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# Black mother's intention to vaccinate daughters against HPV: A mixed methods approach to identify opportunities for targeted communication☆

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## HIGHLIGHTS

- Mothers misunderstand the link between HPV and cancer.
- Majority of mothers did not support a HPV vaccine mandate.
- Mothers need information on vaccine safety and age recommendations.
- A physicians' recommendation is the primary influence on vaccination intention.
- Findings suggest fostering engagement of mothers to create HPV vaccine education programs.

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## ABSTRACT

**Objective.** The cervical cancer disparity continues to exist and has widened between Black and non-Hispanic White women. Human Papillomavirus (HPV) vaccines could potentially reduce this disparity, yet remain under-used among Black female adolescents. We investigated psychosocial and cultural factors associated with Black mothers' intentions to vaccinate their daughters against HPV, and explored views toward a HPV vaccine mandate.

**Methods.** In this quantitative dominant, mixed methods study, cross sectional surveys ( $n = 237$ ) and follow-up semi-structured interviews ( $n = 9$ ) were conducted with Black mothers of daughters. A 2-step logistic regression determined factors associated with Black mothers' intention. Thematic content analysis determined emerging themes.

**Results.** Perceived susceptibility ( $p = .044$ ), perceived barriers ( $p < .001$ ), and subjective norms ( $p = .001$ ) were significant predictors of maternal HPV vaccination intentions. Follow-up interviews provided insight into factors influencing mothers' intentions. Mothers with low intentions did not perceive their daughter to be currently sexually active or in near future, thus, not at HPV risk. Pediatricians were identified as the most influential person on maternal decision-making if there was a pre-existing relationship. However, many mothers had not received a pediatricians' recommendation for their daughters. Barriers influencing mother's decision-making include knowledge, daughters' age, and mistrust in pharmaceutical companies and physicians. Mothers were not in favor of the HPV vaccine mandate.

**Conclusions.** Findings demonstrate the need to develop and evaluate physician-led interventions on HPV and vaccine importance, and engage these mothers in intervention development to build trust between physicians, researchers, and Black mothers to improve HPV vaccine uptake in Black female adolescents.

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**Abbreviations:** HPV, Human Papillomavirus; HPVS-BM, Human Papillomavirus vaccination survey for black mothers with girls aged 9 to 12.

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## 1. Introduction

The Human Papillomavirus (HPV) is the most common sexually transmitted infection [1] associated with significant adverse sequelae [2]. While women do not bear a higher incidence of HPV infection compared to men [3], there is a higher burden of some HPV-related diseases with cervical cancer being the most common [4]. Black women are disproportionately impacted in incidence and mortality from cervical cancer compared with non-Hispanic White women [5]. The vaccine, Gardasil 9, is a primary prevention tool against HPV. Similar to other populations, vaccination rates among Black female adolescents lag significantly behind the national recommendation of 80% of female adolescents completing the regime [6]. In 2015, Black female adolescents compared with non-Hispanic White female adolescents were slightly higher in initiation (66.9% vs. 65.9%) and completion (40.8% vs. 37.1%) rates. This warrants great concern as vaccination rates in Black adolescents are substandard compared to the national recommendation of 80%. This leaves many female adolescents susceptible to cervical cancer [7].

Barriers to vaccination in adolescents include parental knowledge, attitudes, and beliefs surrounding HPV and the vaccine [8–12]. The impact of culture on HPV vaccination has been explored inconsistently [13–15], leaving incongruent findings and unanswered questions. Religiosity, collectivism, racial pride, present-time orientation, and future-time orientation are important cultural variables expressed by Black women in urban environments (see Table 1 for description) [16]. However, no studies have examined the influence of these cultural components on Black parents' mothers' vaccination intention, the key decision-makers in their daughter's vaccination status [8].

The purpose of this mixed methods study was to examine the role attitudes (perceived susceptibility, perceived severity, perceived benefits, perceived barriers), subjective norms, and distal variables (culture: spirituality, culture: collectivism, culture: racial pride, culture: present-time orientation, culture: future-time orientation, HPV knowledge, personal experience, and information sources) have on Black mothers' HPV vaccination intentions. Research questions were: (1) What factors predict Black mothers' intentions to vaccinate their girls aged 9 to 12 years against HPV?; and (2) How do the factors identified in the quantitative phase influence maternal intentions to get their girls aged 9 to 12 years vaccinated? The overall objective is to identify intervention targets for culturally-relevant, theory-based interventions to increase HPV vaccination rates in Black female adolescents.

## 2. Materials and methods

### 2.1. Conceptual framework

Theory of Reasoned Action (TRA) [17] and Health Belief Model (HBM) [18] were adapted as the conceptual framework for this study. TRA posits if a mother has high or positive intentions to vaccinate her daughter against HPV, she has increased likelihood to vaccinate.

**Table 1**  
Cultural dimensions of the African American community.  
Source: Lukwago, Kreuter, Bucholtz, Holt, Clark., 2001.

Dimension	Description
Religiosity	"A range of dimensions from church attendance and prayer to participation in religious ceremonies, spirituality, and beliefs about God as a causal agent"
Collectivism	"The belief that the basic unit of society is the family or group, not the individual"
Racial pride	"Holding positive attitudes about one's race"
Present-time orientation	"A person's tendency to think and act according to consequences that are primarily immediate"
Future-time orientation	"A person's tendency to think and act according to consequences that are more distal"

Mothers' attitudes toward HPV vaccination and their social normative perceptions of their daughter being vaccinated influence their intentions. TRA further suggests distal variables (i.e., culture: spirituality, culture: collectivism, culture: racial pride, culture: present-time orientation, culture: future-time orientation, demographics, personal experience, HPV knowledge, and information sources) indirectly influence intention through attitude and social norms [17].

HBM explains the likelihood a mother will get her daughter vaccinated against HPV. This theory suggests mothers are more likely to vaccinate if: they perceive their daughter is susceptible to HPV, long-term outcomes (e.g., cervical cancer) of HPV are severe, and perceived benefits of vaccinating one's daughter against HPV outweigh perceived barriers [18]. These constructs reflect the attitudinal component of the TRA.

### 2.2. Research design

We employed a sequential, explanatory mixed methods design to investigate factors associated with Black mother's intentions to vaccinate their daughters against HPV. Researchers first collected and analyzed quantitative data (survey), then used the results to design a follow-up qualitative phase (semi-structured interviews) to explain initial quantitative results [19]. The University of Alabama at Birmingham Institutional Review Board approved this study.

### 2.3. Research site and participants

This study was conducted in Alabama where cervical cancer rates (i.e., incidence and mortality) are higher than the national average, and Black women have higher rates compared with non-Hispanic White women [20]. Mothers were defined as primary caregivers (care for and make medical decisions) to their children. Inclusion criteria were: (1) female, (2) Black, (3) have a daughter aged 9 to 12, and (4) Alabama resident. Community sites (i.e., churches, pediatric clinic, children sports events, sorority meetings) identified in the literature and community gatekeepers (i.e., pastors, lead pediatrician(s), coaches, and chapter presidents) [21,22] helped recruit a convenient sample. Participants for the qualitative phase were mothers who: (1) met the survey inclusion criteria; (2) completed the survey; and (3) agreed to participate in follow-up interviews.

### 2.4. Quantitative (phase 1)

#### 2.4.1. Study design

We used a cross-sectional, mixed mode (online and face-to-face) survey design to administer the *Human Papillomavirus Vaccination Survey for Black Mothers with Girls Aged 9 to 12* (HPVS-BM) [23]. Surveys were distributed in-person or online if one lacked time or requested a survey link for circulation. Initial low survey response rates resulted in statewide survey distribution, resulting in collecting 280 surveys.

#### 2.4.2. Survey development

HPVS-BM was developed using items and scales designed to explore the TRA and HBM constructs in the literature. Questions were adapted and validated using content expert review, cognitive interviews, and pilot testing. Content review was used to ensure content of survey items were accurate and valid. This process was a two-phased process involving 7 reviewers. Reviewers first qualitatively evaluated item content and structure, then they qualitatively rated the items on the degree of importance. A content validity ratio was calculated using quantitative results, and those items with a 0.60 or higher were retained. Two rounds of cognitive interviews (5 participants each) were conducted with Black mothers with daughters between the ages of 9 to 12. These interviews provided insight on survey directions, questions, and format. Last, the pilot testing was conducted among 43 Black mothers (18 face-to-face; 25 online) to ensure instructions and questions were comprehensible and determine psychosocial properties of the instrument. Collectively,

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