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## Parental predictors of HPV vaccine initiation among low-income Hispanic females aged 11–17 years

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### ABSTRACT

**Purpose:** Hispanic women experience a disproportionate burden of cervical cancer morbidity and mortality compared to non-Hispanic women. Increasing HPV vaccination among Hispanic adolescents can help alleviate disparities. This study aimed to identify parental psychosocial predictors associated with HPV vaccine initiation and correlates of parental intentions to obtain the vaccine for their Hispanic adolescent daughters aged 11–17 years.

**Methods:** This study is part of a larger three-arm randomized controlled trial testing the effectiveness of interventions to increase HPV vaccination. Parents of adolescent females were recruited in community clinics where we conducted baseline surveys. We obtained electronic medical records six months after baseline to assess vaccination status. Multilevel logistic regression was used to identify correlates of parental intentions to vaccinate and predictors of HPV vaccine initiation. Analyses with initiation as the outcome also controlled for intervention study arm. The Integrated Behavioral Model guided selection of psychosocial and outcome variables.

**Results:** Our sample ( $n = 765$ ) consisted mostly of mothers with less than a high school education born outside of the U.S. Forty-one percent had a household income less than \$15,000. Most daughters had public or private insurance. Twenty-one percent initiated the HPV vaccine series. Correlates of intention to vaccinate included subjective norms related to daughter's doctor (AOR = 1.04; 95% CI 1.01–1.07), belief that the vaccine is safe (AOR = 1.38; 95% CI 1.06–1.78), self-efficacy to obtain the vaccine for their daughter (AOR = 2.39; 95% CI 1.52–3.77), and parental concern about vaccine side effects (AOR = 0.73; 95% CI 0.60–0.89). Intentions predicted initiation (AOR = 2.01; 95% CI 1.10–5.26); concern about sexual disinhibition decreased the odds of having a vaccinated daughter at follow-up (AOR = 0.66; 95% CI 0.47–0.92).

**Discussion:** Parental intention and concerns about sexual disinhibition predict vaccine initiation. Further research is needed to explore the role of intention as a potential mediator between psychosocial variables and vaccination status.

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### 1. Background

The human papillomavirus (HPV) is the most common sexually transmitted infection among sexually active individuals [1]. Persistent infection with high-risk HPV genotypes can lead to a number of malignancies including cervical, anal, vulvar, vaginal, and oropharyngeal cancers [2]. Cervical cancer is the most commonly diagnosed HPV-related cancer in women in the United States with a rate of 7.4 cases per 100,000 females, and almost all cervical cancers are attributable to HPV [3].

Disparities exist in HPV infection prevalence, cervical cancer screening, and cervical cancer morbidity and mortality rates. High-risk types of HPV are more prevalent among women with less than a high school education (38%) compared to those with a high school diploma or more (33% and 27% respectively) and among women living below poverty (40%) compared to those at or above the poverty line (27%) [4]. High-risk types are also most prevalent among non-Hispanic black women (40%), followed by Mexican American (31%), as compared to other race/ethnicities (28%), and non-Hispanic white women (27%) [4]. Hispanic women are significantly less likely than non-Hispanic women to obtain cervical cancer screening [5], and Hispanic women experience a significantly disproportionate rate of cervical cancer (9.7 per 100,000) compared to non-Hispanic women (7.1 per 100,000) [3]. Cervical cancer mortality rates for Hispanic women are second only to rates for Black women and are higher compared to White, Asian/Pacific Islander, and American Indian/Alaska Native women [6].

These disparities highlight the importance of preventing initial HPV infection. HPV vaccines, available for 9–26 year olds, protect against certain virus types that can lead to HPV-related cancers including cervical cancer. The HPV vaccine series includes 2 doses six to twelve months apart for adolescents under 14 years old and 3 doses for adolescents and young adults at 0, 1–2, and 6 months [7]. The CDC Advisory Committee on Immunization Practices (ACIP) recommends the vaccine series be administered to adolescents ages 11–12 years alongside other routine adolescent vaccines [8]. Healthy People 2020 sets the goal that 80% of adolescents ages 13–15 years complete the HPV vaccine series [9], but national vaccination coverage falls below this goal. In 2016, 65% of females ages 13–17 years initiated the HPV vaccine series and only 43% completed the series [10].

Identifying predictors of vaccination can inform interventions for priority groups. Although Hispanic mothers are more accepting of HPV vaccination compared to non-Hispanic White mothers, specific beliefs can negatively influence the decision to vaccinate their daughters [11]. These include sexuality-related concerns, safety concerns, and low perceived risk that daughter will acquire HPV [11]. Studies of Hispanic populations that have examined parental HPV vaccine knowledge [12–16], parental beliefs and attitudes toward the vaccine [17–22], and barriers to vaccination [23–25], often use cross-sectional or qualitative methods. Few have looked at vaccine series initiation and completion using longitudinal studies to assess predictors of vaccination instead of only correlates [11]. Longitudinal studies to identify psychosocial predictors of vaccination among Hispanics are needed because measuring both psychosocial predictors and vaccination status simultaneously obscures the direction of the association.

This study aimed to identify parental psychosocial predictors of HPV vaccine initiation among low-income Hispanic girls aged 11–17 years. Based on the Integrated Behavioral Model, we also aimed to identify associations between parental psychosocial factors and intentions to obtain the HPV vaccine for their daughters.

## 2. Methods

This study used data from *Por Nuestras Hijas* (PNH) (*For Our Daughters*; Cancer Prevention & Research Institute of Texas RP130459), a group randomized controlled trial that tested the effectiveness of two parent-education interventions (a tailored interactive multimedia intervention and print *fotonovela*) [26] to increase HPV vaccination among Hispanic adolescent females in Houston, TX. Data are restricted to females only as the interventions were developed prior to HPV vaccine recommendations for males. The interventions have since been adapted for males [26] and data collection with Hispanic parents of males is ongoing.

The University of Texas Health Science Center at Houston and the Harris Health System Institutional Review Boards approved this research.

### 2.1. Setting and participants

Data collection occurred between November 2012 and January 2015. Participants were recruited from within 29 participating community health clinics. These clinics included Harris Health System (HHS) clinics ( $n = 10$ ) and Federally Qualified Health Centers and other unaffiliated community clinics ( $n = 19$ ). Harris Health System is a large safety net system serving Harris County, Texas. To be eligible to participate, clinics had to serve predominantly Hispanic patients and participate in the Vaccines for Children (VFC) Program. VFC offers vaccines at no cost for patients who are otherwise unable to pay [27]. Participant eligibility criteria for the original study included: (1) have a daughter aged 11–17 years, (2) have a daughter who had not initiated the HPV vaccine series, and (3) self-identify as Hispanic or Latina/o. If a participant had more than one daughter who met eligibility criteria, we restricted questions to the daughter with the most recent birthday.

Trained, bilingual data collectors recruited parents in clinic waiting rooms, assessed eligibility, and obtained informed consent. Informed consent included consent to access daughters' medical records to assess HPV vaccination status, including information on vaccine doses and dates. Once parents consented, data collectors administered a computer-assisted in-person baseline survey which captured parent and daughter sociodemographic characteristics and measured psychosocial variables corresponding to constructs of the Integrated Behavioral Model. Parents received a \$20 gift card for completing the baseline survey.

### 2.2. Theoretical framework

The Integrated Behavioral Model (IBM), an extension of the Theory of Reasoned Action and the Theory of Planned Behavior [28], provided the theoretical framework for this study. Specifically, the IBM and empirical literature guided the selection of psychosocial variables assessed (knowledge, awareness, beliefs, perceived norms, subjective norms, and self-efficacy) and outcomes (intention and vaccination initiation) measured. According to the IBM, these psychosocial variables should predict intention which in turn should predict behavior (vaccination initiation).

### 2.3. Variables and data sources

#### 2.3.1. Primary outcome variable

Vaccination status was measured at 6 months after baseline as a dichotomous variable (at least one dose of HPV vaccine versus none). We obtained the series dose and date of vaccination for daughters directly from Epic electronic medical records in HHS clinics and submitted written requests to other community clinics. For cases where clinics reported that daughters were not patients or if no records were found in Epic, we obtained information from parents about alternative clinics their daughters attended and sought data from these sources.

#### 2.3.2. Secondary outcome variable

Parental intention was measured at baseline using a 5-point Likert scale modeled on stages of change [29]. We dichotomized the scale to obtain a binary outcome with “no thought of getting her the vaccine,” “think I need to consider getting her the vaccine,” and “think I should get her the vaccine, but I am not quite ready” categorized as no intention to obtain the vaccine. We categorized “think I will probably get her the vaccine” and “I am committed

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