



Review

# Factors Influencing USA Women to Receive the Human Papillomavirus Vaccine: A Systematic Literature Review

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**Abstract:** Human papillomavirus (HPV) is the most prevalent sexually transmitted infection in the United States of America (USA). Cervical cancer is the most common HPV-related cancer, which leads to approximately 4000 deaths yearly in women. Despite the nationwide availability of the HPV vaccine, the coverage and series-completion rates have been historically low due to multiple barriers. Previous systematic literature reviews emphasize global quantitative studies regarding parents of pediatric populations. This study aimed to evaluate qualitative studies conducted in the USA to characterize the facilitators and barriers to HPV uptake among eligible women. Four databases, including PubMed/MEDLINE, Embase, Scopus, and the Cumulative Index for Nursing and Allied Health Literature (CINAHL), were utilized to search the literature for comprehensive qualitative studies from 2014 to 2023 with pre-selected inclusion criteria. This review was conducted in compliance with the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA). After detailed full-text extraction, 26 studies met the inclusion criteria, and two authors extracted the data. Three themes emerged from the data: (1) facilitators perceived by women to uptake the HPV vaccine, (2) barriers perceived by women to uptake the HPV vaccine, and (3) barriers and facilitators perceived by women to uptake the HPV vaccine. These themes highlighted different barriers and facilitators to HPV vaccines uptake, such as the lack of healthcare provider recommendation, cost, and safety concerns as barriers to receiving the vaccine. To change the norms towards HPV vaccine hesitancy, the healthcare team has a important opportunity to impart the knowledge and skills known to elicit behavior change.

**Keywords:** HPV; women; vaccine; qualitative studies; USA



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## 1. Introduction

HPV infection is primarily transmitted through sexual activity, and it has been estimated that over 80% of sexually active women could acquire the infection by 45 years of age in the absence of vaccination [1]. Ninety-one percent of HPV infections clear within two years and are often asymptomatic. Persistent infections greater than two years caused by approximately 15 different HPV types are at higher risk for lesions like cervical intraepithelial neoplasias (CIN) and squamous intraepithelial lesions (SIL). These persistent lesions can then become cancerous if undetected and untreated [2]. There is a delay between likely HPV infections and evidence of potentially pre-cancerous CIN/SIL lesions and subsequent cancer development, making it difficult for women to directly see the potential complications of HPV [3].

The most common cancers among women caused by HPV are oropharyngeal, anal, vulvar, and cervical cancer [4]. Historically, cervical cancer was among the most common causes of cancer death in the USA before 2000. Although preventative measures have decreased the incidence, it remains among the top 20 causes of cancer death in women in

the USA [5]. It is estimated that 350,000 women globally and 4000 in the USA die annually from cervical cancer, with untreated HPV being the cause of approximately 85–95% of cervical cancer cases [4,6–8]. HPV infections are also associated with a massive burden on healthcare costs. In 2008, the economic burden of preventing, diagnosing, and treating HPV-related diseases was estimated at \$1.9 billion in direct medical costs (adjusted to 2019 US dollars) [9].

Due to the frequent resolution of HPV symptoms and delayed presentation of severe sequelae, vaccination prior to infection is a common strategy to prevent infection and reduce severe outcomes [2,3]. Historically, there were two vaccines (a bivalent and a quadrivalent vaccine) approved through the US Food and Drug Administration (FDA) for HPV prevention. Since 2016, the only vaccine approved and available in the USA targets nine HPV types: 6, 11, 16, 18, 31, 33, 45, 52, and 58 [10–12]. The Sexually Transmitted Infections Guidelines recommend either a two- or three-dose vaccine series depending on age, with the first dose starting at age nine at the earliest. If females have the first dose before their 15th birthday, then a two-dose series is recommended. Otherwise, a three-dose series is needed [13].

In 2020, at least one dose of an HPV vaccine was administered in 75.1% of eligible adolescents in the USA [14]. Although vaccination rates have increased over the years, they are still below other commonly recommended adolescent and early adult vaccines [14]. A recent insurance claims-based analysis suggested that adherence to the three-dose series among those 9 to 26 years of age was 8.3%, with just over two-thirds of those adherent completing the recommended schedule [15]. Other data suggests that overall percentage of adults ages 18 to 26 has increased, with 22% receiving one or more doses in 2013 to 39% in 2018 [16].

Vaccine hesitancy continues to be a prevalent concern attributed to the following factors: lack of confidence in making decisions about vaccines, being provided limited information, as well as unpleasant healthcare provider encounters [17]. Primarily quantitative studies suggest that knowledge of the HPV vaccine is lower in adult women and potentially recommended less often by practitioners [18]. The researchers from the American Association for Cancer Research used data from the 2010–2019 National Immunization Survey (NIS)-Teen to identify a cohort of 16,383 adolescents who had not received any doses of the HPV vaccine. The results demonstrated a decrease in hesitancy towards the HPV vaccine, reducing from approximately 69% to 63% in 2019 [19].

Previous systematic literature reviews had a global focus on quantitative studies that assessed parents of pediatric populations. For example, Cella et al., conducted a systematic literature review that evaluated cross-sectional surveys that assessed factors influencing vaccine hesitancy. This study explored the notion of “vaccine hesitancy”, which described the increasing number of individuals who are reluctant to accept the offer of immunization that are starting to surface in the scientific community. However, this study did not solely focus on the HPV vaccine and included other vaccines for parents to consider for their children, including meningococcal and H. Influenza [20]. In another systematic literature review, Jarret C. et al., aimed to identify, characterize, and evaluate the potential efficacy of vaccination hesitancy response techniques that have been tested in various international contexts [21]. Overall, the study demonstrated that dialogue-based and multicomponent approaches were the most successful in the pediatric population. Finally, another systematic review conducted by Quadri-Sheriff et al. found that herd immunity is a significant advantage of childhood vaccination; however, it was unclear if parents’ decisions to vaccinate their children are influenced by the idea that immunization will help others [22].

Considering the suboptimal HPV vaccine uptake rates, the vast majority of hesitancy research among children and adolescents, and the updated Center for Disease Control and Prevention (CDC) HPV vaccine guideline recommendations for some adult women, a systematic literature review is needed to address factors influencing and hindering vaccine uptake in women [23]. Therefore, this systematic literature review aimed to evaluate

qualitative studies conducted in the USA to characterize the facilitators and barriers to HPV uptake among eligible women.

## 2. Methods

A systematic literature review was conducted based on the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) [24]. The objective was to identify, select, analyze, and summarize qualitative studies in the USA focused on women's perspectives and attitudes toward the HPV vaccine series.

### 2.1. Selection Criteria: Inclusion and Exclusion

A selection was performed of qualitative studies that complied with Standards for Reporting Qualitative Research (SPQR) [25]. Studies that used qualitative methodology were included. Since the FDA recommends the vaccine for ages 9–45, all other ages outside this range were excluded. Qualitative studies conducted with mothers and daughters were included. Mixed methods studies were also screened, but excluded if the qualitative data could not be extracted. Studies included were exclusive to the USA, and only in English. Gray literature, systematic literature reviews, and meta-analysis were excluded. Qualitative studies that were conducted with women and men were excluded.

### 2.2. Search Sources

A systematic search was undertaken by a trained librarian (HJ) in PubMed/MEDLINE, Embase, Scopus, and the Cumulative Index for Nursing and Allied Health Literature (CINAHL) for comprehensive qualitative studies from 2014–2023 with preselected inclusion criteria. Search strategy core concepts included human papillomavirus (HPV), vaccinations and patient perspectives. Limiters included qualitative studies between 2014–present. The full search strategy for PubMed can be found in the Appendix A.

The search was conducted in October of 2023, and 1696 unique records were imported to Covidence, an online tool for two-phase systematic review screening.

### 2.3. Study Selection

Study selection was performed independently by two researchers using Covidence. Discrepancies, controversies, and methodological concerns were resolved by a third researcher. A total of 1527 results were excluded in the title/abstract review phase, leaving 169 records to be reviewed in full-text. After the full-text review process, 35 records moved to data extraction, where two authors extracted the data and performed additional exclusions as necessary through a template generated by Covidence.

### 2.4. Data Collection and Extraction

The template used for data extraction captured authors, year of publication, qualitative methodology used (interview, focus groups, or both), participants demographics such as age, race, ethnicity, social economic status (if disclosed), insurance status (if disclosed), geographic location, vaccination status (if disclosed), emergent themes, and other pertinent information.

Nine additional records were excluded during data extraction. A total of 26 studies that complied with most of the SRQR quality recommendations for qualitative studies were included in this review [25]. The PRISMA diagram below in Figure 1, adapted from a template generated in Covidence, illustrates this process.

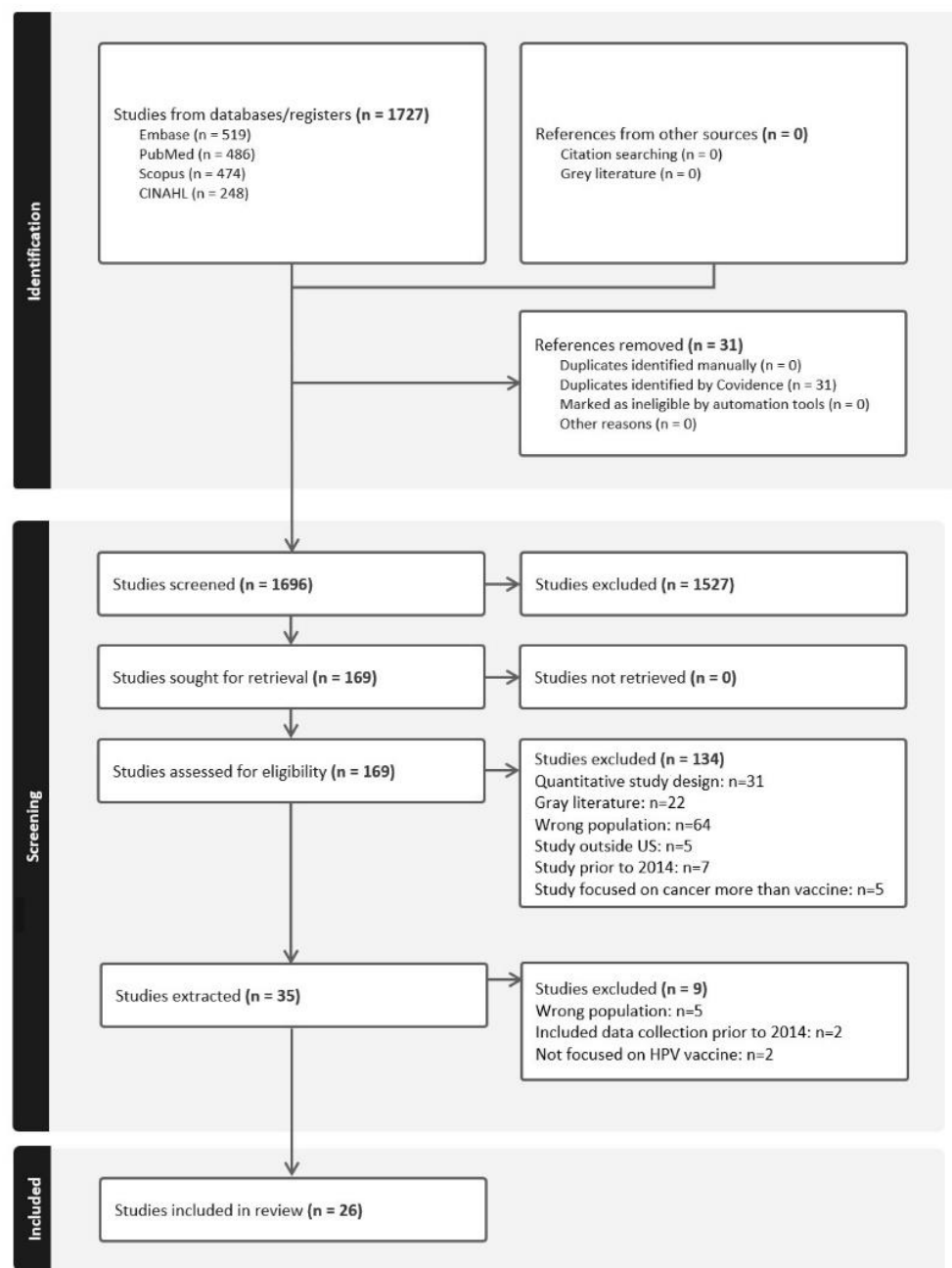


Figure 1. PRISMA diagram.

### 3. Results

Using the search strategy described above, this systematic literature review included a total of 26 studies that aimed to identify barriers and facilitators to HPV vaccine by women in the USA. A total of 24 studies included in this review are solely based on qualitative research, while 2 studies [26,27] used mixed methods by combining qualitative methods with different sizes of surveys. Out of 24 qualitative studies, 17 utilized interviews, 5 used focus groups only [28–32], and 2 [33,34] combined interview and focus groups together in data collection. Table 1 presents more information about the study design, geographic location, race/ethnicity of the participants, and whether the study depicts barriers, facilitators, or both.

Table 1. Study characteristics.

Primary Author Last Name, Publish Date	Study Design * Interview = (INT) * Focus Group = (FG) * Both: Interview and Focus Group = (BO) CERQual Assessment	Geographic Location	Ethnicity/Race/Age	Facilitators	Barriers	Facilitators and Barriers
1. Albright et al., 2017 [33]	BO/High	Southern	White Latina African American Parents of adolescents Ages 18–49		*	
2. Allen et al., 2019 [28]	FG/Moderate	Midwest	African American Parents of adolescents Ages 23–64			*
3. Avni-Singer et al., 2021 [35]	INT/Moderate	East Coast	Latina African American Caucasian Other Ages 15–26		*	
4. Bond et al., 2016 [26]	FG/Moderate	East Coast	Adolescents African American Latina Caucasian Ages 13–19			*
5. Btoush et al., 2019 [29]	FG/High	East Coast	Latina Mothers of adolescents Ages 21–55			*
6. Burke et al., 2015 [36]	INT/High	West Coast	Cambodia Mothers of adolescents Over 30 years old	*		
7. Colon-Lopez et al., 2017 [30]	FG/High	US territory (Puerto Rico)	Latina Puerto Rican Islanders Mothers: 42–54 years old Daughters: 16–24 years old		*	

Table 1. Cont.

Primary Author Last Name, Publish Date	Study Design * Interview = (INT) * Focus Group = (FG) * Both: Interview and Focus Group = (BO) CERQual Assessment	Geographic Location	Ethnicity/Race/Age	Facilitators	Barriers	Facilitators and Barriers
8. Fields et al., 2022 [37]	INT/High	East Coast	African American Latina Caucasian Mixed: Haitian; Hawaiian Ages 18–34		*	
9. Galbraith-Gyan et al., 2017 [38]	INT/High	East Coast	African American Mothers: mean age of 42.6 years old (SD 6.2) Daughters: 12–17 years old			*
10. Garcia et al., 2023 [39]	INT/High	West Coast	Latina (Mexico) Ages 18–26		*	
11. Hopfer et al., 2021 [40]	INT/High	West Coast	Vietnamese Latina Ages 18–24	*		*
12. Hopfer et al., 2017 [41]	INT/High	West Coast	Vietnamese Latina Ages 18–26	*		*
13. Hull et al., 2014 [34]	BO/Moderate	Southern	African American Mothers: 31–55 years old Daughters: 11–18 years old			*
14. Kim et al., 2017 [31]	FG/Moderate	East Coast	Korean American Ages 18–26		*	
15. Lechuga et al., 2020 [27]	INT/High	Southwest	Latina Mothers: age n/a Daughters: 9–15 years old		*	
16. Pierre-Victor et al., 2021 [42]	INT/Moderate	Southeast	Haitian American Age 17–26		*	

Table 1. Cont.

Primary Author Last Name, Publish Date	Study Design * Interview = (INT) * Focus Group = (FG) * Both: Interview and Focus Group = (BO) CERQual Assessment	Geographic Location	Ethnicity/Race/Age	Facilitators	Barriers	Facilitators and Barriers
17. Pierre-Victor et al., 2018 [43]	INT/Moderate	Southeast	Haitian American Age 17–26			
18. Pierre-Victor et al., 2017 [44]	INT/Moderate	Southeast	Haitian American Age 17–26	*		
19. Polonijo et al., 2022 [32]	FG/Moderate	West Coast	Latina Black Asian Ages 27–45		*	
20. Ramirez et al., 2014 [45]	INT/High	Northeastern	Latina Mothers and grandmothers ages 26–76		*	
21. Roncancio et al., 2017 [46]	INT/High	Southeastern	Latina Mothers: mean age of 41.94 years old (SD = 6.02)			*
22. Stephens et al., 2016 [47]	INT/High	Southeastern	White Latina Ages 18–24	*		
23. Stephens et al., 2014 [48]	INT/High	Southeastern	White Latina Ages 18–24	*		
24. Thompson et al., 2017 [49]	INT/High	Southeastern	White Latina Ages 18–26			*
25. Thompson et al., 2018 [50]	INT/High	Southeastern	White Latina Ages 18–26			*
26. Walker et al., 2020 [51]	INT/High	Midwest	White Black Pacific Islander Mothers ages 36–58		*	

\* denotes the presence of facilitators, barriers, or both.

The studies were conducted in all geographic regions of the USA and provide a heterogeneity in the population assessed. For example, some studies focused on capturing the experiences of Latina or African American women, while others focused on Asian women living in the USA.

All the studies reported racial or ethnic distribution. Several studies focused on ethnic minority groups, including Latina (n = 9) [27,29,30,39,45–48,50], Caribbean (n = 3) [42–44], Asian (n = 2) [31,36], and African Americans (n = 2) [34,38]. Four studies sampled multiple races, including Asian and Latina [40,41] and other races [37,51]. Six studies included the socioeconomic background of the participants, of whom the majority met the criteria for being placed in the low-income category [27,29,32,35,38,39]. Participants in 16 studies reported varying levels of insurance coverage, including private insurance, Medicaid, or no coverage at all.

Based on a thematic analysis of the 26 studies, this systematic literature review identified the following themes: (1) facilitators perceived by women to uptake the HPV vaccine; (2) barriers perceived by women to receiving the HPV vaccine; (3) barriers and facilitators perceived by women to uptake the HPV vaccine.

### *3.1. Theme 1: Facilitators Perceived by Women to Uptake the HPV Vaccine (4 Studies)*

The four studies focusing on women's perceptions to uptake the HPV vaccine describe the way women decide to receive the vaccine [36,44,47,48]. In one of these two studies authored by the same researchers, Stephens et al. reported that factors such as marketing via television commercials and discussions with mothers played an important and favorable role in deciding to be vaccinated. Additionally, this cohort was seeking HPV vaccine information from internet sites, close family members, but healthcare providers' communications were preferred [48]. Stephens et al. pointed out that healthcare providers played a crucial role in managing concerns and promoting vaccination. Convenience emerged as a key facilitator, while media messages minimally influenced the sampled women's decisions [47].

Pierre-Victor et al. (Role of healthcare provider) revealed that the communication style used by healthcare providers to influence HPV uptake is essential. Adopting a message system that focused on the vaccine's benefits as a preventive measure rather than the mode of transmission was successful [44]. While prior research demonstrated a limited awareness of the HPV vaccine among Cambodian women, the overarching goal of Burke's study was to collect data for the development of culturally suitable interventions [36]. Interviews explored the dynamics between mothers and daughters, understanding of health matters, interactions with the healthcare system, and apprehensions related to vaccination, explicitly focusing on concerns about the HPV vaccine. The narrative analysis showed Cambodian mothers' eagerness for protection against cervical cancer through vaccines [36].

### *3.2. Theme 2: Barriers Perceived by Women to Uptake the HPV Vaccine (13 Studies Focused Only on Barriers)*

Three studies focused specifically on insufficient knowledge among women due to misleading information dissemination on social and online media and the lack of detailed information about the HPV vaccine provided by the healthcare provider, which are major obstacles hindering uptake of the HPV vaccine [35,37,51]. For example, the findings of Walker et al., 2020 highlighted that social media and misleading messages were the main contributors leading to hesitancy. Fields et al. investigated the obstacles to HPV uptake among heterogeneous unvaccinated women residing on the East Coast. The study revealed additional barriers, including the unlikelihood of acquiring the HPV and ultimately not having a maternal support system to hinder their decision to seek the HPV vaccine. Avni-Singer's study investigated the barriers to the HPV vaccine in a heterogeneous cohort consisting of post-partum women. The study found that insufficient awareness and ambiguous knowledge hindered vaccine uptake [35].



The issue of sex as a taboo discussion with parents is discussed in seven studies, and the main conclusion of these articles is the importance of having open discussions regarding sexuality [27,30,32,33,42,45]. In the study by Polonijo et al., stigma regarding HPV was attributed to the mode of transmission of the HPV and was considered a significant barrier to receiving the vaccine. Furthermore, this study also reported that adolescent women who receive the HPV vaccine are believed to be more likely to engage in sexual activities [32]. Victor-Pierre. et al. also described how conversations about sexual life with parents are challenging. According to the women's narratives, the parents interpreted the conversations about the HPV vaccine as the start of their sexual life [42]. Lechuga's study provides the perspectives of Latina mothers of unvaccinated daughters regarding the obstacles to the vaccine uptake and found the difficulty of discussions about sexuality inevitably contributed to not receiving the HPV vaccine [27]. In another study also conducted with Latina women, Colon-Lopez V. et al., uncovered the fact that the limited and uncomfortable discussions between mothers and daughters regarding sexual activity, and implicitly the HPV vaccine, hindered the vaccine uptake. The authors also highlighted the daughters being ashamed to initiate a conversation on this taboo subject [30]. Albright's study points out that parents with Spanish as their first language were against initiation of the HPV vaccine and were under the impression that sexual activity increased [33].

Several studies attributed the safety concerns of the vaccine as a significant barrier to receiving the HPV vaccine [31–33,39,43]. Although previous clinical studies demonstrated no risks associated with the side effects of receiving the HPV vaccine, Polonijo et al. reported that women in this cohort were concerned about the safety of this vaccine, which stems from misconceptions. Victor-Pierre et al. [43] demonstrated that the fear of developing side effects was the main obstacle perceived by this group to receiving the HPV vaccine. In Kim's study, it was highlighted that some women were concerned about the pain after receiving the HPV vaccine, which hindered the vaccine uptake [31]. Garcia's analysis of vaccinated and unvaccinated Latina women residing in California indicated obstacles such as fear of the pain at the site of injection and concerns about the side effects [39].

Lack of the healthcare provider recommendation was highlighted by a number of studies as a significant obstacle to receive the HPV vaccine [33,43]. Victor-Pierre et al. [43] reported that the lack of a healthcare provider recommendation was the main obstacle perceived by this group to receiving the HPV vaccine. Albright's analysis of parents with Spanish as their first language indicated that they were not supported by their healthcare providers in terms of advocating for the HPV vaccine initiation as well as emphasizing the importance of completing the series [33].

One study mentioned motherhood's role as an obstacle hindering vaccine uptake. Garcia et al. [39] pointed out how motherhood is primarily shaped by time inequality, where women dedicate most of their time to taking care of their children rather than focusing on themselves and their various healthcare needs.

### *3.3. Theme 3: Barriers and Facilitators Perceived by Women to Uptake the HPV Vaccine (9 Studies)*

Nine studies discussed both the barriers that hinder HPV vaccine uptake and the facilitators that ease it.

Several studies presented below focused on facilitators to enhance the vaccine uptake. For example, Thompson et al. reported logistics and convenience including time-off of and distance to work, easy scheduling, vaccine-only appointments, and office efficiency as being the main facilitators for vaccination [50]. Another study also found that factors such as vaccine affordability, transportation, and ease of making appointments as the main contributor towards the vaccine uptake in women [46]. Furthermore, this study also highlighted another facilitator as the role played by mothers in being a champion for receiving the entire vaccine series [46].

A number of studies presented various obstacles, including the lack of healthcare provider recommendations, cost, insurance, and safety of the HPV vaccine, and suggested different strategies to facilitate them. The study by Hull et al. found that the cost and lack

of provider recommendations hinder the decision to receive the vaccine. The authors also revealed that the mothers' and daughters' concerns about the side effects and safety of the vaccine were other important obstacles. Some mothers highlighted that receiving the HPV vaccine could contribute to their daughter's promiscuity. Furthermore, the study participants suggested promoting strategies for the vaccine through various channels to enhance vaccine uptake [34]. Obstacles such as lack of healthcare provider recommendations and lack of support from influential people were also highlighted by Thompson et al. [50]. On the contrary, in Galbraith-Gyan et al.'s analysis, women identified the healthcare provider's recommendation as a motivator to seek the vaccine [38]. Furthermore, Allen et al. reported that the healthcare provider's recommendation and having a nurturing family unit, especially the spouse, were the main facilitators for receiving the HPV vaccine [28].

Btoush et al. conducted focus groups with Latina mothers who had heterogeneous origins from various Hispanic countries. In addition to the side effects and safety of the HPV vaccine being reported as obstacles, this study identified the limited information in Spanish as a significant barrier. Another barrier that emerged in the analysis was the confusion between HIV and HPV and its mode of transmission. The authors described two main facilitators, such as the healthcare provider's recommendation and their strong desire to protect their children from acquiring various forms of cancers [29].

Thompson et al. showed that the low cost for vaccination and insurance coverage were contributors that influenced the decision making in this population. The study also highlighted obstacles such as lack of healthcare provider recommendation and lack of support from influential people [50].

The focus groups' analysis from a mixed-methods study identified the fear of developing significant side effects, including sterility and paralysis, as one of the primary reasons for not receiving the HPV vaccine [26]. Contrary to the previous studies that reported pain as an obstacle to receiving the vaccine, in this study, pain was not a barrier. The desire to be protected against various forms of cancer was cited by many adolescents in this study as the main reason to receive the vaccine [26].

Two studies included in this theme are based on interviews with a heterogenic ethnic cohort of Latina and Vietnamese women residing in California authored by the same group of researchers [40,41]. Hopfer et al. identified a significant reason for this group to receive the HPV vaccine, which was the provider's recommendation. The study explains how discussions about sexual health represent a taboo subject in these communities, resulting in a significant barrier to receiving the vaccine. According to women's narratives, other obstacles mentioned were the level of trust in the partner's HPV status and family silence. The 2021 publication illustrated that this cohort uses multiple resources, including virtual, social media, healthcare classes, and healthcare providers. Facilitators, including credibility, convenience, and access to online information, favor the uptake of the HPV vaccine [40]. At the same time, obstacles that hindered receiving the vaccine were interpersonal relationships and providing too many details about the vaccine [40].

#### 4. Discussion

The overall aim of this systematic review of qualitative studies regarding HPV vaccine uptake in women in the USA was to provide an understanding of the facilitators and barriers they experience. There were three themes identified from the review, including (1) facilitators perceived by women to uptake the HPV vaccine, (2) barriers perceived by women to uptake the HPV vaccine, and (3) barriers and facilitators perceived by women to uptake the HPV vaccine.

Multiple barriers contribute to vaccine hesitancy, which include concerns about the cost of the vaccine, a lack of perceived benefit, side-effects, and lack of healthcare provider recommendation. However, there are also multiple facilitators for HPV vaccine uptake, such as marketing via television commercials [48] or convenience and ease of obtaining the vaccine [47]. Another facilitator example given by Pierre-Victor D. et al. [44] states that adopting a message system that focuses on the HPV vaccine's benefits as a preventive

measure, rather than the mode of transmission, was successful. The insights from this systematic literature review highlight factors influencing and hindering vaccine uptake to all eligible women that are important for health care practice. A systematic review that analyzed vaccine hesitancy among women in the South-East Asian and Western Pacific regions from low to middle-income countries found additional barriers to vaccination rates. The fear of negative perceptions from the women's families, friends, and healthcare providers were important factors in the decision-making process regarding the uptake of the HPV vaccine. The study concluded there is a need to develop programs to promote the vaccine and the benefits for women receiving the vaccine [52].

A common theme among facilitators identified was the role that healthcare providers play in HPV vaccine uptake in women. Several studies highlighted the importance of the patient being educated by the healthcare provider or another trusted individual, such as a family member, about the efficacy of the vaccine [48]. This facilitator is not unique to the USA, as another systematic literature review analyzed the obstacles faced by European countries in receiving the HPV vaccination and included lack of confidence in the healthcare provider. Karafillakis et. al., 2019, concluded that there are multiple ways to tackle this issue, and some strategies could focus on providing adequate information to patients regarding safety and efficacy, which would lead to regaining trust in the healthcare system [53].

As healthcare professionals, pharmacists are considered the most accessible healthcare provider at the frontlines of vaccine administration. Pharmacists are also the drug experts, which presents a key opportunity for the pharmacist to engage their patients about the HPV vaccine. Of note, some states are proposing to permit pharmacists to gain independent prescriptive authority for vaccines, which could improve the accessibility of vaccines to the public [54]. This would address another barrier mentioned, which included logistical challenges in obtaining the vaccine [50]. If pharmacists have prescriptive authority to prescribe and administer the vaccine, the patient could bypass their prescriber and visit the pharmacy to obtain the vaccine. It is evident that healthcare providers play a key role, if not the most important role, in determining whether a patient will accept or decline an HPV vaccine. Therefore, healthcare providers, particularly pharmacists, must appreciate the impact they have on their patients at the pharmacy as well as members of the community about the importance of receiving evidence-based vaccines.

Another facilitator to improve HPV vaccine uptake included television commercials advertising the vaccine. Interestingly, the USA and New Zealand remain the only two industrialized countries that permit direct-to-consumer marketing of prescription drug products. Prior research shows that prescription drugs with lower added clinical benefit ratings were associated with a drug manufacturer spending more money on direct-to-consumer advertising [55]. However, studies in our results indicated that direct-to-consumer marketing may increase the uptake of HPV vaccine in women [55]. Recent television commercials are specifically targeting the young adult population for the HPV vaccine [56]. This dichotomy introduces a concern for how to best equip this population with the knowledge required to determine if the product advertisements are appropriate for them to conclude if the HPV vaccine is necessary. The FDA has published drug ad questions for consumers to consider when exposed to these commercials [57]. The FDA recommends patients ask their provider about the products they have heard about on the television to enhance their understanding of the vaccine itself and its role in the management of disease prevention.

As there are various modes of advertising, it is important to realize not all models are equally effective in delivering the message about the HPV vaccine. While our systematic literature review found that television advertisements were a facilitator to HPV vaccine uptake, other forms of media, such as social media, that are not necessarily coming from knowledgeable healthcare-related personnel, were highlighted as barriers to receiving the HPV vaccine. For example, one study highlighted how messages on social media may be misleading, which could lead to greater vaccine hesitancy [51]. Additionally, it is an interesting finding that some modes of messaging are more effective than others. This is an important takeaway for healthcare practitioners when choosing to provide health

information on different platforms, such as Facebook, Instagram, TikTok, or others. These findings suggest that healthcare providers' perspectives can be used to deliver evidence-based messaging to overcome barriers. Unfortunately, more popular modes of social media are currently being utilized to spread misinformation, which may be less effective at spreading appropriate information.

Finally, a lack of open discussions surrounding the HPV vaccine is another barrier that must be overcome. While different forms of advertising, such as television or social media, may spark conversation, they may not make a significant impact. For example, one study explains how discussions about sexual health represent a taboo subject in these communities, resulting in a significant barrier to receiving the vaccine [40]. There is an opportunity for family members, particularly mothers, as well as healthcare providers, to initiate and champion these conversations to ensure adolescent women receive the entire series of the vaccine [46]. This conversation may be easier to approach in some cultures compared to others, but the HPV vaccine is equally effective. For example, one study emphasized that daughters in some cultures may be ashamed to initiate conversation on this taboo subject because of its proximity to discussing sexual activity [30]. Therefore, additional training may be necessary to improve healthcare providers' ability to effectively counsel patients and their family members on the importance of these preventive measures.

### *Limitations*

To our knowledge, this is the first systematic review that has focused on qualitative studies conducted in women in the USA. However, there are some limitations that have to be taken into account. Since this systematic literature review included only studies conducted in the USA, the generalizability of results outside of the USA may be limited. Additionally, this review included only English-language studies, so literature in other languages would have been missed. The "grey literature" (non-peer-reviewed reports, conference contributions, discussion papers, etc.) have been excluded. Finally, certain searches might have missed studies because they had not been correctly indexed, as well as published studies that still needed to be indexed in at least one of the databases at the time of the search.

## **5. Conclusions**

This systematic literature review highlights qualitative studies focused on the factors influencing women in the USA and their decision to receive the HPV vaccine. The study identified three main themes that described both barriers and facilitators to uptake, such as the lack of healthcare provider recommendation, cost, and safety concerns as barriers to receiving the vaccine. Healthcare providers could benefit from a better understanding of existing barriers in order to facilitate more effective conversations with women about the possibility of receiving the HPV vaccine. Also, advertising media campaigns could be used to provide this population with information to prevent the transmission of HPV and to increase motivation among women to initiate the vaccine. To change the norms towards vaccine hesitancy and improve HPV vaccine uptake, the healthcare team must understand their key role in the decision to receive the vaccine and be diligent in communicating their knowledge to elicit behavior change.

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**Conflicts of Interest:** The authors declare that they have no conflicts of interest.

### Appendix A. PubMed/MEDLINE Search Strategy

(((((“Papillomavirus Infections”[Mesh]) OR “Papillomaviridae”[Mesh]) OR “Uterine Cervical Neoplasms”[Mesh]) OR “Alphapapillomavirus”[Mesh]) OR (human papilloma virus OR HPV OR papillomavirus infections OR papillomaviridae OR uterine cervical neoplasms OR cervical cancer OR alphapapillomavirus))

AND

(((((“Papillomavirus Vaccines”[Mesh]) OR “Immunization Programs”[Mesh]) OR (“Vaccination”[Mesh] OR “Vaccination Refusal”[Mesh] OR “Vaccination Hesitancy”[Mesh] OR “Anti-Vaccination Movement”[Mesh])) OR (papillomavirus vaccines OR immunization programs OR (vaccination AND (refusal OR hesitancy OR anti)) OR anti-vaccination movement OR anti-vax OR antivax OR HPV vaccine OR gardasil OR cervarix)))

AND

(((((“Health Knowledge, Attitudes, Practice”[Mesh]) OR “Patient Acceptance of Health Care”[Mesh]) OR ((patient OR parent OR mother OR daughter OR female OR woman) AND (parent OR knowledge OR attitude OR practice OR acceptance OR perspective OR stigma OR communication OR education)))

AND

(((((“Qualitative Research”[Mesh]) OR (“Interview” [Publication Type] OR “Interviews as Topic”[Mesh])) OR “Focus Groups”[Mesh]) OR (qualitative OR interview\* OR focus group\*)) AND

(2009:2023[pdat])

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