disagree	4	5.9
4-Neutral	20	29.4
5-Somewhat agree	20	29.4
6-Agree	8	11.8
7-Strongly agree	3	4.4

Spanish-Speaking Sample (N=54)

1-Strongly disagree	2	3.7
2-Disagree	9	16.7
3-Somewhat disagree	6	11.1
4-Neutral	19	35.2
5-Somewhat agree	9	16.7
6-Agree	7	13.0
7-Strongly agree	2	3.7

7- The government is trying to cover up the link between vaccines and autism**English-Speaking Sample (N=68)**

1-Strongly disagree	11	16.2
2-Disagree	6	8.8
3-Somewhat disagree	5	7.4
4-Neutral	30	44.1
5-Somewhat agree	10	14.7
6-Agree	4	5.9
7-Strongly agree	2	2.9

Spanish-Speaking Sample (N=54)

1-Strongly disagree	6	11.1
2-Disagree	7	13.0
3-Somewhat disagree	4	7.4
4-Neutral	26	48.1
5-Somewhat agree	5	9.3
6-Agree	4	7.4
7-Strongly agree	2	3.7

Whole Sample (N=122)**M whole=2.76, SD=1.42, Min=1, Max=7****English-Speaking (n=68) M=2.60, SD=1.27, Min=1, Max=7****Spanish-Speaking (n=54) M=2.95, SD=1.59, Min=1, Max=7****(b) - The 7 Vaccine Hesitancy-Lack of Confidence Items*****1- Childhood vaccines are important for my child's health*****English-Speaking Sample (N=68)**

1-Strongly disagree	4	5.9
2-Disagree	1	1.5
3-Somewhat disagree	0	0
4-Neutral	5	7.4
5-Somewhat agree	10	14.7
6-Agree	21	30.9
7-Strongly agree	27	39.7

Spanish-Speaking Sample (N=54)

1-Strongly disagree	5	9.3
2-Disagree	3	5.6
3-Somewhat disagree	1	1.9
4-Neutral	4	7.4
5-Somewhat agree	6	11.1
6-Agree	19	35.2
7-Strongly agree	16	29.6

2- Childhood vaccines are effective**English-Speaking Sample (N=68)**

1-Strongly disagree	5	7.4
2-Disagree	0	0
3-Somewhat disagree	1	1.5
4-Neutral	6	8.8
5-Somewhat agree	9	13.2
6-Agree	33	48.5
7-Strongly agree	14	20.6

Spanish-Speaking Sample (N=54)

1-Strongly disagree	6	11.1
2-Disagree	2	3.7
3-Somewhat disagree	2	3.7
4-Neutral	6	11.1
5-Somewhat agree	8	14.8
6-Agree	20	37.0
7-Strongly agree	10	18.5

3- Having my child vaccinated is important for the health of others in my community**English-Speaking Sample (N=68)**

1-Strongly disagree	4	5.9
2-Disagree	2	2.9
3-Somewhat disagree	2	2.9

4-Neutral	4	5.9
5-Somewhat agree	6	8.8
6-Agree	33	48.5
7-Strongly agree	17	25.0

Spanish-Speaking Sample (N=54)

1-Strongly disagree	7	13.0
2-Disagree	2	3.7
3-Somewhat disagree	2	3.7
4-Neutral	8	14.8
5-Somewhat agree	7	13.0
6-Agree	18	33.3
7-Strongly agree	10	18.5

4- All childhood vaccines offered by the government program in my community are beneficial

English-Speaking Sample (N=68)

1-Strongly disagree	2	2.9
2-Disagree	0	0
3-Somewhat disagree	7	10.3
4-Neutral	21	30.9
5-Somewhat agree	8	11.8
6-Agree	19	27.9
7-Strongly agree	11	16.2

Spanish-Speaking Sample (N=54)

1-Strongly disagree	4	7.4
2-Disagree	3	5.6
3-Somewhat disagree	2	3.7
4-Neutral	9	16.7
5-Somewhat agree	8	14.8
6-Agree	18	33.3
7-Strongly agree	10	18.5

5-The information I receive about vaccines from the vaccine program is reliable and trustworthy

English-Speaking Sample (N=68)

1-Strongly disagree	2	2.9
2-Disagree	1	1.5
3-Somewhat disagree	3	4.4
4-Neutral	18	26.5
5-Somewhat agree	18	26.5
6-Agree	19	27.9
7-Strongly agree	7	10.3

Spanish-Speaking Sample (N=54)

1-Strongly disagree	2	3.7
2-Disagree	2	3.7
3-Somewhat disagree	3	5.6
4-Neutral	16	29.6
5-Somewhat agree	11	20.4

6-Agree	14	25.9
7-Strongly agree	6	11.1
6- Getting vaccines is a good way to protect my child/children from disease		
English-Speaking Sample (N=68)		
1-Strongly disagree	3	4.4
2-Disagree	0	0
3-Somewhat disagree	0	0
4-Neutral	7	10.3
5-Somewhat agree	9	13.2
6-Agree	31	45.6
7-Strongly agree	18	26.5
Spanish-Speaking Sample (N=54)		
1-Strongly disagree	5	9.3
2-Disagree	1	1.9
3-Somewhat disagree	0	0
4-Neutral	7	13.0
5-Somewhat agree	10	18.5
6-Agree	19	35.2
7-Strongly agree	12	22.2
7- Generally I do what my doctor or health care provider recommends about vaccines for my child/children		
English-Speaking Sample (N=68)		
1-Strongly disagree	4	5.9
2-Disagree	0	0
3-Somewhat disagree	3	4.4
4-Neutral	7	10.3
5-Somewhat agree	14	20.6
6-Agree	26	38.2
7-Strongly agree	14	20.6
Spanish-Speaking Sample (N=54)		
1-Strongly disagree	4	7.4
2-Disagree	4	7.4
3-Somewhat disagree	1	1.9
4-Neutral	7	13.0
5-Somewhat agree	5	9.3
6-Agree	22	40.7
7-Strongly agree	11	20.4
Whole Sample (N=122)		
<i>M whole=4.48, SD=1.37, Min=1, Max=7</i>		
<i>English-Speaking (n=68) M=4.56, SD=1.42, Min=1, Max=7</i>		
<i>Spanish-Speaking (n=54) M=4.39, SD=1.31, Min=1.50, Max=7</i>		

(c) - The 2 Vaccine Hesitancy—Hesitancy-Risks Items

1- I am concerned about serious adverse effects of vaccines**English-Speaking Sample (N=68)**

1-Strongly disagree	3	4.4
2-Disagree	5	7.4
3-Somewhat disagree	0	0
4-Neutral	16	23.5
5-Somewhat agree	21	30.9
6-Agree	14	20.6
7-Strongly agree	9	13.2

Spanish-Speaking Sample (N=54)

1-Strongly disagree	0	0
2-Disagree	7	13.0
3-Somewhat disagree	1	1.9
4-Neutral	17	31.5
5-Somewhat agree	12	22.2
6-Agree	12	22.2
7-Strongly agree	5	9.3

2- New vaccines carry more risks than older vaccines**English-Speaking Sample (N=68)**

1-Strongly disagree	4	5.9
2-Disagree	5	7.4
3-Somewhat disagree	8	11.8
4-Neutral	25	36.8
5-Somewhat agree	10	14.7
6-Agree	9	13.2
7-Strongly agree	7	10.3

Spanish-Speaking Sample (N=54)

1-Strongly disagree	4	7.4
2-Disagree	6	11.1
3-Somewhat disagree	1	1.9
4-Neutral	25	46.3
5-Somewhat agree	7	13.0
6-Agree	9	16.7
7-Strongly agree	2	3.7

Results for Research Question #10**What are the parents' perceived barriers to their child completing the HPV vaccination series?**

For the whole sample (n=122), 33.6% experienced the barrier of not knowing how often they should take their child for completion of the HPV vaccination series, and 30.3% experienced the barrier of their work schedule.

See Table 13.

S1. Table 13. Whole Sample: Parents' Perceived Barriers to Completion of the HPV Vaccine Series (PARENTS-PB-CC-HPV-VS-12) (N=122)

	N	%
What are the parents' perceived barriers to their child completing the HPV vaccination series?		
Whole Sample (N=122)		
<i>M whole=1.87, SD=2.43, Min=0, Max=11</i>		
English-Speaking (n=68) M=1.82, SD=2.68, Min=0, Max=11		
Spanish-Speaking (n=54) M=1.93, SD=2.08, Min=0, Max=11		
<i>1-not knowing how often I should take my child (whether once, twice or three times)</i>		
Yes	41	33.6
No	81	66.4
<i>2-not knowing where to take my child</i>		
Yes	20	16.4
No	102	83.6
<i>3-a lack of insurance</i>		
Yes	17	13.9
No	105	86.1
<i>4-a lack of finances/money</i>		
Yes	21	17.2
No	101	82.8
<i>5-a lack of time, or other demands on my time</i>		
Yes	29	23.8
No	93	76.2
<i>6-my work schedule</i>		
Yes	37	30.3
No	85	69.7
<i>7-my own health issues (physical or mental)</i>		
Yes	9	7.4
No	113	92.6
<i>8-the health issues (physical or mental) of others (e.g. other children, husband/partner, babysitter, other family, my parents, etc.)</i>		
Yes	9	7.4
No	113	92.6
<i>9-stress in my life</i>		
Yes	19	15.6
No	103	84.4
<i>10-language—due to having a provider not communicating in my preferred language</i>		
Yes	13	10.7
No	109	89.3

11-cultural barriers—due to having a provider not understanding my culture, or not being culturally sensitive and appropriate

Yes	13	10.7
No	109	89.3

12-other/something else has been an obstacle/barrier for me (Please indicate in the space, below)

Yes	15	12.3
No	107	87.7

For the ESP sample, 26.5% (n=18) experienced the barrier of not knowing how often they should take their child for completion of the HPV vaccination series, and 30.9% (n=21) experienced the barrier of their work schedule.

For the SPS sample, 42.6% (n=23) experienced the barrier of not knowing how often they should take their child for completion of the HPV vaccination series, and 29.6% (n=16) experienced the barrier of their work schedule.

See Table 14.

S1. Table 14. English-Speaking and Spanish-Speaking Parents' Perceived Barriers to Completion of the HPV Vaccine Series (PARENTS-PB-CC-HPV-VS-12) (N=122)

	N	%
What are the parents' perceived barriers to their child completing the HPV vaccination series?		
Whole Sample (N=122)		
M whole=1.87, SD=2.43, Min=0, Max=11		
English-Speaking (n=68) M=1.82, SD=2.68, Min=0, Max=11		
Spanish-Speaking (n=54) M=1.93, SD=2.08, Min=0, Max=11		
<i>1-not knowing how often I should take my child (whether once, twice or three times)</i>		
English-Speaking Sample (N=68)		
Yes	18	26.5
No	50	73.5
Spanish-Speaking Sample (N=54)		
Yes	23	42.6
No	31	57.4

2-not knowing where to take my child**English-Speaking Sample (N=68)**

Yes	8	11.8
No	60	88.2

Spanish-Speaking Sample (N=54)

Yes	12	22.2
No	42	77.8

3-a lack of insurance**English-Speaking Sample (N=68)**

Yes	8	11.8
No	60	88.2

Spanish-Speaking Sample (N=54)

Yes	9	16.7
No	45	83.3

4-a lack of finances/money**English-Speaking Sample (N=68)**

Yes	10	14.7
No	58	85.3

Spanish-Speaking Sample (N=54)

Yes	11	20.4
No	43	79.6

5-a lack of time, or other demands on my time**English-Speaking Sample (N=68)**

Yes	18	26.5
No	50	73.5

Spanish-Speaking Sample (N=54)

Yes	11	20.4
No	43	79.6

6-my work schedule**English-Speaking Sample (N=68)**

Yes	21	30.9
No	47	69.1

Spanish-Speaking Sample (N=54)

Yes	16	29.6
No	38	70.4

7-my own health issues (physical or mental)**English-Speaking Sample (N=68)**

Yes	7	10.3
No	61	89.7

Spanish-Speaking Sample (N=54)

Yes	2	3.7
No	52	96.3

8-the health issues (physical or mental) of others (e.g. other children, husband/partner, babysitter, other family, my parents, etc.)

English-Speaking Sample (N=68)

Yes	7	10.3
No	61	89.7

Spanish-Speaking Sample (N=54)

Yes	2	3.7
No	52	96.3

9-stress in my life

English-Speaking Sample (N=68)

Yes	14	20.6
No	54	79.4

Spanish-Speaking Sample (N=54)

Yes	5	9.3
No	49	90.7

10-language—due to having a provider not communicating in my preferred language

English-Speaking Sample (N=68)

Yes	5	7.4
No	63	92.6

Spanish-Speaking Sample (N=54)

Yes	8	14.8
No	46	85.2

11-cultural barriers—due to having a provider not understanding my culture, or not being culturally sensitive and appropriate

English-Speaking Sample (N=68)

Yes	8	11.8
No	60	88.2

Spanish-Speaking Sample (N=54)

Yes	5	9.3
No	49	90.7

12-other/something else has been an obstacle/barrier for me (Please indicate in the space, below)

English-Speaking Sample (N=68)

Yes	10	14.7
No	58	85.3

Spanish-Speaking Sample (N=54)

Yes	5	9.3
No	49	90.7

Results for Research Question #11

Pre-video viewing, what was the parents' knowledge of HPV, the prevalence of parents being in an action or maintenance stage for making sure their children received the HPV vaccination—as the Study #1 dependent variable—and, their self-efficacy for doing this?

For the whole sample (n=122), before watching the video, the mean self-rating for level of **HPV knowledge** (n=122) was 3.01 or *fair level of knowledge* (min=1-Very Poor, max=6-Excellent, SD=1.28). The mean for **stage of change for performing the HPV-related behaviors** indicated was 2.25 (min=1-pre-contemplation, max=5-maintenance, SD=1.33) for *contemplation stage*. The mean **self-efficacy for performing the HPV-related behaviors** was 33.95 or closest to “60% confident” (min=1, max=6, SD=1.93) before watching the avatar video.

See Table 15.

S1. Table 15. Whole Sample: Pre-video Viewing Parents' HPV Knowledge, Stage of Change, and Self-efficacy for Talking to Providers and Child Receiving the HPV Vaccine (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7) (N=122)

	N	%
Pre-video viewing, what was the parents' knowledge of HPV, the prevalence of parents being in an action or maintenance stage for making sure their children received the HPV vaccination—as the Study #1 dependent variable—and, their self-efficacy for doing this?		
<i>Please rate what you know, or your level of knowledge about the Human papillomavirus (HPV) infection HPV, and the HPV vaccination for children:</i>		
1 - Very Poor	16	13.1
2 – Poor	22	18.0
3 – Fair	51	41.8
4 - Good	17	13.9
5 - Very Good	10	8.2
6 - Excellent	6	4.9

Level of HPV Knowledge

Whole Sample (N=122)

M whole=2.25, SD=1.33, Min=1, Max=5

English-Speaking (n=68) M=2.37, SD=1.43, Min=1, Max=5

Spanish-Speaking (n=54) M=2.09, SD=1.17, Min=1, Max=5

Please rate yourself for the behavior of talking to a pediatrician or family practice medical provider about the Human papillomavirus (HPV) infection HPV, and the HPV vaccination for children—by checking what best describes you, below:

2-For doing this		
1-I am not thinking of doing this behavior at all.	47	38.5
2-I am thinking about doing this behavior.	32	26.2
3-I am preparing to do this behavior.	23	18.9
4-I have been doing this behavior for less than six (6) months.	6	4.9
5-I have been doing this behavior for more than six (6) months up to many years.	14	11.5

Stage of Change for Having Child Vaccinated

Whole Sample (N=122)

M whole=2.61, SD=1.38, Min=1, Max=5

English-Speaking (n=68) M=2.79, SD=1.47, Min=1, Max=5

Spanish-Speaking (n=54) M=2.39, SD=1.24, Min=1, Max=5

2-For doing this		
1-I am not thinking of doing this behavior at all.	35	28.7
2-I am thinking about doing this behavior.	23	18.9
3-I am preparing to do this behavior.	38	31.1
4-I have been doing this behavior for less than six (6) months.	6	4.9
5-I have been doing this behavior for more than six (6) months up to many years.	20	16.4

Stage of Change Having Child Receiving all Doses

Whole Sample (N=122)

M whole=2.75, SD=1.24, Min=1, Max=5

English-Speaking (n=68) M=2.57, SD=1.42, Min=1, Max=5

Spanish-Speaking (n=54) M=2.52, SD=1.23, Min=1, Max=5

2-For doing this		
1-I am not thinking of doing this behavior at all.	38	31.1
2-I am thinking about doing this behavior.	18	14.8
3-I am preparing to do this behavior.	42	34.4
4-I have been doing this behavior for less than six (6) months.	9	7.4
5-I have been doing this behavior for more than six (6) months up to many years.	15	12.3

Self-efficacy-Talking to Provider**Whole Sample (N=122)****M whole=3.66, SD=1.94, Min=1, Max=6****English-Speaking (n=68) M=3.69, SD=2.00, Min=1, Max=6****Spanish-Speaking (n=54) M=3.61, SD=1.89, Min=1, Max=6**

And, for doing this I am

0% confident	32	26.2
20% confident	6	4.9
40% confident	14	11.5
60% confident	22	18.0
80% confident	16	13.1
100% confident	32	26.2

Self-efficacy- Having Child Vaccinated**Whole Sample (N=122)****M whole=3.95, SD=1.93, Min=1, Max=6****English-Speaking (n=68) M=4.15, SD=1.93, Min=1, Max=6****Spanish-Speaking (n=54) M=3.70, SD=1.94, Min=1, Max=6**

And, for doing this I am

0% confident	27	22.1
20% confident	6	4.9
40% confident	11	9.0
60% confident	19	15.6
80% confident	20	16.4
100% confident	39	32.0

Self-efficacy- Having Child Receiving All Doses**Whole Sample (N=122)****M whole=3.99, SD=1.91, Min=1, Max=6****English-Speaking (n=68) M=4.06, SD=1.95, Min=1, Max=6****Spanish-Speaking (n=54) M=3.91, SD=1.87, Min=1, Max=6**

And, for doing this I am

0% confident	25	20.5
20% confident	8	6.6
40% confident	8	6.6
60% confident	22	18.0
80% confident	20	16.4
100% confident	39	32.0

For ESP (n=68), before watching the video, the mean for **stage of change for performing the HPV-related behaviors** indicated was 2.37 (min=1-pre-contemplation, max=5-maintenance, SD=1.43) for *contemplation stage*. The mean **self-efficacy for performing the HPV-related behaviors** was 3.69 or closest to “60% confident” (min=1, max=6, SD=1.93) before watching the avatar video.

For SSP (n=54), before watching the video, the mean for **stage of change for performing the HPV-related behaviors** indicated was 2.09 (min=1-pre-contemplation, max=5-maintenance, SD=1.43) for *contemplation stage*. The mean **self-efficacy for performing the HPV-related behaviors** was 3.61 or closest to “60% confident” (min=1, max=6, SD= 2.02) before watching the avatar video.

See Table 16.

S1. Table 16. English-Speaking and Spanish-Speaking Parents: Pre-video Viewing Parents’ HPV Knowledge, Stage of Change, and Self-efficacy for Talking to Providers and Child Receiving the HPV Vaccine (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7) (N=122)

	N	%
<i>Please rate what you know, or your level of knowledge about the Human papillomavirus (HPV) infection HPV, and the HPV vaccination for children:</i>		
English-Speaking Sample (N=68)		
1 - Very Poor	3	4.4
2 – Poor	10	14.7
3 – Fair	36	52.9
4 – Good	7	10.3
5 - Very Good	8	11.8
6 - Excellent	4	5.9
Spanish-Speaking Sample (N=54)		
1 - Very Poor	13	24.1
2 – Poor	12	22.2
3 – Fair	15	27.8
4 - Good	10	18.5
5 - Very Good	2	3.7
6 - Excellent	2	3.7

HPV Knowledge**Whole Sample (N=122)****M whole=2.25, SD=1.33, Min=1, Max=5****English-Speaking (n=68) M=2.37, SD=1.43, Min=1, Max=5****Spanish-Speaking (n=54) M=2.09, SD=1.17, Min=1, Max=5**

Please rate yourself for the behavior of talking to a pediatrician or family practice medical provider about the Human papillomavirus (HPV) infection HPV, and the HPV vaccination for children—by checking what best describes you, below:

English-Speaking Sample (N=68)

2-For doing this

1-I am not thinking of doing this behavior at all.	25	36.8
--	----	------

2-I am thinking about doing this behavior.	18	26.5
--	----	------

3-I am preparing to do this behavior.	11	16.2
---------------------------------------	----	------

4-I have been doing this behavior for less than six (6) months.	3	4.4
---	---	-----

5-I have been doing this behavior for more than six (6) months up to many years.	11	16.2
--	----	------

Spanish-Speaking Sample (N=54)

2-For doing this

1-I am not thinking of doing this behavior at all.	22	40.7
--	----	------

2-I am thinking about doing this behavior.	14	25.9
--	----	------

3-I am preparing to do this behavior.	12	22.2
---------------------------------------	----	------

4-I have been doing this behavior for less than six (6) months.	3	5.6
---	---	-----

5-I have been doing this behavior for more than six (6) months up to many years.	3	5.6
--	---	-----

Stage of Change for Having Child Vaccinated**Whole Sample (N=122)****M whole=2.61, SD=1.38, Min=1, Max=5****English-Speaking (n=68) M=2.79, SD=1.47, Min=1, Max=5****Spanish-Speaking (n=54) M=2.39, SD=1.24, Min=1, Max=5****English-Speaking (n=68)**

2-For doing this

1-I am not thinking of doing this behavior at all.	18	26.5
--	----	------

2-I am thinking about doing this behavior.	12	17.6
--	----	------

3-I am preparing to do this behavior.	19	27.9
---------------------------------------	----	------

4-I have been doing this behavior for less than six (6) months.	4	5.9
---	---	-----

5-I have been doing this behavior for more than six (6) months up to many years.	15	22.1
Spanish-Speaking Sample (N=54)		
2-For doing this		
1-I am not thinking of doing this behavior at all.	17	31.5
2-I am thinking about doing this behavior.	11	20.4
3-I am preparing to do this behavior.	19	35.2
4-I have been doing this behavior for less than six (6) months.	2	3.7
5-I have been doing this behavior for more than six (6) months up to many years.	5	9.3
<i>Stage of Change Having Child Receiving all Doses</i>		
Whole Sample (N=122)		
M whole=2.75, SD=1.24, Min=1, Max=5		
English-Speaking (n=68) M=2.57, SD=1.42, Min=1, Max=5		
Spanish-Speaking (n=54) M=2.52, SD=1.23, Min=1, Max=5		
English-Speaking (n=68)		
English-Speaking (n=68)		
2-For doing this		
1-I am not thinking of doing this behavior at all.	22	32.4
2-I am thinking about doing this behavior.	11	16.2
3-I am preparing to do this behavior.	20	29.4
4-I have been doing this behavior for less than six (6) months.	4	5.9
5-I have been doing this behavior for more than six (6) months up to many years.	11	16.2
Spanish-Speaking Sample (N=54)		
2-For doing this		
1-I am not thinking of doing this behavior at all.	16	29.6
2-I am thinking about doing this behavior.	7	13.0
3-I am preparing to do this behavior.	22	40.7
4-I have been doing this behavior for less than six (6) months.	5	9.3
5-I have been doing this behavior for more than six (6) months up to many years.	4	7.4

Self-efficacy-Talking to Provider**Whole Sample (N=122)****M whole=3.66, SD=1.940, Min=1, Max=6****English-Speaking (n=68) M=3.69, SD=2.00, Min=1, Max=6****Spanish-Speaking (n=54) M=3.61, SD=1.89, Min=1, Max=6****English-Speaking (n=68)**

And, for doing this I am

1-0% confident	20	29.4
2-20% confident	1	1.5
3-40% confident	6	8.8
4-60% confident	13	19.1
5-80% confident	9	13.2
6-100% confident	19	27.9

Spanish-Speaking Sample (N=54)

1-0% confident	12	22.2
2-20% confident	5	9.3
3-40% confident	8	14.8
4-60% confident	9	16.7
5-80% confident	7	13.0
6-100% confident	13	24.1

Self-efficacy- Having Child Vaccinated**Whole Sample (N=122)****M whole=3.95, SD=1.93, Min=1, Max=6****English-Speaking (n=68) M=4.15, SD=1.93, Min=1, Max=6****Spanish-Speaking (n=54) M=3.70, SD=1.94, Min=1, Max=6****English-Speaking (n=68)**

And, for doing this I am

1-0% confident	15	22.1
2-20% confident	6	8.8
3-40% confident	10	14.7
4-60% confident	13	19.1
5-80% confident	24	35.3
6-100% confident	15	22.1

Spanish-Speaking Sample (N=54)

1-0% confident	12	22.2
2-20% confident	6	11.1
3-40% confident	5	9.3
4-60% confident	9	16.7
5-80% confident	7	13.0
6-100% confident	15	27.8

Self-efficacy- Having Child Receiving All Doses**Whole Sample (N=122)****M whole=3.99, SD=1.91, Min=1, Max=6****English-Speaking (n=68) M=4.06, SD=1.95, Min=1, Max=6****Spanish-Speaking (n=54) M=3.91, SD=1.87, Min=1, Max=6**

English-Speaking (n=68)

And, for doing this I am

1-0% confident	15	22.1
2-20% confident	3	4.4
3-40% confident	3	4.4
4-60% confident	13	19.1
5-80% confident	10	14.7
6-100% confident	24	35.3

Spanish-Speaking Sample (N=54)

1-0% confident	5	9.3
2-20% confident	5	9.3
3-40% confident	9	16.7
4-60% confident	10	18.5
5-80% confident	15	27.8
6-100% confident	5	9.3

Results for Research Question #12

Was there a change in the parents' knowledge of HPV, as well as their stage of change and self-efficacy for three key behaviors [i.e. (1) talking to a pediatrician or family practice medical provider about the Human papillomavirus (HPV) infection, and the HPV vaccination for children; (2) making sure their children receive the HPV vaccination; and (3) making sure their children receive all the required doses (e.g. at least 2 or 3 doses) of the HPV vaccination] when comparing their pre-video viewing to post-video viewing mean scores?

For the whole sample, paired t-tests showed all comparisons were statistically significant, suggesting the brief video intervention had a positive impact, as follows:

- The pre-viewing mean score for the whole sample for parents' **HPV knowledge** was 3.01 or fair (n=115, SD=1.29), versus post-viewing video mean score of 4.02 or good (n=115, SD=1.30), as a difference that was statistically significant ($t=-8.314$, $df=114$, $p=.000$).
- The pre-viewing video mean score for **stage of change (SOC) for talking to Provider (Re: HPV Vaccine for Child)** for the whole sample was 2.27 for contemplation (n=155, SD=1.35) versus the post-viewing video mean score of 2.87 for closest to preparation (n=115, SD=1.28), as a difference that was statistically significant ($t=-5.733$, $df=114$, $p=.000$).
- The pre-viewing video mean score for **self-efficacy (SE) for Talking to Provider (Re: HPV Vaccine for Child)** for the whole sample was 3.66 or closest to 60% confident (n=115, SD=1.95) versus the post-viewing video mean of 4.66 or closest to 80% confident (n=114, SD=1.53), indicating that there was a statistically significant difference ($t=-6.018$, $df=114$, $p=.000$).

- The pre-viewing video mean score of **SOC for Having Child Vaccinated** for the whole sample was 2.61 or contemplation (n=115, SD=1.39) versus the post-viewing video mean 2.89 or closest to preparation (n=115, SD=1.27), indicating there was a statistically significant difference ($t=-3.267$, $df=113$, $p=.007$).
- The pre-viewing video mean score for **SE for Having Child Vaccinated** for the whole sample was 3.96 or closest to 60% confident (n=115, SD=1.95) versus the post-viewing video mean of 4.77 or closest to 80% confident (n=114, SD=1.49), indicating that there was a statistically significant difference ($t=-5.556$, $df=114$, $p=.000$).
- The pre-viewing video mean score for **SOC for Having Child Receive All HPV Vaccine Doses** pre-video for the whole sample was 2.53 or contemplation (n=114, SD=1.35) versus the post-viewing video mean of 2.75 or closest to preparation (n=114, SD=1.25), indicating that there was a statistically significant difference ($t=-2.728$, $df=113$, $p=.007$).
- The pre-viewing video mean score for SE for **Having Child Receive All Doses** for the whole sample was 4.03 or 60% confident (n=114, SD=1.89) versus the post-viewing video mean of 4.71 or closest to 80% confident (n=114, SD=1.58), indicating that there was a statistically significant difference ($t=-4.810$, $df=113$, $p=.000$).

See Table 17.

S1. Table 17. Whole Sample: Paired T-Tests (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7) (N=115)

	M	N	SD	t	t-tests	
					df	P
Parents' HPV Knowledge						
Pre-Video	3.01	115	1.29	-8.314	114	.000***
Post-Video	4.02	115	1.30			
SOC for Talking to Provider (Re: HPV Vaccine for Child)						
Pre-Video	2.27	115	1.35	-5.733	114	.000***
Post-Video	2.87	115	1.28			
SE for Talking to Provider (Re: HPV Vaccine for Child)						
Pre-Video	3.66	115	1.95	-6.018	114	.000***
Post-Video	4.66	115	1.53			
SOC for Having Child Vaccinated						
Pre-Video	2.61	115	1.39	-3.267	113	.001**
Post-Video	2.89	115	1.27			
SE for Having Child Vaccinated						
Pre-Video	3.96	115	1.96	-5.556	114	.000***
Post-Video	4.77	115	1.49			
SOC for Having Child Receive All Doses						
Pre-Video	2.53	114	1.35	-2.728	113	.007**
Post-Video	2.75	114	1.25			

SE for Having Child Receive All Doses

Pre-Video	4.03	114	1.89	-4.810	113	.000***
Post-Video	4.71	114	1.58			

* $p < .05$, ** $p < .01$, *** $p < .001$ Bonferroni Adjustment Significance (.05/7, $p = .007$)

Note: All p values above .007 are considered non-significant, and only those below .007 are considered statistically significant

For the ESP sample, findings using paired t-tests were, as follows:

- The pre-viewing mean score for parents' **HPV knowledge V-PARENTS-HPV-K-1 for ESP** was 3.30 or fair ($n=64$, $SD=1.20$), versus post-viewing video mean score of 4.38 or good ($n=64$, $SD=1.11$), as a difference that was statistically significant ($t=-6.509$, $df=63$, $p=.000$).
- The pre-viewing video mean score for **SOC for Talking to Provider (Re: HPV Vaccine for Child) for ESP** was 2.41 or contemplation ($n=64$, $SD=1.46$) versus the post-viewing video mean score of 3.03 or preparation ($n=64$, $SD=1.39$), as a difference that was statistically significant ($t=-4.465$, $df=63$, $p=.000$).
- The pre-viewing video mean score for **SE for Talking to Provider (Re: HPV Vaccine for Child) for the ESP** was 3.72 or closest to 60% confident ($n=64$, $SD=2.03$) versus the post-viewing video mean of 4.84 or closest to 80% confident ($n=64$, $SD=1.38$), indicating that there was a statistically significant difference ($t=-4.849$, $df=63$, $p=.000$).
- There was not a significant difference between the **pre-video mean for SOC for Having Child Vaccinated for ESP** versus the post video mean ($p=.124$).
- The pre-viewing video mean score for **SE for Having Child Vaccinated for the ESP** was 4.16 or 60% confident ($n=64$, $SD=1.97$) versus the post-viewing video mean of 4.89, or closest to 80% confident ($n=64$, $SD=1.39$), indicating that there was a statistically significant difference ($t=-3.530$, $df=63$, $p=.001$).
- The pre-viewing video mean score for **SOC for Having Child Receive All Doses for the ESP** was 2.54 contemplation ($n=63$, $SD=1.44$) versus the post-viewing video mean of 2.83 or closest to preparation ($n=63$, $SD=1.33$), indicating that there was a statistically significant difference ($t=-2.865$, $df=62$, $p=.006$).
- The pre-viewing video mean score for **SE for Having Child Receive All Doses for the ESP** was 4.14 or 60% confident ($n=63$, $SD=1.95$) versus the post-viewing video mean of 4.87 or closest to 80% confident ($n=63$, $SD=1.48$), indicating that there was a statistically significant difference ($t=-4.810$, $df=62$, $p=.001$).

See Table 18.

S1. Table 18. English-Speaking Sample: Paired T-Tests (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7) (N=115)

	t-tests					
	M	N	SD	t	df	P
Parents' HPV Knowledge						
Pre-Video	3.30	64	1.20	-6.509	63	.000***
Post-Video	4.38	64	1.11			
SOC for Talking to Provider (Re: HPV Vaccine for Child)						
Pre-Video	2.41	64	1.46	-4.465	63	.000***
Post-Video	3.03	64	1.39			
SE for Talking to Provider (Re: HPV Vaccine for Child)						
Pre-Video	3.72	64	2.03	-4.849	63	.000***
Post-Video	4.84	64	1.38			
SOC for Having Child Vaccinated						
Pre-Video	2.77	64	1.49	-1.560	63	.124
Post-Video	2.97	64	1.357			
SE for Having Child Vaccinated						
Pre-Video	4.16	64	1.97	-3.530	63	.001***
Post-Video	4.89	64	1.39			
SOC for Having Child Receive All Doses						
Pre-Video	2.54	63	1.44	-2.865	62	.006***
Post-Video	2.83	63	1.33			
SE for Having Child Receive All Doses						
Pre-Video	4.14	63	1.95	-3.436	62	.001***
Post-Video	4.87	63	1.48			

*p<.05, **p<.01, ***p<.001 Bonferroni Adjustment Significance (.05/7, p=.007)
 Note: All p values above .007 are considered non-significant, and only those below .007 are considered statistically significant

For the SPS sample (n=54), paired t-tests showed the following:

- The pre-video **HPV knowledge** for SSP was 2.65 for poor (n=51, SD=1.31), versus post-viewing video mean score of 3.57 for fair (n=51, SD=1.39), as a difference that was statistically significant ($t=-5.149$, $df=50$, $p=.000$).
- The pre-viewing video mean for **SOC for Talking to Provider (Re: HPV Vaccine for Child) for SSP** was 2.10 or contemplation (n=51, SD=1.19) versus the post-viewing video mean score of 2.67 for preparation (n=51, SD=1.11), as a difference that was statistically significant ($t=-3.575$, $df=50$, $p=.001$).
- The pre-viewing video mean score for **SE for Talking to Provider (Re: HPV Vaccine for Child) for the SSP** was 3.59 or 40% confident (n=51, SD=1.86) versus the post-viewing video mean of 4.43 or 60% confident (n=51, SD=1.69), indicating that there was a statistically significant difference ($t=-3.564$, $df=50$, $p=.001$).

- The pre-viewing video mean score of **SOC for Having Child Vaccinated for SSP** was 2.41 for contemplation (n=51, SD=1.25) versus the post-viewing video mean 2.78 for closest to preparation (n=51, SD=1.15), indicating there was a statistically significant difference ($t=-3.695$, $df=50$, $p=.001$).
- The pre-viewing video mean score for **SE for Having Child Vaccinated for the SSP** was 3.71 or closest to 60% confident (n=51, SD=1.93) versus the post-viewing video mean of 4.61 or 60% confident (n=51, SD=1.61), indicating that there was a statistically significant difference ($t=-4.499$, $df=50$, $p=.000$).
- There was not a significant difference between the pre-video mean for **SOC for Having Child Receive All Doses for SSP** versus the post-video mean ($p=.271$).
- The pre-viewing video mean score for **SE for Having Child Receive All Doses for the SSP** was 3.88 or closest to 60% confident (n=51, SD=1.83) versus the post-viewing video mean of 4.51 or 60% confident (n=51, SD=1.69), indicating that there was a statistically significant difference ($t=-3.459$, $df=62$, $p=.001$).

See Table 19.

S1. Table 19. Spanish-Speaking Sample: Paired T-Tests (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7) (N=115)

	t-tests					
	M	N	SD	t	df	P
Parents' HPV Knowledge						
Pre-Video	2.65	51	1.31	-5.149	50	.000***
Post-Video	3.57	51	1.39			
SOC for Talking to Provider (Re: HPV Vaccine for Child)						
Pre-Video	2.10	51	1.19	-3.575	50	.001***
Post-Video	2.67	51	1.11			
SE for Talking to Provider (Re: HPV Vaccine for Child)						
Pre-Video	3.59	51	1.86	-3.564	50	.001***
Post-Video	4.43	51	1.69			
SOC for Having Child Vaccinated						
Pre-Video	2.41	51	1.25	-3.695	50	.001***
Post-Video	2.78	51	1.15			
SE for Having Child Vaccinated						
Pre-Video	3.71	51	1.93	-4.499	50	.000***
Post-Video	4.61	51	1.61			
SOC for Having Child Receive All Doses						
Pre-Video	2.51	51	1.26	-1.112	50	.271
Post-Video	2.67	51	1.14			

SE for Having Child Receive All Doses

Pre-Video	3.88	51	1.83	-3.459	50	.001***
Post-Video	4.51	51	1.69			

*p<.05, **p<.01, ***p<.001 Bonferroni Adjustment Significance (.05/7, p=.007)

Note: All p values above .007 are considered non-significant, and only those below .007 are considered statistically significant

Results for Research Question #13**How do the parents rate the video cartoon?**

The mean score for the whole sample (N=122) was 5.04 or *very good* (min=1, max=6, SD=.969). The mean score for the ESP (N=68) was 5.08 or *very good* (min=1, max=6, SD=1.01). The mean score for SSP (N=54) was 4.97 or closest to *very good* (min=3, max=6, SD=.918).

See Table 20.

S1. Table 20. Rating the Quality of the Avatar Video (RTV-PARENTS-2) (N=122)

	N	%
How do the parents rate the video cartoon?		
Whole Sample (N=122)		
M whole=5.04, SD=.969, Min=1, Max=6		
English-Speaking (n=68) M=5.08, SD=1.01, Min=1, Max=6		
Spanish-Speaking (n=54) M=4.97, SD=.918, Min=3, Max=6		
<i>Please think about the cartoon video you were asked to watch, and please rate the video:</i>		
1. I rate the video as follows:		
1 - Very Poor	1	.8
2 - Poor	-	-
3 - Fair	2	1.6
4 - Good	22	18.0
5 - Very Good	27	22.1
6 - Excellent	33	27.0
English-Speaking Sample (N=68)		
1 - Very Poor	1	1.5
2 - Poor	0	0
3 - Fair	1	1.5
4 - Good	11	16.2
5 - Very Good	18	26.5
6 - Excellent	21	30.9

Spanish-Speaking Sample (N=54)

1 - Very Poor	0	0
2 - Poor	0	0
3 - Fair	1	1.9
4 - Good	11	20.4
5 - Very Good	9	16.7
6 - Excellent	12	22.2

Results for Research Question #14**Do the parents recommend the video cartoon to other parents?**

Some 80.3% (n=98) of parents reported they would recommend the video to other parents. Among these 98 parents, 83.8% (n=57) were ESP and 75.9% (n=41) were SSP.

See Table 21.

S1. Table 21. Participant Recommendation of the Avatar Video (DOF-UEH-HPV-PARENTS-1) (N =122)

	N	%
<i>Would you recommend this video to other parents?</i>		
Whole Sample (N=122)		
Yes	98	80.3
No	4	3.3
I feel unable to offer a recommendation as I was not able to watch all the video	12	9.8
English-Speaking Sample (N=68)		
Yes	57	83.8
No	3	4.4
I feel unable to offer a recommendation as I was not able to watch all the video	3	4.4
Spanish-Speaking Sample (N=54)		
Yes	41	75.9
No	1	1.9
*I feel unable to offer a recommendation as I was not able to watch all the video	9	16.7

Note: Recall that this was not a study exclusion criterion. The outcome variable data were collected before they watched the video.

Dose of exposure to video. Of note, some 66 ESP and 51 SSP reported that they watched some or almost all the video. Some 66.2% (n=45) of ESP and 44.4% (n=24) of SSP reported that they watched all of the video.

See Table 22.

S1. Table 22. Dose of Exposure to Video

	N	%
<i>How much of the video was watched?</i>		
English-speaking parents (N=68)		
1-None of the video	3	4.4
2-Some of the video	10	14.7
3-Most of the video	8	11.8
4 -All of the video	45	66.2
Spanish-speaking parents (N=54)		
1-None of the video	8	14.8
2-Some of the video	10	18.5
3-Most of the video	9	16.7
4 -All of the video	24	44.4

Results for Research Question #15

Are there any significant differences between the responses of the English-speaking and Spanish-speaking parents on the study measures?

Independent t-tests showed (using $p < .001$, as per Table 23 footnote), as follows:

- When comparing ESP (N=67, Mean=4.72, SD=1.90) to SSP (N=54, Mean=3.22, SD=1.78) for the **level of education**, there *was a significant difference* ($t=4.429$, $df=119$, $p=000$)—with the ESP having a higher level of education.

See Table 23.

S1. Table 23. Independent Sample T-Tests Comparing Dichotomous Groups English- and Spanish-Speaking Parents (N=122)

	N	M	SD	t	df	p
Watched all or Most the Video						
1- ESP	52	5.08	1.01	.495	83	.622
2- SSP	33	4.97	.918			
Participant age						
1- ESP	68	41.16	6.72	1.916	120	.058
2- SSP	54	38.72	7.31			
Yearly Household Income						
1- ESP	68	4.57	1.97	3.179	120	.002**
2- Spanish	54	3.48	1.77			
Level of Education						
1- ESP	67	4.72	1.90	4.429	119	.000***
2- SSP	54	3.22	1.78			
Number of children 9-18						
1- ESP	68	1.63	.710	.284	120	.777
2- SSP	54	1.59	.836			
Exposure to print and digital media information on HPV						
1- ESP	63	2.49	1.66	1.863	114	.065
2- SSP	53	1.94	1.49			
HPV Knowledge						
1- ESP	68	13.15	6.63	2.031	120	.044*
2- SSP	54	10.67	6.79			
HPV Vaccine Knowledge						
1- ESP	68	6.03	3.21	1.934	120	.055
2- SSP	54	4.83	3.61			
Vaccine Conspiracy Beliefs						
1- ESP	68	3.9895	1.24	1.732	120	.086
2- SSP	54	3.6138	1.13			
Less Confidence in Vaccines						
1- ESP	68	2.6008	1.26	-1.330	99.41	.187
2- SSP	54	2.9524	1.59			
Risks from Vaccines						
1- ESP	68	4.5588	1.42	.681	120	.497
2- Spanish	54	4.3889	1.30			
Barriers to HPV Vaccine						
1- ESP	68	1.82	2.68	-.237	119.95	.813
2- SSP	54	1.93	2.08			

Pre-Video Parents' HPV Knowledge						
1- ESP	68	3.28	1.17	2.702	120	.008**
2- SSP	54	2.67	1.33			
Pre-Video SOC for Talking to Provider (Re: HPV Vaccine for Child)						
1- ESP	68	2.37	1.43	1.167	120	.246
2- SSP	54	2.09	1.17			
Pre-Video SE for Talking to Provider (Re: HPV Vaccine for Child)						
1- ESP	68	3.69	2.00	.225	120	.822
2- SSP	54	3.61	1.87			
Pre-Video SOC for Having Child Vaccinated						
1- ESP	68	2.79	1.47	1.620	120	.108
2- SSP	54	2.39	1.24			
Pre-Video SE for Having Child Vaccinated						
1- ESP	68	4.15	1.93	1.259	120	.210
2- Spanish	54	3.70	1.94			
Pre-Video SOC for Having Child Receive All Doses						
1- ESP	68	2.57	1.42	.226	120	.822
2- SSP	54	2.52	1.23			
Pre-Video SE for Having Child Receive All Doses						
1- ESP	68	4.06	1.95	.434	120	.665
2- SSP	54	3.91	1.87			
Post-Video Parents' HPV Knowledge						
1- ESP	64	4.38	1.11	3.467	113	.001**
2- SSP	51	3.57	1.39			
Post-Video SOC for Talking to Provider (Re: HPV Vaccine for Child)						
1- ESP	64	3.03	1.39	1.525	113	.130
2- SSP	51	2.67	1.11			
Post-Video SE for Talking to Provider (Re: HPV Vaccine for Child)						
1- ESP	64	4.84	1.38	1.408	95.973	.162
2- SSP	51	4.43	1.68			

Post-Video SOC for Having Child Vaccinated						
1- ESP	64	2.97	1.36	.773	113	.441
2- SSP	51	2.78	1.15			
Post-Video SE for Having Child Vaccinated						
1- ESP	64	4.89	1.39	1.008	113	.316
2- SSP	51	4.61	1.61			
Post-Video SOC for Having Child Receive All Doses						
1- ESP	63	2.83	1.33	.675	112	.501
2- SSP	51	2.67	1.14			
Post-Video SE for Having Child Receive All Doses						
1- ESP	63	4.87	1.48	1.225	112	.223
2- SSP	51	4.51	1.69			

*p<.05, **p<.01, ***p<.001
Bonferroni Adjustment Significance (.05/26, p=.001)
Note: All p values above .001 are considered non-significant, and only those below .001 are considered statistically significant
p<.001 found *only* for level of education

Pearson correlations. Correlations were examined ($p<.004$, as per footnote in Table A), finding no significant correlations among the study variables.

See Tables A and B in Appendix P, *Non-Significant Correlations*.

Results for Research Question #16

Controlling for social desirability, what are the significant predictors of parents being in an action or maintenance stage for making sure their children received the HPV vaccination—as the Study #1 dependent variable?

Backward stepwise regression. In this approach, the model controlled for social desirability. All independent variables were entered into the model, as follows: social desirability; partner yes/no; age; vaccine risks; confidence in vaccines; born in US yes/no; number of children ages 9-18; if child received flu vaccination; if provider recommended HPV vaccination; if a student; if employed; degree of exposure to HPV

education in media, etc.; degree of barriers to HPV vaccination; parent believes in value of flu vaccination; extent holds conspiracy beliefs about vaccination; if child has already received HPV vaccine yes/no; degree of HPV knowledge; annual household income; education level; if talked to provider about HPV yes/no; level of HPV vaccination knowledge. Then, the program eliminated the variable with the weakest association with the dependent variable. This continued (eliminating one variable at a time) until the only variables left in the model were statistically significant (i.e., $p < .05$).

Using backward stepwise regression analysis, for the *whole sample*, the significant predictors of **Study #1 dependent variable of parents being in an action or maintenance stage of change for having made the decision and taken action to ensure their child received the HPV vaccination—as measured before parents watched a linguistically and culturally tailored cartoon video** were, as follows:

- Having a child actually already received the HPV vaccination ($\beta=1.714$, $SE_B=.599$, $p=.000$)
- Having a higher annual household income is ($\beta=.142$, $SE_B=.200$, $p=.007$)

For this model, the $R^2=.420$, and the $AdjR^2=.405$, meaning that 40.5% of the variance was explained by this model.

See Table 24.

S1. Table 24. Whole Sample: Backward Stepwise Regression Analysis Predicting Higher Pre-Video SOC for Having Child Vaccinated (N=122)

Predictors	b	SE _B	P
Having a child already actually received HPV vaccination	1.714	.599	.000***
Having a higher annual household income is	.142	.200	.007*

* $p < .05$, ** $p < .01$, *** $p < .001$
 $F=26.838$ ($p=.000$)
 $R^2=.420$, $Adj R^2=.405$ —meaning 40.5% of the variance was explained by this model

Results for Research Question #17

How do parents respond when asked why they would or would not recommend the video, including any comments on the strengths and weaknesses of the video, or how could it be improved?

Some 67.2% (n=82) of parents commented on the reasons for recommending the avatar video and provided their feedback to help improve the video. Among these 82 parents, 76.5% (n=52) were ESP and 55.6% (n=30) were SSP.

Thematic content analysis (see Appendix O, *Qualitative Data Analysis Strategy*) was used to identify emergent themes.

Among ESP, five emerged themes about the reasons for parents to recommend the video to other parents were identified, including:

Category I-A: Reasons for Recommending the Video among ESP

Theme 1: Very informative/ educational and linguistically appropriate

Subthemes:

- Simple language
- Easy to understand

Theme 2: Improves knowledge and awareness about the HPV infection and HPV vaccine

Theme 3: Racially and ethnically diverse

Theme 4: Promotes parental discussion with their child's healthcare provider about the HPV and HPV vaccine

Subtheme:

- Promote HPV-information seeking behavior

Theme 5: It's an effective educational tool for parents

See Table 25.

S1. Table 25. ESP Sample's Reasons for Recommending the E-Health Video (N=122)

English-Speaking Sample (N=68)

Emergent Themes	Sample Quotes
<i>Category I-A: Reasons for Recommending the Video</i>	
Theme 1: Very informative/ educational and linguistically appropriate	<i>"I would recommend the video as it offers detailed information on the conditions that HPV can cause in both men and women as well as how it is transmitted."</i>

<p>Subthemes:</p> <ul style="list-style-type: none"> a. Simple language b. Easy to understand 	<p><i>“It uses simple language and answers all questions that parents might have.”</i></p>
<p>Theme 1: Improve knowledge and awareness about the HPV infection and HPV vaccine</p>	<p><i>“I found it very informative and easy to understand.”</i></p> <p><i>“I didn’t know most of those information about HPV, this video was very clarify to me.”</i></p>
<p>Theme 3: Racially and ethnically diverse</p>	<p><i>“The video tells parents like me how the vaccine does not affect our children sexual life and tells how it can prevent HPV cancer. I will recommend the video because it explain the benefit of taking a prevention vaccine for HPV cancer.”</i></p> <p><i>“I think differently about the HPV vaccine. The video made me realize that it can do more good than harm to be prepared and that preparing kids is just a way of protecting them for HVP cancer.”</i></p> <p><i>“...I completely appreciate that it was representative of diverse skin tones...”</i></p> <p><i>“...Another positive attribute the video was able to convey was the racial makeup of the parents and the doctor herself. I’m not sure if the Latino or the African American population or the was the target audience; however, having people of color being placed in a primary position usually occupied by whites counterparts when it come to the creation of media, was very pleasing to see. Diversity is essential, and even more so on the screen, therefore, this video context was able to project a different and more positive image to the POC communities, rather than, what traditions media outlets place; traditionally several stereotypical roles.”</i></p>

Theme 4: Promote parental discussion with their child’s healthcare provider about the HPV and HPV vaccine

Subtheme

a. Promote HPV-information seeking behavior

“I still want to ask my doctor”

“I def. need to talk to my kid pediatric”

Theme 5: It’s an effective educational tool for parents

“I would recommend this video. It is very clear and to the point. Easy to understand for kids and parents.”

“I like the video and would love to share it with my kids.”

“Excellent resource of information. Educational for me & my children I really appreciate.”

Among the SSP, three themes emerged themes for recommending the video:

Category I-B: Reasons for Recommending the Video among SSP

Theme 1: Very informative/educational

Theme 2: Clarifies parents’ concerns and doubts about the HPV vaccine

Theme 3: Improves knowledge and awareness about HPV infection and HPV vaccination

See Table 26.

S1. Table 26. SSP Sample’s Reasons for Recommending the E-Health Video (N=122)
Spanish-Speaking Sample (N=54)

Emergent Themes	Sample Quotes
<i>Category I-B: Reasons for Recommending the Video</i>	
Theme 1: Very informative/educational	<i>“It is educational and very informative.”</i>
	<i>“The video was very good and easy to understand.”</i>
Theme 2: Clarifies parents’ concerns and doubts about the HPV vaccine	<i>“The video is very clear and met all my expectations and doubts, I would recommend it to my friends.”</i>
	<i>“The video is very clear, and explains in detail what HPV is and the consequences as well as the importance of vaccinating children from 9 years to 18 years. It cleared my doubts and concerns and encouraged me</i>

Theme 3: Improves knowledge and awareness about the HPV infection and HPV vaccine

to take the decision to vaccinate my children.”
“Because it explains the importance of getting vaccinated and the recommended age.”
“It helped me expand my knowledge.”

Results for Research Question #18

What additional thoughts or feelings do the parents share in reaction to the video and/or taking the survey?

Three main emergent themes were identified **among ESP** who provided their feedbacks to help improve the video as follows:

Category 2-A: Reasons for Improving the Video among ESP

Theme 1: Improve the quality of the video

Subthemes:

- Incorporate more visual image related to HPV
- Shorten the length of the video

Theme 2: Include information about HPV vaccine side effects, and whether or not there is a recommended HPV test for men

Theme 3: The video should address the importance of engaging children in sexual health education

Subtheme

- Link sexual behavior and health behavior

See Table 27.

S1. Table 27. ESP Sample's Recommendation to Improve the E-Health Video (N=122)

English-Speaking Sample (N=68)

Emergent Themes	Sample Quotes
<i>Category 2-A: Reasons for Improving the Video</i>	
Theme 1: Improve the quality of the video	
Subthemes:	
a) Incorporate more visual image related to HPV	<i>“I think in the video was informative but very dull. Maybe it needed more visuals on the virus itself to make it more interesting to watch. I would recommend it anyways.”</i>
b) Shorten the length of the video	<i>“I was completely distracted by the skin tones of the daughter + father vs the son +</i>

mother. Was this a blended family? So odd...”

“I would recommend the video; the pace of the video is a little slow.”

Theme 2: Include information about HPV vaccine side effects, and whether or not there is a recommended HPV test for men

“...the video failed to explain or what information may be I did not retain, were an explanation of the side effects...”

*“Haven’t heard any of the negatives.”
It doesn’t answer whether or not HPV can be tested for in males.*

Theme 3: The video should address the importance of engaging children in sexual health education

Subthemes:

a. Link sexual behavior and health behavior

“...Because the HPV virus is a sexually transmitted disease, it is necessary to have a small amount of information about how parents engage their children on this particular subject because it falls under sexual education, which is a sensitive topic to address with children...”

“The video should have included a very small discussion between the physician and the parents about how a sensitive topic could be discussed as well as understood in a family dynamic. This is rather important as many parents with children between the ages of 9 and 18 are facing emotional and social challenges with their kids...”

“...It is indeed a concern when sharing any health videos about sexually transmitted diseases to a parent population that more integral information pertaining to family discussions about sexual behavior is included and NOT left out...”

Among SSP who provided their feedbacks to help improve the video, emerged theme identified included:

Category 2-B: Reasons for Improving the Video among SSP:

Theme 1: Include information about HPV vaccine side effects

See Table 28.

S1. Table 28. SSP Sample's Recommendation to Improve the E-Health Video

Spanish-Speaking Sample (N=54)	
Emergent Themes	Sample Quotes
<i>Category 2-A: Reasons for Improving the Video</i>	
Theme 1: Include information about HPV vaccine side effects	<p><i>“There is no information in the video about side effects or reactions that this vaccine in children under age can cause ... and long-term consequences. From my part, it is a question which I would like to clarify if there are enough studies to verify that this vaccine is safe enough to be administered to my son or daughter, given that they show that other vaccines cause or have caused diseases in other children, such as autism.”</i></p> <p><i>“I would like to know a little about the side effects of the vaccine.”</i></p>

Data Analysis Results by Study Question for Study #2

Results for Research Question #1

What were the providers' demographic and background characteristics (gender, age, race/ethnicity, US born or not, partner status, annual household income, status as a current job title, pediatric or family practitioner, work setting, years in current position pediatrics or family practice, years in health care)?

The convenience sample consisted of 19 healthcare providers with 84.2% (n=16) females, 26.3% (n=5) non-Hispanic black, 21.1% (n=4) Hispanic, and 31.6% (n=6) were non-Hispanic White with a mean age of 40.16 years (min=29, max=71, SD=12.64).

Some 63.2% (n=12) were medical doctors. Some 84.2% (n=16) worked in Pediatrics, while 26.3% (n=5) worked in Family Medicine Practice. The mean annual household income was category 6.05 (min=2, max=8, SD=1.43) for \$100,000 to \$199,999.

See Table 29.

S2. Table 29. Providers' Demographic Characteristics (N=19)

	N	%
Gender		
1-Female	16	84.2
2-Male	3	15.8
Age		
<30	4	21
31-40	8	42.1
41-50	3	15.9
51-60	2	10.5
61-72	2	10.5
<i>M=40.16, SD=12.64, Min=29, Max=71</i>		
Race/Ethnicity		
1-Non-Hispanic Black	5	26.3
2- Non-Hispanic White	6	31.6
3-Hispanic/Latino	4	21.1
4-Asian	5	26.3
6-Native Hawaiian/Pacific Islander	0	0
7- Arab American/Middle Eastern	0	0
8- Other group(s)	0	0
US-born		
1-Yes	13	68.4
2-No	6	31.6
Partner Status		
1-Yes	13	68.4
2-No	6	31.6
Level of Education		
1-M.S.N.	1	5.3
2-MPH	2	10.5
3-MSW	1	5.3
4-Nurse Practitioner (NP, FNP, ANP, GNP, etc.)	1	5.3
5-Physician Assistant (PA)	1	5.3
6-M.D. (Medical Doctor)	12	63.2
7-Other (Please explain)	1	5.3
Employment Status		
1-Full Time	18	94.7
2-Part Time	0	0
3-Per Diem	1	5.3

Annual Household Income

1-\$10,000 to \$19,000	1	5.3
2-\$50,000 to \$99,999	5	26.3
3-\$100,000 to \$199,999	6	31.6
4-\$200,000 to \$299,000	4	21.1
5-\$300,000 to \$399,000	3	15.8

M=6.05, SD=1.43, Min=2, Max=8

Work Setting**Pediatrics**

1-Yes	16	84.2
2-No	3	15.8

Family Practice

1-Yes	5	26.3
2-No	14	73.7

Years in Current Position

1 year or less	3	15.8
2-4 years	6	31.6
8-10 years	3	15.8
11-15 years	1	5.3
16-20 years	1	5.3
26-30 years	2	10.5
More than 30 years	1	5.3

Results for Research Question #2

What was the providers' (a) level of knowledge about the Human papillomavirus (HPV) infection, the available HPV vaccinations, and schedule for vaccinating preteen and teen boys and girls—and for the behavior of recommending within their medical practice to parents/guardians that they vaccinate their preteen and teen boys and girls for HPV—and, also their (b) stage of change, (c) self-efficacy, and (d) perception of barriers (e.g. time) experienced during a medical visit for doing this?

The mean score for **providers' HPV knowledge** was 4.53 for *between good and very good* (min=2, max=6, SD=1.12). The mean score for **provider's stage of change** for recommending HPV vaccination to parents for their children was 4.11 for *action stage* (min=1-precontemplation, max=5-maintenance, SD=1.49). The mean **self-efficacy for providers** was 5.32 for *80% confident or high self-efficacy* (min=2, max=6, SD=1.00).

The mean score for barriers to recommending HPV vaccination to parents for children was 3.32 or *low barriers* (min=0 non-existent, max=7 extremely high, SD=2.08) or closest to low. Some 10.5% (n=2) rated barriers as “extremely high.”

See Table 30.

S2. Table 30. Providers’ HPV Knowledge for Recommending HPV Vaccination to Parents for Their Child, and Stage of Change, Self-efficacy, and Barriers (N=19)

	N	%
(a) – HPV Knowledge		
M=4.53, SD=1.12, Min=2, Max=6		
1 – Very Poor	0	0
2 – Poor	1	5.3
3 – Fair	2	10.5
4 – Good	6	31.6
5 – Very Good	6	31.6
6 – Excellent	4	21.1
(b) – Stage of Change for recommending HVP Vaccine		
M=4.11, SD=1.49, Min=1, Max=5		
1-I am not thinking of doing this behavior at all.	2	10.5
2-I am thinking about doing this behavior.	2	10.5
3-I am preparing to do this behavior.	1	5.3
4-I have been doing this behavior for LESS than six (6) months.	1	5.3
5-I have been doing this behavior for MORE than six (6) months up to many years.	13	68.4
(c) – Self-Efficacy for Recommending HVP Vaccine		
M=5.32, SD=1.00, Min=2, Max=6		
1-0% confident	0	0
2-20% confident	1	5.3
3-40% confident	1	5.3
4-60% confident	7	36.8
5-80% confident	10	52.6
6-100% confident	1	5.3

(d) – Degree of Barriers I (e.g. time) Experience in a Medical Visit for Actually Doing This is

M=3.32, SD=2.08, Min=0, Max=7

1-Non-existent (none at all)	2	10.5
2-Extremely low	3	15.8
3-Low	5	26.3
4-Moderate	5	26.3
5-High	1	5.3
6-Very high	1	5.3
7-Extremely high	2	10.5

Results for Research Question #3

How did the providers rate the quality of the cartoon video as a potential linguistically and culturally appropriate tool (i.e., available in English and Spanish) to support parents in their decision-making about whether or not they make sure their preteen or teen child receives the HPV vaccination series?

The mean rating of the video by providers was 4.84 or closest to *very good* (min=3-fair, max=6-excellent, SD=.834). Some 47.4% (n=9) of healthcare providers rated the video as “very good,” and 21.1% (n=4) rated the video as “excellent.”

See Table 31.

S2. Table 31. Rating the Quality of the Avatar Video (RTV-PROVIDERS-1) (N=19)

	N	%
How do the providers rate the video cartoon?		
<i>M=4.84, SD=.834, Min=3, Max=6</i>		
<i>Please think about the cartoon video you were asked to watch, and please rate the video:</i>		
<i>1. I rate the video as follows:</i>		
1 - Very Poor	0	0
2 – Poor	0	0
3 – Fair	1	5.3
4 – Good	5	26.3
5 - Very Good	9	47.4
6 – Excellent	4	21.1

Results for Research Question #4

Do the providers recommend the cartoon video for parents or to other providers so they could share it with parents?

The majority of the sample 89.5% (n=17) of healthcare providers indicated they would recommend the video.

See Table 32.

S2. Table 32. Providers' Recommendation of the Avatar Video (N =19)

	N	%
<i>Would you recommend this video to other parents?</i>		
Whole Sample (N=122)		
Yes	17	89.5
No	2	10.5

Some 78.9% (n=15) of healthcare providers reported that they watched all of the video, while some (n=4) of healthcare providers reported that they watched most of the video.

See Table 33.

S2. Table 33. Dose of Exposure to Video

	N	%
<i>How much of the video was watched?</i>		
3-Most of the video	4	21.1
4 -All of the video	15	78.9

Results for Research Question #5

How do the providers explain why they would or would not recommend the video to parents or other providers, including any comments on the strengths and weaknesses of the video, or how could it be improved?

Some 89.5% (n=17) of healthcare providers commented on the video, while the following themes emerged:

Category 3-A: Reasons for Recommending the Video among Providers

Theme 1: Linguistically appropriate

Subthemes

- Accurate
- Easy to understand
- Informative
- Innovative

Theme 2: Address parental common concerns about the HPV vaccine

Theme 3: Representation of diversity

See Table 34.

S2. Table 34. Provider Reasons for Recommending the E-Health Video (N=17)

Emergent Themes	Sample Quotes
<i>Category 3: Reasons for Recommending the Video</i>	
Theme 1: Linguistically appropriate Subthemes: <ul style="list-style-type: none"> a) Accurate b) Easy to understand c) Informative d) Innovation 	<p><i>“...information was presented in an accurate and simplistic way. I believe most families can relate to the questions that were brought up in the video.”</i></p> <p><i>“The information was accurate and the message was good.”</i></p> <p><i>“Very informative, easy to watch, not too long.”</i></p> <p><i>“Complete and easy to understand information.”</i></p> <p><i>“...the clinician did not use a judgmental tone.”</i></p> <p><i>“Innovation. Great information”</i></p> <p><i>“Super helpful and addressed many common questions.”</i></p> <p><i>“I think this is a very useful video. It explains what HPV is, what it does and the need for the vaccine. It also addresses common myths.”</i></p> <p><i>“The video was clear and covered all FAQs regarding HPV and the vaccine.”</i></p>
Theme 2: Address parental common concerns about the HPV vaccine	
Theme 3: Representation of diversity	<p><i>“I like that the cartoons were of diverse backgrounds...”</i></p>

Results for Research Question #6

What additional thoughts or feelings do the providers share in response to watching the video and/or taking the survey?

Three emergent themes regarding provider's recommendations to improve the video were identified, as follows:

Category 3-B: Reasons for Improving the Video among Providers

Theme 1: Improve the quality of the video

Subthemes:

- Use better graphics
- Shorten the length of the video

Theme 2: Make it more interactive and engaging

Subtheme:

Theme 3: Shift the focus of HPV vaccination away from the route of transmission, particularly at the beginning of the video

Subtheme:

- Shift focus from STDs to primary prevention of HPV-associated cancers

See Table 35.

S2. Table 35. Providers' Recommendation to Improve the E-Health Video (Survey Part-IX QP-RSP-PROVIDERS-1) (N=17)

Emergent Themes	Sample Quotes
<i>Category 3-B: Reasons for Improving the Video</i>	
Theme 1: Improve the quality of the video	"...the graphics weren't the best..."
Subthemes:	"It felt a little long..."
a) Use better graphics	"It seemed very mono-toned and rigid/robotic - the physician in particular. I worry that parents and teens might be turned off or lose interest."
b) Shorten the length of the video	"...the dialogue monotone and the pace slow. It doesn't really grab or hold attention."
	"...it is really slow-paced which will likely lead to people stopping watching it."
Theme 2: Make it more interactive and engaging	"...it could be more engaging and animated."

Theme 3: Shift the focus of HPV vaccination away from the route of transmission, particularly at the beginning of the video

Subtheme:

a) Shift focus from STDs to primary prevention of HPV-associated cancers

“There has been some broader discussion in the pediatric field about shifting the focus of HPV vaccination away from the route of transmission, since this is not a focus on other vaccinations.”

“...would definitely not start with HPV as an STD- many people believe the whole reason we have trouble with HPV vaccination coverage is because it got billed as an STD vaccine and not what it really is - a cancer prevention vaccine.”

Conclusion

This chapter presented the results of data analysis. Results were organized and presented by research questions, providing organization to the chapter. For both Study #1 and Study #2, findings for both the quantitative and qualitative research questions were presented.

Chapter V provides a summary of the present study and a discussion of results, including implications and recommendations as a final conclusion.

Chapter V

SUMMARY, DISCUSSION, IMPLICATIONS, RECOMMENDATIONS, AND CONCLUSION

The present chapter provides a summary of the dissertation research as well as implications and recommendations for further research. Lastly, this chapter ends with a final conclusion.

Summary of the Literature Review

Human papillomavirus (HPV) infection is the most common sexually transmitted infection (STI) among women and men in the world (Newman et al., 2018). According to Tanveer (2017), HPV is a global health problem. There are more than 150 types of HPV, and about 40 types are transmitted through sexual contact, infecting “the anogenital region and other mucosa sites of the body” (Dunne et al., 2014, p. 69). Thus, “most sexually active persons will acquire HPV in their lifetime” (p. 69).

Approximately 38,793 HPV-associated cancers are diagnosed in the United States annually (CDC, 2016e). The number of reported HPV-associated cancer diagnoses were higher among women than among men, at 23,000 and 15,793, respectively. Scientists have identified over 120 HPV types (CDC, 2016d). More than 40 types of HPV may cause infection of the genital tract, while 90% of HPV infections are asymptomatic and

usually disappear within 2 years (CDC, 2016a). However, persistent infection with oncogenic or high-risk HPV types can progress to HPV cancers, such as cancer of the cervix, vulva, vagina, penis, or anus (CDC, 2016b; Holman et al., 2014).

HPV accounts for 99% of all cervical cancer cases (CDC, 2016d; Kessels et al., 2012). It is estimated that 50% of cervical cancer cases worldwide are caused by HPV type 16, while HPV types 16 and 18 are responsible for 70% of cervical cancer diagnoses (CDC, 2016d). HPV has also been linked to some oropharyngeal cancers (CDC, 2016c). Non-oncogenic or low-risk HPV types 6 and 11 can cause 90% of genital warts and abnormal cervical cells (CDC, 2016d; Holman et al., 2014).

In an effort to address the disparity gap in HPV infection, *Healthy People 2020* sought an 80% increase in the proportion of females and males aged 13 to 15 years who complete the HPV vaccination series, with a baseline HPV status of 28.1% and 6.9%, respectively (USDHHS, 2019). The U.S. FDA has licensed three vaccines for use in the United States: Cervarix, Gardasil, and Gardasil 9 (Fontenot et al., 2015; Meites et al., 2016). The three vaccines are administered in a three-dose series at intervals of a range of 0, 1-2, and 6 months (Meites et al., 2016), meaning “1-2 months between dose 1 and 2 and 6 months between dose 1 and 3” (Wilson et al., 2015, p. 396). The 9vHPV vaccine can be administered in a two-dose series schedule for girls and boys from 9 to 14 years old (Meites et al., 2016).

The Advisory Committee on Immunization Practices (ACIP) recommends routine vaccination of all three HPV vaccines for girls from ages 11 to 12 years, but the vaccination series can be initiated as early as 9 years of age (CDC, 2016a; Trogdon & Ahn, 2015). Catch-up vaccination is also recommended for girls and young females from

ages 13 to 26 years who have not previously received the vaccine (Laz et al., 2013; Trogdon & Ahn, 2015). The ACIP also recommends routine HPV vaccinations of the 4vHPV and 9vHPV vaccines for teen boys between ages of 11 and 12 years, and through age 21 years for those who were not previously vaccinated (CDC, 2016a). For specific individuals, such as men who have sex with men (MSM) and for young individuals with certain immunocompromised conditions (e.g., HIV), three doses of the HPV vaccine are administered, starting at age 9 years and continuing through age 26 years, if not vaccinated previously (CDC, 2016a, 2016d, 2016h).

Despite the ACIP recommendations, HPV vaccine uptake and completion rates are lower than expected (Spencer et al., 2018). Data from the 2017 National Immunization Survey-Teen (NIS-Teen) showed that 66% of adolescents aged 13 to 17 years received at least one dose of the HPV vaccine, 69% of girls and 63% of boys received their first dose of the HPV vaccine, and only 49% of teens completed all three recommended doses (Walker et al., 2018). Clearly, national HPV vaccination completion rates are far from meeting the *Healthy People 2020* target of 80% of adolescents aged 13 to 15 years (Katz et al., 2016; Rosen et al., 2018).

Adolescent girls are more likely to be vaccinated than boys (CDC, 2017e). Data from the 2015 NIS-Teen showed that 6 out of 10 girls and 5 out of 10 boys had received at least one dose of the HPV vaccine (CDC, 2017e). Only about 43% of teens had completed all recommended doses of the HPV vaccine (CDC, 2017h). It is argued that delaying “completion of the series places adolescents at risk for acquiring HPV infection due to gaps in immunologic protection from the vaccine doses” (Wilson et al., 2015, p. 396).

Some studies have reported higher rates of the HPV vaccine initiation among African American and Hispanic adolescent girls than their White counterparts (Beavis & Levinson, 2016; Nelson et al., 2015; Okafor et al., 2015). Henry et al. (2018) explained that higher rates of HPV vaccine uptake among racial/ethnic minority groups (e.g., Non-Hispanic Black and Hispanics) living in low-income communities could be due in part to access to safety-net services which provide free or reduced cost vaccinations, or to the availability of long-term targeted interventions. Conversely, higher vaccination rates could be due to living among “co-ethnics in segregated areas with similar cultural norms that promote vaccination” (p. 2).

However, African American and Hispanic individuals continue to report lower rates of the HPV vaccine completion than those who are White (Beavis & Levinson, 2016; Jeudin et al., 2014; Nelson et al., 2015; Okafor et al., 2015). In this regard, Henry et al. (2018) indicated that economic difficulties and barriers related to access to healthcare among individuals living in low-income areas could also result in lower HPV vaccine uptake due to limited access to healthcare resources and preventive services. For example, language barriers and lack of awareness about the benefits of getting the HPV vaccine in racial/ethnic minority communities may result in lower screening rates. Henry et al. further stated that, given how “cancer prevention and screening activities are generally higher among high-income, more educated populations, conventional wisdom suggests that uptake for a recommended vaccine that protects against some cancers would also follow this trend” (p. 2).

Pérez et al. (2018) reported that after adjusting for healthcare factors, foreign-born men had lower odds of HPV vaccine initiation, while foreign-born women had lower

odds of HPV vaccine initiation and completion than U.S.-born women and men. This suggests that immigrants may face barriers other than access to healthcare that contribute to lower HPV vaccine initiation than their U.S.-born counterparts. For example, “foreign-born Latinos have numerous barriers to healthcare, including language, transportation, and documentation status, both at the individual and family level” (p. 257). Also, there are those immigrants who “may not be familiar with navigating the U.S. healthcare system,” or lack knowledge of “U.S. preventive medical guidelines” (p. 257). Also, some immigrants may prioritize “treating symptoms rather than seeking regular preventive services” (p. 257). Yet, even here, for those immigrants who “seek care, healthcare providers have the potential to increase HPV vaccine uptake, as healthcare provider recommendation has been associated with HPV vaccination” (p. 257).

Henry et al. (2018) observed that the higher odds of HPV vaccine in urban areas and among racial/ethnic minorities living in high-poverty areas might be due to parental acceptability of HPV vaccine, greater proportion of providers recommending the vaccine, and parental accessibility to safety net programs. Conversely, lower rates of HPV vaccine initiation among boys living in areas with lower levels of poverty, “irrespective of race/ethnicity, is also likely to due to less parental support of HPV vaccination as compared to parents from lower-SES groups” (p. 11). It is also possible that non-Hispanic Whites are being exposed to “negative sentiment or vaccination safety concerns” and may not pursue vaccinating their sons (p. 11).

Patel and Berenson (2013) conducted a review on parental vaccine hesitancy and explained that parents who refused vaccination tended to be more educated, “have researched the topic extensively and overall show an interest in health-related issues”

(p. 2650). Patel and Berenson further explained the “theory behind this observation,” wherein “educated parents are more often more likely to be have access to specific source of media, such as Internet, which may expose them to contradictory and possibly inaccurate information regarding the HPV vaccine” (p. 2650). Also, those “highly educated parents may feel more confident in their ability to interpret complex scientific and clinical health information, allowing them to ignore the advice of practitioners if contradiction exists” (p. 2650).

In addition, it is possible that providers in more affluent areas are non-adherent to the recommendation guidelines on routinely offering the HPV vaccine to parents for their children (Henry et al., 2018). On the other hand, acculturation may play a key role in HPV vaccination among Hispanics. For instance, Hispanics who live in low-income communities tend to have a lower level of acculturation and are more likely to accept HPV vaccine for their children, “which may account for the differences seen among Hispanics from low-income compared to Hispanics from wealthier areas” (p. 13).

Agénor et al. (2018) explained that tailored-education interventions, including alerts and reminders, can be used to help providers and parents make an informed decision regarding HPV vaccination. Educational interventions should be tailored (e.g., be provided in multiple languages) and tested among non-Hispanic Black, Hispanic, and non-Hispanic Asian individuals in order to ensure the intervention’s appropriateness and effectiveness for those from underserved groups (Agénor et al., 2018).

Tuong et al. (2014) considered the impact of videos in modifying health behaviors, including 28 studies and 12,703 subjects in a systematic review of video studies. Findings showed that video “interventions were variably effective for modifying

health behaviors depending on the target behaviors to be influenced,” being less effective for influencing addiction behaviors (p. 219).

Summary of the Statement of the Problem

The problem that this study addressed is the need to increase HPV vaccination initiation and completion for male and female preteens and teens (ages 9 to 18) by virtue of the dissertation accomplishing the following: (1) addressing parental hesitancy about HPV vaccination and supporting their decision-making to initiate and complete HPV vaccination of their children via exposure to an innovative linguistically and culturally tailored e-health cartoon video intervention on HPV vaccination; and (2) enhancing provider recommendations to parents to vaccinate preteens and teens by providing them the new tool of an innovative linguistically and culturally tailored e-health cartoon video on HPV vaccination, which they may choose to recommend to parents, augmenting their own recommendation to parents to pursue and complete HPV vaccination of children.

Summary of the Statement of the Purpose

Study #1: Parents (English or Spanish Speaking)—Predictors of Parents Having Decided to Take Action to Vaccinate Child for HPV

The first purpose of the dissertation research (i.e., Study # 1) was to identify significant predictors of the *study # 1 dependent variable of parents being in an action or maintenance stage of change for having made the decision and taken action to ensure their child received the HPV vaccination—as measured before parents watched a linguistically and culturally tailored cartoon video.*

Study #1: Parents (English or Spanish Speaking)—Cartoon Video as a Potential Linguistically and Culturally Tailored Brief Intervention

A second purpose of the dissertation research (study #1) was to determine if a linguistically and culturally tailored (i.e., in English or Spanish) video on HPV and HPV vaccination of children can serve as a brief online e-health intervention that promotes significant parental movement across the *stages of change* (i.e., from a precontemplation or contemplation stage, to a preparation stage, as per the theory of Prochaska and DiClemente [1983]) and, significantly increases *self-efficacy* (as per the theory of Bandura [1977]) for *three key behaviors* of: (1) talking to a pediatrician or family practice medical provider about the Human papillomavirus (HPV) infection, and the HPV vaccination for children; (2) making sure their preteen and teen children receive the HPV vaccination; and (3) making sure their preteen and teen children receive all the required doses (e.g., at least 2 or 3 doses) of the HPV vaccination. This involved *a pre-video viewing versus post-video viewing comparison of parents' stage of change and self-efficacy each of these three key behaviors*. In addition, changes in knowledge were examined for parents from pre- to post-video viewing.

Study #1: Parents (English or Spanish Speaking)—Cartoon Video as a Potential Linguistically and Culturally Tailored Brief Intervention

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DiClemente [1982]) and, significantly increases *self-efficacy* (as per the theory of Bandura [1977]) for *three key behaviors* of: (1) talking to a pediatrician or family practice medical provider about the Human papillomavirus (HPV) infection, and the HPV vaccination for children; (2) making sure their preteen and teen children receive the HPV vaccination; and (3) making sure their preteen and teen children receive all the required doses (e.g. at least 2 or 3 doses) of the HPV vaccination. This involved *a pre-video viewing versus post-video viewing comparison of parents' stage of change and self-efficacy each of these three key behaviors*. In addition, changes in knowledge were examined for parents from pre- to post-video viewing.

Study #2: Providers (Pediatricians or Family Practitioners)—Recommending the Cartoon Video to Parents or Not

A third purpose of the dissertation research (i.e., via Study # 2) was to obtain the Study #2 dependent variable of pediatricians/family practitioners recommending (yes/no) the video to parents and/or other providers so they could share it with parents, in order to support parental decision-making about initiating and completing HPV vaccination of their preteen and teen children (as per the Diffusion of Innovation Theory of Rogers [1995]).

Summary of the Research Questions for Study #1

Given an online sample of parents (n=122) who responded to a social media campaign (i.e., “Go to <<https://tinyurl.com/HPV-Video-Study-English>> to take the Survey for Parents on HPV Vaccination for Children and rate a cartoon for a chance to

win 1 of 3 \$100 Amazon gift cards”) and complete the survey, Study #1 sought to answer the following research questions:

1-What are the parents’ demographic characteristics (i.e., selected English or Spanish survey and video, gender, age, race/ethnicity, US born or not, partner status, employment status, annual household income, level of education, type of medical insurance)?

Part I: Parent’s Basic Demographics (PARENTS-BD-10)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

2-What do parents report about their children (i.e., number of children ages 9 to 18, number of male and female children, child sexual orientation, type of medical insurance)?

Part II: About Your Children (AYC-4)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

3-Do parents report providers having talked to them about HPV and the HPV vaccination, and did the providers recommend the HPV vaccination for their child?

Part III: Parent Report on Provider Recommendation on HPV vaccination for Child (PARENT-R-PR-HPV-V-FC-2)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

4-Do parents report one or more of their children ever having received the HPV vaccination?

Part IV: Parent Report on HPV vaccination for Child (PARENT-R-HPV-V-FC-1)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

5-Do parents report one or more of their children ever having received the flu vaccination, and do they believe in the value of an annual (yearly) flu vaccination for their children?

Part V: Parent Report on HPV vaccination for Child (PARENT-R-FLU-V-FC-1)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

6-To what extent have parents been exposed to print or digital media providing information on the HPV vaccination for children?

Part VI: Parent Exposure to Print or Other Media or Information on HPV Vaccination for Children (PARENT-EPOMI-HPV-VFC-1)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

7-What is the parents' level of general HPV knowledge?

Part VII: HPV General Knowledge (HPV-G-K-23)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

8-What is the parents' level of HPV vaccine knowledge?

Part VIII: HPV Vaccine Knowledge Scale (HPV-V-K-S-11)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

9-What are the parents' general vaccine attitudes, including for (a) conspiracy beliefs, (b) vaccine hesitancy—lack of confidence, and (c) vaccine hesitancy—risks?

Part IX: General Vaccine Attitudes-Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks (GVA-CB-HLC-R-16)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

10-What are the parents' perceived barriers to their child completing the HPV vaccination series?

Part X: Parents' Perceived Barriers to Child's Completion of the HPV vaccination Series (PARENTS-PB-CC-HPV-VS-12)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

11-Pre-video viewing, what was the parents' knowledge of HPV, the prevalence of parents being in an action or maintenance stage for making sure their children received the HPV vaccination—as the Study #1 dependent variable—and, their self-efficacy for doing this?

From Item # 4 of Part XII: Pre-Video Parents' HPV Knowledge and Stage of Change and Self-Efficacy for Talking to Provider and Child Receiving the HPV Vaccine (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

12-Was there a change in the parents' knowledge of HPV, as well as their stage of change and self-efficacy for three key behaviors [i.e. (1) talking to a pediatrician or family practice medical provider about the Human papillomavirus (HPV) infection, and the HPV vaccination for children; (2) making sure their children receive the HPV vaccination; and (3) making sure their children receive all the required doses (e.g. at least 2 or 3 doses) of the HPV vaccination] when comparing their pre-video viewing to post-video viewing mean scores?

Part XII: Pre-Video Parents' HPV Knowledge and Stage of Change and Self-Efficacy for Talking to Provider and Child Receiving the HPV Vaccine (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)

and

Part XIV: Post-Video Parents' HPV Knowledge and Stage of Change and Self-Efficacy for Talking to Provider and Child Receiving the HPV Vaccine (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)

Data Analysis Plan: Paired *t*-tests

13-How do the parents rate the video cartoon?

Part XV: Rate the Video for Parent (RTV-PARENTS-2)

Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

14-Do the parents recommend the video cartoon to other parents?

Part XVI: Diffusion of Innovation using E-Health on HPV by Parents (DOF-UEH-HPV-PARENTS-1)

Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

15-Are there any significant differences between the responses of the English-speaking and Spanish-speaking parents on the study measures?

Data Analysis Plan: Independent *t*-tests

16-Controlling for social desirability, what are the significant predictors of parents being in an action or maintenance stage for making sure their children received the HPV vaccination—before the video—as the Study #1 dependent variable?

Data Analysis Plan: Backward stepwise regression

Qualitative Portion of Study #1

17-How do parents respond when asked why they would or would not recommend the video, including any comments on the strengths and weaknesses of the video, or how could it be improved?

Part XVII: Qualitative Portion on Reasons for Recommending the E-Health Video or Not—For Parents (QP-RREHV-PARENTS-1)

Data Analysis Plan: Identification of emergent themes

18-What additional thoughts or feelings do the parents share in reaction to the video and/or taking the survey?

Part XVIII: Qualitative Portion on Reasons to Study Participation by Parents (QP-RSP-PARENTS-1)

Data Analysis Plan: Identification of emergent themes

Summary of the Research Questions for Study #2

Given an online sample of providers (n=19 pediatricians or family practitioners) who respond to a social media campaign (i.e., “Click <<https://tinyurl.com/HPV-Video-Study-For-Providers>> to take 10-12 min Survey for Pediatric & Family Practice Providers on HPV vaccination for preteens/teens & rate a cartoon for parents on HPV”) and complete the survey, the study #2 answered the following research questions:

1-What were the providers’ demographic and background characteristics (gender, age, race/ethnicity, US born or not, partner status, annual household income, status as a current job title, pediatric or family practitioner, work setting, years in current position pediatrics or family practice, years in health care)?

Part I: Provider’s Basic Demographics (PROVIDERS-BD-15)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

2-What was the providers’ (a) level of knowledge about the Human papillomavirus (HPV) infection, the available HPV vaccinations, and schedule for vaccinating preteen and teen boys and girls—and for the behavior of recommending within their medical practice to parents/guardians that they vaccinate their preteen and teen boys and girls for HPV—and, also their (b) stage of change, (c) self-efficacy, and (d) perception of barriers (e.g. time) experienced during a medical visit for doing this?

Part II: Pre-Video Providers’ Overall HPV Knowledge for Recommending HPV Vaccination to Parents for their Child—and Stage of Change, Self-efficacy, and Barriers (PRE-VIDEO-PROVIDERS-SOC-SE-B-4)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

3-How did the providers rate the quality of the cartoon video as a potential linguistically and culturally appropriate tool (i.e., available in English and Spanish) to support parents in their decision-making about whether or not they make sure their preteen or teen child receives the HPV vaccination series.

Part III: Rate the Video for Providers (RTV-PROVIDERS-1)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

4-Do the providers recommend the cartoon video for parents, or to other providers so they could share it with parents?

Part IV: Diffusion of Innovation using E-Health on HPV by Providers (DOF-UEH-HPV-PROVIDERS-1)

Data Analysis Plan: *Descriptive statistics, including means, standard deviations, frequencies, and percentages*

Qualitative Portion of Study #2

5-How do the providers explain why they would or would not recommend the video to parents or other providers, including any comments on the strengths and weaknesses of the video, or how could it be improved?

Part V: Qualitative Portion on Reasons for Recommending the E-Health Video or not – for Providers (QP-RREHV-PROVIDERS-1)

Data Analysis Plan: *Identification of emergent themes and categories*

6-What additional thoughts or feelings do the providers share in response to watching the video and/or taking the survey?

Part VI: Qualitative Portion on Reactions to Study Participation by Providers (QP-RSP-PROVIDERS-1)

Data Analysis Plan: *Identification of emergent themes and categories*

Summary of the Research Instrumentation for Study #1

The following survey parts were used in Study 1:

- Part I: Parent's Basic Demographics (PARENTS-BD-10)
- Part II: About Your Children (AYC-4)
- Part III: Parent Report on Provider Recommendation on HPV vaccination for Child (PARENT-R-PR-HPV-V-FC-2)
- Part IV: Parent Report on HPV vaccination for Child (PARENT-R-HPV-V-FC-1)
- Part V: Parent Report on HPV vaccination for Child (PARENT-R-FLU-V-FC-1)
- Part VI: Parent Exposure to Print or Other Media or Information on HPV Vaccination for Children (PARENT-EPOMI-HPV-VFC-1)
- Part VII: HPV General Knowledge (HPV-G-K-23)
- Part VIII: HPV Vaccine Knowledge Scale (HPV-V-K-S-11)
- Part IX: General Vaccine Attitudes-Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks (GVA-CB-HLC-R-16)
- Part X: Parents' Perceived Barriers to Child's Completion of the HPV vaccination Series (PARENTS-PB-CC-HPV-VS-12)
- Part XI: More about Social Desirability (MAY-13)
- Part XII: Pre-Video Parents' HPV Knowledge and Stage of Change and Self-Efficacy for Talking to Provider and Child Receiving the HPV Vaccine (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)

- Part XII: Pre-Video Parents' HPV Knowledge and Stage of Change and Self-Efficacy for Talking to Provider and Child Receiving the HPV Vaccine (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)
- Part XIV: Post-Video Parents' HPV Knowledge and Stage of Change and Self-Efficacy for Talking to Provider and Child Receiving the HPV Vaccine (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)
- Part XV: Rate the Video for Parent (RTV-PARENTS-2)
- Part XVI: Diffusion of Innovation using E-Health on HPV by Parents (DOF-UEH-HPV-PARENTS-1)
- Part XVII: Qualitative Portion on Reasons for Recommending the E-Health Video or Not—For Parents (QP-RREHV-PARENTS-1)
- Part XVIII: Qualitative Portion on Reasons to Study Participation by Parents (QP-RSP-PARENTS-1)

Summary of the Research Instrumentation for Study #2

The following survey parts were used in Study #2:

- Part I: Provider's Basic Demographics (PROVIDERS-BD-15)
- Part II: Pre-Video Providers' Overall HPV Knowledge-and for Recommending HPV vaccination to Parents for their Child, Providers' Stage of Change, Self-efficacy, and Barriers (PRE-VIDEO-OHPVK-PROVIDERS-SOC-SE-A-M-T-B-7)
- Part III: Rate the Video for Providers (RTV-PROVIDERS-1)
- Part IV: Diffusion of Innovation using E-Health on HPV by Providers (DOF-UEH-HPV-PROVIDERS-1)
- Part V: Qualitative Portion on Reasons for Recommending the E-Health Video or not—for Providers (QP-RREHV-PROVIDERS-1)
- Part VI: Qualitative Portion on Reactions to Study Participation by Providers (QP-RSP-PROVIDERS-1)

Summary of the Results of Data Analysis for Study #1

Findings for Parents' Demographics

The whole sample consisted of 122 parents who provided electronic informed consent and completed the entire online survey. Of the whole sample (n=122), 68 were English-speaking parents (ESP) and 54 were Spanish-speaking parents (SSP). Thus, the convenience sample consisted of 122 of racially and ethnically diverse parents.

In the whole sample of parents (n=122), 95.9% (n=117) were females and only 4.1% (n=5) were males. Among ESP, 94.1% (n=64) were females and 5.9% (n=4) were males. Among SSP, 98.1% (n=53) were females and 1.9% (n=1) was male. The mean age for the whole sample (n=122) was 40.08 years (min=26, max=72, SD=7.06). The mean age for ESP (n=68) was 41.16 years (min=27, max=72, SD=6.72). The mean age for SSP (n=54) was 38.72 years (min=26, max=55, SD=7.31).

The mean education for the whole sample (n=121) was 4.05 (min=1, max=9, SD=1.98). The mean education for the ESP (n=67) was 4.72 (min=1, max=9, SD=1.88). The mean education for the SSP (n=54) was 3.22 (min=1, max=7, SD=1.78).

Regarding employment status, 73.8% (n=90) of parents reported been employed, and of these 90 parents, 79.4% (n=54) were ESP and 66.7% (n=36) were SSP.

Private insurance plans were the most prevalent source of health coverage reported among ESP (58.8%, n=40) and SSP (31.5%, n=17), respectively. Of the 42.6% (n=52) parents who were born in the US, 55.9% (n=38) were ESP and 25.9% (n=14) were SSP.

Findings on the Children

The mean of children aged 9-18 for the whole sample (n=122) was 1.61 (min 1, max 4, SD=.765). The mean of children aged 9-18 for ESP (n=68) was 1.63 (min 1, max 4, SD=.710). The mean of children aged 9-18 for SSP (n=54) was 1.59 (min 1, max 4, SD=.836). Also, 48.4% (n=59) of parents reported that their children had a private health insurance plan, and of those, 58.8% (n=40) were ESP and 35.2% (n=19) were SSP.

Findings on Communication With Provider About HPV

Some 62.3% (n=76) of parents reported that their child's healthcare provider talked to them about the HPV infection and the HPV vaccine. Among these 76 parents, 64.7% (n=44) were ESP and 59.3% (n=32) were SSP. Also, 55.9% (n=38) of ESP and 50% (n=27) SSP reported receiving a provider recommendation to vaccinate their child.

Findings on Vaccination of Children and Related Beliefs

Some 62.3% (n=76) of parents reported that their child's healthcare provider talked to them about the HPV infection and the HPV vaccine. Among these 76 parents, 64.7% (n=44) were ESP and 59.3% (n=32) were SSP. Also, 55.9% (n=38) of ESP and 50% (n=27) SSP reported receiving a provider recommendation to vaccinate their child.

Some 38.5% (n=47) of parents reported that their child received one or more doses of the HPV vaccine. Of the 47 parents, 41.2% (n=28) were ESP and 35.2% (n=19) were SSP. Further, 9% (n=12) of parents reported their child received two doses; of these, 8.8% (n=6) were ESP and 11.1% (n=6) of SSP. Among 11% (n=9) of parents who reported their child received three doses, 11.8% (n=8) were ESP and 5.6% (n=3) of SSP.

As relevant background, consider how, for the whole sample, 86.1 % (n=105) of parents reported that their child received the flu vaccination. Of these 105 parents, 91.2% (n=62) were ESP and 79.6% (n=43) were SSP. Also, 52.9% (n=36) of ESP and 83.3% (n=45) of SSP indicated that they believe in the value of flu vaccination.

Findings on Low Exposure to Media on HPV

The mean score for the whole sample (n=116) was 2.24 for exposed to a *very low amount of information* (min=0, max=5, SD=1.60). The mean score ESP (n=63) was 2.49

or exposed to a very low amount of information (min 0, max 5, SD=1.66). The mean score for SSP (n=54) was 1.94 or closest to being exposed to a very low amount of information (min 0, max 5, SD=1.45).

Findings for General HPV Knowledge and HPV Vaccine Knowledge

The mean score for the whole sample for general HPV knowledge (n=122) was 12.05 (min=0, max=23, SD=6.79) for *moderate level of general HPV knowledge*. The mean score for the whole sample for HPV vaccine knowledge (n=122) was 5.50 (min 0, max 11, SD=3.43) for a *moderate level of HPV vaccine knowledge*.

Findings for General Vaccine Attitudes: Conspiracy Beliefs and Vaccine Hesitancy

The mean score for **vaccine conspiracy beliefs** for the whole sample (n=122) was 3.82 or closest to neutral (min=1, max=7, SD=1.20). The mean score for **vaccine hesitancy –lack confidence** for the whole sample (n=122) was 2.76 or closest to somewhat disagree (min=1, max=7, SD=1.42). The mean score for **vaccine hesitancy—hesitancy—risks** for the whole sample (n=122) was 4.48 or neutral (min=1, max=7, SD=1.37).

Findings for Perceived Barriers to Child Completing HPV Vaccination Series

For the whole sample (n=122), 33.6% experienced the barrier of not knowing how often they should take their child for completion of the HPV vaccination series, and 30.3% experienced the barrier of their work schedule.

**Main Study Findings:
Positive Impact From the Brief E-Health Video Intervention**

In terms of evaluating the e-health video designed to be culturally and linguistically appropriate, the cartoon was rated very good overall; the mean rating for the whole sample (N=122) was 5.04 or *very good* (min=1, max=6, SD=.969), for the ESP (N=68) it was 5.08 or *very good* (min=1, max=6, SD=1.01), and for SSP (N=54) it was 4.97 or closest to *very good* (min=3, max=6, SD=.918).

Most importantly, **for the whole sample**, paired t-tests showed all comparisons were statistically significant, suggesting the brief video intervention had a positive impact, as follows: parents' **HPV knowledge** was 3.01 or *fair* (n=115, SD=1.29), versus post-viewing video mean score of 4.02 or *good* (n=115, SD=1.30), as a difference that was statistically significant ($t=-8.314$, $df=114$, $p=.000$). Other statistically significant pre-video to post-video viewing included: the pre-viewing video mean score for **stage of change (SOC) for talking to Provider (Re: HPV Vaccine for Child)** was 2.27 for contemplation (n=155, SD=1.35) versus the post-viewing video mean score of 2.87 for closest to preparation (n=115, SD=1.28), as a difference that was statistically significant ($t=-5.733$, $df=114$, $p=.000$); the pre-viewing video mean score for **self-efficacy (SE) for Talking to Provider (Re: HPV Vaccine for Child)** was 3.66 or closest to 60% confident (n=115, SD=1.95) versus the post-viewing video mean of 4.66 or closest to 80% confident (n=114, SD=1.53), indicating that there was a statistically significant difference ($t=-6.018$, $df=114$, $p=.000$); the pre-viewing video mean score of **SOC for Having Child Vaccinated** was 2.61 or contemplation (n=115, SD=1.39) versus the post-viewing video mean 2.89 or closest to preparation (n=115, SD=1.27), indicating there was a statistically significant difference ($t=-3.267$, $df=113$, $p=.007$); the pre-viewing

video mean score for **SE for Having Child Vaccinated** was 3.96 or closest to 60% confident (n=115, SD=1.95) versus the post-viewing video mean of 4.77 or closest to 80% confident (n=114, SD=1.49), indicating that there was a statistically significant difference ($t=-5.556$, $df=114$, $p=.000$); the pre-viewing video mean score for **SOC for Having Child Receive All HPV Vaccine Doses** pre-video was 2.53 or contemplation (n=114, SD=1.35) versus the post-viewing video mean of 2.75 or closest to preparation (n=114, SD=1.25), indicating that there was a statistically significant difference ($t=-2.728$, $df=113$, $p=.007$). The pre-viewing video mean score for **SE for Having Child Receive All Doses** was 4.03 or 60% confident (n=114, SD=1.89) versus the post-viewing video mean of 4.71 or closest to 80% confident (n=114, SD=1.58), indicating that there was a statistically significant difference ($t=-4.810$, $df=113$, $p=.000$).

As another indicator of the value in the brief intervention, 80.3% (n=98) of parents reported they would recommend the video to other parents. Among these 98 parents, 83.8% (n=57) were ESP and 75.9% (n=41) were SSP.

Comparing the ESP and SSP

Regarding any significant differences between the responses of the English-speaking (ESP) and Spanish-speaking parents (SSP) on the study measures, independent t-tests showed (using $p<.001$) only one finding. When comparing ESP (N=67, Mean=4.72, SD=1.90) to SSP (N=54, Mean=3.22, SD=1.78) for the **level of education**, there was a significant difference ($t=4.429$, $df=119$, $p=.000$)—with the ESP having a higher level of education.

Predicting Parental Stage of Change for Vaccinating Child Pre-Video

Using backward stepwise regression, the model controlled for social desirability. Given this was an exploratory study, all independent variables were entered into the model, as follows: social desirability; partner yes/no; age; vaccine risks; confidence in vaccines; born in US yes/no; number of children ages 9-18; if child received flu vaccination; if provider recommended HPV vaccination; if a student; if employed; degree of exposure to HPV education in media; degree of barriers to HPV vaccination; parent believes in value of flu vaccination; extent holds conspiracy beliefs about vaccination; if child has already received HPV vaccine yes/no; degree of HPV knowledge; annual household income; education level; if talked to provider about HPV yes/no; level of HPV vaccination knowledge. Then, the program eliminated the variable with the weakest association with the dependent variable. This continued (eliminating one variable at a time) until the only variables left in the model were statistically significant (i.e., $p < .05$).

For the *whole sample*, the significant predictors of **Study #1 dependent variable of parents being in an action or maintenance stage of change for having made the decision and taken action to ensure their child received the HPV vaccination—as measured before parents watched a linguistically and culturally tailored cartoon video** were as follows: having a child actually already received the HPV vaccination ($\beta = 1.714$, $SE_B = .599$, $p = .000$); and, having a higher annual household income is ($\beta = .142$, $SE_B = .200$, $p = .007$). For this model, the $R^2 = .420$, and the $AdjR^2 = .405$, meaning that 40.5% of the variance was explained by this model.

Findings Relevant to Diffusion of Innovation Theory

Some 67.2% (n=82) of parents commented on the reasons for recommending the avatar video and provided their feedback to help improve the video. Among these 82 parents, 76.5% (n=52) were ESP and 55.6% (n=30) were SSP. **Among ESP**, five emerged themes about the reasons for parents to recommend the video to other parents were identified including:

- Very informative/ educational and linguistically appropriate
 - Simple language
 - Easy to understand
- Improves knowledge and awareness about the HPV infection and HPV vaccine
- Racially and ethnically diverse
- Promotes parental discussion with their child's healthcare provider about the HPV and HPV vaccine
 - Promote HPV-information seeking behavior
- It's an effective educational tool for parents

Among the SPS, three themes emerged themes for recommending the video:

- Very informative/educational
- Clarifies parents' concerns and doubts about the HPV vaccine
- Improves knowledge and awareness about HPV infection and HPV vaccination

Findings for Improving the Video

Three main emergent themes were identified **among ESP** who provided their feedback to help improve the video as follows:

- Improve the quality of the video
 - Incorporate more visual image related to HPV
 - Shorten the length of the video
- Include information about HPV vaccine side effects, and whether or not there is a recommended HPV test for men
- The video should address the importance of engaging children in sexual health education
 - Link sexual behavior and health behavior

Among SSP who provided their feedbacks to help improve the video, emerged theme identified included:

- Include information about HPV vaccine side effects

Summary of the Results of Data Analysis for Study #2

Findings for Providers' Demographics

The convenience sample consisted of 19 healthcare providers with 84.2% (n=16) females, 26.3% (n=5) non-Hispanic Black, 21.1% (n=4) Hispanic, and 31.6% (n=6) were non-Hispanic White with a mean age of 40.16 years (min=29, max=71, SD=12.64).

Some 63.2% (n=12) were medical doctors. Some 84.2% (n=16) worked in Pediatrics, while 26.3% (n=5) worked in Family Medicine Practice. The mean annual household income was category 6.05 (min=2, max=8, SD=1.43) for \$100,000 to \$199,999.

Findings on Providers' HPV Knowledge, Stages of Change, and Self-efficacy

The mean score for **providers' HPV knowledge** was 4.53 for *between good and very good* (min=2, max=6, SD=1.12). The mean score for **providers' stage of change** for recommending HPV vaccination to parents for their children was 4.11 for *action stage* (min=1-precontemplation, max=5-maintenance, SD=1.49). The mean **self-efficacy for providers** was 5.32 for *80% confident or high self-efficacy* (min=2, max=6, SD=1.00). The mean score for barriers to recommending HPV vaccination to parents for children was 3.32 or *low barriers* (min=0 non-existent, max=7 extremely high, SD=2.08) or closest to low. Some 10.5% (n=2) rated barriers as "extremely high."

Findings for Providers' Ratings of the E-Health Video and Diffusion

The mean rating of the video by providers was 4.84 or closest to *very good* (min=3-fair, max=6-excellent, SD=.834). Some 47.4% (n=9) of healthcare providers rated the video as “very good,” and 21.1% (n=4) rated the video as “excellent.”

The majority of the sample 89.5% (n=17) of healthcare providers indicated they would recommend the video for parents or to other providers so they could share it with parents, as diffusion of the innovation of educating parents about HPV using the e-health video.

Findings From Providers' Qualitative Data

In response to their being asked to explain why they would or would not recommend the video to parents or other providers, including any comments on the strengths and weaknesses of the video, or how could it be improved, providers' open-ended responses permitted the following emergent themes to be identified:

- Linguistically appropriate
 - Accurate
 - Easy to understand
 - Informative
 - Innovative
- Address parental common concerns about the HPV vaccine
- Representation of diversity

Finally, providers offered their additional thoughts or feelings in response to the video, permitting the identification of three emergent themes regarding recommendations to improve the video, as follows:

- Improve the quality of the video
- Use better graphics
- Shorten the length of the video
- Make it more interactive and engaging

- Shift the focus of HPV vaccination away from the route of transmission, particularly at the beginning of the video
- Shift focus from STDs to primary prevention of HPV-associated cancers

Discussion of Study #1

Discussion of Study #1—Parents' Demographics

In the present study, for the whole sample of parents (n=122), 95.9% (n=117) were females and only 4.1% (n=5) were males. Among ESP, 94.1% (n=64) were females and 5.9% (n=4) were males. In a systematic review, Gilkey and McRee (2016) found that studies of parent and adolescent “communication roles in clinical settings consistently found” that a parent, “most often mother, was responsible for making the ultimate decision about HPV vaccination” (p. 1456). Hence, the convenience sample this study obtained may be reflective of those involved in the HPV vaccination decision-making process for children in families.

Independent t-tests showed (using $p < .001$) comparing ESP and SSP, finding the ESP had a higher level of education (N=67, Mean=4.72, SD=1.90) in comparison to the SSP (N=54, Mean=3.22, SD=1.78) for the **level of education**, as *a significant difference* ($t=4.429$, $df = 119$, $p=000$). This is consistent with the study conducted by Ramírez, Willis, and Rutten (2017), where Spanish-speaking speaking respondents reported lower levels of education compared with the English-speaking respondents.

The ESP sample of convenience may be comparable to other data, as this sample (n=68) attracted participants who were 44.1% (n=30) were Hispanic/Latino. Further, the addition SSP sample was 68% (n=83) Hispanic/Latino. This study's collection of data on the Hispanic/Latino population is vital, given how “Hispanics are the largest ethnic

minority in the USA; in 2014, Hispanics comprised 17.4% of the US population (55.4 million), and this percentage is expected to increase to 28.6% (119 million) by 2060” (Velasco-Mondragon et al., 2016, p. 1). Hispanics in the United States include all those native-born and foreign-born from places as varied as South America, the Caribbean, and Spain (Velasco-Mondragon et al., 2016).

Private insurance plan was the most prevalent source of health coverage reported among ESP (58.8%, n=40) and SSP and (31.5%, n=17). Hispanics are more likely to be uninsured compared to any other racial or ethnic group (USDHHS, Office of Minority Health, 2019). Data from the Census Bureau revealed that in 2015, 47% of Hispanics have private insurance, while 19.5% of the Hispanic population did not have health insurance, as compared to 6.3% of the non-Hispanic White population (USDHHS, Office of Minority Health, 2019).

Discussion of Data on the Children

Most of studies that assessed factors associated with HPV vaccine initiation and completion were mostly based on nationally representative data and often focused on girls from ages 13 to 17, and fewer studies included both sexes together (Johnson et al., 2017). This study included a sample of parents with female *and* male children aged 9-18.

Some 48.4% (n=59) parents reported that their children had a private health plan; of those 59, 58.8% (n=40) were ESP and 35.2% (n=19) were SSP, with 73.8% (n=90) of the whole sample employed, including 79.4% (n=54) ESP and 66.7% (n=36) SSP. Given that the majority of parents reported having private insurance plans as compared to Medicaid, it could be that children received health coverage through their parents’ private health plan from their employment. Prior research indicated that low-income minority

children of color tended to receive health insurance coverage through Medicaid or Vaccine for Children Program (VFC) (Ylitalo, Lee & Mehta, 2013).

Discussion on the Key Provider Recommendation

This study found that more than half 62.3% (n=76) of parents reported that their child's healthcare provider had talked to them about HPV infection and the HPV vaccine. Among these 76 parents, 64.7% (n=44) were ESP and 59.3% (n=32) were SSP. Though their sample lacked heterogeneity with regard to race and ethnicity, Gilkey and McRee (2016) conducted a systematic review and found that "one study examining patients' race/ethnicity suggested disparities in provider communication—with parents of African American and Hispanic adolescents" being found to engage in "less often" discussion on the "HPV vaccine with a provider or receiving HPV recommendation than parents of non-Hispanic adolescents" (p. 1456). In another study, some providers reported difficulty discussing sexual health before recommending the HPV vaccine due to the time it takes to discuss HPV vaccination, particularly with parents of children aged 11-12 who were more likely to refuse vaccination compared to parents of older adolescents (Dempsey et al., 2016).

Although parents' perceived strength of provider recommendation was not assessed in this study, receiving strong provider recommendation of the HPV vaccine has been associated with parental vaccine intention and uptake (Meers, Short, Zimet, Rosenthal, & Auslander, 2017). Other research showed that when parents perceived provider recommendation of the HPV vaccine as optional, then parents preferred to delay vaccination and/or refuse to vaccinate their child (Gilkey & McRee (2016).

Over half the parents, 53.3% (n=65), reported receiving a provider recommendation to vaccinate their child in the present study, while only 38.5 (n=47) of parents reported that their child received one or more doses of the HPV vaccine. Of the 47 parents, 41.2% (n=28) were ESP and 35.2% (n=19) were SSP. The study sample reported vaccine initiation rates lower than the rates reported in the National Immunization Survey-Teen (NIS-Teen). For instance, data from the 2017 NIS-Teen showed that 66% of adolescents aged 13 to 17 years received at least one dose of the HPV vaccine (Walker et al., 2018).

Further, national data revealed that only 49% of teens completed all three recommended doses (Walker et al., 2018). Low completion rates of HPV vaccine are of concern. Spencer et al. (2018) examined data from 2004-2014, when the HPV vaccine was administered in a three-dose series. The study sample consisted of 1.3 million individuals aged 9-26 who had private insurance. The study outcome was receipt of third dose within 12 months of the first dose. Spencer et al. found that timely HPV vaccine completion follow-through fell over time. This trend was pronounced among females (from 67% in 2006 to 38 in 2014) and also among males (from 36% in 2011 to 33% in 2014). Similar trends persisted when they controlled for age, region, insurance plan type, provider type, and seasonal influenza vaccination (Spencer et al., 2018).

Discussion on Prior Flu Vaccination and Beliefs

Prior studies have shown that receiving the seasonal flu vaccine in the most recent year was positively associated with initiating and completing the HPV vaccine series (Donahue et al., 2015; Spencer et al., 2018). In this study, the results showed that some 86.1% of parents reported one or more of their children ever receiving the seasonal flu

vaccine, including 91.2% ESP and 79.6% SSP. Also, 66.4% of parents indicated that they believe in the value of seasonal flu vaccination, suggesting that overall, the study sample believed in the benefits of the seasonal flu vaccine. The results revealed that more 83.3% (n=45) SSP believed in the value of the seasonal flu vaccine compared to 52.9% (n=36) ESP. This highlights the importance of the provider recommending the HPV vaccine at every medical encounter visit. The latter is of great importance, given that when parents do not receive a firm or consistent recommendation for HPV vaccination, then this “led to the perception that the vaccine was optional or less important compared to the other adolescent vaccines” (Lai et al., 2017, p. 9).

Discussion of Exposure to Media on HPV

This study found parents had low to very low exposure to media on HPV. For the whole sample (n=116), mean exposure was very low (2.24, SD=1.60). Further, the SSP (n=54) mean was 1.94 for closest to a very low amount of information (SD=1.45). Lai et al. (2017) discussed how inaccurate information related to HPV vaccine has been associated with media sources. Albright et al. (2017) found that, among English-speaking parents, a reported distrust of sources of information was a reason for not initiating the HPV vaccine. Stevens, Caughy, Lee, Bishop and Tiro (2013) indicated that English speakers spent more time using the internet and television compared to Spanish speakers, potentially disproportionately exposing them to media on vaccines.

Discussion of Parental General HPV Knowledge

Parents in this study correctly responded to over half of the questions in the HPV Vaccine Knowledge Scale. For the whole sample (n=122), the mean score sample

(n=122) was 5.50 (min=0, max=11, SD=3.43) for a *moderate level of HPV vaccine knowledge*; for the ESP sample, it was 6.03 (SD=3.21, min=0, max=11), and for the SSP sample, it was 4.83 (SD=3.61, min=0, max=11). Acosta, Bonney, Fost and Green (2013) found that most of their study sample of underserved Latinas correctly answered that HPV is related to cervical cancer, for example, as evidence of having some knowledge. But, the highest level of knowledge was associated with those who were more proficient in the English language. Steve

Stevens et al. (2013) found that English-speaking mothers had higher moderately HPV knowledge than did Spanish-speaking mothers, although the results revealed no differences in HPV vaccine initiation. In the present study, there was a trend that missed the significance level of $p < .001$ (Bonferroni Adjustment Significance (.05/26, $p = .001$) for the ESP sample having a higher post-video HPV knowledge in comparison to the SSP sample ($p = .001$). Also, in this study, the sample of ESP and SSP parents reported low HPV vaccine initiation and completion rates.

Discussion of Parental HPV Vaccine Knowledge

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Evidence has suggested that racial and minority groups are less likely to have heard of HPV vaccine, “as women born outside of the United States” (Wisk, Allchin & Witt, 2014, p. 5). Wisk et al. (2014) explained that low acculturation or English-language

proficiency may contribute to racial and ethnic disparities. Furthermore, evidence has suggested that language may moderate information-seeking behavior about HPV vaccine, indicating the importance of providing “culturally sensitive information and information in a variety of language may improve awareness for vulnerable groups” (p. 5).

Discussion of General Vaccine Attitudes

The mean score for **vaccine conspiracy beliefs** for the whole sample (n=122) was 3.82 or closest to neutral (min=1, max=7, SD=1.20). The mean score for **vaccine hesitancy—lack confidence** for the whole sample (n=122) was 2.76 or closest to somewhat disagree (min=1, max=7, SD=1.42). The mean score for **vaccine hesitancy—hesitancy—risks** for the whole sample (n=122) was 4.48 or neutral (min=1, max=7, SD=1.37).

According to Edwards and Smith (2011), social desirability is one of the factors that influence the choice of a neutral response. For instance, Krosnick et al. (2002) pointed out that

some people have opinions on any given issue and are aware of possessing those opinions, whereas other people do not have opinions and are aware that they do not. All of the former individuals are presumed to report their opinions, regardless of whether or not a no-opinion response option is offered by a question. But the behavior of people without opinions is presumed to be contingent on question format. These individuals are presumed to report the fact that they have no opinion accurately when a no-opinion option is offered, but when no such option is offered, some or all of these people may fabricate reports of “non-attitudes” due to pressure to appear opinionated. (p. 373)

In a recent study, Shapiro et al. (2018) assessed vaccine attitudes with validated scales, including the Vaccine Conspiracy Beliefs Scale and the Vaccine Hesitancy Scale (i.e., one subscale on vaccine hesitancy—lack of confidence, and one subscale on vaccine hesitancy—risks), as used in this study. They found that parents in the “decided not to

vaccinate stage” had significantly greater odds of having vaccine conspiracy beliefs as well as perceived harms from vaccines, a lack of confidence, and perceived risks.

Discussion of Parental Barriers

Recall that for the whole sample (n=122) in this study, 33.6% experienced the barrier of not knowing how often they should take their child for completion of the HPV vaccination series, and 30.3% experienced the barrier of their work schedule. Overall, the majority of parents reported low perceived barriers with having their child/children completing the recommended doses series. This result was not consistent with prior literature that suggested that barriers to HPV vaccine initiation and completion included lack of knowledge about the HPV vaccine, lack of knowledge about the association of HPV and cervical cancer, concerns about the cost of the vaccine, and low perceived need for the vaccine (Albright et al., 2017). Parents had reported lack of time to return for another doctor’s visit as a barrier for non-completion of the HPV vaccine series (Holman et al., 2014). Others have also documented in the literature that parents reported “being unaware of or forgetting about the need for additional doses” as a barrier for vaccine incompleteness (p. 16).

Discussion on the Impact of the E-Health Video as a Brief Intervention

Paired t-tests comparing pre-video to post-video viewing mean scores showed statistical increases for all seven independent variables of interest: parents’ HPV knowledge, $p=.000$; SOC for talking to provider about HPV vaccine for child, $p=.000$; SE for talking to provider about HPV vaccine for child, $p=.000$; SOC for having child vaccinated, $p=.000$; SE for having child vaccinated, $p=.000$; SOC for having child

receive all doses, $p=.007$; and SE for having child receive all doses, $p=.000$. This body of data suggested that the e-health video, as a brief online intervention, had a positive impact insofar as parents significantly increased in knowledge from pre- to post-test, while also significantly progressing across the stages of change toward taking action, and showing significant increases in self-efficacy to engage in the behaviors of interest.

Using an avatar video tailored for mother-child dyads on increasing fruit and vegetable intake and physical activity levels, Chung (2013) found via 15 paired sample t-tests for stage of change, knowledge, and self-efficacy, indicating significant improvement across all areas and suggesting the e-health avatar videos served as an effective brief online intervention. This is consistent with the impact of an avatar/cartoon tailored to be linguistically and culturally appropriate for diverse parents—as in this study, while also one of Chung’s (2013) goals with her African American sample.

This study’s results were also consistent with the finding of Chen et al. (2018) who conducted a pilot study to determine the acceptability and feasibility of a computer-tailored avatar intervention for Latino parents to increase HPV vaccination among children aged 11-17. The results showed that the mean HPV-related knowledge scores differed significantly from pre-intervention ($M=9.3$, $SD=2.21$) to post-intervention ($M=13.9$, $SD=0.37$); $t(41)=-13.77$, $p<0.001$) (Chen et al., 2018). Improving parental knowledge of HPV and HPV vaccine has been associated with HPV vaccine intention and uptake (Kessels et al., 2012).

Central to an evaluation of the brief online e-health video intervention was how it was highly rated. The mean score for the whole sample ($N=122$) was 5.04 or *very good* (min 1, max 6, $SD .969$); for the ESP ($N=68$), 5.08 or *very good* (min=1, max=6,

SD=1.01); and SSP (N=54) 4.97 or closest to *very good* (min=3, max=6, SD=.918).

Similarly, Chung (2013) also found a high rating of the videos used in that study (Mean = 8.16, Min=1, Max=10, SD=1.42).

Another dimension to evaluating this study's brief online e-health video intervention involved whether parents would recommend it others, thereby diffusing the innovation of learning about HPV and HPV vaccination via an avatar/cartoon video. In this study, 80.3% (n=98) of parents reported they would recommend the video to other parents, including 83.8% (n=57) ESP and 75.9% (n=41) SSP. Similarly, Chung (2013) found that 84.9% (n=79) of African American mothers would recommend the brief online intervention of the video.

Discussion on Relationships and Predictors of Parents Taking Action on HPV Vaccination

There was only one significant difference between the ESP and SSP via **independent t-tests** (using $p < .001$) for **level of education** ($t=4.429$, $df=119$, $p=000$)—with the ESP having a higher level of education. In this study, the results indicated that ESP had higher income compared to SSP.

Also, **using backward stepwise regression** analysis, for the **whole sample**, the significant predictors of *Study #1 dependent variable of parents being in an action or maintenance stage of change for having made the decision and taken action to ensure their child received the HPV vaccination—as measured before parents watched a linguistically and culturally tailored cartoon video* were, as follows: (a) having a child actually already received the HPV vaccination ($\beta=1.714$, $SE_B=.599$, $p=.000$); and (b) having a higher annual household income is ($\beta=.142$, $SE_B=.200$, $p=.007$). For this

model, the $R^2=.420$, and the $AdjR^2=.405$, meaning that 40.5% of the variance was explained by this model.

Chung (2013) sought to predict rating of the video in her regression, as that study's outcome variable, while going on to identify significant predictors of (a) mother was currently enrolled as a student ($B=.589$, $p=.008$), and (b) mothers having a lower education level ($B=-.132$, $p=.05$; [$AdjR^2=.123$]), with 12.3% of the variance accounted for in the model. Of note, in the present study, despite the independent t-test finding ESP having a significantly higher level of education than SSP, level of education was not a significant predictor in the present study. Also, in comparison to Chung, it is important to acknowledge how the variables and scales selected in the present study accounted for a substantially higher 40.5% of the variance in a model predicting Study #1 dependent variable (i.e., parents being in an action or maintenance stage of change for having made the decision and taken action to ensure their child received the HPV vaccination)—as measured before parents watched a linguistically and culturally tailored cartoon video.

Discussion of Qualitative Data From Parents

The results from the qualitative analysis supported the quantitative results regarding how most parents rated the video as a brief online intervention as very good. Overall, ESP and SSP expressed that the video was very informative and educational; here, easy to understand and simple language were identified as subthemes. Sanders, Shaw, Guez, Baur and Rudd (2009) pointed out that providing all children and families with clear information about health promotion and disease prevention is a “national priority” (p. 307). This is of particular importance given that one in three U.S. adults have limited health literacy, and 78 million U.S. adults, which was 38% of the population,

were unable to perform basic child preventive health tasks such as following recommendations from a health brochure (Sanders et al., 2009). Thus, the use of e-health education interventions can potentially mitigate some of the challenge that individuals with low health literacy face when accessing and or seeking health information such as HPV and HPV vaccine related information.

Furthermore, the qualitative results also suggested that this brief e-health intervention helped to improve parental knowledge about the HPV and the need for vaccinating children by the recommend ages of 11-12. Themes of relevance here from the ESP were: improves knowledge and awareness about the HPV infection and HPV vaccine; promotes parental discussion with their child's healthcare provider about the HPV and HPV vaccine; it is an effective educational tool for parents. Also, emergent themes for SSP were overlapping as follows: very informative/educational; clarifies parents' concerns and doubts about the HPV vaccine; and improves knowledge and awareness about HPV infection and HPV vaccination.

Results from the thematic content analysis revealed that this brief online e-health video intervention promoted parent intention to perform the behavior of talking with their child provider regarding HPV and HPV vaccine. Thus, the avatar figures/cartoon characters appeared to serve as an influential role model for how parents may engage in conversation with their child healthcare providers about the HPV and HPV vaccine; hence, this is consistent with observational learning within Social Learning Theory (Bandura, 1977).

The results of the qualitative analysis supported Scott, Plotnikoff, Karunamuni, Bize, and Rodgers (2008), who explained that in accordance with the Diffusion of

Innovation, “innovations that have a clear, unambiguous advantage over the previous approach will be more easily adopted and implemented;” including when an innovation (compatibility) “fits with the existing values, past experiences, and need of potential adapters” (p. 2).

Regarding feedback for improving the video, among ESP, emergent themes identified were: a) improve the quality of the video—subthemes (incorporate more visual image related to HPV and shorten the length of the video); (b) include information about HPV vaccine side effects, and whether or not there is a recommended HPV test for men; and (c) the video should address the importance of engaging children in sexual health education—subtheme (link sexual behavior and health behavior). Among SSP, emergent theme identified included: (a) include information about HPV vaccine side effects. Consistent with previous research, parental concerns about HPV vaccine side effects and efficacy have been cited in the literature as common reasons for not vaccinating (Albright et al., 2017; Fontenot et al., 2015; Holman et al., 2014).

Discussion of Study 2

Discussion of the Providers’ Demographics

With a focus on providers, Study # 2 obtained a small sample (N=19) with 84.3% in pediatrics and 26.3% in family medicine, while the sample was 84.2% (n=16) females, 26.3% (n=5) non-Hispanic Black, 21.1% (n=4) Hispanic, and 31.6% (n=6) were non-Hispanic White. The sample had a mean age of 40.16 years (min=29, max=71, SD=12.64). Some 63.2% (n=12) were medical doctors where the mean annual household income was category 6.05 (min=2, max=8, SD=1.43) for \$100,000 to \$199,999.

The sociodemographic characteristics of the study sample differed from those reported for the study sample described by Walker et al. (2017). In Walker et al., the sample size was much larger and consisted of 600 pediatricians, 740 family medicine practitioners, and 330 nurse practitioners. Participants included in the final analysis were 75 pediatricians, 136 family practice physicians, and 43 nurse practitioners (Walker et al., 2017). While the original intent in this study was to recruit N=250 of such diverse providers, the barrier of time likely prevented other providers from taking the survey—even when just a 12-minute research endeavor for them. Providers ended up being difficult to recruit, necessitating accepting the value in a small pilot study.

Discussion on Providers' Pre-Video Viewing Self-Rating of Knowledge, Stage of Change, Self-efficacy, and Barriers during a Medical Visit

Recall the key findings pre-video viewing for providers, as follows in brief. The mean score for **providers' HPV knowledge** was 4.53 for *between good and very good* (min 2, max 6, SD=1.12). The mean score for **provider's stage of change** for recommending HPV vaccination to parents for their children was 4.11 for *action stage* (min 1-precontemplation, max=5-maintenance, SD=1.49). The mean **self-efficacy for providers** was 5.32 for *80% confident or high self-efficacy* (min=2, max=6, SD=1.00). The mean score for barriers to recommending HPV vaccination to parents for children was 3.32 or *low barriers* (min=0 non-existent, max=7 extremely high, SD=2.08) or closest to low. Some 10.5% (n=2) rated barriers as “extremely high.”

Findings from a qualitative systematic study showed that **providers' knowledge of HPV and HPV vaccine** varied (Rosen, Shepard, & Kahn, 2018); for instance, “correct responses to items assessing HPV knowledge ranged from 22% to 95% and correct

responses assessing HPV vaccine knowledge ranged from 17% to 91%.” Providers’ level of knowledge about HPV in males was lower compared to their level of knowledge about HPV in women; knowledge “was particularly low with respect to understanding of vaccine recommendation for men, such as the upper age limit of the recommendation and which male HPV-related cancers the vaccines prevent” (p. 57).

Regarding provider **stage of change** for recommending the HPV vaccine, the majority of healthcare providers were in the action stage, indicating that they are recommending the vaccine to children (mean score=4.1, min=1 precontemplation, max=5 maintenance, SD=1.49). In the study sample, a high proportion 68.4% (n=13) of healthcare providers were in a maintenance stage for recommending the HPV vaccine for more than 6 months. The results in this study suggested providers’ compliance with Advisory Committee on Immunization Practices (ACIP) recommendations for routinely recommending the HPV vaccine to children aged 11-12 years.

According to Rosen et al. (2018), results from the qualitative systematic review showed that for “studies that examined intention among clinicians, rates varied widely, from 16% to 96%. The mean for intention rates was 66.9 (SD=23) and the median was 73; the 16% intention rates was an outlier” (p. 57). Walker et al. (2017) pointed out that healthcare provider **level of knowledge** about the HPV vaccines influence their intention to recommend the HPV vaccines. Thus, in this study, most healthcare providers rated their knowledge as good and the majority of them were in the action stage for recommending the vaccine, suggesting that higher level of knowledge about HPV and HPV vaccine may contribute to healthcare provider adherence to the ACIP HPV vaccine recommendations (Meites et al., 2017).

Regarding the providers' levels of **self-efficacy** for recommending the HPV vaccine, the results showed that the mean score for self-efficacy for healthcare providers was 5.32 (min=2, max=6, SD=1.00), indicating 80% confident for recommending the HPV vaccines. McRee, Gilkey and Dempsey (2014) asserted that "improving providers' self-efficacy to address parental concerns may be important for supporting recommendation practices and ultimately improving HPV vaccine uptake the target aged group" (p. 7). Gilkey and McRee (2016) further explained that "providers' perceptions of themselves, self-efficacy to communicate about HPV vaccine was associated with recommending and intending to recommend the vaccine" (p. 1456).

In addition, the mean score for **barriers** to discussing HPV and HPV vaccination of preteens and teens with parents for healthcare providers was 3.32 (min=0 non-existent, max=7 extremely high, SD=2.08), indicating that *providers perceived low degree of barriers* that they may experience in a medical visit. This result was not consistent with prior studies that indicated that providers reported facing a number of barriers to recommending the HPV vaccine including parental hesitancy and/or refusal to vaccinate their younger children (aged 11-12), perceived parental concern about vaccine safety, difficulty discussing sexual health-related issues that may pertain to HPV vaccination, particularly with younger adolescents (Daley et al., 2010; Holman et al., 2014; McRee et al., 2014). Also, when providers perceived parents' refusal or hesitancy to vaccinate, they "are reluctant to strongly recommend the vaccine due to concerns about initiating time-consuming or confrontational debates" (McRee et al., 2014, p. 2).

In terms of barriers related to the clinical setting, Gilkey and McRee (2016) found that "deficiencies in scheduling as limiting provider communication about the HPV

vaccination” (p. 1463). The providers “identified patient reminder/recall as critical to their efforts to recommend HPV vaccination, but many reported that they did not use these systems”—and, instead, providers “relied on patients to initiate scheduling” (p. 1463). Finally, “providers reported that the time constraints in the clinical encounter” were also a “barrier to HPV vaccine communication” (Gilkey & McRee, 2016, p. 1463).

A body of research indicated that parental refusal or hesitancy regarding the HPV vaccine influences healthcare providers’ recommendation practices regarding routinely administration of the HPV vaccine to eligible children; also key is the amount of time it takes to discuss and address parents’ concerns about the need to vaccinate (Daley et al., 2010; Holman et al., 2014; McRee et al., 2014). Therefore, this brief health intervention could potentially assist providers in addressing parental concerns about the HPV vaccine, and may promote and facilitate parent-provider communication about HPV and the HPV vaccine—which may potentially lead to parents’ decisions to vaccinate their children. Given that the study sample of healthcare providers perceived the benefits of using this brief e-health education to increase knowledge and address parental concerns about HPV, this may lead to the adoption of this e-health educational intervention among healthcare providers.

Of note, three themes emerged regarding providers’ recommendations to improve the video as follows: improve the quality of the video—subthemes (use better graphics and shorten the length of the video); make it more interactive and engaging; and shift the focus of HPV vaccination away from the route of transmission, particularly at the beginning of the video—subtheme (shift the focus from STDs to primary prevention of HPV-associated cancers).

This recommendation is in line with the existing literature that healthcare providers perceived parents' association between HPV vaccine and sexual activity to be “a common source of hesitancy” and/or “delay, particularly among children aged 11-12” (McRee et al., 2014, p. 7). Some parents of children aged 11-12 believed that their children were too fragile and not physiologically mature (e.g., in relation not sexually active) to receive the HPV vaccine) (Grandahl et al., 2014).

This qualitative data indicated the need to use message framing in the context of prevention—given how Rwamwejo et al. (2019) conducted a study among providers of adolescents from a five-country region (i.e., Argentina, Malaysia, South Africa, South Korea, and Spain) to determine the most effective messaging to promote the HPV vaccine across these countries. The study results revealed that most providers supported use of the most optimal messages emphasizing cancer prevention, strong provider recommendation to vaccinate, vaccine safety and efficacy, timely vaccination, and a national policy supporting HPV vaccination. Also, framing HPV vaccine “as one of several vaccine in the routine schedule” in conjunction with a “strong recommendation” revealed that “providers reported low levels of parental hesitancy and higher levels of HPV vaccine uptake among parents” (Gilkey & McRee, 2016, p. 1462).

Implications and Recommendations

The overall findings of Study #1 and Study #2 have a number of important implications for health education research and practice, as well as public health in general.

1. A main study finding is that the e-health online brief avatar/cartoon video emerged as having a significant impact from pre-video to post-video viewing for parents in the sample, in terms of findings of higher scores post-video viewing. Specifically, paired t-tests comparing pre-video to post-video viewing mean scores showed statistical increases for all seven independent variables of interest: parents' HPV knowledge, $p=.000$; SOC for talking to provider about HPV vaccine for child, $p=.000$; SE for talking to provider about HPV vaccine for child, $p=.000$; SOC for having child vaccinated, $p=.000$; SE for having child vaccinated, $p=.000$; SOC for having child receive all doses $p=.007$; and SE for having child receive all doses, $p=.000$. This body of data suggested that the e-health video, as a brief online intervention, had a positive impact insofar as parents significantly increased in knowledge from pre- to post-test, while also significantly progressing across the stages of change toward taking action, and showing significant increases in self-efficacy to engage in the behaviors of interest. Implications include the need to widely disseminate and utilize the e-health online brief avatar/cartoon video in numerous settings and by varied health providers. As the pilot study with the small provider sample ($n=19$) included not only physicians in pediatric or family practice medicine, but also nurse practitioners, for example, then diverse providers may use it as follows: as a video that plays in waiting areas of hospitals and clinics; as a link that providers text-message to clients in advance of their scheduled appointment, especially when it is time for the HPV vaccination for a preteen; as a link on a card or brochure that is handed out to patients; and as a tool for use when providers hold short education sessions with groups of parents—as something made possible by this new video.

2. Building on the provider pilot data recommending the video, and the data of the parents, it is possible to use the findings of Study #1 and Study #2 to apply for a major grant to seek to replicate the study with a large nationally representative sample, while including funds to support coalitions in communities to come together and determine the best uses and adaptations of the video to best meet their community's health needs—including via community-based participatory research models.

3. Of great import is how this study found that HPV vaccine initiation and completion rates among the study sample were lower than the national rates (i.e., 66% of teens have received the first dose, 49% of teens completed the three doses of the HPV vaccines) (Walker et al., 2018). Over half the sample (53.3%, n=65) reported receiving a provider recommendation to vaccinate their child against the HPV vaccine, while only 38.5% (n=47) of parents reported that their child received one or more doses of the HPV vaccine. Of the 47 parents, 41.2% (n=28) were ESP and 35.2% (n=19) were SSP. Provider recommendation of HPV vaccine has been consistently cited in the literature as the most important predictor for HPV vaccine uptake and completion (Johnson et al., 2017; Meites et al., 2017). However, the process of actually initiating behavior, maintaining behavior over time, and preventing relapse requires knowledge and skills training, as in health educators learning to deploy a brief form of motivational interviewing as well as relapse prevention, as described elsewhere (Wallace 2019). Implications for health educators involve the need to develop nation-wide strategies designed to increase HPV initiation and completion rates for preteens and teens, potentially using the e-health video used in this study.

4. The lack of HPV vaccine completion rates “places adolescents at risk for acquiring HPV infection due to gaps in immunologic protection from the vaccine doses” (Wilson et al., 2015, p. 396). In the study sample, some 9.8% (n=12) of parents reported that their child received two doses of HPV vaccine; of these, 8.8% (n=6) were ESP and 11.1% (n=6) of SSP; while 9% (n=11) of parents who reported their child received three doses, 11.8% (n=8) were ESP and 5.6% (n=3) of SSP. This suggests a serious public health challenge that necessitates a national social media campaign that widely disseminates the link to the video, ideally as part of a related website. The video may be used as part of the workforce development and continuing education aims for the nation, including for receipt of continuing education contact hours upon passing a related test or quiz. This is consistent with the online focus for the delivery of online interventions in this current era—thereby making content readily available nationwide as well as in places such as Puerto Rico, the Dominican Republic, South America, and the larger global community. Meanwhile, this study has produced a culturally and linguistically appropriate e-health video as the basis for all such efforts aimed at avoiding placing “adolescents at risk for acquiring HPV infection due to gaps in immunologic protection from the vaccine doses” (Wilson et al., 2015, p. 396).

5. Given the new brief online e-health avatar/cartoon video, as well as study findings, a special focus is warranted on Hispanics/Latinos as a vulnerable immigrant population that was found, as the SPS were found, to have a lower level of education in comparison to the ESP sample. Targeting the population of Hispanics/Latinos and immigrants for special culturally and linguistically appropriate interventions—including in places such as Puerto Rico, the Dominican Republic, South and Central America, and

the larger global community, in the Spanish language—is warranted; this is especially the case, given frequent international travel “back home,” and to the United States by parents with children; this includes short periods of migration to receive a higher quality health care in the United States for those who can afford such travel for healthcare. Exposure online to this study’s brief avatar/cartoon video can permit sufficiently broad global exposure, as social networks that span the United States and communities “back home” disseminate the video.

6. Providers have reported a lack of time during a well-child care visit represents a barrier to HPV vaccine communication, particularly when the provider faces parents who refuse to vaccinate their children (Gilkey & McRee, 2016). Providers may not provide a strong recommendation to vaccinate when encountering parents who oppose vaccinate for their children “due to concerns about initiating time-consuming or confrontational debates” (McRee et al., 2014, p. 2). Just as a nurse may take weight, height, blood pressure, and temperature before a patient sees the medical provider or nurse practitioner, a nurse could have a patient view this study’s short video before going in to see the doctor. Thus, as per the McRee et al. (2014) concern, providers may avoid confrontation and debate, and instead encounter a parent who by virtue of watching the video enters to see the medical provider while having just moved across stages of change from contemplation to preparation, as shown in this study.

7. Also, findings from the mixed methods supported the feasibility and acceptability of using a brief culturally tailored e-health educational intervention to educate parents about HPV and HPV vaccine, and promote and facilitate parents’-providers’ communication which may lead to a parental decision to vaccinate their

daughters and sons. Parents can enter the consultation room with the medical provider in a stage of preparation, after just watching 5 minutes of the video with a nurse, or alone—saving time and sparing the provider confrontation, debate, and related stress. Thus, there are implications about the adoption of this innovative brief e-health intervention to facilitate parental movement across the *stages of change* regarding their adoption to HPV vaccine.

8. Lastly, a longitudinal study is recommended to determine the effect of this e-health education intervention in performing the behavior of vaccinating one's children against HPV. This could involve follow-up evaluations at 1 month, 3 months, 6 months, 1 year, 2 years, and beyond—in order to capture impacts for younger children as they approach and enter the age for HPV vaccination.

Limitations of the Study

The study findings should be interpreted in light of some limitations. First, this study used self-reported data and causal inferences and associations between awareness of and knowledge about HPV and the HPV vaccine; however, inferences about actual behavior cannot be made (i.e., taking action for vaccinating children against HPV). Also, the study consisted of a convenience sample, which limits the generalizability of findings. In addition, the sample consisted mainly of Hispanic/Latino parents suggesting that the findings cannot be generalized across racial and ethnic groups. In addition, use of an online survey may represent a barrier to some parents who may not have access to the internet or computer or other mobile devices. Lastly, a time burden for study volunteers

to participate in the study may have contributed to low recruitment rates, particularly among healthcare providers.

Conclusion

The first purpose of the dissertation research (i.e., Study #1) was to identify significant predictors of the *Study #1 dependent variable of parents being in an action or maintenance stage of change for having made the decision and taken action to ensure their child received the HPV vaccination—as measured before parents watched a linguistically and culturally tailored cartoon video*. Using backward stepwise regression analysis, the significant predictors of parents being in an higher stage of change (e.g., action or maintenance stage) for making sure their children received the HPV vaccination was predicted before viewing the video (Whole sample, N=122) by: if a child has actually already received HPV vaccination ($\beta=1.714$, $SE_B=.599$, $p=.000$); and a higher yearly household income ($\beta=.142$, $SE_B=.200$, $p=.007$). For this model, the $R^2=.420$, and the $AdjR^2=.405$, meaning that 40.5% of the variance was explained by this model.

A second purpose of the dissertation research (Study #1) was to determine if a linguistically and culturally tailored (i.e., in English or Spanish) video on HPV and HPV vaccination of children can serve as a brief online e-health intervention that promotes significant parental movement across the *stages of change* (i.e., from a precontemplation or contemplation stage, to a preparation stage, as per the theory of Prochaska and DiClemente [1982]) and significantly increases *self-efficacy* (as per the theory of Bandura [1977]) for *three key behaviors* of: (1) talking to a pediatrician or family practice medical provider about the Human papillomavirus (HPV) infection, and the HPV vaccination for

children; (2) making sure their preteen and teen children receive the HPV vaccination; and (3) making sure their preteen and teen children receive all the required doses (e.g., at least two or three doses) of the HPV vaccination. This involved *a pre-video viewing versus post-video viewing comparison of parents' stage of change and self-efficacy each of these three key behaviors*. In addition, changes in knowledge were examined for parents from pre- to post-video viewing.

For this second purpose, paired t-tests compared the means score for the pre-video and post-video. The pre-viewing mean score for parents' HPV knowledge V-PARENTS-HPV-K-1 for the whole sample was 3.01 or fair (n=115, SD=1.29), versus post-viewing video mean score of 4.02 or good (n=115, SD=1.30), as a difference that was statistically significant ($t=-8.314$, $df=114$, $p=.000$). The pre-viewing video mean score for SOC for Talking to Provider (Re: HPV Vaccine for Child) for the whole sample was 2.27 or contemplation (n=155, SD 1.35) versus the post-viewing video mean score of 2.87 or closest to preparation (n=115, SD=1.28), as a difference that was statistically significant ($t=-5.733$, $df=114$, $p=.000$). The pre-viewing video mean score for SE for Talking to Provider (Re: HPV Vaccine for Child) for the whole sample was 3.66 or closest to 60% confident (n=115, SD=1.95) versus the post-viewing video mean of 4.66 or closest to 80% confident (n=114, SD=1.53), indicating that there was a statistically significant difference ($t=-6.018$, $df=114$, $p=.000$). The brief online e-health avatar/cartoon video emerged as associated with significant increases in numerous variables, as shown above, from pre- to post-video viewing.

A third purpose of the dissertation research (i.e., via Study #2) was to obtain the Study #2 dependent variable of pediatricians/family practitioners recommending (yes/no)

the video to parents and/or other providers so they could share it with parents, in order to support parental decision making about initiating and completing HPV vaccination of their preteen and teen children (as per the Diffusion of Innovation Theory of Rogers [1995]). The majority 89.5% (n=17) of healthcare providers indicated they would recommend the video.

Both Study #1 and Study #2 were grounded in an integrated theoretical framework of health behavior changes such as the Health Belief Model, TTM-stage of change, Social Cognitive Theory—Self-efficacy, and Diffusion of Innovation. This study was also guided by prior research conducted by the Research Group on Disparities in Health (RGDH) and based on validated instruments used in prior studies (Pérez et al., 2016; Shapiro et al., 2016). In addition, the study followed the standard RGDH protocol for conducting e-health research (e.g., Chung, 2013). The recruitment approach consisted of conducting a social media campaign and snowballing.

The theory-based approach has identified the brief online e-health avatar/cartoon video intervention as a new evidence-based approach that obtained via a pilot the support of providers who overwhelmingly recommended it.

The resultant evidence-based approach to increasing parental HPV knowledge promoting movement across the stages of change toward taking recommended HPV-related prevention actions for their child and increasing self-efficacy for taking action deserves to be scaled up and evaluated with a nationally representative sample of parents.

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Appendix A
IRB Approval Letter

TEACHERS COLLEGE
COLUMBIA UNIVERSITY

Teachers College IRB

Exempt Study Approval

To: Alejandrina Canelo Villafana
From: Myra Luna Lucero, Research Compliance Manager
Subject: IRB Approval: 19-172 Protocol
Date: 02/21/2019

Thank you for submitting your study entitled, "VACCINATING CHILDREN FOR THE HUMAN PAPILLOMAVIRUS (HPV): PREDICTORS OF PARENTS VACCINATING THEIR CHILD AND PROVIDERS RECOMMENDING A NEW LINGUISTICALLY AND CULTURALLY TAILORED VIDEO INTERVENTION DESIGNED TO INCREASE VACCINATION INITIATION AND COMPLETION," the IRB has determined that your study is **Exempt** from committee review (Category 2) on 02/21/2019.

Please keep in mind that the IRB Committee must be contacted if there are any changes to your research protocol. The number assigned to your protocol is **19-172**. Feel free to contact the IRB Office by using the "Messages" option in the electronic Mentor IRB system if you have any questions about this protocol.

Please note that your Consent form bears an official IRB authorization stamp and is attached to this email. Copies of this form with the IRB stamp must be used for your research work. Further, all research recruitment materials must include the study's IRB-approved protocol number. You can retrieve a PDF copy of this approval letter from Mentor IRB.

Best wishes for your research work.

Sincerely,
Dr. Myra Luna Lucero
Research Compliance Manager
IRB@tc.edu

Attachments:

- CONSENT FORM-IN ENG-PARENTS.pdf
- CONSENT FORM-IN SPANISH-PARENTS.pdf
- CONSENT FORM-PROVIDERS.pdf

Appendix B

Study #1 Recruitment Emails

****PARENTS/LEGAL GUARDIANS ARE INVITED****

DO YOU HAVE CHILDREN AGES 9-18?
 VOLUNTEER FOR A 35-40 MINUTE CONFIDENTIAL STUDY ABOUT
 VACCINATING YOUR CHILDREN AGES 9-18 FOR THE HUMAN
 PAPILOMAVIRUS (HPV)
 IRB Protocol Number 19-172

The Research Group on Disparities in Health within the Department of Health and Behavior Studies at Teachers College, Columbia University, in New York, NY is conducting a study to see how parents rate a new cartoon video on the Human Papillomavirus (HPV) and what they believe about giving their children ages 9-18 the HPV vaccination.

ARE YOU A PARENT OR LEGAL GUARDIAN WHO...

- Wants to learn about the Human Papillomavirus (HPV) and the recommended guidelines for vaccinating preteens and teens for HPV?
- Is interested in learning more about how to talk to medical providers about HPV?
- Is age 25 or older and has at least 1 child age 9 to 18
- Is willing to answer survey questions for about 20-25 minutes
- Is able to watch a cartoon video for about 5 minutes
- Willing to rate the cartoon video and answer a final set of survey questions for about 5-10 minutes?

To learn more about the study, read the Informed Consent, and proceed to study participation, please:

GO TO <https://tinyurl.com/HPV-Video-Study-English> if you have a child age 9-18, watch the video on the Human Papillomavirus (HPV), rate the video, & complete a survey for chance to win one of 3 \$100 Amazon gift cards [If you prefer taking the survey and watching the video in Spanish, then Go to <https://tinyurl.com/HPV-Video-Study-Spanish>]

NOTE: Participants have a 3 in 250 chance of winning 1 of 3 \$100 Amazon gift cards

For more information about this research study, please contact:
 Alejandrina Canelo Villafana, MS at ac3523@tc.columbia.edu or the Research Sponsor,
 Dr. Barbara Wallace, at atbcw3@tc.columbia.edu.
 Study contact number: 267-269-7411

SE INVITA A PADRES/MADRES/TUTORES LEGALES
 ¿TIENE NIÑOS DE 9-18 años?
 PARTICIPACIÓN VOLUNTARIA DE 35 A 40 MINUTOS PARA UN ESTUDIO
 CONFIDENCIAL
 SOBRE LA VACUNACIÓN DE SUS HIJOS
 CONTRA EL VIRUS DEL PAPILOMA HUMANO (VPH)

IRB Protocol Number 19-172

El Grupo de Investigación sobre Disparidades en Salud dentro del Departamento de Salud y Estudios de Comportamiento de Teachers College, Columbia University, en Nueva York, Nueva York, está llevando a cabo un estudio para ver cómo los padres califican un nuevo video de caricaturas sobre el Virus del Papiloma Humano (VPH) y sus opiniones. Creer en darles a sus niños de 9 a 18 años la vacuna contra el VPH.

¿ES USTED PADRE/MADRE o TUTOR LEGAL QUE...

- ¿Quiere aprender sobre el virus del papiloma humano (VPH) y las recomendaciones para vacunar a pre-adolescentes y adolescentes contra el VPH?
- ¿Le interesa aprender más acerca de cómo hablar con su proveedor de salud sobre el VPH?
- Tiene 25 años o más y al menos 1 hijo o hija entre 9 y 18 años
- Está dispuesto a contestar las preguntas de una encuesta durante 20-25 minutos
- Puede ver un video de dibujos animados durante unos 6 minutos
- ¿Está dispuesto a calificar el video y contestar una serie de preguntas finales durante aproximadamente 5-10 minutos?

Para obtener más información sobre el estudio, lea el Consentimiento informado y continúe con la participación en el estudio, por favor:

Vaya a <https://tinyurl.com/HPV-Video-Study-Spanish> si tiene un niño de 9 a 18 años de edad, mire el video sobre el virus del papiloma humano (VPH), califique el video y complete una encuesta para la oportunidad para ganar una de 3 tarjetas de regalo de Amazon de \$ 100

[Si usted prefiere tomar la encuesta y ver el video en inglés, vaya a <https://tinyurl.com/HPV-Video-Study-English>]

NOTA: Los participantes tienen una probabilidad de 3 en 250 de ganar 1 de 3 tarjetas de regalo de Amazon de \$ 100

Para obtener más información sobre este estudio de investigación, comuníquese con:
 Alejandrina Canelo Villafana, MS enac3523@tc.columbia.edu o la patrocinadora de la investigación, Dra. Barbara Wallace, en bcw3@tc.columbia.edu. Número de contacto del estudio: 267-269-7411

Appendix C

Study #2 Recruitment Email

MEDICAL PROVIDERS TO YOUTH
AGES 9-18
ARE INVITED TO JOIN THE HPV VIDEO STUDY

PEDIATRICIANS! FAMILY MEDICAL PROVIDERS!
PHYSICIAN ASSISTANTS! NURSE PRACTITIONERS!
VOLUNTEER FOR A CONFIDENTIAL
SHORT 10-12 MINUTE STUDY
FOR A CHANCE TO WIN 1 of 3 \$100 AMAZON GIFT CARDS
IRB Protocol Number 19-172

The Research Group on Disparities in Health within the Department of Health and Behavior Studies at Teachers College, Columbia University, in New York, NY is conducting a study to see how medical providers (i.e. pediatricians, family medical providers, physician assistants, nurse practitioners) rate a new cartoon video on the Human Papillomavirus (HPV) and HPV vaccination that was designed for parents of children ages 9-18. The study seeks to determine how medical providers rate and evaluate the new cartoon video, and if they recommend it for parents.

To learn more about the study, read the Informed Consent, and proceed to study participation, please:

CLICK <https://tinyurl.com/HPV-Video-Study-For-Providers> if U R a medical provider to youth ages 9-18, watch & rate an HPV video, & complete a survey—in just 10-12 minutes-for chance to win 1 of 3 \$100 Amazon gift cards

NOTE: Participants have a 3 in 250 chance of winning 1 of 3 \$100 Amazon gift cards

For more information about this research study, please contact:
 Alejandrina Canelo Villafana, MS at ac3523@tc.columbia.edu or the Research Sponsor,
 Dr. Barbara Wallace, at bcw3@tc.columbia.edu. Study contact number: 267-269-7411.

THANK YOU FOR YOUR STUDY PARTICIPATION!

Please text or tweet other medical providers to:

CLICK <https://tinyurl.com/HPV-Video-Study-For-Providers> if U R a medical provider to youth ages 9-18, watch & rate an HPV video, & complete a survey—in just 10-12 minutes-for chance to win 1 of 3 \$100 Amazon gift cards.

Appendix D

Study #1 Text/Tweet

GO TO <https://tinyurl.com/HPV-Video-Study-English> if you have a child age 9-18, watch the video on the Human Papillomavirus (HPV), rate the video,& complete a survey for chance to win one of 3 \$100 Amazon gift cards [If you prefer taking the survey and watching the video in Spanish, then Go to <https://tinyurl.com/HPV-Video-Study-Spanish>]

Vaya a <https://tinyurl.com/HPV-Video-Study-Spanish> si tiene un niño de 9 a 18 años de edad, mire el video sobre el virus del papiloma humano (VPH), califique el video y complete una encuesta para la oportunidad para ganar una de 3 tarjetas de regalo de Amazon de \$ 100

[Si usted prefiere tomar la encuesta y ver el video en inglés, vaya a <https://tinyurl.com/HPV-Video-Study-English>]

Appendix E

Study #2 Text/Tweet

GO TO <https://tinyurl.com/HPV-Video-Study-For-Providers> if U R a medical provider to youth ages 9-18, watch & rate an HPV video, & complete a survey—in just 10-12 minutes—for chance to win 1 of 3 \$100 Amazon gift cards

Appendix F

Study #1 Recruitment Flyers

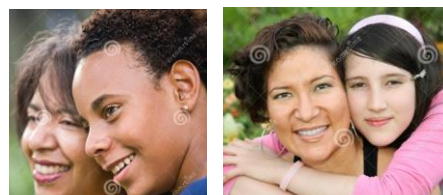
**** PARENTS/LEGAL GUARDIANS ARE INVITED ******VOLUNTEER FOR A 35-40 MINUTE CONFIDENTIAL STUDY ABOUT
VACCINATING YOUR CHILDREN AGES 9-18 FOR THE HUMAN
PAPILLOMAVIRUS (HPV)**

IRB Protocol Number 19-172

The Research Group on Disparities in Health within the Department of Health and Behavior Studies at Teachers College, Columbia University, in New York, NY is conducting a study to see how parents rate a new cartoon video on the Human Papillomavirus (HPV) and what they believe about giving their children ages 9-18 the HPV vaccination.

ARE YOU A PARENT OR LEGAL GUARDIAN WHO...

- Wants to learn about the Human Papillomavirus (HPV) and the recommended guidelines for vaccinating pre-teens and teens for HPV?
- Is interested in learning more about how to talk to medical providers about HPV?
- Is age 25 or older and has at least 1 child age 9 to 18
- Is willing to answer survey questions for about 20-25 minutes
- Is able to watch a cartoon video for about 5 minutes
- Willing to rate the cartoon video and answer a final set of survey questions for about 5-10 minutes?



For more information about this research study, please contact: Alejandrina Canelo Villafana, MS at ac3523@tc.columbia.edu or the Research Sponsor, Dr. Barbara Wallace, at bcw3@tc.columbia.edu. Study contact number: 267-269-7411

To learn more about the study and read the Informed Consent, please:

GO TO <https://tinyurl.com/HPV-Video-Study-English> if you have a child age 9-18, watch the video on the Human Papillomavirus (HPV), rate the video, & complete a survey for chance to win one of 3 \$100 Amazon gift cards [If you prefer taking the survey and watching the video in Spanish, then Go to <https://tinyurl.com/HPV-Video-Study-Spanish>] NOTE: Participants have a 3 in 250 chance of winning 1 of 3 \$100 Amazon gift cards

Tear-off a tab with the link to the survey and spread the word

☐

GO TO
<https://tinyurl.com/HPV-Video-Study-English>
if you have a child age 9-18, watch
the video on the Human
Papillomavirus (HPV), rate
the video, & complete a survey for
chance to win one of 3 \$100
Amazon gift cards

GO TO
<https://tinyurl.com/HPV-Video-Study-English>
if you have a child age 9-18, watch
the video on the Human
Papillomavirus (HPV), rate
the video, & complete a survey for
chance to win one of 3 \$100
Amazon gift cards

GO TO
<https://tinyurl.com/HPV-Video-Study-English>
if you have a child age 9-18, watch
the video on the Human
Papillomavirus (HPV), rate
the video, & complete a survey for
chance to win one of 3 \$100
Amazon gift cards

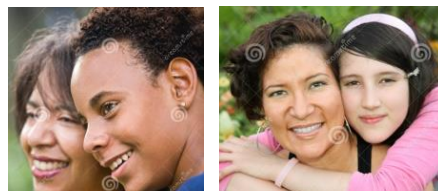
**** SE INVITA A PADRES/MADRES/TUTORES LEGALES ****
PARTICIPACIÓN VOLUNTARIA DE 35 A 40 MINUTOS PARA UN ESTUDIO
CONFIDENCIAL SOBRE LA VACUNACIÓN DE SUS HIJOS CONTRA EL VIRUS
DEL PAPILOMA HUMANO (VPH)

IRB Protocol Number 19-172

El Grupo de Investigación sobre Disparidades en Salud dentro del Departamento de Salud y Estudios de Comportamiento de Teachers College, Columbia University, en Nueva York, Nueva York, está llevando a cabo un estudio para ver cómo los padres califican un nuevo video de caricaturas sobre el Virus del Papiloma Humano (VPH) y sus opiniones. Creer en darles a sus niños de 9 a 18 años la vacuna contra el VPH.☒

¿ES USTED PADRE/MADRE o TUTOR LEGAL QUE...

- ¿Quiere aprender sobre el virus del papiloma humano (VPH) y las recomendaciones para vacunar a pre-adolescentes y adolescentes contra el VPH?
- ¿Le interesa aprender más acerca de cómo hablar con su proveedor de salud sobre el VPH?
- Tiene 25 años o más y al menos 1 hijo o hija entre 9 y 18 años
- Está dispuesto a contestar las preguntas de una encuesta durante 20-25 minutos
- Puede ver un video de dibujos animados durante unos 5 minutos
- ¿Está dispuesto a calificar el video y contestar una serie de preguntas finales durante aproximadamente 5-10 minutos?
-



Para obtener más información sobre este estudio de investigación, comuníquese con: Alejandrina Canelo Villafana, MS en ac3523@tc.columbia.edu o la patrocinadora de la investigación, Dra. Barbara Wallace, en bcw3@tc.columbia.edu. Número de contacto del estudio: 267-269-7411

Para obtener más información sobre el estudio y leer el Consentimiento informado, por favor: Vaya a <https://tinyurl.com/HPV-Video-Study-Spanish> si tiene un niño de 9 a 18 años de edad, mire el video sobre el virus del papiloma humano (VPH), califique el video y complete una encuesta para la oportunidad para ganar una de 3 tarjetas de regalo de Amazon de \$ 100 [Si usted prefiere tomar la encuesta y ver el video en inglés, vaya a <https://tinyurl.com/HPV-Video-Study-English>]

NOTA: Los participantes tienen una probabilidad de 3 en 250 de ganar 1 de 3 tarjetas de regalo de Amazon de \$ 100

Arranque una pestaña con el enlace a la encuesta y corra la voz☒

Vaya a	Vaya a	Vaya a
https://tinyurl.com/HPV-Video-Study-Spanish si tiene un niño de 9 a 18 años de edad, mire el video sobre el virus del papiloma humano (VPH), califique el video y complete una encuesta para la oportunidad para ganar una de 3 tarjetas de regalo de Amazon de \$ 100	https://tinyurl.com/HPV-Video-Study-Spanish si tiene un niño de 9 a 18 años de edad, mire el video sobre el virus del papiloma humano (VPH), califique el video y complete una encuesta para la oportunidad para ganar una de 3 tarjetas de regalo de Amazon de \$ 100	https://tinyurl.com/HPV-Video-Study-Spanish si tiene un niño de 9 a 18 años de edad, mire el video sobre el virus del papiloma humano (VPH), califique el video y complete una encuesta para la oportunidad para ganar una de 3 tarjetas de regalo de Amazon de \$ 100

Appendix G

Study #1 Informed Consent in English

Teachers College, Columbia University 525 West 120th Street
New York NY 10027 212 678 3000

INFORMED CONSENT FOR PARENTS**IRB Protocol Number 19-172**

**NOTE: If you prefer taking the survey and watching the video in Spanish, then
Go to <https://tinyurl.com/HPV-Video-Study-Spanish>**

**Protocol Title: VACCINATING CHILDREN FOR THE HUMAN
PAPILLOMAVIRUS (HPV): PREDICTORS OF PARENTS VACCINATING THEIR
CHILD AND PROVIDERS RECOMMENDING A NEW LINGUISTICALLY AND
CULTURALLY TAILORED VIDEO INTERVENTION DESIGNED TO INCREASE
VACCINATION INITIATION AND COMPLETION**

Principal Investigator: Alejandrina Canelo Villafana, MS
Teachers College, Columbia University; 973-391-4128; ac3523@tc.columbia.edu

INTRODUCTION You are being invited to participate in this research study called “VACCINATING CHILDREN FOR THE HUMAN PAPILLOMAVIRUS (HPV): PREDICTORS OF PARENTS VACCINATING THEIR CHILD AND PROVIDERS RECOMMENDING A NEW LINGUISTICALLY AND CULTURALLY TAILORED VIDEO INTERVENTION DESIGNED TO INCREASE VACCINATION INITIATION AND COMPLETION.” You may qualify to take part in this research study if you are: at least at least 25 years of age; the parent/caregiver or legal guardian of at least ONE child between the ages of 9 and 18 years of age; are willing to answer survey questions about yourself, your child, what you know about the human papillomavirus (HPV), and what you think about having your child vaccinated for HPV; and, are able to watch a 5-minute cartoon video aloud (i.e. using a smart phone with headphones, or laptop or computer with working speakers). Approximately 250 parents will participate in this study and it will take 35-40 minutes of your time to complete.

WHY IS THIS STUDY BEING DONE? This study is being done to evaluate a new cartoon video designed to educate parents about the human papillomavirus (HPV) and the decision to have their child vaccinated for HPV. The evaluation will determine if, after watching the cartoon video, parents feel more prepared and confident to: (1) talk to a medical provider about HPV and the HPV vaccination for children ages 9 to 18; and, (2) decide if they will have their children receive the HPV vaccination and all the required doses.

WHAT WILL I BE ASKED TO DO IF I AGREE TO TAKE PART IN THIS STUDY? If you decide to participate in this study, you will be asked to:

- **BEFORE WATCHING THE CARTOON:** you will spend about **20-25 minutes** answering a set of questions about you and your child
- **WATCH THE CARTOON:** you will spend **about 5 minutes** watching a cartoon using a computer with an Internet connection in a place where you can play the cartoon aloud
- **AFTER THE CARTOON:** you will spend **about 5-10 minutes** answering a final set of questions, including rating the cartoon and deciding if you would recommend it to other parents.

WHAT POSSIBLE RISKS OR DISCOMFORTS CAN I EXPECT FROM TAKING PART IN THIS STUDY? This is a minimal risk study, which means the harms or discomforts that you may experience are not greater than you would ordinarily experience if you were thinking about the health of your child. A participant who experiences any emotional discomfort can discontinue answering questions or can stop watching the cartoon at any time—without suffering any negative consequences.

WHAT POSSIBLE BENEFITS CAN I EXPECT FROM TAKING PART IN THIS STUDY? There is no direct benefit to you for participating in this study. Participation may benefit the field of health education by determining if there is value in a cartoon video for educating parents about HPV and the HPV vaccination for children.

WILL I BE PAID FOR BEING IN THIS STUDY? You will not be paid to participate. However, when you complete the survey you will be invited to enter your email address and to hit a “submit” button—so that you are officially entered into a drawing for a chance to receive a prize (i.e., there will be 3 bar coded Amazon gift certificates for \$100 each). You do not have to enter the lottery drawing to complete the survey. Once you submit your email address, then it will automatically be entered into a private and secure data base that even the principal investigator cannot access. Once 250 people have completed the entire survey, you will have a 3 in 250 chance of winning one of the 3 bar coded Amazon gift certificates for \$100 each. The www.Amazon.com gift certificates will be sent to three randomly chosen email accounts using a secure online program. This occurs without in any way linking your identity to the survey results. The principal investigator is not able to view any of the email addresses to which the gift certificates are sent. Only the 3 winners will be contacted.

WHEN IS THE STUDY OVER? CAN I LEAVE THE STUDY BEFORE IT ENDS?

The study is over when you have completed the online survey. However, you can discontinue answering the survey questions at any time. You can exit the study at any time and delete the link to the study.

PROTECTION OF YOUR CONFIDENTIALITY The study does not involve linking your survey responses to any personal information that might identify you, keeping your information confidential. Teachers College, Columbia University has determined that www.Qualtrics.com provides a secure platform for the online survey you will take. The survey data files will also be saved on the primary researcher's password protected computer. Regulations require that research data be kept for at least three years.

For quality assurance, the study team, and/or members of the Teachers College Institutional Review Board (IRB) may review the data collected from you as part of this study. Otherwise, all information obtained from your participation in this study will be held strictly confidential and will be disclosed only with your permission or as required by U.S. or State law.

HOW WILL THE RESULTS BE USED? The results of this study will be published in journals and presented at academic conferences. This study is being conducted as part of the dissertation of the principal investigator.

WHO CAN ANSWER MY QUESTIONS ABOUT THIS STUDY?

If you have any questions about taking part in this research study, you should contact the principal investigator, Alejandrina Canelo Villafana, MS at 973-391-4128 or at ac3523@tc.columbia.edu. You can also contact the faculty advisor, Dr. Barbara C. Wallace at [\(267\)-269-7411](tel:(267)269-7411) or bcw3@tc.columbia.edu.

If you have questions or concerns about your rights as a research subject, you should contact the Institutional Review Board (IRB) (the human research ethics committee) at 212-678-4105 or email IRB@tc.edu. Or you can write to the IRB at Teachers College, Columbia University, 525 W. 120th Street, New York, NY 1002. The IRB is the committee that oversees human research protection for Teachers College, Columbia University.

Appendix H

Study #1 Informed Consent in Spanish

Teachers College, Columbia University
525 West 120th Street
New York NY 10027
212 678 3000

CONSENTIMIENTO INFORMADO PARA PADRES

Número de Protocolo IRB 19-172

NOTA: Si usted prefiere tomar la encuesta y ver el video en inglés, vaya a <https://tinyurl.com/HPV-Video-Study-English>

Título del Protocolo: VACUNANDO A LOS NIÑOS CONTRA EL VIRUS DEL PAPILOMA HUMANO (HPV): FACTORES PREDICTORES DE LA RESPUESTA DE LOS PADRES PARA VACUNAR A SUS HIJOS E HIJAS Y RECOMENDACION DE LOS PROVEEDORES DE SALUD DE UN VIDEO DE INTERVENCION ADAPTADO LINGÜÍSTICA Y CULTURALMENTE DISEÑADO PARA LOGRAR UN INCREMENTO EN EL INICIO Y FINALIZACION DE LA VACUNACION

Investigador Principal: Alejandrina Canelo Villafana, MS
 Teachers College, Columbia University; 973-391-4128; ac3523@tc.columbia.edu

INTRODUCCION Usted está invitado a participar en este estudio de investigación llamado “VACUNANDO A LOS NIÑOS Y NIÑAS CONTRA EL VIRUS DEL PAPILOMA HUMANO (VPH): FACTORES PREDICTORES DE LA RESPUESTA DE PADRES Y MADRES PARA VACUNAR A SUS HIJOS E HIJAS Y RECOMENDACION DE LOS PROVEEDORES DE SALUD DE UN VIDEO DE INTERVENCION ADAPTADO LINGÜÍSTICA Y CULTURALMENTE DISEÑADO PARA LOGRAR UN INCREMENTO EN EL INICIO Y FINALIZACION DE LA VACUNACION.” Los requisitos para poder participar de este estudio de investigación son: tener 25 años de edad o más; ser padre, madre o tutor legal de al menos UN niño o niña que tenga entre 9 a 18 años de edad; estar dispuesto a contestar una encuesta con preguntas acerca de Usted, sus hijos y/o hijas, lo que usted conoce a cerca del virus del papiloma humano (VPH), y lo que usted piensa sobre tener a sus hijos y/o hijas vacunados contra el virus del papiloma humano (VPH); y estar dispuesto a ver un video animado de 5 minutos de duración en volumen alto (por ejemplo usando un teléfono inteligente con audífonos, una computadora portátil o computadora de escritorio con bocinas que funcionen correctamente). Aproximadamente 250 personas podrán formar parte de este estudio y su participación tomará 35 a 40 minutos de su tiempo para completar la encuesta.

¿POR QUÉ SE REALIZARÁ ESTE ESTUDIO? Este estudio se hace para evaluar un nuevo video animado diseñado para enseñar a padres, madres o tutores legales a cerca del virus del papiloma humano (VPH) y tomar la decisión de vacunar a sus hijos y/o hijas contra el VPH. La evaluación determinará si, luego de ver el video animado, los padres, madres o tutores legales se sienten más preparados y con mayor confianza para: (1) hablar con un proveedor de salud acerca del VPH y la vacuna contra el VPH para sus hijos e hijas entre 9 a 18 años de edad; y, (2) decidir si sus hijos e hijas recibirán la vacuna contra el VPH y en las dosis necesarias.

¿QUÉ ME PEDIRÁN HACER SI DECIDO PARTICIPAR EN ESTE ESTUDIO?

Si Usted decide formar parte de esta investigación, se le pedirá:

- ANTES DE VER EL VIDEO DE DIBUJOS ANIMADOS: deberá contestar una serie de preguntas sobre Usted y sus hijos y/o hijas. Esto le tomará **20-25 minutos**
- VER EL VIDEO DE DIBUJOS ANIMADOS: necesitará **alrededor de 5 minutos** para mirar el video usando una computadora con conexión a internet en un lugar donde pueda reproducir el video en volumen alto.
- LUEGO DE VER EL VIDEO DE DIBUJOS ANIMADOS: necesitará **alrededor de 5-10 minutos más** para contestar una serie final de preguntas, calificar el video y decidir si recomendaría el video a otros padres/madres o tutores legales.

¿QUÉ RIESGOS O MALESTARES SON POSIBLES DE ESPERAR SI FORMO PARTE DE ESTE ESTUDIO?

Este es un estudio de riesgo mínimo, lo cual significa que los daños o malestares que usted pueda experimentar no son mayores a los que podría experimentar cualquier persona al pensar en la salud de sus hijos. Si un participante experimenta alguna molestia o malestar emocional, puede dejar de contestar las preguntas o dejar de mirar el video en cualquier momento—sin sufrir ninguna consecuencia negativa.

¿QUÉ BENEFICIOS SON POSIBLES DE ESPERAR POR MI PARTICIPACION EN ESTE ESTUDIO?

No hay un beneficio directo para usted por participar en este estudio. Su participación puede beneficiar al área de educación en salud al determinar la utilidad de un video de dibujos animados para enseñar a padres sobre el VPH y la vacunación contra el VPH para niños.

¿ME PAGARÁN POR PARTICIPAR EN ESTE ESTUDIO?

No se le ofrecerá ningún tipo de pago /dinero por participar en este estudio. Sin embargo, cuando usted complete la encuesta se le pedirá que ingrese su dirección de correo electrónico y que pulse la tecla “enviar”—de esta forma usted ingresará oficialmente a una casilla por la posibilidad de recibir un premio (por ejemplo, habrá 3 certificados de regalo de Amazon con códigos de barra por un valor de \$100 cada uno). Usted no tiene que entrar a la casilla de sorteo para completar la encuesta. Una vez que usted envíe su dirección de correo electrónico, la misma entrará automáticamente a una base de datos privada y segura. Una vez que 250 personas hayan realizado la encuesta completa, usted tendrá la posibilidad de 3 en 250 de ganar una de los 3 certificados de regalo de Amazon con códigos de barra por un valor de \$100 cada uno. Los certificados de regalo de www.Amazon.com serán enviados a 3 cuentas de correo electrónico elegidas

al azar usando un programa seguro en línea. Esto se realiza sin vincular de ninguna manera su identidad a los resultados de la encuesta. La investigadora principal no tiene acceso a mirar ninguna de las direcciones de correo electrónico a las cuales se envían los certificados de regalo. Sólo los 3 ganadores serán contactados.

¿CUANDO TERMINA MI PARTICIPACIÓN EN EL ESTUDIO? ¿PUEDO ABANDONAR EL ESTUDIO ANTES DE TERMINAR? El estudio ha terminado cuando haya completado la encuesta en línea. Sin embargo, puede dejar de responder las preguntas de la encuesta en cualquier momento. Puede salir del estudio en cualquier momento y eliminar el enlace al estudio.

PROTECCION DE SU CONFIDENCIALIDAD El estudio no implica vincular las respuestas de su encuesta a ninguna información personal que pueda identificarlo, manteniendo su información confidencial. Teachers College, Columbia University ha determinado que www.Qualtrics.com proporciona una plataforma segura para la encuesta en línea que realizará. Los archivos de datos de la encuesta también se guardarán en la computadora protegida por contraseña del investigador principal. Las regulaciones requieren que los datos de investigación se mantengan durante al menos tres años.

Para garantizar la calidad, el equipo de estudio y / o los miembros de la Junta de Revisión Institucional (IRB) de Teachers College pueden revisar los datos recopilados de usted como parte de este estudio. De lo contrario, toda la información obtenida de su participación en este estudio se mantendrá estrictamente confidencial y se divulgará solo con su permiso o según lo exija la ley de los Estados Unidos o del estado.

¿COMO SE UTILIZARÁN LOS RESULTADOS? Los resultados de este estudio serán publicados en revistas científicas y serán presentados en conferencias académicas. Este estudio se lleva a cabo como parte de la tesis doctoral de la investigadora principal.

¿QUIÉN PUEDE CONTESTAR MIS PREGUNTAS O DUDAS A CERCA DE ESTE ESTUDIO?

Si usted tiene alguna duda o pregunta en relación a formar parte de este estudio de investigación, deberá ponerse en contacto con la investigadora principal, Alejandrina Canelo Villafana, MS al teléfono 973-391-4128 ó a la siguiente dirección de correo electrónico ac3523@tc.columbia.edu. Además, puede contactar a la tutora académica, Dr. Barbara C. Wallace al tel (267)-269-7411 ó bcw3@tc.columbia.edu.

DERECHOS DEL PARTICIPANTE

- He leído el consentimiento informado y tuve oportunidad de realizar preguntas sobre investigación (investigadora principal, o tutora académica).
- He tenido suficiente oportunidad de preguntar sobre los propósitos, procedimientos, riesgos y beneficios en relación a este estudio de investigación.
- Entiendo que mi participación es voluntaria. Puedo rehusarme a participar o abandonar mi participación en cualquier momento sin recibir sanción alguna.
- El investigador puede retirarme de la investigación según su criterio profesional.
- Si durante el transcurso de la investigación, se encuentra disponible nueva información importante que pueda relacionarse con mi predisposición a continuar participando, el investigador me proporcionará esta información.
- Cualquier información correspondiente al proyecto de investigación que pueda identificarme no será comunicada o divulgada sin mi consentimiento por separado, excepto que sea requerido específicamente por ley.
- Los datos no identificables pueden ser usada para estudios de investigación futuros, o proporcionados a otro investigador para investigaciones futuras sin consentimiento informado adicional de la persona o su representante legal.
- Puedo descargar y guardar una copia de este documento de Consentimiento Informado.

Al marcar la casilla a continuación, acepto participar en el estudio y confirmo que soy: un adulto de 25 años o más; el padre / cuidador o tutor legal de al menos UN niño entre las edades de 9 y 18 años de edad; capaz de leer y entender Español en la escuela secundaria; capaz de dedicar entre 35 y 40 minutos a este estudio, incluso ver un video de dibujos animados de 5 minutos (por ejemplo usando un teléfono inteligente con audífonos, una computadora portátil o computadora de escritorio con bocinas que funcionen correctamente) y responder preguntas de la encuesta.

Acepto participar en este estudio.

Appendix I

Study #2 Informed Consent

Teachers College, Columbia University
525 West 120th Street
New York NY 10027
212 678 3000
INFORMED CONSENT FOR PROVIDERS
IRB Protocol Number 19-172

Protocol Title: Vaccinating Children for the Human Papillomavirus (HPV): Predictors of Parents Vaccinating their Child and Providers Recommending a New Linguistically and Culturally Tailored Video Intervention Designed to Increase Vaccination Initiation and Completion

Principal Investigator: Alejandrina Canelo Villafana, MS
Teachers College, Columbia University; 973-391-4128; ac3523@tc.columbia.edu

INTRODUCTION You are being invited to participate in this research study called “Vaccinating Children for the Human Papillomavirus (HPV): Predictors of Parents Vaccinating their Child and Providers Recommending a New Linguistically and Culturally Tailored Video Intervention Designed to Increase Vaccination Initiation and Completion.” You may qualify to take part in this research study if you are a pediatrician or family practitioner, or other medical health care provider (e.g. physicians, physician assistants, nurse practitioners); you have had direct contact with pediatric patients (children, adolescents) within the past six months; and, you will be able to watch and listen to a 5-minute cartoon video (i.e. smart phone with headphones, or laptop or computer with working speakers). Approximately 250 providers will participate in this study and it will take 10-12 minutes of your time to complete.

WHY IS THIS STUDY BEING DONE? This study is being done to evaluate a new cartoon video designed to educate parents about the human papillomavirus (HPV) and the decision to having their child vaccinated for HPV. The evaluation will determine if, after watching the cartoon video, you recommend it for parents in need of education on HPV vaccination.

WHAT WILL I BE ASKED TO DO IF I AGREE TO TAKE PART IN THIS STUDY? If you decide to participate in this study, you will be asked to spend about **3-4 minutes** answering a set of questions about you and your practice, including your knowledge about HPV and extent to which you have discussed HPV vaccination with parents; then spend **about 5 minutes** watching a cartoon online; and, finally spend **about**

2-3 minutes answering a final set of questions, including rating the cartoon and deciding if you would recommend it to for parents.

WHAT POSSIBLE RISKS OR DISCOMFORTS CAN I EXPECT FROM TAKING PART IN THIS STUDY? This is a minimal risk study, which means the harms or discomforts that you may experience are not greater than you would ordinarily experience if you were thinking about the health of children in your practice. A participant who experiences any discomfort can discontinue answering questions or can stop watching the cartoon at any time—without suffering any negative consequences.

WHAT POSSIBLE BENEFITS CAN I EXPECT FROM TAKING PART IN THIS STUDY? There is no direct benefit to you for participating in this study.

WILL I BE PAID FOR BEING IN THIS STUDY? You will not be paid to participate. However, when you complete the survey you will be invited to enter your email address and to hit a “submit” button—so that you are officially entered into a drawing for a chance to receive a prize (i.e., there will be 3 bar coded Amazon gift certificates for \$100 each). You do not have to enter the lottery drawing to complete the survey. Once you submit your email address, then it will automatically be entered into a private and secure data base that even the principal investigator cannot access. Once 250 people have completed the entire survey, you will have a 3 in 250 chance of winning one of the 3 bar coded Amazon gift certificates for \$100 each. The www.Amazon.com gift certificates will be sent to three randomly chosen email accounts using a secure online program. This occurs without in any way linking your identity to the survey results. The principal investigator is not able to view any of the email addresses to which the gift certificates are sent. Only the 3 winners will be contacted.

WHEN IS THE STUDY OVER? CAN I LEAVE THE STUDY BEFORE IT ENDS? The study is over when you have completed the online survey. However, you can discontinue answering the survey questions at any time. You can exit the study at any time and delete the link to the study.

PROTECTION OF YOUR CONFIDENTIALITY The study does not involve linking your survey responses to any personal information that might identify you, keeping your information confidential. Teachers College, Columbia University has determined that www.Qualtrics.com provides a secure platform for the online survey you will take. The survey data files will also be saved on the primary researcher’s password protected computer. Regulations require that research data be kept for at least three years. For quality assurance, the study team, and/or members of the Teachers College Institutional Review Board (IRB) may review the data collected from you as part of this study. Otherwise, all information obtained from your participation in this study will be held strictly confidential and will be disclosed only with your permission or as required by U.S. or State law.

HOW WILL THE RESULTS BE USED? The results of this study will be published in journals and presented at academic conferences. This study is being conducted as part of the dissertation of the principal investigator.

WHO CAN ANSWER MY QUESTIONS ABOUT THIS STUDY? If you have any questions about taking part in this research study, you should contact the principal investigator, **Alejandrina Canelo Villafana, MS at 973-391-4128 or at ac3523@tc.columbia.edu. You can also contact the faculty advisor, Dr. Barbara C. Wallace at (267)-269-7411 or bcw3@tc.columbia.edu.**

If you have questions or concerns about your rights as a research subject, you should contact the Institutional Review Board (IRB) (the human research ethics committee) at 212-678-4105 or email IRB@tc.edu. Or you can write to the IRB at Teachers College, Columbia University, 525 W. 120th Street, New York, NY 1002. The IRB is the committee that oversees human research protection for Teachers College, Columbia University.

PARTICIPANT'S RIGHTS

- I have read the Informed Consent Form and have been offered the opportunity to discuss the form with the researcher.
- I have had ample opportunity to ask questions about the purposes, procedures, risks and benefits regarding this research study.
- I understand that my participation is voluntary. I may refuse to participate or withdraw participation at any time without penalty.
- The researcher may withdraw me from the research at his or her professional discretion. I understand that if I take the survey more than once I will be eliminated from the study.
- If, during the course of the study, significant new information that has been developed becomes available which may relate to my willingness to continue my participation, the researcher will provide this information to me.
- Any information derived from the research study that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.
- I should receive a copy of the Informed Consent Form document. (I understand that I can download it).

By checking the box below, I agree to participate in the study and I am confirming that I am: a medical health care provider (e.g. physician, physician assistant, nurse practitioner) who works in a pediatric or family care practice—while having had direct contact with pediatric patients (children, adolescents) within the past 6 months; and, able to devote about 10-12 minutes to this study, including watching a 5-minute cartoon video (i.e. using a smart phone with headphones, or laptop or computer with working speakers) and answering survey questions.

I agree to participate in this study.

Appendix J

Video Script in English

ENGLISH VERSION OF FINAL SCRIPT FOR
 TOMAS GETS HIS FIRST HPV VACCINATION SHOT
 (5 Minute Avatar/Cartoon Video)
 NOTE: 675 words = 5.7 minutes

CAST:

D = Dr. James

T = Tomas, age 11

M = Mother

F = Father

S = Simone, Sister of Tom, age 12

SCENE – Doctor’s Office

D: How are you Mr. Ramirez? And you, Mrs. Ramirez?

M: Great, Dr. James.

F: Great. We have a birthday boy, here!

D: Tomas, Happy Birthday!

T: Thank you! I’m 11 now!

S: I’m still older!

D: It’s time for your son, Tomas, to get a number of recommended vaccines for those age 11 to 12.

F: Yes, I know about the vaccines for flu, tdap and meningococcal. But, I wanted to learn more about the HPV vaccine.

S: I remember getting the HPV vaccine last year. I came here with Mom.

D: Yes. HPV vaccine is recommended for all 11 to 12 year old girls and boys—or can start as early as age 9. I recommend that Tomas receive the HPV vaccination, today.

S: Just like me!

[Children are in a corner looking at books, toys, etc., being distracted, and not listening to the adults’ conversation]

F: So, Dr. James, please tell me more about HPV.

D: Certainly.

F: I know HPV is a sexually transmitted disease.

D: Yes! HPV is the most common sexually transmitted disease. HPV is transmitted by having vaginal, anal or oral sex with someone who has the virus. Almost all sexually active people will get HPV at some time in their lives.

M: And most people will never even know they have HPV.

F: But, my son is not sexually active. He's just 11!

D: It is because he is not yet sexually active that we recommend the HPV vaccination at his age. By vaccinating for HPV today, your child will have the best protection possible BEFORE the start of any kind of sexual activity.

F: Really?

D: Yes. We vaccinate people well BEFORE they are exposed to an infection.

M: Dr. James, please share with my husband what you told me before: why the HPV vaccine is so important.

D: The HPV vaccine is very important because it helps prevent cancer.

F: I remember hearing that the HPV vaccine was important for girls to receive, in order to help prevent cervical cancer.

D: HPV not only causes many of the cancers of the cervix, vagina and vulva in women, but also of the penis in men. Both men and women can get genital warts and cancers of the anus, mouth, and throat from HPV. The HPV vaccine can help prevent these cancers.

F: I just remembered my boss saying the cause of his cancer of the mouth was most likely HPV!

M: So, there is a good reason to vaccinate preteens and teens BEFORE they become sexually active!

D: Research shows that vaccinating preteens and teens does not make them more likely to become sexually active. Other research shows the HPV vaccine to be extremely effective in reducing infections caused by HPV.

M: Have you vaccinated your children?

D: Yes. I strongly believe in the importance of this cancer-preventing vaccine. I follow the recommendations of the American Academy of Pediatrics and many other experts.

F: Well, let's get Tomas vaccinated! I'm convinced that HPV vaccination is important.

(Children hear this declaration and return to the area where the adults are talking)

S: Is Thomas going to have to come back for his second HPV shot?

D: Yes.

M: Just like you did last year.

T: So, I get one HPV shot today, and then I have to come back for another one?

D: Yes. Because you are under age 15, you get two doses of the HPV vaccine. You will get the second dose 6-12 months from now.

M: Do some children get 3 doses?

D: Yes, the 3-dose schedule is recommended for children starting the HPV vaccination series on or after their 15th birthday. For those teens the second dose is given 1-2 months after the first, and the third dose is administered 6 months after the first dose.

F: What happens if a child does not receive all of their doses?

D: They can still complete the vaccine series. I just saw a 16 year old teen who had his first HPV dose at age 13 when he lived in another state. His Dad brought him in for dose number 2.

M: Wow

D: This reflects the recommendation that all parents with children ages 9 to 18 under their care have their children complete ALL the doses in the HPV vaccination series.

M: I'll make the appointment for Tomas's second HPV shot before we leave here today.

S: Just like I got my second shot!

M: Yes!

D: Are you ready for your first HPV shot, Tomas?

T: I'm ready!

Final Page:

This video was brought to you by:

Research Group on Disparities in Health (RGDH)

Department of Health and Behavior Studies

Teachers College, Columbia University

New York, NY

Contact Persons:

Alejandrina Canelo Villafana, MS, (Doctoral Candidate), Fellow of the RGDH

Barbara C. Wallace, Ph.D. Director of the RGDH

bcw3@tc.columbia.edu

Appendix K

Video Script in Spanish

**VERSION FINAL EN ESPAÑOL DEL GUIÓN PARA
TOMAS RECIBE SU PRIMERA DOSIS DE VACUNA VPH
(Avatar/Video Animado de 5 Minutos)
NOTA: 675 (948) palabras = 6.25 minutos**

PERSONAJES:**D = Dr. James****T = Tomas, 11 años****M = Madre****P = Padre****S = Simone, Hermana de Tomy, 12 años****ESCENA – Consultorio del Doctor**

D: ¿Cómo está usted Sr. Ramirez? Y usted, Sra. Ramirez?

M: Muy bien, Dr. James.

P: Muy bien. ¡Tenemos un niño de cumpleaños, aquí está!

D: ¡Tomas, Feliz Cumpleaños!

T: ¡Gracias! ¡Ahora tengo 11!

S: ¡Todavía soy mayor que tú!

D: Es tiempo que su hijo, Tomas, reciba una serie de vacunas recomendadas para niños quienes tienen de 11 a 12 años de edad.

P: Si, conozco sobre las vacunas para la gripe, dTap y meningococo. Pero quiero aprender más sobre las vacunas contra el virus del papiloma humano (VPH).

S: Yo recuerdo que recibí la vacuna VPH el año pasado. Vine acá con Mamá.

D: Si. La vacuna VPH se recomienda para todos los niños y niñas de 11 a 12 años de edad—o se puede comenzar tan pronto como a la edad de 9 años. Yo recomiendo que Tomás reciba la vacuna del VPH, hoy.

S: ¡Igual que yo!

[Los niños están en un rincón mirando libros, juguetes, etc., están distraídos y no escuchan la conversación de los adultos]

P: Entonces, Dr. James, dígame sobre el VPH.

D: Por supuesto.

P: Sé que el VPH es una enfermedad de transmisión sexual.

D: ¡Exacto! El VPH es la más común de las enfermedades de transmisión sexual. El VPH se transmite por tener sexo vaginal, anal u oral con alguien que tiene el virus. Casi todas las personas sexualmente activas contraerán el VPH en algún momento de sus vidas.

M: Y la mayoría de las personas ni siquiera sabrán que tienen el VPH.

P: Pero, mi hijo no es sexualmente activo. ¡Tiene solo 11 años!

D: Justamente, es *porque él no ha estado aun sexualmente activo* es que recomendamos la vacunación contra el VPH a esta edad. Si se vacuna contra el VPH hoy, su hijo tendrá la mejor protección posible ANTES del inicio de cualquier tipo de actividad sexual.

P: ¿De verdad?

D: Si. Nosotros vacunamos a las personas justo ANTES de que estén expuestas a una infección.

M: Dr. James, por favor cuéntele a mi marido lo que usted me dijo antes: por qué la vacuna contra el VPH es tan importante.

D: La vacuna contra el VPH es muy importante porque ayuda a prevenir los tipos de cáncer relacionados con el VPH.

P: Recuerdo haber escuchado que la vacuna contra el VPH era importante para las niñas, para prevenir cáncer cervical.

D: el VPH no sólo causa muchos de los cánceres de cuello uterino, vagina y vulva en mujeres, sino también produce cáncer de pene en hombres. Tanto hombres como mujeres pueden tener verrugas genitales y cánceres de ano, boca y garganta por VPH. La vacuna contra el VPH puede ayudar a prevenir estos cánceres.

P: ¡Justo recordé que mi jefe dijo que la causa de su cáncer de boca fue lo más probable por VPH!

M: ¡Entonces, hay una buena razón para vacunar a los pre-adolescentes y adolescentes ANTES que lleguen a ser sexualmente activos!

D: Las investigaciones demuestran que el vacunar a los pre-adolescentes y adolescentes no los hace más propensos a ser sexualmente activos. Otros estudios muestran que la vacuna contra el VPH es extremadamente efectiva al reducir las infecciones causadas por el VPH

M: ¿Ha vacunado usted a sus hijos?

D: Si. Creo firmemente en la importancia de esta vacuna para prevenir el cáncer. Yo sigo las recomendaciones de la Academia Americana de Pediatría (American Academy of Pediatrics) y muchos otros expertos.

P: Bien, vacunemos a Tomás! Estoy convencido que la vacunación contra el VPH es importante.

(Los niños escuchan esta afirmación y regresan al área donde los adultos están hablando)

S: Tomás tiene que regresar para su segunda dosis de VPH?

D: Si.

M: Igual que tú lo hiciste el año pasado.

T: ¿Entonces, recibo una dosis de la vacuna VPH hoy, y después tengo que regresar para otra dosis?

D: Si. Como tú tienes menos de 15 años, recibes 2 dosis de la vacuna VPH. Recibirás la segunda dosis dentro de 6 a 12 meses a partir de ahora.

M: ¿Algunos niños reciben 3 dosis?

D: Si, La vacuna se administra como una serie de 3 dosis a niños que comienzan la serie de vacunación VPH a los 15 años o después de esa edad. Para esos adolescentes, la segunda dosis se da 1 a 2 meses después de la primera dosis, y la tercera dosis se administra 6 meses después de la primera dosis.

P: ¿Qué pasa si un niño no recibe todas sus dosis?

D: Igual pueden completar su serie de vacunas. Justamente vi a un adolescente de 16 años que tuvo su primera dosis a los 13 años cuando vivía en otro estado. Su papá lo trajo para la dosis número 2.

M: Wow

D: Esto muestra la recomendación que todos los padres con hijos de 9 a 18 años de edad bajo su cuidado hayan completado TODAS las dosis de la serie de vacunación contra el VPH.

M: Pediré una cita para la segunda dosis de VPH de Tomás antes de salir de acá hoy.

S: ¡Del mismo modo que yo tuve mi segunda dosis!

M: ¡Si!

D: ¿Estás listo para tu primer dosis de VPH, Tomás?

T: ¡Estoy listo!

Página Final:

Este video llegó a Usted a través de:

Research Group on Disparities in Health (RGDH)

Department of Health and Behavior Studies

Teachers College, Columbia University

New York, NY

Personas de Contacto:

Alejandrina Canelo Villafana, MS, (Candidata a Doctorado), Fellow del RGDH

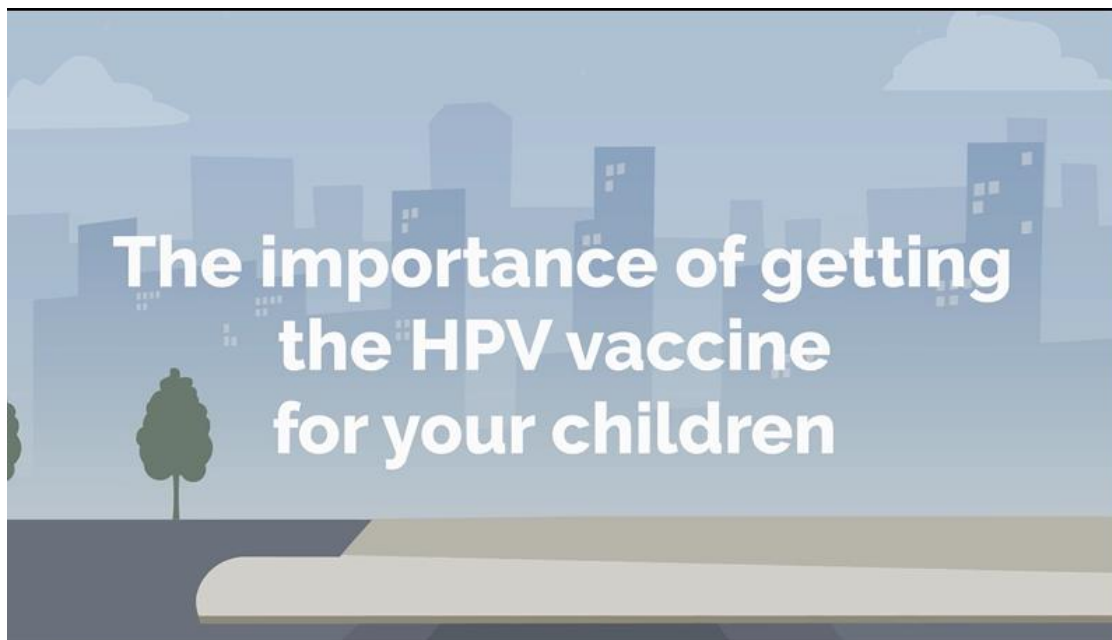
Barbara C. Wallace, Ph.D. Directora del RGDH

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Appendix L

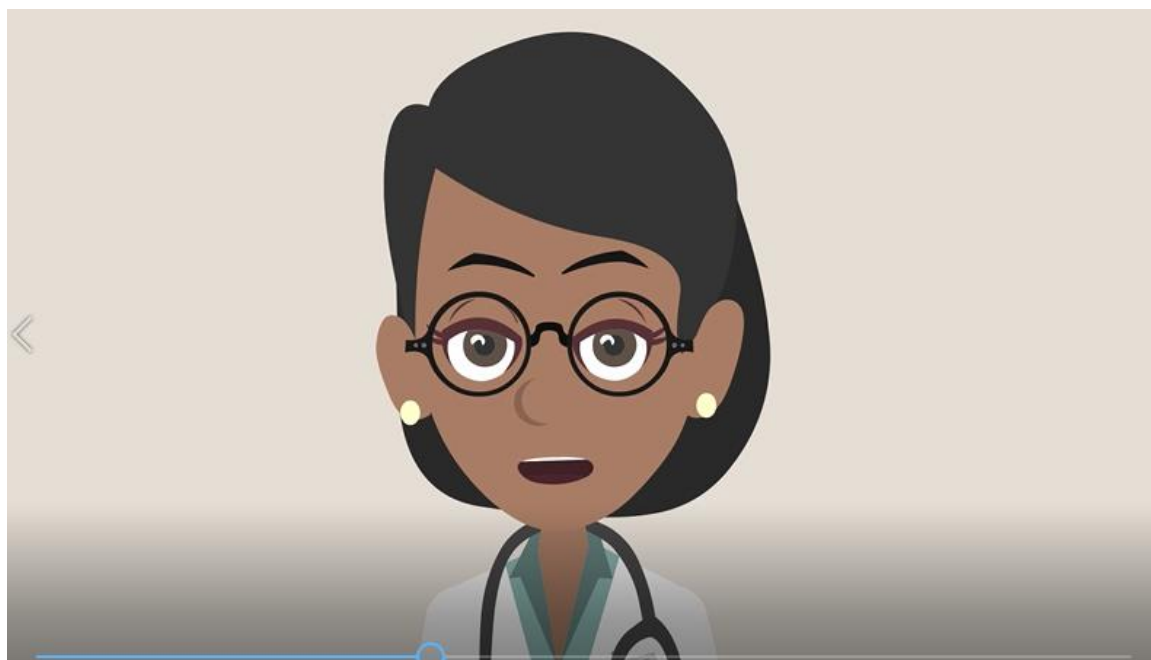
Screenshots of Video

(Selected screen shots)





**La importancia de vacunar
a sus hijos/hijas contra
el Virus del Papiloma Humano**



Appendix M

Study #1 Survey in English

SCREENING TOOL IN ENGLISH FOR IRB PROTOCOL # 19-172

1-Are you at least at least 25 years of age?

Yes___ No___

2-Are you the parent/caregiver or legal guardian of at least ONE child between the ages of 9 and 18 years of age?

Yes___ No___

3-Are you able to read and understand English on a 12th grade level?

Yes___ No___

4-Are you able to devote about **35-40 minutes** to this study at this time—for a chance to win one of three \$100 Amazon gift cards?

Yes___ No___

5-More specifically, first, are you able to spend about **20-25 minutes** answering a set of questions?

Yes___ No___

6-Second, are you willing to spend **about 5 minutes** watching a cartoon video? This means using a computer with an Internet connection in a convenient location that will allow you to play the cartoon aloud?

Yes___ No___

7-Third, after you watch the cartoon, are you willing to rate it and answer a final set of questions for about another **5-10 minutes**?

Yes___ No___

If they answered YES to all of the above questions→ they access survey.

If they answered NO to any of the above questions→ they receive this message:

Thank you for your time, but, unfortunately you are not qualified to participate in this study.

Feel free to invite other parents who have children between the ages of 9 to 18 to participate in this study. Send them the study link that you used to access this survey. THANK YOU!

SURVEY FOR PARENTS ON HPV VACCINATION FOR CHILDREN

FOR ENGLISH SPEAKING PARENTS

(To be translated into Spanish for Spanish Speaking Parents)

Please choose to take this survey and watch a video in English or Spanish

I choose English I choose Spanish

Instructions. Please answer the following questions by either placing a check mark next to your answer, or filling in the blank space.

PART I: PARENT'S BASIC DEMOGRAPHICS (PARENTS-BD-10)

[NOTE: This is a standard tool commonly used by Research Group on Disparities in Health RGDH]

1) MY gender is: Female Male Other (Please explain _____)

2) MY age is: _____ (USE DROP DOWN MENU OF 18 to 85)

3) MY race/ethnicity is as follows: (Please mark all that apply)

Black/African American

White / Caucasian / European American

Hispanic / Latino (including Dominican, Puerto Rican, Mexican, Mexican American, Chicano, Cuban, other Spanish)

Asian (Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, or other Asian)

American Indian / Alaska Native

Native Hawaiian / Pacific Islander

Arab American / Middle Eastern

Other group(s) (Please specify)

4) Do you live in the United States? Yes No If NO—EXIT SURVEY

If yes, what is your current zip code? _____

5) Were you born in the United States? Yes No

If you answered "No," where was YOUR place of birth or country of origin?

b-1. Country of _____ [Drop down menu]

b-2. And, at what age did YOU come to the US? [Drop down menu 1-70]

6) I AM currently:

a. Single

b. Married

c. Separated

d. Divorced

e. Widowed

f. In Domestic Partnership

g. Living with Significant

Other

7). I am currently (check all that apply)

a. part-time undergraduate student

b. full-time undergraduate student

c. part-time graduate student

d. full-time graduate student

e. employed

f. unemployed

- g. ___ homemaker
- h. ___ on Welfare
- i. ___ receiving Social Security Income
- j. ___ receiving Social Security Disability Income
- k. ___ receiving Worker's Compensation
- l. ___ retired
- m. ___ Other (please explain_____)

8). MY yearly household income is:

- 1-Less than \$920,000
- 2-\$10,000 to \$19,000
- 3-\$20,000 to \$39,000
- 4-\$40,000 to \$49,000
- 5-\$50,000 to \$99,999
- 6-\$100,000 to \$199,999
- 7-\$200,000 to \$299,000
- 8-\$300,000 to \$399,000
- 9-\$400,000 to \$499,000
- 10-\$500,000 to \$799,000
- 11-\$800,000 or More

9). MY highest education level is:

- Less than high school
- High school or high school equivalent (GED)
- Some college or a Certificate Program
- 2 year college degree (Associates)
- 4 year college degree (Bachelor's)
- Masters degree
- J.D. - Lawyer
- Doctoral Degree (Ph.D., Ed.D, etc.).
- Medical Degree (M.D., D.D.S., etc.)

10) My type of medical insurance is (check all that apply)

- a) Private insurance plan (e.g. Blue Cross/Blue Shield, Aetna, Oxford, etc...)
- b) HMO c) Medicaid d) Medicare.. e) Not Applicable, I have no medical insurance

PART II: ABOUT YOUR CHILDREN (AYC-4)

1-How many children do you have in your care between the ages of 9 to 18?

[Drop down menu 0-10]

2- How many of your children were born [3 Drop down menus 0-10 for each option]

___Male ___Female ___Other

3- How many of your children are [2 Drop down menus 0-10 for each option]

___heterosexual ___other sexual orientation (e.g. LGBTQ) ___I don't know

4-Please indicate the types of medical insurance that your children have—and check all that apply for all of your children between the ages of 9 to 18)

- a) Private insurance plan (e.g. Blue Cross/Blue Shield, Aetna, Oxford, etc...)
- b) HMO
- c) Medicaid
- d) Medicare
- e) Not Applicable, no medical insurance

PART III: PARENT REPORT ON PROVIDER RECOMMENDATION ON HPV VACCINATION FOR CHILD (PARENT-R-PR-HPV-V-FC-2)

Has a pediatrician or family practice medical provider ever....

1-talked to you about the Human papillomavirus (HPV) infection? Yes No Not sure/Don't know

HPV2- recommended that your child receive the HPV vaccination? Yes No Not sure/Don't know

PART IV: PARENT REPORT ON HPV VACCINATION FOR CHILD (PARENT-R-HPV-V-FC-1)

1-Has one or more of your children ever received the HPV vaccination?

1 Yes 0 No I'm not sure

2-For the HPV vaccination given to your child, please indicate how many doses your child received (i.e. returned to medical provider for dose or doses:

I'm not sure 1 dose 2 doses 3 doses

PART V: PARENT REPORT ON FLU VACCINATION FOR CHILD (PARENT-R-FLU-V-FC-1)

[This is a new scale created by the Principal Investigator and her dissertation sponsor, Dr. Barbara Wallace, for use by the Research Group on Disparities in Health (RGDH).]

1-Has one or more of your children ever received the flu vaccination

1 Yes 0 No I'm not sure

2-Do you believe in the value of an annual (yearly) flu vaccination for your child?

1 Yes 0 No I'm not sure

PART VI: PARENT EXPOSURE TO PRINT OR OTHER MEDIA OR INFORMATION ON HPV VACCINATION FOR CHILDREN (PARENT-EPOMI-HPV-VFC-1)

1-Have you ever read anything, or watched a video, or seen anything on television, or Facebook, or on the Internet about the Human papillomavirus (HPV) infection and the HPV vaccination for children?

0 No, no information at all

1 Yes, I was exposed to a very low amount of information

2 Yes, I was exposed to a low amount of information

3 Yes, I was exposed to a moderate amount of information

4 Yes, I was exposed to a large amount of information

5 Yes, I was exposed to a very large amount of information

Not Applicable - I'm not sure about this

PART VII: HPV GENERAL KNOWLEDGE (HPV-G-K-23)

[Source: Pérez, S., Tatar, O., Ostini, R., Shapiro, G. K., Waller, J., Zimet, G., & Rosberger, Z. (2016). Extending and validating a human papillomavirus (HPV) knowledge measure in a national sample of Canadian parents of boys. *Preventive Medicine*, 91, 43-49.]Note. As per Shapiro et al (2018), as recommended by Pérez et al (2016), two items from the original General Knowledge scale administration ('HPV usually doesn't need any treatment' and 'HPV can cause herpes') were deleted from the Shapiro et al (2018) study because the psychometric evaluation found that when removed the reliability of the scale improved.]

Please indicate whether the following items are True or False, or if you Don't Know.

Score 1=true

- 1 HPV is very rare (FALSE) _T _F _Don't Know
 - 2 HPV always has visible signs or symptoms (FALSE) _T _F _Don't Know
 - 3 HPV can cause cervical cancer (TRUE) _T _F _Don't Know
 - 4 HPV can be transmitted through genital skin-to-skin contact (TRUE) _T _F _Don't Know
 - 5 There are many types of HPV (TRUE) _T _F _Don't Know
 - 6 HPV can cause HIV/AIDS (FALSE – etc.....) _T _F _Don't Know
 - 7 HPV can be passed on during sexual intercourse ((TRUE) _T _F _Don't Know
 - 8 HPV can cause genital warts (TRUE) _T _F _Don't Know
 - 9 Men cannot get HPV (FALSE) _T _F _Don't Know
 - 10 Using condoms reduces the chances of HPV transmission (TRUE) _T _F _Don't Know
 - 11 HPV can be cured with antibiotics (FALSE) _T _F _Don't Know
 - 12 Having many sexual partners increases the risk of getting HPV (TRUE) _T _F _Don't Know
 - 13 Most sexually active people will get HPV at some point in their lives (TRUE) _T _F _Don't Know
 - 14 A person could have HPV for many years without knowing it (TRUE) _T _F _Don't Know
 - 15 Having sex at an early age increases the risk of getting HPV (TRUE) _T _F _Don't Know
 - 16 HPV can cause anal cancer (TRUE) _T _F _Don't Know
 - 17 HPV is a bacterial infection (FALSE) _T _F _Don't Know
 - 18 HPV can be transmitted through oral sex (TRUE) _T _F _Don't Know
 - 19 HPV can cause cancer of the penis (TRUE) _T _F _Don't Know
 - 20 HPV can be transmitted through anal sex (TRUE) _T _F _Don't Know
 - 21 HPV infections always leads to health problems (FALSE) _T _F _Don't Know
 - 22 HPV can cause oral cancer (TRUE) _T _F _Don't Know
 - 23 A person with no symptoms cannot transmit the HPV infection (FALSE) _T _F _Don't Know
-

PART VIII: HPV VACCINE KNOWLEDGE SCALE (HPV-V-K-S-11)

[Source: Pérez, S., Tatar, O., Ostini, R., Shapiro, G. K., Waller, J., Zimet, G., & Rosberger, Z. (2016). Extending and validating a human papillomavirus (HPV) knowledge measure in a national sample of Canadian parents of boys. *Preventive Medicine*, 91, 43-49.]

Note. As per Shapiro et al (2018), in their study's administration of the Vaccine Knowledge Scale, 'vaccines' was changed to 'vaccine' to make the measure consistently in the singular. Slight adaptations were also made to ensure the items were gender-neutral (rather than directed at parents of males only) and updated based on policy recommendations and current generation vaccines.

NOTE: Questions # 10 and 11 were specific to Canada, being deleted and replaced with new items # 10 and #11]

Please indicate whether the following items are True or False, or if you Don't Know.
Score 1=true

- 1-The HPV vaccine requires at least 2 doses (TRUE) _T _F _Don't Know
- 2-The HPV vaccines offers protection against all sexually transmitted infections (FALSE, etc) _T _F _Don't Know
- 3-The HPV vaccines are most effective if given to people who've never had sex (TRUE) _T _F _Don't Know
- 4-Someone who has had the HPV vaccine cannot develop cervical cancer (FALSE) _T _F _Don't Know
- 5-The HPV vaccines offer protection against cervical cancers (TRUE) _T _F _Don't Know
- 6-The HPV vaccine offers protection against genital warts (TRUE) _T _F _Don't Know
- 7-Girls who have had an HPV vaccine do not need a Pap test when they are older (FALSE) _T _F _Don't Know
- 8-The HPV vaccine protects you from every type of HPV (FALSE) _T _F _Don't Know
- 9-You can cure HPV by getting the HPV vaccine (FALSE) _T _F _Don't Know
- 10-HPV vaccination is most effective when given to preteens and teens before they become sexually active (TRUE) _T _F _Don't Know
- 11-Sexually active individuals can still benefit from getting the HPV vaccines (TRUE) _T _F _Don't Know

PART IX: GENERAL VACCINE ATTITUDES—CONSPIRACY BELIEFS, AND HESITANCY DUE TO LACK OF CONFIDENCE OR RISKS (GVA-CB-HLC-R-16)

[Sources: 1 Shapiro GK, Holding A, Pérez S, Amsel R, Rosberger Z. (2016). Validation of the vaccine conspiracy belief scale. *Papillomavirus Research* 2016; 2: 167-72.

2 Shapiro GK, Tatar O, Dube E, et al. (2018) The Vaccine Hesitancy Scale: Psychometric properties and validation. *Vaccine* 2018; 36: 545-52.

Note. * One item from the original scale ('immunizing children is harmful and this fact is covered up') was modified slightly in the Shapiro et al (2016) study's administration (to 'negative vaccination effects are covered up') as this was a double-barrelled question. (R) Indicates items that were reverse coded.]

[Note: Each of the three subscales, A, B, or C is scored 1 to 5, as follows]

Please answer the following questions, using this rating scale (Note: likert scale options to appear under every question, below in qualtrics version):

1__strongly disagree 2__disagree 3__somehwhat disagree
4__neutral 5__somewhat agree . 6__agree 7. __strongly agree

(A) VACCINE CONSPIRACY BELIEFS SUBSCALE 1

- 1-Vaccine safety data is often fabricated 1 2 3 4 5 6 7
- 2-Negative vaccination effects are covered up * 1 2 3 4 5 6 7
- 3-Pharmaceutical companies cover up the dangers of vaccines 1 2 3 4 5 6 7
- 4-People are deceived about vaccine efficacy 1 2 3 4 5 6 7
- 5-Vaccine efficacy data is often fabricated 1 2 3 4 5 6 7
- 6-People are deceived about vaccine safety 1 2 3 4 5 6 7
- 7-The government is trying to cover up the link between vaccines and autism. 1 2 3 4 5 6 7

(B) VACCINE HESITANCY SUBSCALE—LACK OF CONFIDENCE 2

- 1-Childhood vaccines are important for my child's health (R=Reverse Coded) 1 2 3 4 5 6 7
- 2-Childhood vaccines are effective (R) 1 2 3 4 5 6 7
- 3-Having my child vaccinated is important for the health of others in my community (R) 1 2 3 4 5 6 7
- 4-All childhood vaccines offered by the government program in my community are beneficial (R) 1 2 3 4 5 6 7
- 5-The information I receive about vaccines from the vaccine program is reliable and trustworthy (R) 1 2 3 4 5 6 7
- 6-Getting vaccines is a good way to protect my child/children from disease (R) 1 2 3 4 5 6 7
- 7-Generally I do what my doctor or health care provider recommends about vaccines for my child/children (R) 1 2 3 4 5 6 7

(C) VACCINE HESITANCY SUB-SCALE—RISKS 1

- 1-I am concerned about serious adverse effects of vaccines 1 2 3 4 5 6 7
- 2-New vaccines carry more risks than older vaccines 1 2 3 4 5 6 7

PART X: PARENTS' PERCEIVED BARRIERS TO CHILD'S COMPLETION OF THE HPV VACCINATION SERIES (PARENTS-PB-CC-HPV-VS-12)

[This is a new scale created in 2018 for use by the Research Group on Disparities in Health (RGDH). This is scored as a continuous scale of 0-12, where 0= no barriers and 12=highest barriers. This version added items on language and culture.]

Score 1=yes

Please think about ALL of your children and indicate if you have experienced any of the following barriers or obstacles or challenges that have prevented you from having any of your children vaccinated with the HPV vaccine. Please select Yes or No, as your answer

1. not knowing how often I should take my child (whether once, twice or three times) YES (1) NO (0)
2. not knowing where to take my child YES (1) NO (0)
3. a lack of insurance YES (1) NO (0)
4. a lack of finances/money YES (1) NO (0)
5. a lack of time, or other demands on my time YES (1) NO (0)
6. my work schedule YES (1) NO (0)
7. my own health issues (physical or mental) YES (1) NO (0)
8. the health issues (physical or mental) of others (e.g. other children, husband/partner, babysitter, other family, my parents, etc) YES (1) NO (0)
9. stress in my life YES (1) NO (0)
10. language—due to having a provider not communicating in my preferred language YES (1) NO (0)
11. cultural barriers—due to having a provider not understanding my culture, or not being culturally sensitive and appropriate YES (1) NO (0)
12. other/something else has been an obstacle/barrier for me (Please indicate in the space, below) YES (1) NO (0) Explain _____

PART XI: MORE ABOUT YOU (SOCIAL DESIRABILITY) (MAY-13)

same as all prior analyses this year

Read each item below and decide whether the statement is true or false as it pertains to you personally. Circle T for True or F for false.

1. It is sometimes hard for me to go on with my work if I am not encouraged. T F
2. I sometimes feel resentful when I don't get my way. T F
3. On a few occasions, I have given up doing something because I thought too little of my ability. T F
4. There have been times when I felt like rebelling against people in authority even though I knew they were right. T F
5. No matter who I'm talking to, I'm always a good listener. T F
6. There have been occasions when I took advantage of someone. T F
7. I'm always willing to admit it when I make a mistake. T F
8. I sometimes try to get even rather than forgive and forget. T F
9. I am always courteous, even to people who are disagreeable T F
10. I have never been irked when people expressed ideas very different from my own. T F
11. There have been times when I was quite jealous of the good fortune of others. T F
12. I am sometimes irritated by people who ask favors of me. T F
13. I have never deliberately said something to hurt someone's feelings . T F

“GO TO <LINK> to take the African American Women’s Breast Cancer Survivors’ Survey on life satisfaction and coping for a chance to win one of three \$100 Amazon gift cards”

PART XII: PRE-VIDEO PARENTS’ HPV KNOWLEDGE AND STAGE OF CHANGE AND SELF-EFFICACY FOR TALKING TO PROVIDERS AND CHILD RECEIVING THE HPV VACCINE (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)

[This is a new scale created by the Principal Investigator and her dissertation sponsor, Dr. Barbara Wallace, for use by the Research Group on Disparities in Health (RGDH). The scale provides a continuous score for the sub-scales of: (1) self-rating of level of HPV knowledge [K-item # 1]; (2) stage of change for performing the HPV-related behaviors indicated [SOC-items # 2, 4, 6], and (3) self-efficacy for performing the HPV-related behaviors indicated [SE-items # 3, 5, 7]]

1-Please rate what you know, or your level of knowledge about the Human papillomavirus (HPV) infection HPV, and the HPV vaccination for children:

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

Please rate yourself for the behavior of talking to a pediatrician or family practice medical provider about the Human papillomavirus (HPV) infection HPV, and the HPV vaccination for children – by checking what best describes you, below:

2-For doing this

- 1 ___ I am not thinking of doing this behavior at all.
 2 ___ I am thinking about doing this behavior.
 3 ___ I am preparing to do this behavior.
 4 ___ I have been doing this behavior for less than six (6) months.
 5 ___ I have been doing this behavior for more than six (6) months up to many years

___ I cannot answer, because I do not know enough about the HPV vaccination

3-And, for doing this I am

- 1 ___ 0% confident 2 ___ 20% confident 3 ___ 40% confident
 4 ___ 60% confident 5 ___ 80% confident 6 ___ 100% confident
 ___ I cannot answer, because I do not know enough about the HPV vaccination

NOTE: ITEM # 4 action and maintenance stages (less than 6 months and more than 6 months up to many year) = Study # 1 Dependent Variable:

Please rate yourself for the behavior of making sure your children receive the HPV vaccination– by checking what best describes you, below:

4-For doing this

- I am not thinking of doing this behavior at all.
 - I am thinking about doing this behavior.
 - I am preparing to do this behavior.
 - I have been doing this behavior for less than six (6) months.
 - I have been doing this behavior for more than six (6) months up to many years
 - I cannot answer, because I do not know enough about the HPV vaccination
- 5- And, for doing this I am
- 0% confident 20% confident 40% confident
 - 60% confident 80% confident 100% confident
 - I cannot answer, because I do not know enough about the HPV vaccination

Please rate yourself for the behavior of making sure your child receives all the required doses (e.g. at least 2 or 3 doses) of the HPV vaccination – by checking what best describes you, below:

- 6-For doing this
- I am not thinking of doing this behavior at all.
 - I am thinking about doing this behavior.
 - I am preparing to do this behavior.
 - I have been doing this behavior for less than six (6) months.
 - I have been doing this behavior for more than six (6) months up to many years
 - I cannot answer, because I do not know enough about the HPV vaccination
- 7- And, for doing this I am
- 0% confident 20% confident 40% confident
 - 60% confident 80% confident 100% confident
 - I cannot answer, because I do not know enough about the HPV vaccination

**PARENTS PLEASE CLICK ON THE LINK TO WATCH THE CARTOON
 (for approximately 5 minutes)**

**PART XIII: POST-VIDEO VIEWING ADHERENCE SURVEY FOR
 PROVIDERS (PVV-AS-PROVIDERS- 1)**
 [This is a common scale used by the Research Group on Disparities in Health (RGDH).]

Answer the following questions, please:
 1-How much of the video was watched?
 3__All of the video 2__Most of the video 1__Some of the video 0__None of the video

PART XIV: POST-VIDEO PARENTS' HPV KNOWLEDGE AND STAGE OF CHANGE AND SELF-EFFICACY FOR TALKING TO PROVIDERS AND CHILD RECEIVING THE HPV VACCINE (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)

[See description under PART XII. This is the same scale, but for post-video]

1-Please rate what you know, or your level of knowledge about the Human papillomavirus (HPV) infection, and the HPV vaccination for children:

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

Please rate yourself for the behavior of talking to a pediatrician or family practice medical provider about the Human papillomavirus (HPV) infection, and the HPV vaccination for children – by checking what best describes you, below:

2-For doing this 1-5

- I am not thinking of doing this behavior at all.
 I am thinking about doing this behavior.
 I am preparing to do this behavior.
 I have been doing this behavior for less than six (6) months.
 I have been doing this behavior for more than six (6) months up to many years
 I cannot answer, because I do not know enough about the HPV vaccination

3-And, for doing this I am 1-6

- 0% confident 20% confident 40% confident
 60% confident 80% confident 100% confident
 I cannot answer, because I do not know enough about the HPV vaccination

Please rate yourself for the behavior of making sure your children receive the HPV vaccination– by checking what best describes you, below:

4-For doing this

- I am not thinking of doing this behavior at all.
 I am thinking about doing this behavior.
 I am preparing to do this behavior.
 I have been doing this behavior for less than six (6) months.
 I have been doing this behavior for more than six (6) months up to many years
 I cannot answer, because I do not know enough about the HPV vaccination

5- And, for doing this I am

- 0% confident 20% confident 40% confident
 60% confident 80% confident 100% confident
 I cannot answer, because I do not know enough about the HPV vaccination

Please rate yourself for the behavior of making sure your child receives all the required doses (e.g. at least 2 or 3 doses) of the HPV vaccination – by checking what best describes you, below:

6-For doing this

- I am not thinking of doing this behavior at all.
- I am thinking about doing this behavior.
- I am preparing to do this behavior.
- I have been doing this behavior for less than six (6) months.
- I have been doing this behavior for more than six (6) months up to many years
- I cannot answer, because I do not know enough about the HPV vaccination

7- And, for doing this I am

- 0% confident 20% confident 40% confident
- 60% confident 80% confident 100% confident
- I cannot answer, because I do not know enough about the HPV vaccination

PART XV: RATE THE VIDEO FOR PARENTS (RTV-PARENTS-2)

[This is a common scale used by the Research Group on Disparities in Health (RGDH).]

Please think about the cartoon video you were asked to watch, and please rate the video:

1. I rate the video as follows:

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

I feel unable to rate the video - I was not able to watch all the video

PART XVI: DIFFUSION OF INNOVATION USING E-HEALTH ON HPV BY PARENTS (DOF-UEH-HPV-PARENTS-1)

[This is a common scale used by the Research Group on Disparities in Health (RGDH).]

Score 1=yes

1. Would you recommend this video to other parents with children?

Yes No I feel unable to offer a recommendation – as I was not able to watch all the video

PART XVII: QUALITATIVE PORTION ON REASONS FOR RECOMMENDING THE E-HEALTH VIDEO OR NOT—FOR PARENTS (QP-RREHV-PARENTS-1)

[This is a common scale used by the Research Group on Disparities in Health (RGDH).]

1- Please explain why you would or would not recommend the video. Feel free to offer your comments on the strengths and weaknesses of the video, or how could it be improved.

I feel unable to comment on the video – as I was not able to watch all the video

I offer my comments on the video, as follows:

PART XVIII: QUALITATIVE PORTION ON REACTIONS TO STUDY PARTICIPATION BY PARENTS (QP-RSP-PARENTS-1)

[This is a new question created by the Principal Investigator and her dissertation sponsor, Dr. Barbara Wallace, for use by the Research Group on Disparities in Health (RGDH).]

1-What thoughts or feelings might you share in response to watching the video and/or taking this survey?

----- END OF SURVEY – THANK YOU! -----

Appendix N

Study #1 Survey in Spanish

SCREENING TOOL IN SPANISH FOR IRB PROTOCOL # 19-172

Herramienta de evaluación para padres que hablan español

1- ¿Tiene usted al menos 25 años de edad?

Si___ No___

2- ¿Es usted padre/madre, cuidador/a o tutor/a legal de algún niño/a que tenga entre 9 y 18 años de edad?

Si___ No___

3-¿Puede usted leer y entender inglés al nivel de 12° grado?

Si___ No___

4-¿Dispone usted de 35 a 40 minutos para participar en este estudio en este momento y tener la posibilidad de ganar una de las tres tarjetas de regalo por \$100 de Amazon?

Si___ No___

5-¿Más específicamente, en primer lugar, podrá disponer de 20 a 25 minutos de su tiempo para contestar una serie de preguntas?

Si___ No___

6-Segundo, ¿está usted dispuesto a pasar unos 5 minutos viendo un video animado? Para ello se requiere de una computadora con acceso a internet en un lugar donde pueda escuchar el video en volumen alto.

Si___ No___

7-Tercero, después de ver el video, ¿estaría dispuesto a calificarlo y contestar una serie de preguntas durante otros 5 a 10 minutos?

Si___ No___

Si respondieron SÍ a todas las preguntas anteriores, acceden a la encuesta. Si contestaron NO a cualquiera de las preguntas anteriores, reciben este mensaje: Gracias por su tiempo, pero desafortunadamente no está calificado para participar en este estudio.

Siéntase en la libertad de invitar a otros padres que tengan niños entre las edades de 9 a 18 años a participar en este estudio. Envíeles el enlace del estudio que utilizó para acceder a esta encuesta. ¡GRACIAS!

**ENCUESTA PARA PADRES SOBRE LA VACUNACIÓN DEL VPH PARA
NIÑOS
PARA PADRES EN ESPAÑOL**

Por favor, elija tomar esta encuesta y ver un video en inglés o español.

Elijo inglés Elijo español

Instrucciones. Por favor responda a las siguientes preguntas colocando una marca de verificación a continuación

**PARTE I: INFORMACION DEMOGRAFICA BASICA DE LOS PADRES
(PADRES-BD-10)**

- 1- **Soy:** A. Mujer B. Hombre C. Otro (Por favor explique _____)
- 2- **Mi edad es:** _____ (UTILIZE EL MENÚ DE DESCENSO DE 18 A 85)
- 3- **Mi raza u origen étnico es:**
(Por favor marcar todas las opciones adecuadas)
 - Negra Afro descendente
 - Blanca Caucásico/a Europeo descendente
 - Hispano Latino (incluyendo Dominicano, Puertorriqueño, Mejicano, Mejicano Americano, Chicano, Cubano, otro Latinos)
 - Asiática (Indo asiático, Chino, Filipino, Japonés, Koreano, Vietnemes, u otro origen asiático)
 - Nativo Americano Nativo de Alaska
 - Hawaiano nativo de las Islas del Pacifico
 - Árabe Medio oriente
 - Otra raza/ tipo étnico (Por favor, explique) _____
- 4- ¿Vive usted en los Estados Unidos? Si No, Si respondió NO — POR FAVOR SALGA DE LA ENCUESTA
SI respondió SI, indique su código postal _____
- 5- ¿Nació usted en los Estados Unidos? Si No
Si respondió “No”, ¿Cuál fue su lugar de nacimiento o país de origen?
b-1. País de _____ [Menú desplegable]
b-2. ¿Y a qué edad vino usted a los Estados Unidos? [UTILIZE EL MENÚ DE DESCENSO 1-70]
- 6- Ahora estoy: A. Soltero/a B. Casado/a
C. Separado/a D. Divorciado/a E. Viudo/a F. Compañero/a doméstico (En pareja de hecho) G. Viviendo con mi pareja
H. Otra forma (Explicar) _____
- 7- Estoy actualmente (marque todas las opciones que correspondan):
 - a. Estudiante de tiempo parcial en la universidad
 - b. Estudiante dedicación completa en la universidad
 - c. Estudiante de tiempo parcial en la Maestría de la universidad o Maestría pos graduado.

- d. Estudiante dedicación completa en la Maestría de la universidad o Maestría pos graduado.
 - e. Empleado
 - f. Desempleado
 - g. Ama de casa
 - h. Recibe planes de Welfare (bienestar social del gobierno)
 - i. Recibe planes sociales SSI (subsidio de seguro social)
 - j. Recibe planes sociales SSD (subsidio o seguro social por discapacidad)
 - k. Compensación de trabajador/a
 - l. Jubilado
 - m. Otro (por favor especifique) _____
- 8- El ingreso total de toda la familia anual:
- 1- Menos de \$9,000
 - 2- \$10,000 to \$19,000
 - 3- \$20,000 to \$39,000
 - 4- \$40,000 to \$49,000
 - 5- \$50,000 to \$99,999
 - 6- \$100,000 to \$199,999
 - 7- \$200,000 to \$299,000
 - 8- \$300,000 to \$399,000
 - 9- \$400,000 to \$499,000
 - 10- \$500,000 to \$799,000
 - 11- \$800,000 o Más
- 9- Mi nivel más alto de educación es:
- Escuela secundaria incompleta.
 - Escuela superior o escuela secundaria o terciaria o su equivalente (GED, etc...) completa.
 - La universidad no completada o título técnico.
 - Universidad o título técnico incompleto.
 - Grado asociado (2 años de duración en la universidad).
 - Bachillerato de la universidad o Licenciatura de 4 años o más de la universidad.
 - Maestría de la universidad o Maestría pos graduado.
 - Doctor en Jurisprudencia - Abogado (J.D.).
 - Doctorado (Ph.D., Ed.D, etc.) o (filosofía, educación, ciencias sociales, ciencias).
 - Doctorado de Medicina (M.D., D.D.S., .D.O. etc.).
- 10- Mi tipo de seguro de salud o seguro médico es (marque todas las opciones que correspondan)
- a) Plan de seguro privado (por ejemplo, Blue Cross / Blue Shield, Aetna, Oxford, etc.)
 - b) HMO c) Medicaid d) Medicare e) No aplica, Yo no tengo seguro médico

PARTE II: CUESTIONARIO SOBRE SUS HIJOS (AYC-4)

[Este es un formulario nuevo creado por la Investigadora Principal y su Directora de Investigación, Dra. Barbara Wallace, para ser usado por el Grupo de Estudios sobre Desigualdades en Salud (RGDH).]

1- ¿Cuántos hijos de 9 a 18 años tiene bajo su responsabilidad?

[Abra el menú de opciones 0-10]

2- ¿Cuántos de sus hijos nacieron: [Abra el menú 1, 2, o 3 y marce la opción de 0-10]

___ Sexo masculino ___ Sexo femenino ___ Otro

3- ¿Cuántos de sus hijos son: [Abra el menú 1, 2, o 3 y marce la opción de 0-10]

___ heterosexuales ___ otra orientación sexual (ejemplo: LGBTQ) ___ No lo sé

4- Por favor indique el tipo de cobertura médica que tienen sus hijos - y marque todas las que correspondan para todos sus hijos entre las edades de 9 y 18 años)

a) Plan privado de cobertura (por e.j. Blue Cross/Blue Shield, Aetna, Oxford, etc...)

b) HMO

c) Medicaid

d) Medicare

e) No corresponde, sin cobertura médica

PARTE III: CUESTIONARIO A LOS PADRES SOBRE LAS RECOMENDACIONES DEL PROVEEDOR DE SERVICIOS MEDICOS SOBRE LA VACUNA CONTRA EL VPH PARA SUS HIJOS (PARENT-R-PR-HPV-V-FC-2)

[Este es un formulario nuevo creado por la Investigadora Principal y su Directora de Investigación, Dra. Barbara Wallace, para ser usado por el Grupo de Estudios sobre Desigualdades en Salud (RGDH).]

Un pediatra o médico de familia alguna vez...

1-¿le habló sobre la infección por el virus del papiloma humano (VPH)? ___Si ___No ___No estoy seguro/a. No lo sé

2-¿le recomendó que su hijo reciba la vacuna contra el VPH? ___Si ___No ___No estoy seguro/a. No lo sé

PARTE IV: CUESTIONARIO A LOS PADRES SOBRE LA VACUNA CONTRA EL VPH PARA SUS HIJOS (PARENT-R-HPV-V-FC-1)

[Este es un formulario nuevo creado por la Investigadora Principal y su Directora de Investigación, Dra. Barbara Wallace, para ser usado por el Grupo de Estudios sobre Desigualdades en Salud (RGDH).]

1-Uno o más de sus hijos han recibido alguna vez la vacuna contra el VPH?

___Si ___No ___No estoy seguro/a

2- Para la vacuna que recibió su hijo/a, por favor indique cuántas dosis recibió su hijo/a (por ejemplo si regresó a su proveedor de salud para otra u otras dosis:

___No estoy seguro/a ___ 1 dosis ___ 2 dosis ___ 3 dosis

PARTE V: CUESTIONARIO A LOS PADRES SOBRE LA VACUNA CONTRA LA INFLUENZA PARA SUS HIJOS (PARENT-R-FLU-V-FC-1)

[Este es un formulario nuevo creado por la Investigadora Principal y su Directora de Investigación, Dra. Barbara Wallace, para ser usado por el Grupo de Estudios sobre Desigualdades en Salud (RGDH).]

1-¿Uno o más de sus hijos han recibido alguna vez la vacuna contra la influenza?

Si No No estoy seguro/a

2-¿Cree Usted en la importancia de vacunar anualmente (una vez al año) a sus hijos?

Si No No estoy seguro/a

PARTE VI: ACCESO DE LOS PADRES A INFORMACIÓN EN MEDIOS DE COMUNICACIÓN O IMPRESA SOBRE LA VACUNA CONTRA EL HPV PARA NIÑOS (PARENT-EPOMI-HPV-VFC-1)

[Este es un formulario nuevo creado por la Investigadora Principal y su Directora de Investigación, Dra. Barbara Wallace, para ser usado por el Grupo de Estudios sobre Desigualdades en Salud (RGDH).]

1-¿Alguna vez leyó, miró un video o vio algo en televisión o Facebook o en Internet sobre la infección por el virus del papiloma humano (VPH) y la vacuna contra el VPH para niños?

0__ No, ningún tipo de información

1__ Si, recibí muy poca información

2__ Si, recibí poca información

3__ Si, recibí una cantidad moderada de información

4__ Si, recibí mucha información

5__ Si, recibí una gran cantidad de información

No corresponde - No estoy seguro/a de haber recibido alguna información

PARTE VII: CONOCIMIENTOS GENERALES SOBRE EL VPH (HPV-G-K-23)

[Source: Pérez, S., Tatar, O., Ostini, R., Shapiro, G. K., Waller, J., Zimet, G., & Rosberger, Z. (2016). Extending and validating a human papillomavirus (HPV) knowledge measure in a national sample of Canadian parents of boys. *Preventive Medicine*, 91, 43-49.] Note. As per Shapiro et al (2018), as recommended by Pérez et al (2016), two items from the original General Knowledge scale administration ('HPV usually doesn't need any treatment' and 'HPV can cause herpes') were deleted from the Shapiro et al (2018) study because the psychometric evaluation found that when removed the reliability of the scale improved.]

Por favor indique si las siguientes declaraciones son verdaderos o falsos o si no lo sabe.

1 El VPH es muy raro (FALSO) V F No lo sé

2 El VPH siempre presenta signos y síntomas visibles (FALSO) V F No lo sé

3 El VPH puede causar cáncer cervical (VERDADERO) V F No lo sé

4 El VPH puede transmitirse por contacto genital de piel a piel (VERDADERO)

V F No lo sé

- 5 Hay muchos tipos de VPH (VERDADERO) _V _F _No lo sé
- 6 El VPH puede causar HIV/SIDA (FALSO) _V _F _No lo sé
- 7 El VPH se puede transmitir durante las relaciones sexuales (VERDADERO) _V _F _No lo sé
- 8 El VPH puede producir verrugas genitales (VERDADERO) _V _F _No lo sé
- 9 Los hombres no se infectan con el VPH (FALSO) _V _F _No lo sé
- 10 El uso de preservativo disminuye la posibilidad de contagio por VPH (VERDADERO) _V _F _No lo sé
- 11 El VPH se puede curar con antibióticos (FALSO) _V _F _No lo sé
- 12 Tener múltiples parejas sexuales incrementa el riesgo de contagio por VPH (VERDADERO) _V _F _No lo sé
- 13 La mayoría de las personas sexualmente activas contraerán el VPH en algún momento de su vida (VERDADERO) _V _F _No lo sé
- 14 Una persona puede tener el VPH durante varios años sin saberlo (VERDADERO) _V _F _No lo sé
- 15 Tener relaciones sexuales a edad temprana aumenta el riesgo de tener el VPH (VERDADERO) _V _F _No lo sé
- 16 El VPH puede causar cáncer anal (VERDADERO) _V _F _No lo sé
- 17 El VPH es una infección bacteriana (FALSO) _V _F _No lo sé
- 18 El VPH se puede transmitir por sexo oral (VERDADERO) _V _F _No lo sé
- 19 El VPH puede causar cáncer de pene (VERDADERO) _V _F _No lo sé
- 20 El VPH se puede transmitir por sexo anal (VERDADERO) _V _F _No lo sé
- 21 La infección por VPH siempre causa problemas de salud (FALSO) _V _F _No lo sé
- 22 El VPH puede causar cáncer de boca (VERDADERO) _V _F _No lo sé
- 23 Una persona que no tiene síntomas no puede transmitir la infección por VPH (FALSO) _V _F _No lo sé

PARTE VIII: MEDICION DEL CONOCIMIENTO SOBRE LA VACUNA CONTRA EL VPH (HPV-V-K-S-11)

[Source: Pérez, S., Tatar, O., Ostini, R., Shapiro, G. K., Waller, J., Zimet, G., & Rosberger, Z. (2016). Extending and validating a human papillomavirus (HPV) knowledge measure in a national sample of Canadian parents of boys. *Preventive Medicine*, 91, 43-49.]

Note. As per Shapiro et al (2018), in their study's administration of the Vaccine Knowledge Scale, 'vaccines' was changed to 'vaccine' to make the measure consistently in the singular. Slight adaptations were also made to ensure the items were gender-neutral (rather than directed at parents of males only) and updated based on policy recommendations and current generation vaccines.

NOTE: Questions # 10 and 11 were specific to Canada, being deleted and replaced with new items # 10 and #11]

Por favor indique si las siguientes declaraciones son verdaderos o falsos o si no lo sabe.

- 1-La vacuna contra el VPH requiere al menos 2 dosis (VERDADERO) _V _F _No lo sé
- 2-La vacuna contra el VPH protege contra todas las enfermedades de transmisión sexual (FALSO) _V _F _No lo sé
- 3-La vacuna contra el VPH es más efectiva si se administran a personas que nunca han tenido relaciones sexuales (VERDADERO) _V _F _No lo sé
- 4-Si alguien recibe la vacuna contra el VPH no puede desarrollar cáncer cervical (FALSO) _V _F _No lo sé
- 5-La vacuna contra el VPH protege contra el cáncer cervical (VERDADERO) _V _F _No lo sé
- 6- La vacuna contra el VPH protege de las verrugas genitales (VERDADERO) _V _F _No lo sé
- 7-Las niñas que han recibido una vacuna contra el VPH no necesitan hacerse la prueba del Pap cuando sean mayores (FALSO) _V _F _No lo sé
- 8- La vacuna contra el VPH lo protege contra todos los tipos de HPV (FALSO) _V _F _No lo sé
- 9-La infección por VPH se puede curar con la vacuna contra el HPV (FALSO) _V _F _No lo sé
- 10- La vacuna contra el VPH es más efectiva si se administra a preadolescentes y adolescentes antes que sean sexualmente activos (VERDADERO) _V _F _No lo sé
- 11-Las personas sexualmente activas se pueden beneficiarse de recibir la vacuna contra el VPH (VERDADERO) _V _F _No lo sé

**PARTE IX: ACTITUDES GENERALES FRENTE A LA VACUNA__
CREENCIAS CONSPIRATIVAS, DUDAS POR FALTA DE CONFIANZA O
RIESGOS (GVA-CB-HLC-R-16)**

[Sources: 1 Shapiro GK, Holding A, Pérez S, Amsel R, Rosberger Z. (2016). Validation of the vaccine conspiracy belief scale. *Papillomavirus Research* 2016; 2: 167-72.
2 Shapiro GK, Tatar O, Dube E, et al. (2018) The Vaccine Hesitancy Scale: Psychometric properties and validation. *Vaccine* 2018; 36: 545-52.

Note. * One item from the original scale ('immunizing children is harmful and this fact is covered up') was modified slightly in the Shapiro et al (2016) study's administration (to 'negative vaccination effects are covered up') as this was a double-barrelled question. (R) Indicates items that were reverse coded.]

[Note: Each of the three subscales, A, B, or C is scored 1 to 5, as follows]

Por favor, conteste las preguntas a continuación usando la siguiente escala de medición (Nota: las opciones de la escala Likert aparecen debajo de cada pregunta, más abajo en la versión qualtrics):

- 1__totalmente en desacuerdo 2__en desacuerdo 3__parcialmente en desacuerdo
- 4__neutral 5__parcialmente de acuerdo 6__de acuerdo 7__totalmente de acuerdo

(A) SUBESCALA1 SOBRE CREENCIAS CONSPIRATIVAS A CERCA DE LA VACUNA

- 1-Los datos de seguridad de las vacunas muchas veces son inventados 1 2 3 4 5 6 7
- 2-Los efectos negativos de las vacunas se ocultan* 1 2 3 4 5 6 7
- 3-Las empresas farmacéuticas ocultan los peligros de las vacunas 1 2 3 4 5 6 7
- 4-La gente es engañada a cerca de la eficacia de las vacunas 1 2 3 4 5 6 7
- 5-La información sobre eficacia de las vacunas muchas veces es inventada 1 2 3 4 5 6 7
- 6- La gente es engañada a cerca de la seguridad de las vacunas 1 2 3 4 5 6 7
- 7-El gobierno está tratando de ocultar la relación entre las vacunas y el autismo 1 2 3 4 5 6 7

(B) SUBESCALA SOBRE DUDAS__FALTA DE CONFIANZA HACIA LA VACUNA2

- 1-Las vacunas en la niñez son importantes para la salud de mis hijos (R=código reverso/opuesto) 1 2 3 4 5 6 7
- 2-Las vacunas en la niñez son efectivas (R) 1 2 3 4 5 6 7
- 3-Es importante para la salud de otros en mi comunidad que mi hijo/a esté vacunado (R) 1 2 3 4 5 6 7
- 4-Todas las vacunas para la niñez que ofrece el programa del gobierno en mi comunidad son beneficiosas (R) 1 2 3 4 5 6 7
- 5-La información que recibo del programa de vacunación sobre las vacunas es segura y confiable (R) 1 2 3 4 5 6 7
- 6-Vacunar a mis hijos es una buena manera de protegerlos de enfermedades (R) 1 2 3 4 5 6 7
- 7-Generalmente hago lo que mi médico o proveedor de salud me recomienda a cerca de las vacunas para mis hijos (R) 1 2 3 4 5 6 7

(C) SUBESCALA SOBRE DUDAS__RIESGOS DE LA VACUNA 1

- 1-Estoy preocupado/a por los graves efectos adversos de las vacunas 1 2 3 4 5 6 7
- 2-Las nuevas vacunas presentan más riesgos que las vacunas de antes 1 2 3 4 5 6 7

PARTE X: BARRERAS PERCIBIDAS POR LOS PADRES PARA COMPLETAR LA SERIE DE VACUNACION CONTRA EL VPH(PARENTS-PB-CC-HPV-VS-12)

[This is a new scale created in 2018 for use by the Research Group on Disparities in Health (RGDH). This is scored as a continuous scale of 0-12, where 0= no barriers and 12=highest barriers. This version added items on language and culture.]

Por favor, piense en TODOS sus hijos e indique si usted ha experimentado alguna de las siguientes barreras u obstáculos o desafíos que le han impedido de vacunar a alguno de sus hijos con la vacuna contra el VPH. Por favor seleccione Si o No, como su respuesta

- 1.13. ___ no saber con qué frecuencia debo traer a mi hijo (ya sea una, dos o tres veces) ___SI (1) ___NO (0)
- 2.14. ___ no saber a dónde llevar a mi hijo ___SI (1) ___NO (0)

- 3.15. falta de seguro medico SI (1) NO (0)
- 4.16. falta de subsidio/dinero SI (1) NO (0)
- 5.17. falta de tiempo, o otras exigencias en mis horarios SI (1) NO (0)
- 6.18. mi horario de trabajo SI (1) NO (0)
- 7.19. problemas con mi salud (física o mental) SI (1) NO (0)
- 8.20. problemas de salud (física o mental) de otros (ej. otros hijos, esposo/pareja, niñera, otro familiar, mis padres, etc. SI (1) NO (0)
- 9.21. Estrés en mi vida SI (1) NO (0)
- 10.22. idioma—debido a que mi proveedor de salud no se comunica en mi idioma preferido SI (1) NO (0)
- 11.23. barreras culturales—debido a que mi proveedor de salud no entiende mi cultura o no es culturalmente sensible y adecuado SI (1) NO (0)
- 12.24. otro/algo más que ha sido un obstáculo/barrera para mí (por favor indicar en el espacio abajo) SI (1) NO (0)
- Explique _____

PARTE XI: MAS A CERCA DE USTED. (SOCIALMENTE DESEABLE) (MAY-13)

[Using a short form, arising from the original work of: Crowne, D. and Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. Journal of Consulting Psychology, 24(4):349 - 354. More details will be presented in dissertation]

Lea cada declaración abajo y decida si la frase es verdadera o falsa en relación a usted. Marcar con un círculo la V para Verdadero y la F para Falso

- | | | |
|---|---|---|
| 1. A veces es difícil para mí continuar con mi trabajo si no estoy motivado | V | F |
| 2. A veces me siento resentido cuando no tengo lo que quiero (cuando no me salgo con la mía) | V | F |
| 3. En pocas ocasiones, me dí por vencido porque pensé que tenía poca capacidad | V | F |
| 4. Ha habido ocasiones en la que me sentí con ganas de rebelarme contra personas de autoridad aunque yo sabía que ellos tenían razón. | V | F |
| 5. No importa con quien hable, siempre soy bueno escuchando | V | F |
| 6. Ha habido ocasiones en las que me aproveché de alguien | V | F |
| 7. Siempre estoy dispuesto a admitir cuando cometo un error | V | F |
| 8. Algunas veces trato de vengarme en lugar de perdonar y olvidar | V | F |
| 9. Siempre soy amable, aún con personas desagradables | V | F |
| 10. Nunca me molesté cuando la gente expresaba ideas muy diferentes a las mías | V | F |
| 11. Ha habido ocasiones en la que me sentí envidioso de la buena suerte de otros | V | F |
| 12. A veces me molesta la gente que me pida favores | V | F |
| 13. Nunca dije intencionalmente algo para herir los sentimientos de alguien | V | F |
-

PARTE XII: PREVIO AL VIDEO: CONOCIMIENTO DE LOS PADRES SOBRE EL VPH, ETAPA DE CAMBIO Y AUTOEFICACIA PARA HABLAR CON PROVEEDORES DE SALUD Y QUE LOS NIÑOS RECIBAN LA VACUNA CONTRA EL VPH (PRE-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)

[This is a new scale created by the Principal Investigator and her dissertation sponsor, Dr. Barbara Wallace, for use by the Research Group on Disparities in Health (RGDH). The scale provides a continuous score for the sub-scales of: (1) self-rating of level of HPV knowledge [K-item # 1]; (2) stage of change for performing the HPV-related behaviors indicated [SOC-items # 2, 4, 6], and (3) self-efficacy for performing the HPV-related behaviors indicated [SE-items # 3, 5, 7]]

1-Por favor, califica lo que sabes o tu nivel de conocimiento a cerca de la infección por el virus del papiloma humano y la vacuna contra el virus VPH para chicos:

Muy poco	Poco	Intermedio	Bueno	Muy Bueno	Excelente
1	2	3	4	5	6

Por favor, califícate a ti mismo por el comportamiento al hablar con un pediatra o médico de familia a cerca de la infección por el virus del papiloma humano y la vacuna contra el virus VPH para niños. Marca abajo lo que mejor te describa:

2-Por hacer esto

- No pienso realizar este comportamiento para nada.
 Estoy pensando en realizar este comportamiento.
 Me estoy preparando para realizar este comportamiento.
 Estuve realizando este comportamiento durante menos de seis (6) meses.
 Estuve realizando este comportamiento durante más de seis (6) meses hasta varios años.

No puedo contestar porque no conozco suficiente a cerca de la vacuna contra el VPH.

3-Y, por hacer esto me siento

- 0% seguro 20% seguro 40% seguro
 60% seguro 80% seguro 100% seguro
 No puedo contestar porque no conozco suficiente a cerca de la vacuna

NOTE: ITEM # 4 action and maintenance stages (less than 6 months and more than 6 months up to many year) = Study # 1 Dependent Variable:

Por favor, califícate a ti mismo por el comportamiento de asegurarte que tus hijos reciban la vacuna contra el virus VPH. Marca abajo lo que mejor te describa:

4-Por hacer esto

- No pienso realizar este comportamiento para nada.
 Estoy pensando en realizar este comportamiento.
 Me estoy preparando para realizar este comportamiento.

- Estuve realizando este comportamiento durante menos de seis (6) meses.
- Estuve realizando este comportamiento durante más de seis (6) meses hasta varios años.
- No puedo contestar porque no conozco suficiente a cerca de la vacuna contra el VPH.
- 5-Y, por hacer esto me siento
- 0% seguro 20% seguro 40% seguro
- 60% seguro 80% seguro 100% seguro
- No puedo contestar porque no conozco suficiente a cerca de la vacuna

Por favor, califícate a ti mismo por el comportamiento de asegurarte que tus hijos reciban todas las dosis necesarias (ej. al menos 2 o 3 dosis) de la vacuna contra el virus VPH. Marca abajo lo que mejor te describa:

- 6- Por hacer esto
- No pienso realizar este comportamiento para nada.
- Estoy pensando en realizar este comportamiento.
- Me estoy preparando para realizar este comportamiento.
- Estuve realizando este comportamiento durante menos de seis (6) meses.
- Estuve realizando este comportamiento durante más de seis (6) meses hasta varios años.
- No puedo contestar porque no conozco suficiente a cerca de la vacuna contra el VPH.
- 7-Y, por hacer esto me siento
- 0% seguro 20% seguro 40% seguro
- 60% seguro 80% seguro 100% seguro
- No puedo contestar porque no conozco suficiente a cerca de la vacuna

PADRES, POR FAVOR HAGAN CLICK EN EL EN EL ENLACE PARA VER EL DIBUJOS ANIMADOS

(durante aproximadamente 5 minutos)

PARTE XIII: ENCUESTA DE ADHERENCIA PARA PROVEEDORES DE SALUD LUEGO DE VER EL VIDEO (PVV-AS-PROVIDERS- 1)

[Este es un formulario de medición comúnmente usado por el Grupo de Estudios sobre Desigualdades en Salud (RGDH).]

Por favor, conteste las siguientes preguntas:

1- ¿Cuánto vio del video?

3__Todo el video 2__La mayor parte del video 1__Algo del video 0__Nada del video

PARTE XIV: DÉSPUES AL VIDEO: CONOCIMIENTO DE LOS PADRES SOBRE EL VPH, ETAPA DE CAMBIO Y AUTOEFICACIA PARA HABLAR CON PROVEEDORES DE SALUD Y QUE LOS NIÑOS RECIBAN LA VACUNA CONTRA EL HPV (PRE ((isn't it POST))))-V-PARENTS-HPV-K-SOC-SE-FTP-CR-HPV-V-7)

[See description under PART XII. This is the same scale, but for post-video]

1-Por favor, califica lo que sabes o tu nivel de conocimiento a cerca de la infección por el virus del papiloma humano y la vacuna contra el virus VPH para chicos:

Muy poco	Poco	Intermedio	Bueno	Muy Bueno	Excelente
1	2	3	4	5	6

Por favor, califícate a ti mismo por el comportamiento al hablar con un pediatra o médico de familia a cerca de la infección por el virus del papiloma humano y la vacuna contra el virus VPH para niños. Marca abajo lo que mejor te describa:

2-Por hacer esto

- No pienso realizar este comportamiento para nada.
 Estoy pensando en realizar este comportamiento.
 Me estoy preparando para realizar este comportamiento.
 Estuve realizando este comportamiento durante menos de seis (6) meses.
 Estuve realizando este comportamiento durante más de seis (6) meses hasta varios años.
 No puedo contestar porque no conozco suficiente a cerca de la vacuna contra el VPH.

3-Y, por hacer esto me siento

- 0% seguro 20% seguro 40% seguro
 60% seguro 80% seguro 100% seguro
 No puedo contestar porque no conozco suficiente a cerca de la vacuna

Por favor, califícate a ti mismo por el comportamiento de asegurarte que tus hijos reciban la vacuna contra el virus VPH. Marca abajo lo que mejor te describa:

4-Por hacer esto

- No pienso realizar este comportamiento para nada.
 Estoy pensando en realizar este comportamiento.
 Me estoy preparando para realizar este comportamiento.
 Estuve realizando este comportamiento durante menos de seis (6) meses.
 Estuve realizando este comportamiento durante más de seis (6) meses hasta varios años.
 No puedo contestar porque no conozco suficiente a cerca de la vacuna contra el VPH.

5-Y, por hacer esto me siento

0% seguro 20% seguro 40% seguro
 60% seguro 80% seguro 100% seguro
 No puedo contestar porque no conozco suficiente a cerca de la vacuna

Por favor, califícate a ti mismo por el comportamiento de asegurarte que tus hijos reciban todas las dosis necesarias (ej. al menos 2 o 3 dosis) de la vacuna contra el virus VPH.

Marca abajo lo que mejor te describa:

6-Por hacer esto

No pienso realizar este comportamiento para nada.
 Estoy pensando en realizar este comportamiento.
 Me estoy preparando para realizar este comportamiento.
 Estuve realizando este comportamiento durante menos de seis (6) meses.
 Estuve realizando este comportamiento durante más de seis (6) meses hasta varios años.
 No puedo contestar porque no conozco suficiente a cerca de la vacuna contra el VPH.

7-Y, por hacer esto me siento

0% seguro 20% seguro 40% seguro
 60% seguro 80% seguro 100% seguro
 No puedo contestar porque no conozco suficiente a cerca de la vacuna

PARTE XV: CALIFICA EL VIDEO PARA PADRES (RTV-PARENTS-2)

[Este es un formulario de medición comúnmente usado por el Grupo de Estudios sobre Desigualdades en Salud (RGDH).]

Por favor, piense en el video de dibujos animados que le solicitamos mirar y califique el video:

1. Yo califico el video como:

Muy malo	Malo	Intermedio	Bueno	Muy bueno	Excelente
1	2	3	4	5	6

No me siento capaz de calificar el video – No pude ver todo el video

PARTE XVI: DIFUSION DE LA INNOVACION DE USAR E-SALUD SOBRE VPH PARA PADRES (DOF-UEH-HPV-PARENTS-1)

[Este es un formulario de medición comúnmente usado por el Grupo de Estudios sobre Desigualdades en Salud (RGDH).]

1. ¿Recomendaría usted este video a otros padres con niños?

Si No No me siento capaz de ofrecer una recomendación – ya que no pude ver todo el video

PARTE XVII: SECCION CUALITATIVA SOBRE LAS RAZONES PARA RECOMENDAR O NO, EL VIDEO DE E-SALUD PARA PADRES (QP-RREHV-PARENTS-1)

[Este es un formulario de medición comúnmente usado por el Grupo de Estudios sobre Desigualdades en Salud (RGDH).]

1- Por favor explique por qué recomendaría o no el video. Siéntase libre de comentar sobre lo positivo y lo negativo del video, o cómo se podría mejorar el video.

___ No me siento capaz de comentar sobre el video ya que no pude ver el video completo

___ Mis comentarios sobre el video son:

PARTE XVIII: SECCION CUALITATIVA SOBRE LAS REACCIONES DE LOS PADRES FRENTE A SU PARTICIPACION EN EL ESTUDIO (QP-RSP-PARENTS-1)

[Esta es una nueva pregunta creado por la Investigadora Principal y su Directora de Investigación, Dra. Barbara Wallace, para ser usado por el Grupo de Estudios sobre Desigualdades en Salud (RGDH).]

1- ¿Qué pensamientos o sentimientos podría usted compartir como resultado de ver el video y/o hacer esta encuesta?

Appendix O

Study #2 Survey

SCREENING TOOL FOR PROVIDERS
FOR IRB PROTOCOL # 19-172

1-Are you a medical health care provider (e.g. physicians, physician assistants, nurse practitioners)? ___Yes ___No

2-Do you work in a pediatric or family care practice? ___Yes ___No

3-Have you had direct contact with patients within the past six months?
___Yes ___No

4-Are you at least 24 years of age?
___Yes ___No

5-Are you able to devote about **10-12 minutes** to this study at this time, including watching a 5-minute avatar/cartoon video and stating if you recommend it to other parents and providers?
Yes___ No___

If they answered YES to all of the above questions → they access survey.
If they answered NO to any of the above questions → they receive this message:
Thank you for your time, but, unfortunately you are not qualified to participate in this study.

Feel free to invite medical providers for children to participate in this study. Send them the study link that you used to access this survey. THANK YOU!

HPV SURVEY FOR PEDIATRIC AND FAMILY PRACTICE PROVIDERS

Instructions. Please answer the following questions by either placing a check mark next to your answer, or filling in the blank space.

PART I: PROVIDERS' BASIC DEMOGRAPHICS (PROVIDERS-BD-125)

[This is a common tool used by the Research Group on Disparities in Health (RGDH).

Questions have been added specific to medical providers for this study.]

- 1) MY gender is: Female Male Other (Please explain_____)
- 2) MY age is: _____ (USE DROP DOWN MENU OF 18 to 85)
- 3) MY race/ethnicity is as follows: (Please mark all that apply)
 - Black/African American
 - White / Caucasian / European American
 - Hispanic / Latino (including Dominican, Puerto Rican, Mexican, Mexican American, Chicano, Cuban, other Spanish)
 - Asian (Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, or other Asian)
 - American Indian / Alaska Native
 - Native Hawaiian / Pacific Islander
 - Arab American / Middle Eastern
 - Other group(s) (Please specify)
- 4) Do you live in the United States? Yes No If NO—EXIT SURVEY
If yes, what is your current zip code?
- 5) Were you born in the United States? Yes No
If you answered "No," where was YOUR place of birth or country of origin?
 - b-1. Country of _____ [Drop down menu]
 - b-2. And, at what age did YOU come to the US? [Drop down menu 1-70]
- 6) Do you have a partner? Yes No I AM currently:
 - a. Single
 - b. Married
 - c. Separated
 - d. Divorced
 - e. Widowed
 - f. In Domestic Partnership
 - g. Living with Significant Other
- 7). My annual household income is:
 - 1-Less than \$920,000
 - 2-\$10,000 to \$19,000
 - 3-\$20,000 to \$39,000
 - 4-\$40,000 to \$49,000
 - 5-\$50,000 to \$99,999
 - 6-\$100,000 to \$199,999
 - 7-\$200,000 to \$299,000
 - 8-\$300,000 to \$399,000
 - 9-\$400,000 to \$499,000
 - 10-\$500,000 to \$799,000
 - 11-\$800,000 or More

8) My highest education level/degrees obtained is: (check all that apply)

- Nursing Diploma.
 M.S.N
 MPH
 MSW
 Nurse Practitioner (NP, FNP, ANP, GNP, etc...)
 Physician Assistant (PA)
 M.D. (Medical Doctor)
 DO (Doctor of Osteopathic Medicine)
 Other (Please explain _____)

9- My current job title is: _____

9 10-My employment status is: a. Full Time b. Part Time c. Per Diem

c. Unemployed for a period of _____

d. Retired for a period of _____

11-Do you work in pediatrics? Yes No

12-Do you work in a family practice? Yes No

13. In terms of the type of health care setting in which I work, it may best be described as a:

- Hospital or medical center
 outpatient medical clinic
 outpatient medical primary care practice office
 outpatient community clinic
 outpatient private practice
 outpatient mobile medical van
 emergency room
 other (explain) _____

14. I have worked in my current position for a period of

1 year or less

2-4 years

5-7 years

8-10 years

11-15 years

16-20 years

21-25 years

26-30 years

more than 30 years

135. In terms of my career, I have worked in pediatrics or a family practice some type of health care setting (hospital, medical center, clinic, emergency room, etc...) for a total period of

1 year or less SCORE 1-8 CATEGORIES

2-4 years

5-7 years

8-10 years

11-15 years

- 16-20 years
- 21-25 years
- 26-30 years
- more than 30 years

PART II: PRE-VIDEO PROVIDERS’ OVERALL HPV KNOWLEDGE FOR RECOMMENDING HPV VACCINATION TO PARENTS FOR THEIR CHILD— AND STAGE OF CHANGE, SELF-EFFICACY, AND BARRIERS (PRE-VIDEO- PROVIDERS-SOC-SE-B-4)

[This is a new scale created by the Principal Investigator and her dissertation sponsor, Dr. Barbara Wallace, for use by the Research Group on Disparities in Health (RGDH).]

1-Please rate what you know, or your level of knowledge about the Human papillomavirus (HPV) infection, the available HPV vaccinations, and the schedule for vaccinating preteen and teen boys and girls?

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

Please rate yourself for the behavior of recommending within my medical practice to parents/guardians that they vaccinate their preteen and teen boys and girls for HPV– by checking what best describes you, below

2-For doing this 1-5

- I am not thinking of doing this behavior at all.
- I am thinking about doing this behavior.
- I am preparing to do this behavior.
- I have been doing this behavior for less than six (6) months.
- I have been doing this behavior for more than six (6) months up to many years
- I cannot answer, because I do not know enough about the HPV vaccination

3-And, for doing this I am 1-6

- 0% confident 20% confident 40% confident
- 60% confident 80% confident 100% confident
- I cannot answer, because I do not know enough about the HPV vaccination

4-And, the degree of barriers I (e.g. time) experience in a medical visit for actually doing this is

- (0) non-existent (none at all) (1) extremely low (2) very low (3) moderate (4) high (5) very high (6) extremely high

PROVIDERS PLEASE CLICK ON THE LINK TO WATCH THE CARTOON
 (for approximately 5 minutes)

**PART III: POST-VIDEO VIEWING ADHERENCE SURVEY FOR PROVIDERS
(PVV-AS-PROVIDERS- 1)**

Answer the following questions, please:

1-How much of the video was watched?

3__All of the video 2__Most of the video 1_Some of the video 0_None of the video

PART IV: RATE THE VIDEO FOR PROVIDERS (RTV-PROVIDERS-1)

[This is a common scale used by the Research Group on Disparities in Health (RGDH).]

Please think about the cartoon video you were asked to watch. Please rate this cartoon as a potential linguistically and culturally appropriate tool (i.e. available in English and Spanish) to support parents in their decision-making about whether or not they make sure their preteen or teen child receives the HPV vaccination series.

1. I rate the video as follows:

Very Poor Poor Fair Good Very Good Excellent

1 2 3 4 5 6

___NA/Unable to rate - I was not able to watch the video

**PART V: DIFFUSION OF INNOVATION USING E-HEALTH ON HPV BY
PROVIDERS (DOF-UEH-HPV-PROVIDERS-1)**

NOTE: This is the study # 2 dependent variable of pediatricians/family practitioners recommending (yes/no) the video to parents and/or other providers so they could share it with parents.

1- Would you recommend this cartoon video for parents, or to other providers so they could share it with parents?

1- __Yes _0-_No ___NA/Unable - I was not able to watch the video

**PART VI: QUALITATIVE PORTION ON REASONS FOR RECOMMENDING
THE E-HEALTH VIDEO OR NOT—FOR PROVIDERS (QP-RREHV-
PROVIDERS-1)**

[NOT A REQUIRED QUESTION IN QUALTRICS]

1- Please explain why you would or would not recommend the video. Feel free to offer your comments on the strengths and weaknesses of the video, or how could it be improved.

___I feel unable to comment on the video – as I was not able to watch all the video

___I offer my comments on the video, as follows:

**PART VII: QUALITATIVE PORTION ON REACTIONS TO STUDY
PARTICIPATION BY PROVIDERS (QP-RSP-PROVIDERS-1)
[NOT A REQUIRED QUESTION IN QUALTRICS]**

1-What other thoughts or feelings might you share in response to watching the video and/or taking this survey?

----- END OF SURVEY FOR PROVIDERS – THANK YOU! -----

Appendix P

Non-Significant Correlations

S1. Table A-Correlations Between Selected Variables and Pre-Video SOC for Having Child Vaccinated and Rating of the Video (Watched All or Most)

Variables selected	Pre-Video SOC for Having Child Vaccinated			Rating of the Video		
	N	Pearson Correlation	P	N	Pearson Correlation	P
Participant age	122	.196	.031*	85	.225	.038*
Yearly Household Income	122	.154	.091	85	-.073	.507
Educational level	121	.122	.182	84	.066	.552
Number of children aged 9-18	122	.132	.147	85	.122	.267
Exposure to print and digital media information on HPV	116	.221	.017*	80	.188	.096
HPV Knowledge	122	.287	.001***	85	.014	.897
HPV Vaccine Knowledge	122	.269	.003***	85	.060	.587
Vaccine Conspiracy Beliefs	122	-.077	.399	85	-.150	.169
Vaccine hesitancy—lack of confidence	122	-.238	.008***	85	-.068	.534
Vaccine hesitancy-hesitancy risks	122	-.049	.589	85	-.003	.981
Perceived barriers	174	-.020	.826	85	.072	.512
Social desirability	122	-.174	.055	85	.041	.713

*p<.05, **p<.01, ***p<.001

Bonferroni Adjustment Significance (.05/12, p= .004)

Note: All p values above .004 are considered non-significant, and only those below .004 are considered statistically significant

S1. Table B. Correlation Between Selected Variables and Pre-Video SOC for Having Child Vaccinated and Rating of the Video (Watched All or Most)

Variables selected	Pre-Video SOC for Having Child Vaccinated			Rating of the Video		
	N	Pearson Correlation	P	N	Pearson Correlation	p
Participant age						
1-ESP	68	.169	.167	52	.180	.202
2- SSP	54	.186	.179	33	.291	.100
Yearly Household Income						
1-ESP	68	.113	.358	52	-.149	.292
2- SSP	54	.129	.354	33	.007	.970
Educational level						
1-ESP	67	.124	.317	51	.002	.991
2- SSP	54	-.006	.967	33	.124	.490
Number of children aged 9-18						
1-ESP	68	.226	.063	52	.263	.060
2- SSP	54	.010	.942	33	-.057	.753
Exposure to print and digital media information on HPV						
1-ESP	63	.078	.542	48	.156	.289
2- SSP	53	.386	.004**	32	.219	.228
HPV Knowledge						
1-ESP	68	.194	.112	52	.058	.683
2- SSP	54	.378	.005**	33	-.095	.599
HPV Vaccine Knowledge						
1-ESP	68	.232	.057	52	.072	.610
2- SSP	54	.282	.039*	33	.024	.896
Vaccine Conspiracy Beliefs						
1-ESP	68	-.077	.530	52	-.250	.074
2- SSP	54	-.143	.301	33	.032	.859

Vaccine hesitancy						
—lack of confidence						
1-ESP	68	-.167	.173	52	-.087	.541
2- SSP	54	-.301	.027*	33	-.033	.853
Vaccine hesitancy-						
hesitancy risks						
1-ESP	68	-.134	.278	52	-.118	.406
2- SSP	54	.062	.654	33	.243	.173
Perceived barriers						
1-ESP	68	-.043	.725	52	.214	.127
2- SSP	54	.033	.810	33	-.255	.152
Social desirability						
1-ESP	68	-.192	.117	52	.067	.635
2- SSP	54	-.088	.527	33	.006	.975

*p<.05, **p<.01, ***p<.001

Bonferroni Adjustment Significance (.05/12, p= .004)

Note: All p values above .004 are considered non-significant, and only those below .004 are considered statistically significant

Appendix Q

Internal Consistency of the Study Scales

*S1. Table C. Internal Consistency of Scales (GVA-CB-HLC-R-16) (N=122)

Scale	#of items	Cronbach's Alpha
Whole Sample (N=122)		
(a) –The General Vaccine Attitudes- Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	7	.890
(b) –The General Vaccine Attitudes- Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	7	.943
(c) –The General Vaccine Attitudes- Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	2	.765
ESP: (N=64)		
(a) - The General Vaccine Attitudes- Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	7	.915
(b) - The General Vaccine Attitudes- Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	7	.931
(c) - The General Vaccine Attitudes- Conspiracy Beliefs and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	2	.795
SSP (N=54)		
(a) - The General Vaccine Attitudes- Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	7	.851
(b) - The General Vaccine Attitudes- Conspiracy Beliefs and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	7	.953
(c) - The General Vaccine Attitudes- Conspiracy Beliefs and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	2	.720

Note: Regarding Research Question # 9-What are the parents' general vaccine attitudes, including for (a) conspiracy beliefs, (b) vaccine hesitancy—lack of confidence, and (c) vaccine hesitancy—risks?

S1. Table C. Internal Consistency of the Scale (GVA-CB-HLC-R-16) (N=122)

Scale	#of items	Cronbach's Alpha
Whole Sample (N=122)		
(a) - The General Vaccine Attitudes- Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	7	.890
(b) - The General Vaccine Attitudes- Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	7	.943
(c) - The General Vaccine Attitudes- Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	2	.765
ESP: (N=64)		
(a) - The General Vaccine Attitudes- Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	7	.915
(b) - The General Vaccine Attitudes- Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	7	.931
(c) - The General Vaccine Attitudes- Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	2	.795
SSP (N=54)		
(a) - The General Vaccine Attitudes- Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	7	.851
(b) - The General Vaccine Attitudes- Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	7	.953
(c) - The General Vaccine Attitudes- Conspiracy Beliefs, and Hesitancy due to Lack of Confidence or Risks Scale (GVA-CB-HLC-R-16)	2	.720

Appendix R

Qualitative Data Analysis Strategy

ANALYZING QUALITATIVE DATA

The Research Group on Disparities in Health (RGDH) highly values mixed methods dissertations that combine quantitative and qualitative methods. Professor Barbara Wallace, Director of the RGDH, has provided this step-by-step guide for the analysis of qualitative data. Typically, a dissertation is rooted in three to four theories (e.g. stages of change, self-efficacy, diffusion of innovation) and surveys collecting quantitative data have a rationale in corresponding theory. Meanwhile, all surveys end with open-ended questions (1-3) that are analyzed for themes; some students use a qualitative data analysis package for this task. However, I recommend the following steps for analyzing qualitative data:

Myth: you do not need to read all of your qualitative data

Truth: you DO need to follow all these steps

START WITH YOUR FIRST QUALITATIVE RESEARCH QUESTION

- 1) **ORGANIZE**- copy and paste qualitative data from survey monkey into one file--organizing by question asked
- 2) **HIGHLIGHT** - as you read it, highlight in yellow quotes that stand out--and, after you read about twenty answers, go back to the first highlighted yellow and in brackets at the end put an emergent theme:
- 3) **CREATE ACTION PHRASES - ITALICIZE AND BOLD** - the emergent theme in brackets should be an action phrase--such as *perceiving the need for supervision/training* or *striving to achieve positive outcomes* or *pursuing objectives by taking action*
- 4) **LIST DOCUMENT FOR EMERGENT THEMES** -as you continue to read beyond the first twenty answers, have a second document where you are copying and pasting your emergent themes--creating a LIST; as you read your twentieth to fortieth answer, start to just copy and paste the relevant emergent theme from your LIST, placing it in brackets where it applies
- 5) **THEMES EXPAND TO ACCOMMODATE MORE DATA** - feel free to elaborate on the emergent theme to accommodate the answers you see (twentieth to fortieth answers); for example, *perceiving the need for supervision/training/new curriculum* or *striving to achieve positive outcomes/goals/highest potential*, or *pursuing objectives by taking action/engaging in advocacy*
- 6) **SEE HOW EXPANDED THEMES ACCOMMODATE ALL DATA** - the new elaborated emergent themes now encompass ALL the examples (#1-20, 21-40)
- 7) **CLASSIFY ALL DATA BY THEMES** - continue to go through all of your data (examples 41-100) and only highlight in yellow where needed, and mostly copy and paste

the emergent theme in brackets; put any NEW emergent themes in your second document where you are copying and pasting your emergent themes--creating a LIST

8) **QUICKLY CONTINUE TO CLASSIFY ALL DATA BY THEMES** - if you have a LOT of data, eyeball and read quickly examples (101-200)--searching for every place you can highlight in yellow a new emergent theme (e.g. *feeling the focus is unnecessary/rebelling/not caring*)--to place on your LIST; or, quickly copy and paste where the new emergent theme fits in (e.g. #104 reflects the theme of *perceiving the need for supervision/training/new curriculum*)

9) **CREATE TABLE AND ORGANIZE BY REDUCED CATEGORIES THAT ENCOMPASS GROUPS OF THEMES:** *turn your final LIST of emergent themes (e.g. 20) into a TABLE; search for CATEGORIES OF THEMES that may accommodate 3-5 of your emergent themes (fit under it like an umbrella); organize the LIST of emergent themes so groups appear under the higher order CATEGORIES.* For example, there may be just **3 categories** of *solutions*, or *strategies*, or *complaints* might each encompass 3-4 themes.

10) **ENTER FREQUENCY AND PERCENTAGE IN TABLE:** go back and count the number of times each emergent theme appeared in your data; add to your TABLE n and % for number of times the emergent theme appeared--even as it it now under a CATEGORY in your table.