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Original article

Awareness and Determinants of Human Papillomavirus Vaccination among Libyan Women: A Cross-Sectional Study

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Abstract
Human papillomavirus (HPV) is a major etiological factor in cervical cancer, yet awareness and uptake of the HPV vaccine remain low across the Middle East and North Africa. Libya has not introduced HPV vaccination into its national immunization program, and little is known about women's knowledge, attitudes, or acceptance. This study aimed to assess awareness, knowledge, and acceptance of HPV vaccination among Libyan women aged 18–50 years and to identify factors influencing vaccine acceptance. A cross-sectional online survey was disseminated using convenience sampling, yielding 351 valid responses. Most participants were aged 18–25 years (69.2%), single (78.1%), and university students (66.7%). Awareness of HPV reached 71.5%, and 55.6% had heard of the HPV vaccine, while 61.3% recognized HPV as a cause of cervical cancer. Overall vaccine acceptance was 60.7%, comprising 43.6% willing to receive the vaccine and 17.1% already vaccinated. Prior awareness of the HPV vaccine was the strongest predictor of acceptance, showing a significant association ($\chi^2 = 35.7$; $p < 0.001$) and remaining an independent determinant in logistic regression analysis (AOR= 3.96; 95% CI 2.48–6.31). The findings highlight moderate HPV knowledge but substantial uncertainty regarding vaccination, suggesting that inadequate information—rather than firm refusal—is the main barrier. Enhancing public health education and strengthening healthcare provider communication may support the future introduction of the HPV vaccine into Libya's national immunization program.
***Keywords**: Human papillomavirus; HPV vaccine; cervical cancer; awareness; acceptance; Libya.*

Introduction

Cervical cancer remains a major public-health concern worldwide, despite being largely preventable through effective screening and vaccination strategies. Persistent infection with high-risk human papillomavirus (HPV) types, particularly HPV-16 and HPV-18, is recognized as the necessary cause of cervical carcinogenesis. Prophylactic HPV vaccines have demonstrated high efficacy in preventing HPV infection and cervical intraepithelial neoplasia, especially when administered prior to sexual debut and before exposure to the virus (1).

Nevertheless, HPV vaccine uptake shows considerable variation across regions. In the Middle East and North Africa (MENA), coverage remains suboptimal due to multiple barriers, including sociocultural beliefs, misinformation, limited health communication, and the absence of national vaccination programs (2,3). These challenges are compounded by gaps in healthcare infrastructure and the lack of systematic school-based vaccination initiatives, which have proven successful in other regions. In Libya, HPV vaccination has not yet been incorporated into the national immunization schedule, and population-level data on women's awareness, knowledge, and acceptance of the vaccine are scarce. This absence of structured vaccination efforts places Libyan women at increased risk of preventable cervical cancer morbidity and mortality.

Understanding awareness, attitudes, and determinants of vaccine acceptance is therefore essential for evidence-based public-health planning. Studies from the MENA region highlight that knowledge about HPV and its link to cervical cancer is generally low, and misconceptions about vaccine safety and necessity are widespread (2,3). Factors influencing acceptance include educational level, trust in healthcare providers, cultural perceptions of sexual health, and exposure to accurate health communication campaigns. Addressing these determinants through targeted interventions, culturally sensitive education, and integration of HPV vaccination into national immunization programs could significantly improve uptake and reduce cervical cancer burden in Libya and the wider region. This study aimed to assess HPV and HPV-vaccine awareness, knowledge, and acceptance among Libyan women, and to identify sociodemographic and cultural factors associated with acceptance. Findings will provide evidence to guide national policy, inform health communication strategies, and support the eventual integration of HPV vaccination into Libya's immunization schedule.

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Methods

Study Design and Participants

A cross-sectional study was conducted among Libyan women aged 18–50 years residing in Libya. Eligibility required Arabic literacy and provision of informed electronic consent.

Sampling and Data Collection

Data were collected using a self-administered online questionnaire distributed via social-media platforms using convenience and snowball sampling. The questionnaire included sections on socio-demographic characteristics, HPV knowledge, HPV-vaccine awareness, attitudes, and vaccine acceptance.

Sample Size

Using a 95% confidence level, 5% precision, and an assumed proportion of 50%, the minimum required sample size was 384. A total of 351 complete responses were included in the final analysis.

Variables

The primary outcome was HPV vaccine acceptance, defined as willingness to receive the vaccine or prior vaccination. Independent variables included age, marital status, education, occupation, residence, HPV awareness, and HPV-vaccine awareness.

Statistical Analysis

Data were analyzed using Python. Descriptive statistics summarized participant characteristics. Associations were assessed using chi-square tests. Multivariable logistic regression was performed to identify independent predictors of vaccine acceptance. Statistical significance was set at $p < 0.05$.

Ethical Considerations

Participation was voluntary and anonymous. Electronic informed consent was obtained before data collection. No personal identifiers were collected.

Results

Among the 351 participants, 69.2% were aged 18–25 years, 78.1% were single, 66.7% were university students, and 87.7% resided in urban areas (Figure 1).

Overall, 71.5% of participants had heard of HPV, and 61.3% correctly identified HPV as a cause of cervical cancer. More than half (55.9%) believed that HPV infection is preventable (Figure 2). Awareness of the HPV vaccine was reported by 55.6% of participants. Vaccine acceptance was observed in 60.7% of women, including 43.6% who were willing to receive the vaccine and 17.1% who had already been vaccinated.

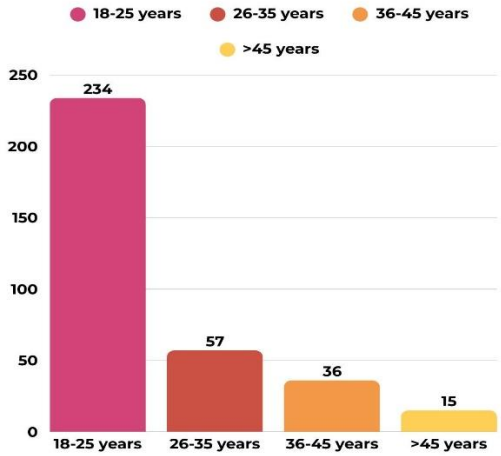

Figure 1. Sociodemographic characteristics of participants.

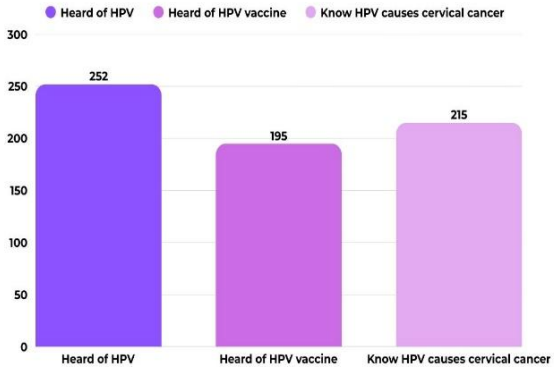

Figure 2. Awareness and knowledge of HPV among participants.

Acceptance was significantly higher among women who were aware of the HPV vaccine compared with those who were unaware (74.9% vs 43.0%; $\chi^2 = 35.7$; $p < 0.001$). In multivariable logistic regression, prior awareness of the HPV vaccine remained an independent predictor of acceptance (AOR = 3.96; 95% CI: 2.48–6.31) (Figure 3).

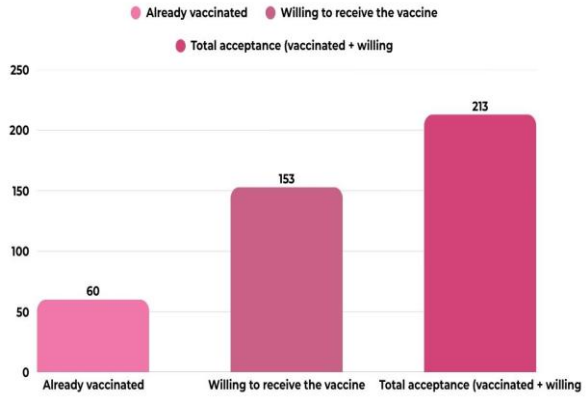

Figure 3. HPV vaccine acceptance by awareness status.

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Discussion

This study revealed moderate awareness of HPV among Libyan women, with comparatively lower awareness of the HPV vaccine. A substantial proportion of participants expressed uncertainty about vaccination, suggesting that hesitancy may be driven more by insufficient information than by strong opposition. This distinction is important, as vaccine hesitancy rooted in informational gaps can be addressed through targeted education and healthcare-provider communication, whereas entrenched refusal requires different strategies.

Our findings are consistent with evidence from other Middle Eastern and North African (MENA) countries, where limited knowledge and misconceptions about HPV and its vaccine remain major barriers to uptake (4,5). Prior awareness of the HPV vaccine emerged as the strongest determinant of acceptance, underscoring the pivotal role of information dissemination. Similar associations have been documented in Lebanon, Saudi Arabia, and Morocco, where awareness and trust in healthcare providers significantly influenced vaccine acceptance (6–11). These results highlight the importance of culturally sensitive communication strategies that normalize discussions about HPV, cervical cancer, and vaccination.

Globally, HPV vaccination programs have demonstrated substantial reductions in HPV infection, cervical intraepithelial neoplasia, and cervical cancer incidence (7,8). However, disparities in coverage persist, particularly in low- and middle-income countries where structural barriers, sociocultural norms, and limited health communication hinder uptake (12,13). Libya exemplifies these challenges: HPV vaccination has not yet been incorporated into the national immunization schedule, and population-level data on awareness and acceptance remain scarce. Local studies confirm low awareness among Libyan women, with significant disparities linked to education and access to health information (14). Without national-level initiatives, these gaps will continue to place Libyan women at risk of preventable cervical cancer morbidity and mortality.

The implications for public health planning in Libya are clear. First, healthcare-provider communication must be strengthened, as trust in physicians and nurses has consistently been shown to be a critical determinant of vaccine acceptance (10). Second, culturally tailored educational campaigns should be developed to address misconceptions and reduce stigma surrounding sexually transmitted infections. Third, integration of HPV vaccination into the national immunization schedule, ideally through school-based delivery models, could significantly improve coverage, as demonstrated in other regions (7,13). Finally, further research is needed to explore sociocultural determinants of vaccine acceptance in Libya, including gender norms, perceptions of vaccine safety, and stigma, to inform evidence-based interventions.

Conclusion

Libyan women demonstrated moderate awareness of HPV but limited awareness of the HPV vaccine. Although overall acceptance was encouraging, uncertainty remains common. Strengthening public education and healthcare-provider engagement is essential to support future implementation of HPV-vaccination strategies and reduce the burden of cervical cancer in Libya.

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Conflict of interest. Nil

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