

Factors Associated With African American Mothers' Perceptions of Human Papillomavirus Vaccination of Their Daughters: An Integrated Literature Review

Stella Ngozi Dike, MSN, RN, OCN®, and Wyona M. Freysteinson, PhD, MN

PROBLEM IDENTIFICATION: African American (AA) women have a higher mortality rate for cervical and other cancers and are less likely to have received the human papillomavirus (HPV) vaccine than White women. Mothers play a significant family role and have a unique relationship with their daughters. Mothers' positive views on HPV vaccination may enhance the HPV vaccination rate among their daughters.

LITERATURE SEARCH: The review was conducted by searching literature in PubMed®, CINAHL®, ScienceDirect, Ovid MEDLINE®, and ProQuest databases. The search was limited to studies conducted in the United States and published since the inception of the HPV vaccine in 2006.

DATA EVALUATION: Of 10,566 publications retrieved, 28 articles were included in the final sample.

SYNTHESIS: Factors associated with HPV vaccination were approval and disapproval of HPV vaccination from physicians, family, and friends; HPV knowledge; attitude and belief about HPV vaccination; benefits of vaccination; and challenges of and barriers to HPV vaccination.

IMPLICATIONS FOR PRACTICE: Understanding factors related to HPV vaccination decisions among AA mothers will inform healthcare providers of the best approach to improving vaccination rates among this high-risk population.

KEYWORDS human papillomavirus vaccine; HPV; African Americans; mothers; perceptions; attitude
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Human papillomavirus (HPV) is a key cause of the following six cancers: cervical, vulvar, vaginal, anal, penile, and oropharyngeal cancers (American Cancer Society [ACS], 2020). HPV is the most common sexually transmitted viral infection affecting both men and women (ACS, 2020). In the United States, 14 million new cases of HPV are reported every year, and about 80% of people will get an HPV infection in their lifetime (Centers for Disease Control and Prevention [CDC], 2019).

The latest version of the HPV vaccine (Gardasil®9) was approved in 2016 by the Advisory Committee on Immunization Practices (ACIP); the immunization covered nine strains of HPV (6, 11, 16, 18, 31, 33, 45, 52, and 58) (CDC, 2020). According to the CDC (2019), Gardasil 9 was routinely recommended for males and females aged 11–12 years but can be administered from ages 9 through 26 years. Two doses of Gardasil 9 are required for preteens aged 9–14 years, with 6–12 months between each dose, and teens and young adults aged 15–26 years can receive three doses scheduled at 0, 2, and 6 months. In June 2019, the ACIP recommended HPV vaccination to individuals aged 27 through 45 years who were not already vaccinated (CDC, 2019).

The HPV vaccine has been effective in preventing cancer-causing infections and precancers (CDC, 2019). The infections with HPV-related cancers and genital warts have reduced by 86% among teen girls and 71% among young adult women (CDC, 2019). There was a 40% reduction in cervical precancer caused by HPV infection among women vaccinated with the HPV vaccine (CDC, 2019).

Despite the HPV vaccine's effectiveness, the rate of vaccine remained below 80% of the Healthy People 2020 target (Townsend et al., 2017). The national rate of initial doses of HPV vaccinations has increased

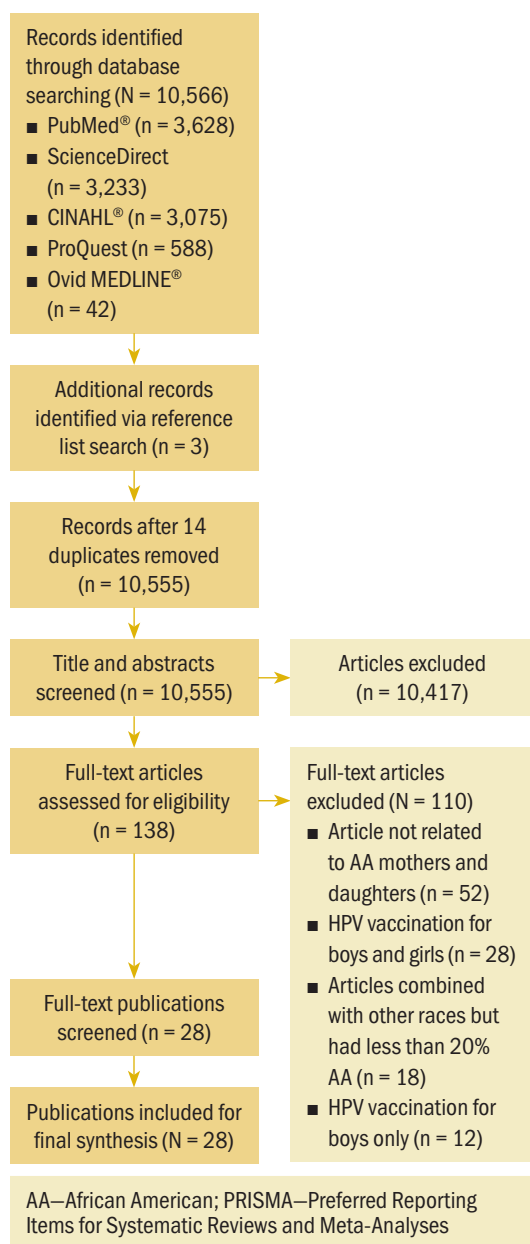
from 68.1% in 2018 to 71.5% in 2019; however, the national rate of completion of the three-dose vaccine series remains low at 51.1% in 2018 and 54.2% in 2019 (Elam-Evans et al., 2020). African American women are 10% less likely to have received the HPV vaccine than White women, and the vaccination rate for non-Hispanic Black individuals was 38% compared to 44.7% for non-Hispanic White individuals in 2015 (Williams et al., 2017). These HPV vaccination

rates are much lower than in other countries, such as Australia, where the girls' vaccination rate remains at 79% (Hall et al., 2019).

African American women have the highest mortality rate as compared to other racial/ethnic groups in the United States for cancer (ACS, 2019). The incidence of cervical cancer is 30% higher in non-Hispanic Black women than in non-Hispanic White women; in addition, non-Hispanic Black women are 80% more likely to die from cervical cancer than non-Hispanic White women (ACS, 2019).

African American mothers play a significant role in the family and have strong relationships with their daughters, and this plays an important role in increasing resilience, which helps daughters to develop effective self-worth, self-esteem, and coping strategies (Everet et al., 2016). This mother–daughter bond may enhance the HPV vaccination rate among this population. Therefore, African American mothers are in the best position to discuss HPV vaccination and cervical cancer prevention with their daughters. There is a significant need to improve HPV vaccination uptake among this high-risk population. The purpose of this review is to examine factors associated with the maternal perceptions of HPV vaccination among African American daughters in the United States.

FIGURE 1. PRISMA Flow Diagram



Methods

This literature review aims to synthesize factors associated with the maternal perception of HPV vaccination among African American mothers. This information can inform the development of an intervention for this high-risk population and provide direction for future research studies. The following PICO question guided the search: What factors affect African American mothers' perceptions of HPV vaccination of their daughters? The literature review synthesis was guided by the Health Belief Model (HBM) construct (perceived susceptibility, perceived benefit, perceived barrier, perceived severity, cues to action, and self-efficacy) (Rosenstock et al., 1988). The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology was used in this integrative literature review (Moher et al., 2009).

Eligibility Criteria

The qualitative, quantitative, and mixed-methods studies of HPV vaccination among African American mothers and daughters published in the English language between 2006, when the U.S. Food and Drug Administration (2019) approved the first available

TABLE 1. Selected Articles for Integrative Review (N = 28)

Study	Purpose and Design	Population and Sample	Variables	Results	Limitations
Bryer, 2014 ^a	To examine the determinants of AA parents' intention to have their daughters receive the HPV vaccine; descriptive correlational	AA parents from a northeastern public college and 3 educational centers in the same area; 262 parents (219 mothers and 43 fathers) (aged 26–55 years) of daughters (aged 9–17 years)	The HPV vaccine, attitude, and intention	HPV parental attitude significantly related to vaccine intention ($r = 0.865$, $p < 0.001$); significant relationship between HPV vaccine behavioral belief and HPV vaccine attitude among AA parents ($r = 0.239$, $p < 0.001$)	Decreased generalizability (sample limited to AA mothers only); parents are more educated; new instrument used only on a set of AA mothers
Bynum et al., 2011 ^a	To assess factors associated with HPV vaccine uptake among young AA women; survey study	363 young AA women aged 18–26 years from 3 historically Black universities in South Carolina	HPV vaccine uptake, age, knowledge, perceived severity, barriers, and cues to action	Women who reported uptake had significantly higher HPV knowledge, had lower perceived barriers to vaccination, and were younger (all $p < 0.05$).	Nonprobability sample of historically Black college women; may not be representative of entire population; recall bias because self-report not validated with the electronic health record; cross-sectional measuring beliefs and behaviors concurrently
Cipriano et al., 2018 ^a	To evaluate parental attitude toward general vaccination protocol and increase parental knowledge about the HPV vaccine; pre-/post-test study design	75 parents (White, $n = 29$; AA, $n = 19$; Hispanic, $n = 19$; Asian, $n = 1$; other, $n = 7$) in a pediatric office in southern New Jersey; adolescent age was 11–16 years; participants were mainly female parents.	Attitude, HPV vaccination, and knowledge	HPV knowledge post-test score greater than pretest ($t = -10.585$, $p < 0.001$); parental attitude module and HPV knowledge pretest showed positive moderate relation ($r_s = 0.552$, $p < 0.001$)	Small sample size; only those who could read and write English and Hispanic; computer tablet proficiency was included; 7 Hispanic participants dropped out of the study (unable to complete Spanish survey)
Cunningham-Erves et al., 2018 ^a	To investigate the psychosocial and cultural factors associated with mothers' intentions to vaccinate their daughters against HPV; sequential, explanatory mixed-methods design	237 AA mothers (aged 19 to older than 40 years) with daughters (aged 9–12 years); community site (church, pediatric clinic, children's sports event) in Alabama	Knowledge about the HPV vaccine, experience, and source of information for the HPV vaccine; intention to vaccinate daughters against HPV	Perceived susceptibility ($p = 0.044$), perceived barriers ($p < 0.001$), and subjective norms ($p = 0.001$) were significant predictors of maternal HPV vaccination intention. Barriers included knowledge, daughters' age, and mistrust of pharmaceutical companies and physicians.	Small sample size; results limited to only AA individuals; may not be generalized

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TABLE 1. Selected Articles for Integrative Review (N = 28) (Continued)

Study	Purpose and Design	Population and Sample	Variables	Results	Limitations
DiClemente et al., 2015 ^b	To examine an innovative culturally tailored, computer-delivered media-based strategy to promote HPV vaccine uptake; randomized controlled clinical trial	216 AA girls (aged 14–18 years) seeking service in family planning and sexually transmitted infection at a public health clinic in Atlanta, Georgia	HPV/cervical cancer knowledge, HPV vaccine acceptability, and severity of cervical cancer; perception about vaccines in general and HPV vaccines; normative beliefs	Intervention group participants believed they were more at risk for getting HPV and developing cervical cancer than comparison group participants ($p < 0.05$). Intervention group participants also worried about getting cervical cancer ($p = 0.05$) and were more likely to get the HPV vaccine than control group participants ($p = 0.01$).	Limited sample size; unable to track vaccine doses received outside study participating clinics; result may have been influenced by patient-provider interaction.
Dixon et al., 2018 ^c	To examine the effect of a digital HPV vaccine educational intervention to improve HPV vaccination; randomized cluster trial	1,596 parents (870 AA, 141 White, and 585 other) of adolescents aged 11–12 years; urban health clinic	HPV education and HPV vaccination uptake	A change in vaccine status was higher in parents who attended the intervention clinic (64.8%) versus the control clinic (50.1%) ($p < 0.001$). A patient who watched the video was 3 times more likely to receive a dose of the HPV vaccine ($p = 0.003$).	The study was done in a single urban health clinic and may not be generalized to other clinics. The intervention should have been broader than just patients who received tablets. The intervention may have shown an effect on vaccine initiation or completion because each participant watched a different video.
Fishman et al., 2014 ^a	To examine the strength of the relationship between HPV vaccination uptake among high-risk adolescents and their parents' previous knowledge; longitudinal cohort study using a questionnaire	149 parents (140 AA, 4 Hispanic/Latino, 5 other) and 211 adolescents (194 AA, 11 Hispanic/Latino, 6 other)	Vaccination uptake and HPV knowledge	Neither parental nor adolescent knowledge was associated with or predictive of adolescent vaccination. Parents and adolescents answered slightly less than 50% of knowledge items correctly. Within 12 months, 20 of 149 parents' (13.4%) daughters received the HPV vaccine, and 32 of 211 (15.2%) of the other adolescent sample did so.	Participants were mainly female. Findings may not be generalized among male adolescents.

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TABLE 1. Selected Articles for Integrative Review (N = 28) (Continued)

Study	Purpose and Design	Population and Sample	Variables	Results	Limitations
Fu et al., 2019 ^a	To examine the association of social process with HPV vaccine refusal among AA parents; cross-sectional survey	353 AA parents (332 mothers and 21 fathers) (average age = 37 years) of children aged 10–12 years in Washington, DC	Social process (contacts), vaccine advice, HPV vaccine refusal, and acceptance	Slightly more than 80% trusted family members and friends. Perceived high exposure to anti-HPV vaccine viewpoints and low exposure to pro-HPV vaccine viewpoints were associated with HPV vaccine refusal (adjusted OR = 1.5, 95% CI [1.01, 2.3] and adjusted OR = 1.7, 95% CI [1.2, 2.6], respectively).	Report that network members' viewpoint came from participants and not the network members themselves; generalizability limited because study participants were from a single urban academic center; participants were limited to parents who brought their children to the clinic during the study period.
Galbraith-Gyan et al., 2017 ^a	To explore the influence of culture on AA mothers' and daughters' HPV vaccine acceptance using the PEN-3 Model Cultural Framework, a culturally centered conceptual framework; grounded theory	28 AA mothers, with a mean age of 42.6 years, and 34 daughters (aged 12–17 years) in Guilford County, North Carolina, and New York, New York	Knowledge, attitude, culture, religious belief, HCP recommendation, media messages, mother–daughter communication, and HPV vaccination	Positive attitude toward HPV vaccination was related to beliefs about cancer prevention benefits and that vaccines in general protect against infectious disease. Negative attitude stemmed from beliefs that the vaccine was too new and not effective, daughters were too young, and the vaccine was not a one-size-fits-all intervention. Religious doctrine did not impede decision.	Limited generalization; study was guided by PEN-3 and may have restricted attitude of culture related to attitude and belief.
Galbraith-Gyan et al., 2018 ^a	To increase understanding about the health beliefs toward HPV infection and HPV vaccine acceptance; grounded theory	30 AA parents (28 mothers and 2 fathers), with a mean age of 42.9 years, and 34 daughters (aged 12–17 years) in Guilford County, North Carolina, and New York, New York	Total HPV dosage received, belief toward HPV and HPV vaccine acceptance, and knowledge of HPV infection and HPV vaccine	Mothers and daughters perceived low susceptibility to HPV infection. Both perceived the vaccine as beneficial against genital warts and cervical cancer. Barriers among mothers and daughters were politicization of the vaccine by government officials and unknown side effects, safety, and effectiveness. Self-efficacy was higher among mothers.	Researchers did not mention any limitations to this study.

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TABLE 1. Selected Articles for Integrative Review (N = 28) (Continued)

Study	Purpose and Design	Population and Sample	Variables	Results	Limitations
Gelman et al., 2013 ^a	To examine the association between race/ethnicity and HPV vaccine initiation and to determine how access to health care influences this relationship; national survey	2,168 females (1,110 White, 504 AA, 405 Hispanic [United States-born], 149 Hispanic [foreign-born]) aged 15–24 years	Race/ethnicity, access to care, HPV vaccine initiation	Significant racial/ethnic disparities; United States- and foreign-born Hispanic and AA individuals were less likely to initiate vaccination than White individuals ($p < 0.001$). AA individuals remained less likely than White individuals to have initiated vaccination (adjusted OR = 0.49, 95% CI [0.36, 0.68]).	Lower rates of HPV vaccination among AA females may not be because of access to care. Further research is needed to identify factors contributing to HPV vaccination among the AA population.
Gottlieb et al., 2009 ^a	To assess HPV vaccination of adolescent girls living with elevated cervical cancer rates; interviews	886 parents from North Carolina counties; 624 White (52%), 206 Black (38%), 28 Hispanic (5%), and 28 other (5%)	HPV vaccination initiation, females, living in the elevated cervical cancer community	Factors independently associated with vaccination: older age of daughters and physicians' recommendation; reasons for not initiating vaccination: need more information, never heard about the vaccine, belief daughter is too young, not yet sexually active, and have not been to the doctor yet; only 0.5% cited likely to have sex as the reason for not vaccinating daughter.	Study was done soon after development of the vaccine, so the vaccine was too new. More studies are needed to identify parents' intentions to vaccinate. Findings may not be generalized because the focus was on cervical cancer-elevated counties. Vaccination record was not obtained from the physician, and parents reported the vaccinations.
Griffioen et al., 2012 ^a	To explore the factors influencing mothers' decision to vaccinate 11- or 12-year-old daughters against HPV, and the mothers' and daughters' perspective about HPV vaccine-related decision-making; qualitative with a semi-structured interview	49% White, 45% Black, and 6% multiracial; from 2 suburban clinics and 1 urban hospital-based clinic; 32 mothers aged 27–41 years and 33 daughters aged 11–12 years	HPV vaccination, factors influencing mothers' decision	Primary factors influencing mothers' decision included mothers' beliefs and experiences; interactions with physicians, friends, and family members; and exposure to media reports/marketing; most daughters believed the decision was mutual, but most mothers believed the decision was theirs.	Findings are limited to daughters in a specific clinic. The study was done in a clinic setting and may not be applicable to other locations. Study findings were from participants who had received the HPV vaccine; therefore, the study's relevance was limited to mothers who had not vaccinated their daughters.

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TABLE 1. Selected Articles for Integrative Review (N = 28) (Continued)

Study	Purpose and Design	Population and Sample	Variables	Results	Limitations
Hamlish et al., 2012 ^a	To identify motivations and barriers to HPV vaccination and culturally relevant and meaningful opportunity for vaccine promotion among AA mothers and adolescent daughters; qualitative exploratory design	AA mothers and their daughters in Chicago, Illinois; 19 mothers (ages not given) and 19 daughters (aged 9–17 years)	Knowledge of HPV and HPV vaccination, prior vaccine experience, relationship with a physician, the experience of cervical cancer or dysplasia	Mothers' cervical dysplasia/cancer motivated a strong commitment to vaccinate daughters. Limited knowledge of HPV connection to cancer reduces the medical benefits of the vaccine. Mothers anticipate the sexual debut of their daughters and advocate for health-care intervention to protect them. Mothers trusted HCPs to initiate discussion.	Snowball recruiting and possible that most mothers had an interest in HPV vaccination based on previous experience with cervical cancer/dysplasia
Hull et al., 2014 ^a	To generate recommendations for framing messages to promote HPV vaccination; a qualitative study with a cross-sectional observational design	AA mothers and their daughters in Tennessee; 31 mothers (aged 30 to older than 40 years) and 34 daughters (aged 11–18 years)	The benefit of HPV vaccination, perceived barriers, the decision about HPV vaccination, disseminating messages and promoting HPV vaccination	HPV vaccines should be presented to undecided mothers and adolescents as a routine vaccine, just like other vaccines that help prevent cancer.	The study relied on parents' self-report of daughters' vaccination status; convenience sample limited by selection bias
Joseph et al., 2014 ^b	To examine facilitators and barriers to HPV vaccine uptake in AA, Haitian, Latina, and White women aged 18–22 years and to determine vaccination rates among participants over 5 years; qualitative using semi-structured interview	132 participants (47 Haitian, 45 AA, 20 Latina, and 20 White women)	HPV vaccine barriers, facilitators, knowledge of HPV vaccine, and HPV vaccine uptake	90% stated the likelihood of accepting HPV vaccination if offered by a physician. Despite low knowledge, participants trusted the physician. 51% initiated the vaccine over the next 5 years. More White participants completed the 3 doses of the vaccine than other races.	The interview was limited to study participants only. Others may have different perspectives on HPV vaccination. Limit missed opportunities during a clinic visit to increase HPV vaccine uptake. Increase provider recommendations in clinics.
Joseph et al., 2016 ^b	To evaluate the impact of client-centered behavioral intervention on mothers' HPV vaccine knowledge and vaccination initiation for their adolescent daughters; a pilot randomized controlled trial	200 AA (n = 100) and Haitian American (n = 100) mothers and their daughters (aged 11–15 years) from a large urban hospital	Brief negotiated interviewing, knowledge of HPV; increase HPV vaccination initiation and completion	Intervention group demonstrated increased knowledge score about HPV and significantly higher mean scores; initiation and completion of vaccine was not significant between groups.	Small sample size design as a pilot study; the pilot study was powered to identify the difference in initiation rates.

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TABLE 1. Selected Articles for Integrative Review (N = 28) (Continued)

Study	Purpose and Design	Population and Sample	Variables	Results	Limitations
Nagpal et al., 2016 ^a	To examine the association between knowledge about HPV and timely completion of the 3-dose quadrivalent vaccine series in an inner-city population of adolescent females; survey	134 females (73 Hispanic, 46 AA, and 15 other) aged 14–20 years in New York, New York	Knowledge, HPV vaccine series completion	Participants with high knowledge were significantly more likely to complete the series earlier than those with low to moderate knowledge; knowledge associated with shorter time to complete series	Sample size is low from the medical free clinic; generalization is limited. Selection bias may have occurred from participants who withdrew from the study.
Nan et al., 2016 ^a	To evaluate educational materials about HPV vaccination (pre-/post-test versus HPV vaccination pamphlet framed gain or loss); survey	211 AA parents (73% mothers and 27% fathers) aged 22–71 years from community outlets in a Maryland suburb outside of Washington, DC; children's age was 9–17 years.	Support for mandating HPV vaccination, policy advocacy, message framing	Parents responded more positively to gain-frames (benefit of doing a task) if they focused on distant future and loss-frames (cost of not doing the task) if they focused on immediate future.	The findings were limited to only AA individuals in a suburb outside of Washington, DC.
Nan et al., 2019 ^a	To examine how/why health information from HCPs and government agencies predicts acceptance of HPV vaccination of children among AA parents; survey	124 AA parents (95 female and 29 male) aged 23–71 years from community venues; children's age was 9–17 years.	Health information, HCPs/government agencies, HPV vaccination uptake	Low trust in information from government health agencies was associated with less favorable parental attitudes and intentions toward vaccination; partially mediated by perceived vaccine efficacy; trust in health information from physician or HCP did not predict vaccine acceptance.	Limited sample size; study findings were only in the AA population and may not be generalized.
Perkins et al., 2010 ^a	To explore low-income minority parents' attitudes, intentions, and actions to vaccinate their daughters against HPV; qualitative with semi-structured interview conducted in English and Spanish	76 parents, mostly mothers (33 AA, 21 Latino, 20 White, and 2 other) from an urban medical center and a community health center	Parents' attitude, intention, and actions; HPV vaccination	Intention correlates with vaccine uptake. 91% of parents intended to vaccinate their daughters. 89% of girls received vaccination within 12 months. Most parents focused on potential for cancer prevention. Concerns about side effects and promotion of unsafe sex did not hinder vaccine acceptance in most cases.	Small sample size in a medical center and nonrandomized study limits generalizability; parents had access to medical care, and other parents who did not participate may not have had access to care; unable to assess vaccine completion; intervention was not provided to the parents.

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TABLE 1. Selected Articles for Integrative Review (N = 28) (Continued)

Study	Purpose and Design	Population and Sample	Variables	Results	Limitations
Read et al., 2010 ^a	To describe attitude and perception toward acceptability of HPV vaccination among inner-city Caribbean and AA parents; survey with questionnaire	168 adolescent girls (85 AA [51%], 66 Caribbean [39%], and 17 Hispanic [10%]) aged 13–19 years and 74 parents from an urban adolescent clinic	Attitude and perceptions, HPV acceptability, cervical cancer	55.8% of girls had knowledge of HPV. Less than half were interested in receiving the vaccine, compared with 37.5% of parents. There was no significant influence in parental acceptance of the vaccine based on age, ethnicity, education level, insurance, and living condition. Most parents wanted the vaccine for its role in preventing cancer. A minority of parents were concerned with promoting sexual activity.	The population is with a convenience sample of girls and mothers in a clinic setting, limiting generalization. Information is self-report, and that may affect the validity of the study. There may be selection bias because of convenience sampling.
Rosenthal et al., 2008 ^a	To examine the relationship of demographics, parenting, and vaccine attitudes with HPV acceptance and intent to vaccinate in the next 12 months; questionnaire	153 mothers (39% AA, 34% non-Hispanic White, 20% Hispanic, 7% other) aged 27–77 years with daughters aged 11–17 years from a university-based primary clinic	Demographics, parenting, vaccine attitude, HPV vaccination acceptance, and intent	Mothers with less than high school education, with history of sexually transmitted disease, who supervise daughter more when she is with peers, and whose daughters did not mind receiving 3 doses accepted their daughter being vaccinated. Parental decision was not related to their sexual values or daughters' sexual behavior.	Convenience sample from a primary university clinic with a large vaccine clinic; the clinic provides information on vaccine safety and the dangers of misinformation; small sample size; intention to vaccinate may not be followed with vaccination.
Strohl et al., 2015 ^a	To assess knowledge of HPV, cervical cancer, and HPV vaccination; quantitative cross-sectional survey	215 AA women aged 18–70 years at a community fair in Chicago, Illinois	Knowledge regarding HPV, cervical cancer, and HPV vaccination	73% of participants scored less than 65% on the knowledge portion of the survey. Education level, household income, and having a child who had been offered the HPV vaccine were associated with an adequate knowledge score.	A convenience sample of middle-aged AA women from an urban area may limit the generalization of findings.

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TABLE 1. Selected Articles for Integrative Review (N = 28) (Continued)

Study	Purpose and Design	Population and Sample	Variables	Results	Limitations
Thompson et al., 2011 ^a	To determine knowledge about HPV and HPV vaccination and its relationship to cancer; to assess acceptability of and intent to vaccinate; and to describe individual characteristics, cultural attitudes, and social and environmental factors that affect AA parents' intent to vaccinate; survey study	200 AA parents (\bar{X} age = 40 years) (137 mothers, 61 fathers, 2 not identified as mother or father) of daughters aged 9–17 years in the St. Louis, Missouri, metropolitan statistical area	Knowledge of HPV and HPV vaccination and its relationship to cancer, acceptability, and intent to vaccinate; spirituality/religion, medical mistrust, and cultural attitude	Two-thirds of participants were aware of HPV and HPV vaccination and knowledgeable about HPV, but knowledge alone did not necessarily lead to vaccination. Vaccination status was significantly affected by whether a pediatrician had recommended the vaccine ($p < 0.001$). Parents of vaccinated children were worried about sexually transmitted infection.	Convenience sample; not generalizable; cultural issues may not be salient, and they may consider the more traditional issue and variables that influence vaccination utilization.
Thompson et al., 2012 ^a	To describe attitudes and social and environmental factors that affect AA parents' intent to vaccinate their daughters against HPV; a qualitative design using a structured interview	30 AA parents (25 mothers and 5 fathers aged 26–60 years) of daughters aged 9–17 years in the St. Louis, Missouri, metropolitan statistical area	Intent to vaccinate, perception of community norms, vaccination before or after initiation of sexual activity	Recurring themes include influence of physician recommendations, vaccine cost, and lack of insurance. Fear of early sexuality because of vaccination was limited. Participants stated that religious belief would not interfere with HPV vaccination.	Lack of diversity among interviewers resulted in participants producing socially desirable comments. There was a greater number of individuals with health care and physician relationships. The interviews were developed before the approval of Cervarix [®] and before Gardasil [®] was approved for men.
Underwood et al., 2016 ^b	To describe how the parental source of information about HPV vaccination is associated with adolescent HPV uptake and to understand the relationship between the source of information, vaccine uptake, and parental attitude; 3-arm randomized controlled trial	360 parents (267 AA, 59 White, 6 Hispanic, and 28 other) (84% mothers, 9% fathers, and 7% other) from Georgia	Source of information, HPV vaccination uptake, parental attitude	53% of parents reported their adolescents received 1 dose. Top sources of information were a physician or medical professional (80%) and television (64%). Source of information is associated with parental attitude and attitude is associated with vaccine uptake among adolescents.	Participants are from 1 county in Georgia, and the sample was mainly AA, so the results may not be generalizable. Consent return was slow because of parental signature. There may be response bias from parents who have vaccinated a child and with a favorable attitude than those who have not.

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TABLE 1. Selected Articles for Integrative Review (N = 28) (Continued)

Study	Purpose and Design	Population and Sample	Variables	Results	Limitations
Watkins et al., 2015 ^a	To assess correlates of HPV awareness, knowledge, and attitudes; longitudinal cohort study	759 church-going AA women aged 40–80 years in Houston, Texas	Awareness, knowledge, and attitude	Younger age, higher education, history of cancer, and less spirituality were associated with HPV awareness individually and when considered jointly in a single model ($p \leq 0.038$). Higher education was related to HPV knowledge ($p = 0.006$).	HPV knowledge and attitude items were only administered to women who responded positively to the HPV awareness item. Participants who were not parents were asked to consider a hypothetical daughter. High percentage of intent to vaccinate may not be actual vaccine initiation and completion.

^a Level of evidence 3, quality rating B

^b Level of evidence 2, quality rating A

^c Level of evidence 2, quality rating B

AA—African American; CI—confidence interval; HCP—healthcare provider; HPV—human papillomavirus; OR—odds ratio

HPV vaccine for girls, through the date of the final search (December 30, 2020) were included. Reviews were excluded if the study had African American boys because the focus was on African American mothers and daughters. The review's primary purpose was to explore the maternal perception of HPV vaccination of their daughters after 14 years of HPV vaccine development for girls. The review's findings can be used to compare future reviews and interventions for adolescent male vaccinations among this high-risk population. However, research studies were included if the sample had at least 20% African American females in combination with other races, such as Hispanic, Haitian, Caribbean, and White. Studies were also included with fathers, as long as the sample consisted of more mothers than fathers. Research commentary papers, expert opinions, dissertations, and case studies were excluded.

Information Sources and Search

The review was guided by Whittemore and Knaff's (2005) methodology, and it consisted of the following five stages: problem identification, literature search, data evaluation, data analysis, and presentation of findings. The studies were evaluated using the Johns Hopkins Research Evidence Appraisal Tool (Johns Hopkins Medicine, 2017). The first author developed search strategies in consultation with a school

librarian who is knowledgeable about developing and documenting search strategies and identified keywords using MeSH (Medical Subject Heading) terms. A comprehensive search was conducted using CINAHL®, PubMed®, Ovid MEDLINE®, ProQuest, and ScienceDirect. The keywords used were *human papillomavirus* or *papillomaviridae*, *immunization* or *vaccination*, *African Americans* or *Black*, *mothers* or *parents*, *perception*, and *psychology*. An ancestry search of the reference list of retrieved articles was manually conducted for additional articles.

Study Selection and Data Collection

The initial search yielded a total of 10,566 articles; among the articles, 3,628 were from PubMed, 3,233 from ScienceDirect, 3,075 from CINAHL, 588 from ProQuest, and 42 from Ovid MEDLINE. Three additional studies retrieved from ancestry reference lists of selected articles were included, and 14 duplicates were excluded. A total of 10,555 article titles and abstracts were reviewed to determine whether they met the inclusion criteria, and 10,417 articles were excluded because their foci did not match the necessary criteria. One hundred thirty-eight full-text articles were assessed for eligibility. After a closer examination of the articles, 110 publications were excluded because they were not related to HPV vaccination among African American mothers and their

daughters. Twenty-eight publications were screened for eligibility and were included for the final synthesis (see Figure 1). Studies were appraised and evaluated for quality and level of evidence using the Johns Hopkins Research Evidence Appraisal Tool (see Table 1).

Results

Characteristics of the Findings

The parents in this review were predominantly mothers aged 18–80 years and their daughters aged 9–26 years. The participants in three studies were only mothers (Cunningham-Erves et al., 2018; Strohl et al., 2015; Watkins et al., 2015). Two studies consisted of daughters only (Bynum et al., 2011; DiClemente et al., 2015), and four studies examined factors associated with both daughters and mothers in HPV vaccination uptake (Galbraith-Gyan et al., 2017; Hamlish et al., 2012; Hull et al., 2014; Joseph et al., 2016). Although seven publications examined parental beliefs and intention for HPV vaccination, the participants were predominantly mothers (Bryer, 2014; Fu et al., 2019; Galbraith-Gyan et al., 2018; Nan et al., 2016, 2019; Thompson et al., 2011, 2012). Participants in 12 studies had more than 20% African American females (Cipriano et al., 2018; Dixon et al., 2018; Fishman et al., 2014; Gelman et al., 2013; Gottlieb et al., 2009; Griffioen et al., 2012; Joseph et al., 2014; Nagpal et al., 2016; Perkins et al., 2010; Read et al., 2010; Rosenthal et al., 2008; Underwood et al., 2016).

Studies included were four randomized controlled trials (DiClemente et al., 2015; Dixon et al., 2018; Joseph et al., 2016; Underwood et al., 2016), 14 quantitative publications (Bryer, 2014; Bynum et al., 2011; Cipriano et al., 2018; Fishman et al., 2014; Fu et al., 2019; Gelman et al., 2013; Nagpal et al., 2016; Nan et al., 2016, 2019; Read et al., 2010; Rosenthal et al., 2008; Strohl et al., 2015; Thompson et al., 2011; Watkins et al., 2015), nine qualitative studies (Galbraith-Gyan et al., 2017, 2018; Gottlieb et al., 2009; Griffioen et al., 2012; Hamlish et al., 2012; Hull et al., 2014; Joseph et al., 2014; Perkins et al., 2010; Thompson et al., 2012), and one mixed study (Cunningham-Erves et al., 2018).

Factors Associated With HPV Vaccination of African American Mothers and Daughters

The factors identified in the review that affected HPV vaccination of African American mothers were summarized in five groups: approval and disapproval of HPV vaccination from physicians, family, and friends;

HPV knowledge; attitudes and beliefs about HPV vaccination; benefits of vaccination; and challenges of and barriers to HPV vaccination.

Approval and Disapproval of HPV Vaccination From Physicians, Family, and Friends

African American mothers and daughters' HPV vaccination decision was associated with approval or disapproval of healthcare providers, family, and friends. The majority of mothers trusted their healthcare providers to initiate the discussion of HPV vaccination (Hamlish et al., 2012). Mothers rely on HPV vaccination approval or disapproval from their daughters' pediatrician. Physician recommendation was independently associated with HPV vaccination (Gottlieb et al., 2009), and most participants verbalized the likelihood of accepting HPV vaccination if offered by a physician (Joseph et al., 2014). The vaccination status of adolescents was significantly affected by whether a pediatrician had recommended the vaccine ($p < 0.001$) (Thompson et al., 2011). The majority of mothers indicated the influence of physician recommendation on HPV vaccination of their daughters (Thompson et al., 2012).

Source of information should be vital in HPV vaccination uptake. Most mothers rely on HPV vaccination information from the healthcare provider. The maternal source of information about HPV vaccine was associated with attitude, and attitude was associated with vaccine uptake among adolescents (Underwood et al., 2016). Low trust in health information from other sources, such as government health agencies, was associated with less favorable parental attitudes and intentions for HPV vaccination; however, trust in health information from physicians or healthcare providers did not predict vaccine acceptance (Nan et al., 2019).

The perceived social pressure from friends, family, and healthcare providers was also a significant predictor of maternal HPV vaccination intentions ($p = 0.001$) (Cunningham-Erves et al., 2018). Mothers trusted family members' and friends' advice regarding HPV vaccination. Perceived high exposure of mothers to anti-HPV vaccine viewpoints and low exposure to pro-HPV vaccine viewpoints were associated with HPV vaccine refusal (Fu et al., 2019). Negative information from media affects HPV vaccination acceptance (Galbraith-Gyan et al., 2017). Factors associated with HPV vaccination uptake among mothers included interactions with physicians, friends, family members, and media reports/marketing (Griffioen et al., 2012).

HPV Knowledge

Knowledge about HPV and HPV vaccination was one of the factors associated with HPV vaccination uptake among African American mothers. A positive relationship existed between maternal attitude and knowledge about HPV (Cipriano et al., 2018). Most women with higher knowledge of HPV vaccination reported significantly higher HPV vaccination uptake (Bynum et al., 2011). Mothers with an increased understanding of HPV vaccinations were significantly ($p = 0.04$) more likely to complete the three-dose series earlier than those with low to moderate knowledge about HPV vaccinations (Nagpal et al., 2016). Mothers who received HPV vaccination educational interventions had a three-times-greater odd of receiving a dose of HPV vaccine ($p = 0.003$) (Dixon et al., 2018). Mothers reported limited information and lack of knowledge about the HPV vaccine as the reason for not initiating HPV vaccination (Gottlieb et al., 2009). Women who were younger, had a history of cancer, were less spiritual, and had higher education had better awareness of the HPV vaccine (Watkins et al., 2015). In addition, education level, household income, and having a child who had been offered HPV vaccination were associated with adequate knowledge about the HPV vaccine (Strohl et al., 2015).

However, in some studies, knowledge was not associated with adolescent vaccination (Fishman et al., 2014). In a study by Joseph et al. (2016), increase in knowledge scores postintervention was not associated with initiation and completion of vaccinations. Knowledge about the HPV vaccine alone did not necessarily lead to vaccinations (Thompson et al., 2011).

Attitudes and Beliefs About HPV Vaccination

Positive and negative attitudes influence mothers' HPV vaccination of their adolescent daughters. Positive attitudes toward HPV vaccination were related to cancer prevention benefit and protection against infectious disease (Galbraith-Gyan et al., 2017). There was a relationship between vaccine behavioral beliefs and HPV attitudes, and attitude was related to vaccination intention (Bryer, 2014). The intention to vaccinate daughters against HPV correlates with vaccine uptake (Perkins et al., 2010). The factors influencing mothers' decisions to vaccinate their daughters are beliefs and experiences (Griffioen et al., 2012). Mothers who believed that they were at risk for getting HPV infection and at risk for developing cervical cancer were more likely to get the HPV vaccine (DiClemente et al., 2015). The mother's opinion about getting HPV infection was a significant

predictor of maternal HPV vaccination intention ($p = 0.044$) (Cunningham-Erves et al., 2018). A study by Galbraith-Gyan et al. (2018) noted that both mothers and daughters perceived low risk of getting HPV infection, and mothers believed in their ability to decide on HPV vaccination for their daughters. Mothers with a high school diploma or lower and history of a sexually transmitted disease were more likely to accept HPV vaccination if their daughters were willing to receive three doses of HPV vaccination (Rosenthal et al., 2008).

Mothers with negative attitudes believed that the HPV vaccine was too new, their daughters were too young, and that the vaccine was not a one-size-fits-all intervention (Galbraith-Gyan et al., 2017). The mothers' reasons for not initiating the HPV vaccine included the following: the daughter was too young, the daughter was not yet sexually active, and the daughter had not been to a physician yet (Gottlieb et al., 2009). Mothers anticipated their daughters' sexual debut because of HPV vaccination and advocated for healthcare provider intervention to protect them (Hamlisch et al., 2012). There have been discussions regarding religious belief and HPV vaccination uptake. Studies by Galbraith-Gyan et al. (2017) and Thompson et al. (2012) noted that religious doctrine did not hinder vaccination decisions among African American mothers.

Benefits of Vaccination

Understanding the benefits of HPV vaccination is vital in the uptake of the vaccine. HPV vaccination education offered to undecided mothers and daughters should be focused on the vaccine as cancer prevention (Hull et al., 2014). In the study by Galbraith-Gyan et al. (2018), mothers and daughters perceived that the HPV vaccine was beneficial against genital warts and cervical cancer. Mothers with cervical dysplasia or cancer were strongly motivated to vaccinate their daughters (Hamlisch et al., 2012). Most mothers focused on the potential for cancer prevention when making the decision about HPV vaccination of their daughters (Perkins et al., 2010). A daughter's knowledge about HPV vaccination and its association with cervical cancer prevention was significantly related to her interest in accepting the HPV vaccine ($p < 0.001$) (Read et al., 2010). Mothers responded more positively to the benefit of HPV vaccination as cancer prevention (Nan et al., 2016). Limited knowledge about the connection of HPV to cancer reduces the medical benefits of the vaccine (Hamlisch et al., 2012).

Challenges of and Barriers to HPV Vaccination

Perceived barriers, such as limited knowledge, daughters' age, and mistrust of pharmaceutical companies and physicians, affect maternal HPV vaccination intention ($p < 0.001$) (Cunningham-Erves et al., 2018). Barriers among mothers and daughters included policies and politics related to HPV vaccination, unknown side effects, and the safety of the HPV vaccine (Galbraith-Gyan et al., 2018). Attitude and social environmental factors, such as cost of vaccination, lack of insurance, and fear of early sexual activity, affected HPV vaccination uptake among African American mothers (Thompson et al., 2012). There were significant ethical and racial disparities related to HPV vaccination; African American individuals are less likely to initiate HPV vaccination than White individuals ($p < 0.001$) (Gelman et al., 2013).

Discussion

The synthesis of the literature review findings was guided by the HBM to better understand the factors associated with HPV vaccination among African American mothers and their daughters. The HBM was developed to identify primary preventive behaviors related to vaccinations and explore the determinants of health-related behaviors pertaining to vaccinating a child (Rosenstock et al., 1988). Four HBM items were associated with four of the categories identified in the Results section, and they include the following: cues to action, perceived susceptibility, perceived benefit, and perceived barrier.

Cues to Action

Cues to action refer to the strategies to activate vaccination readiness through information from healthcare providers, media, friends, and relatives. Among the factors affecting HPV vaccination, the approval of vaccination from a healthcare provider was the most frequently identified factor in HPV vaccination intentions.

Healthcare provider recommendation was significantly associated with HPV vaccination intentions and uptake among African American mothers and daughters. Seven articles (Gottlieb et al., 2009; Hamlish et al., 2012; Joseph et al., 2014; Nan et al., 2019; Thompson et al., 2011, 2012; Underwood et al., 2016) explored the influence of a healthcare provider recommendation on HPV vaccination acceptance and uptake. A study by Hamlish et al. (2012) was performed to identify motivations and barriers to HPV vaccination and meaningful opportunity for vaccine promotion among African American mothers and

daughters. The findings noted that mothers trusted healthcare providers to initiate a discussion about HPV vaccination. There is an association between HPV vaccination and physicians' recommendations. Most mothers would accept HPV vaccination for their daughters if a healthcare provider recommended the vaccine (Gottlieb et al., 2009; Joseph et al., 2014; Thompson et al., 2012). The daughter's vaccination status was significantly associated with physician recommendation ($p < 0.001$) (Thompson et al., 2011). Distributing health information related to HPV vaccination in the pediatrician's office is essential because mothers' source of information about HPV was associated with attitude and vaccine uptake (Underwood et al., 2016). Although mothers trusted health information from physicians and healthcare providers, receiving HPV information does not predict vaccine acceptance (Nan et al., 2019). Future studies will be needed to identify reasons related to unfavorable attitudes toward information from government health agencies.

Maternal strategy to activate readiness for HPV vaccination depends on interaction with friends and relatives. Mothers consider the viewpoint of their friends and relatives as it relates to immunization. Being around other mothers who were against HPV vaccination was associated with vaccine refusal (Fu et al., 2019). In addition, negative information from the media (Galbraith-Gyan et al., 2017), physicians, friends, and family members, including exposure to media reports and marketing, affects HPV vaccination acceptance (Griffioen et al., 2012). Interventions to improve HPV vaccination should include strategies to connect pro-vaccination mothers with mothers who have not decided to vaccinate their adolescent daughters against HPV.

Perceived Susceptibility

The maternal decision for HPV vaccination was associated with perceived susceptibility, which means one's opinion about getting HPV infection. If mothers believe their daughters can get HPV infection and cancer, their HPV vaccination intention will be favorable. Most of the studies reviewed indicated that positive beliefs and attitudes toward HPV vaccination intentions increased vaccine acceptance, and negative attitudes increased vaccine refusal. Bryer (2014) examined the determinants of African American mothers' intentions to vaccinate their daughters against HPV. The findings indicated a significant relationship between HPV vaccine behavioral beliefs and HPV vaccine attitudes among African

American mothers ($r = 0.239$, $p < 0.001$); mothers' attitudes were significantly related to vaccine intentions ($r = 0.865$, $p < 0.001$). The intention to vaccinate daughters correlates with vaccine uptake (Perkins et al., 2010). Identifying factors influencing African American mothers' decisions to vaccinate is essential in developing strategies to promote HPV vaccination uptake. Mothers' decisions to vaccinate were based on their beliefs and experiences (Griffioen et al., 2012). The positive attitude toward HPV vaccination was related to the vaccine's benefit in preventing infections and cancer (Galbraith-Gyan et al., 2017). A study by Cunningham-Erves et al. (2018) to investigate psychological and cultural factors associated with mothers' intentions to vaccinate their daughters against HPV noted that mothers' perceived risk of developing HPV infections was a significant predictor of maternal HPV vaccination intentions ($p = 0.044$). There is a significant need for educational interventions that focus on presenting the HPV vaccine as a cancer prevention vaccination. Mothers who believe that they are at risk for getting HPV and developing cervical cancer are more likely to get the HPV vaccine (DiClemente et al., 2015).

Negative attitudes and beliefs affect both mothers' and daughters' HPV vaccination intentions. A study by Gottlieb et al. (2009) to assess HPV vaccination of adolescent girls living in areas with elevated cervical cancer rates identified the mothers' reason for not initiating HPV vaccination as the belief that the daughter was too young and not yet sexually active. Therefore, there is a need for educational interventions about HPV and HPV vaccination, focusing on the need for vaccinating daughters at an early age before they initiate sexual activity. Although mothers anticipate the sexual debut of their daughters because of HPV vaccination (Hamlisch et al., 2012), the decision about HPV vaccination was not related to their sexual values or daughters' sexual behavior (Rosenthal et al., 2008). Educational interventions to improve HPV vaccination uptake should include the effectiveness and safety of the vaccine 14 years after its inception.

To address maternal concerns about daughters' sexuality and age of vaccination, educational interventions for African American mothers should emphasize the point that there was no relationship between HPV vaccination and an increase in sexual activities (Madhivanan et al., 2016). Creating awareness of the importance of vaccinating children early, at age 9 years, to prevent HPV infection before they start exposure to sexual activities would be ideal (CDC, 2019) to address parental concerns about the

KNOWLEDGE TRANSLATION

- Maternal attitudes and beliefs, knowledge about human papillomavirus (HPV), and the approval or disapproval of HPV vaccination from healthcare providers, friends, and family affect maternal perceptions of HPV vaccination.
 - Mothers' attitudes and beliefs play a significant role in the decision to vaccinate their daughters.
 - Maternal knowledge of HPV vaccine as cancer prevention and the benefits of HPV vaccination in cancer prevention were strongly associated with vaccine intentions and uptake.
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age of vaccination. This is like suggesting vaccination of children against measles and chickenpox before exposure to the disease. Much has been said regarding the impact of religious belief on HPV vaccination (Thompson et al., 2012); however, African American mothers and daughters stated that religion would not interfere with their vaccination decisions (Galbraith-Gyan et al., 2017; Thompson et al., 2012).

Perceived Benefit

The benefits and challenges of HPV vaccination influence African American mothers' decisions on HPV vaccination. Based on the HBM concept, the perceived benefit of vaccination is one's belief of the vaccine's efficacy to reduce the risk of cancer, and the perceived barrier is one's opinion of the cost, access, transportation, and self-efficacy related to HPV vaccination. The HBM claims that if individuals believe they have the risk of getting an infection, they will more likely conclude that the benefits outweigh the barriers associated with behavior change to prevent the health issue (Rosenstock et al., 1988).

The review identified the relationship between the benefit of HPV vaccination as a cancer prevention vaccine and vaccination intent and uptake. Mothers with cervical dysplasia or cancer of the cervix were motivated to participate in cancer prevention activities for their children and had a strong commitment to vaccinate their daughters (Hamlisch et al., 2012). The benefit of the HPV vaccine was related to cancer prevention. In a study by Read et al. (2010), about 55.8% of daughters' knowledge of HPV vaccination and its association with cervical cancer prevention was significantly related to interest in accepting the HPV vaccine ($p < 0.001$); most mothers wanted the vaccine for its role in preventing cancer (Read et al., 2010; Perkins et al., 2010). HPV vaccination discussion with mothers who have not decided to accept

HPV vaccination should focus on cancer prevention (Hull et al., 2014). Intervention studies to increase HPV vaccination should include emphasis on the benefit of HPV vaccine in cancer prevention because limited knowledge of HPV's connection to cancer reduces the vaccine's medical benefits (Hamlisch et al., 2012).

Barriers identified by both mothers and daughters related to HPV vaccination include unknown side effects, safety, and effectiveness (Galbraith-Gyan et al., 2018). In a qualitative study by Thompson et al. (2012), using a structured interview to describe attitudes and social environmental factors that affect African American mothers' intent to vaccinate their daughters against HPV identified barriers to HPV vaccination as the cost of immunization, lack of insurance, and fear of early sexual activity. Immunization cost and lack of insurance can be addressed by referral of eligible mothers to the Vaccines for Children Program. This federally funded program provides vaccines at no cost to low-income families (CDC, 2019). Mothers identified limited knowledge, daughter's age, and mistrust of pharmaceutical companies and physicians as factors affecting maternal HPV vaccination intention ($p < 0.001$) (Cunningham-Erves et al., 2018). Another barrier to HPV vaccination among African American daughters was ethical and racial disparities. There were significant ethical and racial disparities in HPV vaccination among this population. African American individuals were less likely to initiate HPV vaccination than White individuals ($p < 0.001$) (Gelman et al., 2013).

Perceived Barrier

Among the factors affecting HPV vaccination among African American mothers is inadequate knowledge about HPV and HPV vaccination. Having sufficient knowledge about HPV vaccination was associated with HPV vaccination intentions and uptake. A study by Bynum et al. (2011) assessed factors associated with HPV vaccine uptake among young African American women. The findings reported significantly higher knowledge among women with HPV vaccine acceptance ($p < 0.05$). The completion of the HPV vaccination series was essential in protecting daughters against HPV infection and HPV-related cancers. Most mothers with higher knowledge of HPV vaccine are three times more likely to accept a dose of the HPV vaccine (Dixon et al., 2018) and significantly more likely to complete the three-dose series of HPV vaccination (Nagpal et al., 2016). HPV vaccine knowledge was associated with higher

education level, history of cancer, younger mothers (Watkins et al., 2015), higher household income, and having a child who has been offered HPV vaccination (Strohl et al., 2015). Mothers' attitude was associated with HPV vaccine knowledge. A study by Cipriano et al. (2018) to evaluate parental attitude toward general vaccination protocol and increase knowledge about the HPV vaccine indicated that a moderate positive relationship existed between parental attitude and knowledge about HPV ($r = 0.552$, $p < 0.001$).

There were some studies in which knowledge about HPV vaccination was not positively related to vaccination acceptance and uptake. A randomized controlled pilot study by Joseph et al. (2016) to examine facilitators of and barriers to HPV vaccine uptake among African American mothers and daughters reported that increased knowledge score postintervention was not significantly associated with the initiation and completion of the HPV vaccine. Having adequate knowledge about HPV and the HPV vaccine alone did not necessarily lead to HPV vaccination uptake among African American individuals (Thompson et al., 2011). In addition, previous knowledge of mothers and their daughters was not associated with HPV vaccination prediction (Fishman et al., 2014). More research studies are needed to examine the educational interventions and their relationship with intentions to vaccinate.

Implications for Practice

Understanding factors related to HPV vaccination decisions among African American mothers will inform healthcare providers and researchers of the best approach to improving vaccination rates among this high-risk population. In all of the studies reviewed, major factors associated with HPV vaccination were depicted. Attitudes and beliefs were among the significant factors associated with maternal decisions to vaccinate daughters. Addressing African American mothers' attitudes and beliefs toward HPV vaccination may be challenging. Nurses should play a significant role in providing HPV and HPV vaccination education that focuses on the HPV vaccine as a cancer prevention vaccination. Because mothers rely on healthcare provider information and recommendations, nurses should minimize missed opportunities in pediatric clinics and offer HPV vaccination information, including flyers, to mothers during clinic visits. In collaboration with other interprofessional teams, nurses can design and provide HPV vaccination interventions that can

further assess the implications of the factors identified in this review. They can also design strategies to improve HPV vaccination uptake among this high-risk population.

Limitations

The level of evidence and quality rating was limited because there were only four randomized controlled trials. The rest of the articles were qualitative and quantitative, with one mixed-methods study. Most studies had a small sample size and convenience samples, indicating a need for more clinical trials in this underrepresented population. There were a limited number of HPV-related studies designed for only African American mothers. Twelve studies were done with other racial groups, with more than 20% African American participants. These combinations may not depict the specific perception of factors affecting African American mothers regarding vaccinating their daughters. The findings were limited to articles obtained since the last search date; additional factors may have emerged from recent studies. The search was limited to HPV vaccination alone, and the factors affecting vaccination of adolescents, in general, may be missing.

Conclusion

The articles synthesized depict factors associated with HPV vaccination among African American mothers and daughters, including approval and disapproval of HPV vaccination from physicians, family, and friends; HPV knowledge; attitudes and beliefs about HPV vaccination; benefits of vaccination; and challenges of and barriers to HPV vaccination. Among the factors identified, attitudes and beliefs about HPV vaccination played a significant role in mothers' decision to vaccinate their daughters. Although mothers decide based on the approval of friends and relatives, healthcare provider recommendation was the most significant predictor for intention to vaccinate against HPV. Knowledge about the HPV vaccine and the benefit of HPV vaccination in cancer prevention was strongly associated with vaccine intentions and uptake. The factors identified in the review could inform interventions that may improve vaccination uptake and decrease barriers to HPV vaccination among this high-risk population. Future research is needed to design more quantitative and randomized controlled trials to depict more factors affecting African American mothers' perception of HPV vaccination. Strategies should be included to improve positive attitudes and

beliefs regarding HPV vaccination among this high-risk population.

Stella Ngozi Dike, MSN, RN, OCN®, is a nurse educator and doctoral student and **Wyona M. Freysteinson, PhD, MN**, is a professor, both in the Nelda C. Stark College of Nursing at Texas Woman's University in Houston. Dike can be reached at sdike1@twu.edu, with copy to ONFEditor@ons.org. (Submitted December 2020. Accepted February 24, 2021.)

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QUESTION GUIDE FOR A JOURNAL CLUB

Journal clubs can help to increase and translate findings to clinical practice, education, administration, and research. Use the following questions to start discussion at your next journal club meeting. Then, take time to recap the discussion and make plans to proceed with suggested strategies.

1. How have changes over time in the human papillomavirus (HPV) vaccine affected decision-making about vaccine uptake?
2. What role do nurses have in encouraging vaccine uptake? What are potential barriers and facilitators?
3. How are vaccines that affect potentially sexually transmitted conditions different than other childhood vaccines? What are the potential cultural implications of the HPV vaccine among diverse communities?

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