

Health beliefs and Responses of parents towards Human papillomavirus vaccination in the Middle East: a qualitative systematic review

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Health beliefs and Responses of parents towards Human papillomavirus vaccination in the Middle East: a qualitative systematic review

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Abstract

Background: Human papillomavirus (HPV) is the most frequent sexually transmitted disease in women and the major cause of cervical cancer (CC). Several countries have significantly reduced CC deaths and rates by offering cervical screening and HPV vaccination programs. The number of CC screening and HPV vaccine programs in around 100 countries around the world has led to dramatic reductions in incidence and death rates for the disease. HPV vaccination could prevent up to 70% of HPV-related cervical cancer and 90% of genital warts. HPV vaccination plays an influential role in decreasing CC worldwide. Thus, it is essential to formulate a suitable vaccination program for each nation so that they can combat the life-threatening conditions caused by HPV infection.

Objective: This study aimed to systematically synthesize the attitudes and health beliefs of Middle Eastern (ME) parents regarding HPV vaccination, and to examine parents' uptake of HPV vaccination in ME nations, as well as assess their children's HPV vaccine uptake.

Methods: This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Since the first HPV vaccination was approved in 2006, PubMed/MEDLINE, Web of Science, CINAHL, and Google Scholar were searched for papers between January 1, 2006, and May 2025.

Results: Out of the 33 included studies, 32 were quantitative observational (cross-sectional), while one was a qualitative study. The findings were synthesised according to the six components of the health belief model: perceived susceptibility and severity regarding HPV and vaccination, perceived barriers to HPV vaccination uptake, perceived benefits of HPV vaccination, self-efficacy as a measure of HPV vaccination, concerns surrounding HPV vaccination, modifying variables influencing HPV uptake, and parental attitudes towards HPV vaccination uptake. Parents expressed apprehension about their limited knowledge of the virus and vaccine, citing obstacles such as a shortage of healthcare providers, safety concerns, cost, and vaccine availability.

Conclusions: The knowledge of HPV and its possible carcinogenic consequences in Middle Eastern nations was insufficient. Strategies to improve HPV vaccination uptake included mass medical campaigns, healthcare professional involvement, educational interventions, health insurance coverage, and recommendations from the Ministry of Health. Self-efficacy played a crucial role in enhancing vaccine uptake.

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Original Manuscript

Health beliefs and Responses of parents towards Human papillomavirus vaccination in the Middle East: a qualitative systematic review

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ABSTRACT

Background: Human papillomavirus (HPV) is the most frequent sexually transmitted disease in women and the major cause of cervical cancer (CC). Several countries have significantly reduced CC deaths and rates by offering cervical screening and HPV vaccination programs. The number of CC screening and HPV vaccine programs in around 100 countries around the world has led to dramatic reductions in incidence and death rates for the disease. HPV vaccination could prevent up to 70% of HPV-related cervical cancer and 90% of genital warts. HPV vaccination plays an influential role in decreasing CC worldwide. Thus, it is essential to formulate a suitable vaccination program for each nation so that they can combat the life-threatening conditions caused by HPV infection.

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Conclusions: The knowledge of HPV and its possible carcinogenic consequences in Middle Eastern nations was insufficient. Strategies to improve HPV vaccination uptake included mass medical campaigns, healthcare professional involvement, educational interventions, health insurance coverage, and recommendations from the Ministry of Health. Self-efficacy played a crucial role in enhancing vaccine uptake.

keywords: Middle Eastern; Human papillomavirus; Human papillomavirus vaccine- Health Belief Model; Parents

INTRODUCTION

The prevalence of sexually transmitted diseases (STDs) is on the rise in Middle Eastern (ME) countries, which had been previously reported to be low compared to the rest of the world [1]. This rise is due to rapid life changes due to globalization and changes in sexual behavior among the younger generation in ME [2]. Human papillomavirus (HPV) is the most common STD in women

worldwide and the leading cause of cervical cancer (CC), anogenital cancer in both men and women. In some ME countries, such as Oman and the United Arab Emirates (UAE), CC is the second most common cancer among women [3].

HPV vaccines are now available and can potentially reduce the incidence of CC and other anogenital cancers. Only two ME countries, including the UAE and Saudi Arabia, have effectively introduced the HPV vaccine through a national program [4]. However, most studies have indicated that people mainly favor vaccines [5]. Some studies show a positive attitude towards vaccination due to fear of HPV, CC, and genital warts, but also concerns about encouraging sexual promiscuity among children. Only 20 countries included boys in their HPV immunization programs in 2017 [6]. Parents play a crucial role in preventing HPV in their children through their decision-making process. However, low knowledge and understanding of HPV and the vaccine among parents and vaccinated girls have been reported, and decisions are often made without sufficient awareness of relevant issues.

A recent systematic review found that immigrant parents in Australia have generally low knowledge, attitudes, and perceptions about HPV-related diseases and vaccines, and have negative attitudes toward HPV vaccines [7]. However, no systematic reviews have been conducted on this topic in ME countries, despite some evidence of research studies in this field. Despite a preliminary search of the Cochrane Database of Systematic Reviews, PROSPERO (International Prospective Register of Systematic Reviews), Joanna Briggs Institute (JBI) Evidence Synthesis, and Campbell Systematic Reviews, no current systematic reviews or scoping reviews were found.

This study aimed to systematically synthesize parents' attitudes and health beliefs regarding HPV vaccination in ME countries. Its objectives are to explore factors influencing parents' uptake, determine their level of uptake in ME countries, and choose the parents' level of uptake of their children's HPV vaccination.

The review questions were as follows:

- What are the factors of controversy for parents (attitude, knowledge, perceptions, and health beliefs) regarding the HPV vaccines in the ME countries?
- Can the health belief model (HBM) explain or predict the acceptance level of HPV vaccination in ME countries?
- How are the government policies in the ME countries involved in advocating for the acceptance of HPV vaccines?

METHODS

The systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [8]. The protocol for this systematic review was registered with the worldwide prospective registry for systematic reviews (PROSPERO) with the Registration number CRD42025645551.

Search Strategy and Critical Appraisal

Studies selected for retrieval were assessed by two independent reviewers (AA as the primary reviewer) for methodological validity before inclusion, using the Critical Appraisal Skills Programme (CASP) [9]. This procedure revealed minor discrepancies, resolved by consensus through discussions among the research group (CJ as an arbitrator). Four electronic databases, i.e., PubMed/MEDLINE, Web of Science, CINAHL, and Google Scholar, were systematically searched for the identification of the studies between January 1, 2006, and June 2024, because the first licensed HPV vaccine was in 2006 [10]. The complete search strategy and keywords are provided in Table 1.

Inclusion criteria

The inclusion criteria adopted for this systematic review are the PICO (Population, Phenomenon of

Interest, Context). The review considered the population who are parents of children below 18, HPV carriers, and CC patients/other gynecological cancers in the ME countries. The phenomena of interest were parents' knowledge, perception, and health beliefs regarding their children's HPV vaccination. Furthermore, the context of this review involved the studies conducted in the ME countries. The ME includes 18 countries: Bahrain, Cyprus, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, the Syrian Arab Republic, Turkey, the United Arab Emirates, and Yemen. The systematic review included peer-reviewed studies published in English. Quantitative observational studies and qualitative studies were included in the current review.

Data extraction and synthesis of results

Data from the final list of included studies were extracted in a data extraction form developed by the authors by using a standardized approach in a tabular form consisting of the following fields: author name, types of studies, publication year, journal, country; the study aims and objectives, methods and study design, sample size, and variables related to parents' uptake of HPV vaccination.

We used inductive (thematic analysis) and deductive approaches to the HBM in the general synthesis [11]. We evaluated and critically analyzed parents' knowledge, perceptions, attitudes, and health beliefs regarding their daughters' HPV vaccination to determine the most common themes and categories. The themes were then generated through the theoretical framework, i.e., HBM, and theme extraction analyses were regulated on a semantic level. The explicit content of the included studies was considered without making any assumptions about the latent underpinnings of the data.

Quality appraisal

None of the studies were excluded from this systematic review based on the CASP quality appraisal tool [12]. The tool did not provide a way to score and categorize the studies objectively but assesses the quality of the included studies in three broad areas: validity of the study results, results from outcomes, and whether the study results are helpful locally or not. All studies reported clearly

focused aims and objectives. Similarly, all studies described the recruitment of participants, and there were minimal chances of reporting bias in all studies except one study [13]. A qualitative study, however, the studies did not describe reflexivity in their study, so it was unclear if there was any bias in reporting¹³. Similarly, all studies used acceptable outcome measures; however, due to their qualitative nature, they did not report any specific outcome measures [13]. Whether confounding factors were taken into consideration or not was unclear in 6 studies [14-19]. Sample size justifications were not provided in 10 studies [18,20-28]. The precision and accuracy of findings were evident in all included studies. Similarly, all studies reported implications. Generalizability was questionable in 10 studies [13,15,16,20,21,23-25,28-29]. Table 2

RESULTS

Study selection

The final search of the selected databases was conducted in June 2024, and 330 studies were obtained after the duplicates were removed. A total of 249 studies were excluded based on a screening process based on the articles' titles, abstracts, and keywords. The remaining 81 studies were subjected to full-text screening. This process resulted in 48 articles being excluded and 33 articles being included. (Figure 1)

Included Study Characteristics

Of the 33 included studies, 32 were quantitative observational (cross-sectional) studies, while only one was a qualitative study [13]. The included studies were published between 2012 and 2024. The majority of the studies were published in Saudi Arabia (n = 13) [10,13,14,17,20,22,24,29-33] followed by Turkey (n= 5) [16,27,34-36] and Lebanon (n=3) [15,19,37]. All included studies assessed parents' knowledge, attitudes, and perceptions regarding HPV and its vaccination. The sample size varied across the studies. Of the 32 cross-sectional studies, 5 used online questionnaires

for data collection. [22,29,30,33,37] , while the remaining 27 studies used self-administered questionnaires for data collection. The qualitative research conducted included focus group discussions and semi-structured individual interviews for data collection [13]. Table 3

Study Findings

The results were synthesized according to the six components of HBM [38]. Additionally, some other factors emerged from the included studies, which were reported as “Other factors.”

Perceived Susceptibility to HPV and Vaccination Measure

As one of the key HBM constructs, perceived explained the particular health behavior changes based on risk probabilities. The researcher established themes that explored perceived susceptibility from studies. This HBM construct was examined in 13 of the included articles, using different themes as discussed:

HPV as a risk factor for other health conditions

This was a widely discussed theme in most of the included studies. Gender significantly impacted HPV infection rates, increasing susceptibility to other comorbidities like cervical cancer³⁹. Parents often worry their children are not immune to HPV risks and will indeed be infected throughout their life course, [28], but studies show low perceived risks. Parents who perceive HPV as a risk factor prioritized vaccination for their children [17]. While those who did not were less concerned about HPV [25], low-risk susceptibility participants assume their children were not engaged in premarital sex [19]. Lack of faith in vaccines and trust in their spouses remained free from STDs [40]. CC's untreatable nature also influenced perceived susceptibility to HPV vaccination, as respondents said no reason to vaccinate or conduct screening tests because they believed that it is incurable [13].

Vaccination education and knowledge

Research indicated a lack of knowledge about HPV and its vaccination among parents, with only a

few having a basic understanding. Hence, could not understand the risk of the disease to their children [20,36]. This suggests that highly knowledgeable parents with higher education attainment only perceive high susceptibility risks [31]. Insufficient knowledge also hindered HPV vaccination uptake in 21.1% of respondents. Perceived susceptibility increased with age and economic status, with factors such as education attainment, age, social role, employment status, and income levels also playing a role [14,17].

Perceived severity of HPV and vaccination measures

Perceived severity as an HBM construct explained the belief in changing health behavior based on the seriousness of the consequences or risks. A disease's perceived severity can significantly impact a person's health and influence their engagement in preventive or curative health behaviors. The researcher established perceived severity by including 13 studies.

knowledge and income levels

As the main themes, Studies have shown that most participants had limited knowledge about HPV, and only a few knowledgeable parents were concerned about the severity of HPV infection in their children and complications. The study found that only a few parents had adequate knowledge of HPV and were concerned about its seriousness in their children [14,15]. Parents who understand the association between HPV and cancer are more likely to accept vaccination, which had a higher probability (1.794 times higher) [23,30]. Factors such as income levels, nationality, education attainment levels, and occupation or employment status, i.e., healthcare workers, also strongly predicted HPV severity and infection awareness among parents [14,35,37]. Mothers were found to be more informed on HPV severity and infection than fathers, top of education levels and income status [23,31]. However, poor literacy on HPV infection severity might be due to a lack of informed pediatrician recommendations or insufficient explanations, limiting their knowledge of the severity

of HPV infection [15,22]. Confidence and belief in having less risk also contribute to the low understanding of parents of HPV infection severity [29].

Perceived Barriers to HPV Vaccination Uptake

Researchers found that fear of barriers, such as religion, culture, lack of support, and insufficient information about vaccines and associated costs, is a significant reason for not changing health behaviors toward HPV.

Limited vaccine information and recommendations:

Most studies showed that a lack of vaccine information is the main perceived barrier to HPV vaccine uptake. Factors such as withholding information [13], fear of sexual promiscuity in children [40], insufficient understanding of vaccination's importance and harm [25,33,41], and lack of knowledge and awareness of vaccination necessity are also perceived barriers [18,27,28,13,32,42]. Ignorance of not being at risk is also a barrier [29]. Less knowledge of vaccine safety and efficacy was a potential barrier to HPV vaccination barrier [18,22,24,26,13,19,39,40].

Associated costs: The cost of the HPV vaccine significantly affected its uptake, with most parents expressing regret over its unaffordability, which limited its acquisition. [10,24,40,34,43]. Religion and culture significantly hindered HPV vaccine uptake and tolerability [18,26,31,44]. Most parents, who were the main participants, attribute their cultural beliefs and social and religious sensitivity as reasons why they did not consider taking the HPV vaccination for their children.

Studies indicated that vaccine acceptance is significantly influenced by support, such as from the Ministry of Health (MOH), and belief in vaccine efficacy [22]. Therefore, lack of support was a perceived barrier to HPV vaccination in their children [10,21,17].

Other barriers to HPV vaccine uptake included limited vaccine availability and access [15], lack of time [16,27,13,30,32,43] and unclear vaccine significance [17], possibly due to an inadequate health practitioner or spouse recommendation.

Perceived benefits of HPV vaccination

Perceived benefits constituted any return people achieve by changing or embracing a particular health behavior. The study found that the main perceived benefits of HPV vaccination were disease prevention and knowledge of the HPV vaccine.

Disease prevention:

The authors agreed on the importance of the HPV vaccine for preventing CC and genital warts [10,26,28,17,33,42,34]. They believe that taking tests helped to determine the source of HPV infection [24]. The HPV vaccine is considered a treatment rather than a precautionary measure, one of its perceived benefits.

Educational attainment and HPV vaccine knowledge:

The study suggested that education and understanding of the HPV vaccine significantly influenced the perceived benefits of HPV vaccination, which was linked to employment status and age [23]. Parents knowledgeable about vaccine benefits were more likely to vaccinate their children or had a positive attitude toward HPV vaccine uptake [14,36].

Cues to Action as HPV Vaccination Measure

As presented in 28 studies, the main themes influencing cues to action in relation to HPV vaccine uptake were vaccine-related doctors' advice, MOH guidelines, and vaccine education.

Physician advice: The study found that physician advice positively influenced the decision to uptake the HPV vaccine, as it positively influenced vaccine acceptance and willingness to uptake [23,36,22]. This was linked to improving and effective communication between parents and healthcare providers [22].

MOH guidelines coupled with vaccine education:

The consulted works of literature argued that relevant ministries should enact policies and public awareness campaigns to increase HPV vaccination uptake via education and formal notifications [14,16,20, 21,29,17,32,33,19,37,41,43,44]. Training programs and social media campaigns could help narrow vaccination knowledge gaps [25,26,30,31,39,40]. Educational intervention programs should focus on boosting the fight against HPV by communicating accurate information on vaccine effectiveness, safety, and availability [24,27,28,34].

Self-Efficacy as an HPV Vaccination Measure

Self-efficacy is attributed to a person's abilities and beliefs about accepting and acting on the desired health behavioral change.

Healthcare professional advice

Individuals receiving physician education recommendations or positive attitudes toward HPV vaccination showed self-efficacy toward vaccine uptake [18,28,29,31]. While parents who perceived the initiative as nonbeneficial, or believe their children were too young to be vaccinated, showed low self-efficacy [44].

Other factors

Concerns about HPV vaccination

A study showed 13.5% agreed that girls should receive vaccines from the age of 9 years old [25]. 45% want to administer the vaccine before children understand sexual relations [45]. Over 90% of individuals supported providing information about the HPV vaccine to adolescents [40]. The trust in the MOH regarding the effectiveness of the HPV vaccine did not significantly increase trust [28]. Of the 1403 parents, 22.6% had heard of HPV infection and vaccination, with digital forms being the most prevalent source of information. [39]. In Jordan, 19.2% of parents believed the efficacy of the HPV vaccine was unclear. Also, Smoking and early marriage were identified as potential risk factors for HPV infection [42]. In Lebanon, people learn about the HPV vaccine more often through doctors

than through television [15].

Modifying variables in the HPV uptake

Male guardianship was a crucial factor in deciding whether to get the HPV vaccine for children [10,18,13,17,44]. A study showed a significant correlation between a male spouse's education and knowledge about the vaccine and their influence on their wife/daughter's decision to take the vaccine or not [18]. However, a study found a negative correlation between participants' knowledge and their agreement with vaccinating daughters [17]. Girls with a family history of CC were more willing to receive the vaccine [27]. Some participants found MOH statements untrustworthy [28].

The attitude of parents toward HPV vaccination uptake

The majority of parents and guardians in the included articles had a positive attitude towards HPV vaccination uptake, with studies showing that between 58% and 94.6% of participants were aware of the concept and supported it for their children. However, only 22.4% of fathers and 21.6% of mothers agreed to give their child the HPV vaccine [16]. Only 29.1% of women were willing to vaccinate their daughters [25]. In Turkey, a minority of mothers and fathers were willing to get their daughters vaccinated against the HPV, with 45.5% of women agreeing to have their daughters vaccinated and 44.9% of fathers agreeing to do so [27]. In Jordan, a low percentage of parents (35%) trusted the HPV vaccine [42]. In Lebanon, 60% of the 185 parents who were aware of the HPV vaccination had no plans of doing so [15].

DISCUSSION

The study found that most parents agreed to HPV vaccination for their children despite concerns about safety and side effects. The perceived susceptibility was low, and the perceived benefits of HPV vaccination were reported. Perceived barriers to vaccination included religious and cultural sensitivity, male guardianship, decision-making, cost, and advice from doctors or family members [46].

A WHO Eastern Mediterranean Regional Office systematic review found that despite low to moderate knowledge about HPV infection, some countries in the ME have moderate to high levels of HPV vaccine acceptability [47]. However, cultural and religious sensitivity had led to decreased inclusion of HPV in national immunization programs due to fear of public backlash [48]. The stigma associated with STIs and the potential perception of vaccination as unsafe sexual conduct might hinder vaccine uptake [49]. Studies on women's opinions on HPV screening had also shown deterring religious beliefs on the vaccine and cervical screening [50]. Male parents played a crucial role in children's vaccination decisions, so targeting them equally in awareness campaigns is essential. Female participants highlighted the male guardianship and potential barriers to the daughters' vaccination, and higher perceived barriers and risks about the harm of vaccines had reduced the scope of vaccination, particularly for HPV vaccines [51]. Insurance coverage was another barrier, especially in the United States [51]. In contrast, studies showed that 95% of fathers passionately believe in vaccinating their daughters before marriage [10]. The majority of male partners were increasingly supporting their wives for Pap smear and HPV vaccination. Public willingness to vaccinate increases when recommended by their MOH [18,26,39]. Similarly, trust in governmental programs played a crucial role in the decision to use the HPV vaccine, as knowledge is influenced by campaigns and government-sponsored programs [52].

The current review of HPV vaccine acceptability studies revealed that factors such as high cost, concerns about side effects and effectiveness, cultural, societal, and religious sensitivities, lack of spouse support, and lack of knowledge and awareness about HPV infection and vaccination are perceived barriers. These findings aligned with broader literature, which also found similar findings. Radisic et al.'s 2017 systematic review found that knowledge, family dynamics, parent-child communication, and cultural values influence the decision to vaccinate children. Other barriers to HPV vaccination included fear of side effects, uncertainty about vaccine effectiveness, cost, and lack of guidance from healthcare professionals [53]. Wijayanti et al.'s 2021 review found that barriers to

HPV vaccination in Southeast Asian Nations include low perception of risk, belief that children are not sexually active, safety concerns, lack of understanding of the need to vaccinate, and lack of information [54]. Netfa et al.'s 2020 review found that economic concerns, safety concerns, negative attitudes, and lack of knowledge were the most common factors influencing the acceptability of HPV vaccination of immigrant parents [7]. These findings are consistent with the broader literature.

Conclusions

The awareness of HPV and its potential cancer-causing effects in ME countries was inadequate. Parents were concerned about the lack of information about the virus and vaccine, with barriers such as insufficient healthcare providers, safety, cost, and availability of vaccines. There were also gaps in policy and education about the virus and vaccination. Cultural, societal, and religious norms influence parents' perceptions of HPV susceptibility. Parents who were aware of the severity of HPV infection were more likely to accept the vaccine. However, barriers like high costs, side effects, and lack of spouse support hinder vaccination. Strategies to improve HPV vaccination uptake included mass medical campaigns, healthcare professional involvement, educational interventions, health insurance coverage, and MOH recommendations. Self-efficacy played a crucial role in enhancing vaccine uptake. This systematic review suggested that some parents were willing to vaccinate their children for HPV in ME countries despite some concerns about the safety and side effects of HPV vaccines and the region's cultural and religious sensitivity.

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Conflicts of Interest

There is no conflict of interest in this project.

Data Availability

The manuscript reported all supporting data.

Author Contributions

AA: Conceptualization, Writing, Editing- original draft manuscript, Overall coordination, Methodology, Formal Analysis.

MSRJ: Conceptualization, Review Concept, Manuscript structure refining.

CE: Conceptualization, Review Concept.

CJ: Conceptualization, Review, Editing, Manuscript structure refining, Overall coordination.

Abbreviations

HPV- Human papillomavirus

ME- Middle Eastern

PRISMA- Preferred Reporting Items for Systematic Reviews and Meta-Analyses

STD- Sexually transmitted diseases

CC- Cervical Cancer

JBI- Joanna Briggs Institute

HBM- Health Belief Model

CASP- Critical Appraisal Skills Programme

MOH - Ministry of Health

UAE- United Arab Emirates

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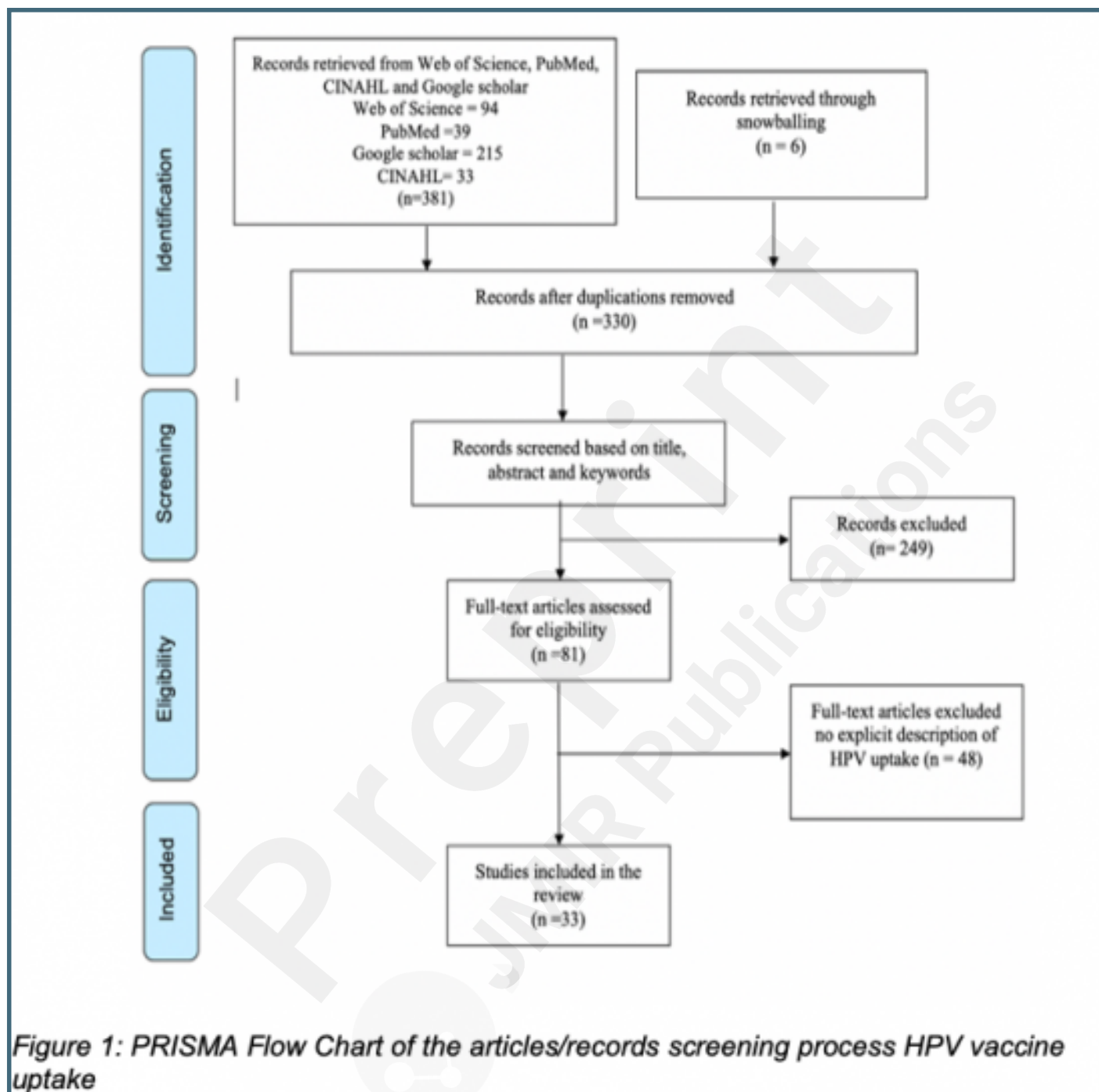
Supplementary Files

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Figures

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Multimedia Appendixes

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