Awareness, Perceptions, and Acceptance of the Cervical Cancer Vaccine (GARDASIL 9): A Survey-Based Study

Abstract

Cervical cancer is a major health issue for women in India, with HPV infection being the leading cause. This study assesses the awareness, perception, and acceptance of the GARDASIL 9 HPV vaccine among females above 17 years in Ludhiana. A survey revealed that 87% of participants were aware of the vaccine, but only 58.7% believed in its effectiveness. Healthcare providers were the most trusted source of information, and over 90% supported government-led campaigns. Despite high awareness, many respondents were uncertain about the vaccine's benefits, highlighting the need for more targeted education and community engagement. The findings underscore the importance of improving health communication and empowering healthcare professionals to increase vaccine uptake and reduce cervical cancer risk.

1. Introduction:

Cervical cancer is the fourth most common cancer among women worldwide and a leading cause of cancer-related deaths among women in India. It is caused primarily by persistent infection with high-risk types of the human papillomavirus (HPV), a virus that is transmitted through sexual contact. According to the World Health Organization (WHO), nearly all cervical cancer cases (over 95%) are linked to HPV infection, which makes it one of the most preventable types of cancer with appropriate vaccination and regular screening.

The advent of prophylactic vaccines such as GARDASIL and GARDASIL 9 has revolutionized the fight against cervical cancer. GARDASIL 9 protects against nine HPV types, including those most commonly associated with cervical, vaginal, vulvar, and anal cancers. Administering the vaccine before the onset of sexual activity—typically during adolescence—has been proven to offer the highest protection. The WHO recommends routine HPV vaccination for girls aged 9–14 years as part of national immunization programs.

Despite the vaccine's efficacy and endorsement by health authorities globally, its acceptance in India faces numerous barriers, including lack of awareness, socio-cultural stigma, misinformation, and cost-related concerns. Furthermore, cervical cancer remains underdiagnosed and underreported, particularly in lower- and middle-income settings.

Ludhiana, as a major industrial and educational city in Punjab, presents a critical opportunity to understand urban attitudes towards the HPV vaccine. With access to healthcare infrastructure and an educated population, the city offers insights into the potential reach and limitations of awareness campaigns. This study aims to investigate the level of awareness, sources of information, perceived effectiveness, and societal acceptance of GARDASIL 9 among the

residents of Ludhiana, thereby contributing valuable data to support vaccine promotion and cervical cancer prevention efforts.

2. Review of Literature:

Numerous studies have explored public awareness and acceptance of the HPV vaccine across various regions of the world. According to a WHO position paper (2022), widespread vaccination has significantly reduced the prevalence of HPV-related infections and pre-cancerous cervical lesions in countries with high vaccine coverage.

In India, Ladner et al. (2014) identified significant gaps in HPV awareness, especially among rural and semi-urban populations. Another study by Perlman et al. (2014) noted that while knowledge about cervical cancer is increasing, understanding of the vaccine remains limited, primarily due to cultural beliefs and lack of access to reliable information.

A research study conducted in Delhi by Bhatla et al. (2012) revealed that only 19% of women surveyed were aware of HPV and even fewer were aware of the HPV vaccine. However, once informed, most participants showed a positive attitude towards vaccination, indicating that awareness plays a critical role in vaccine uptake.

Similarly, a study by Madhivanan et al. (2009) in Mysore found that mothers' awareness and acceptance of the HPV vaccine were strongly influenced by physician recommendation and perceptions of vaccine safety. Trust in government programs and the inclusion of the vaccine in school immunization drives were also associated with higher acceptance rates.

These studies collectively underscore the importance of awareness, education, and accessibility in increasing HPV vaccine uptake. The current study builds on this existing body of literature by providing context-specific insights from Ludhiana, thereby contributing localized evidence for targeted public health interventions.

3. Gap of the study

Most studies on HPV vaccine awareness in India focus on rural or semi-urban areas. A common finding in these studies is that there is limited awareness, often due to a lack of access to healthcare or education. While rural areas have been extensively studied, there is limited research on **urban settings** like Ludhiana, which has a relatively higher level of education and healthcare infrastructure. This gap in localized, urban data led you to investigate how awareness and acceptance play out in a city with relatively better access to information and healthcare services.

The research, therefore, targets an urban population with access to healthcare, thus providing data on the challenges faced even in more educated and healthcare-accessible environments.

4. Research Methodology

1. Research Design

This study employs a **quantitative research design** aimed at assessing the **awareness**, **acceptance**, and **perceptions** of the **HPV vaccine (GARDASIL 9)** among **females above 17 years of age** in **Ludhiana, Punjab**. The research seeks to examine the factors influencing vaccine acceptance and identify the barriers to its uptake, focusing specifically on women, who are the primary target for HPV vaccination. A **cross-sectional survey design** was adopted to gather data at a single point in time, providing a snapshot of attitudes and knowledge within this demographic.

2. Study Area

The study was conducted in **Ludhiana**, an urban center in the state of Punjab, India. Ludhiana was chosen due to its industrial importance, educational infrastructure, and relatively better access to healthcare compared to rural regions. The city represents an important setting to assess vaccine awareness and acceptance in a growing urban environment.

3. Target Population

The **target population** for this survey consisted of **females aged 17 years and above** residing in **Ludhiana**. This group was selected based on the WHO's recommendation for the routine HPV vaccination of girls aged 9-14 years, with the study focusing on older females who may have missed early vaccination or whose awareness and acceptance of the vaccine are key factors in increasing overall uptake.

The rationale for focusing solely on females is rooted in the fact that the HPV vaccine is primarily designed to protect against cervical cancer, which affects only women. Additionally, since cervical cancer is the leading cause of cancer-related deaths in Indian women, understanding their attitudes and awareness is crucial for effective public health interventions.

4. Sampling Method

A **stratified random sampling technique** was employed to ensure that various subgroups within the female population (such as age, education level, and socioeconomic status) were adequately represented. The strata included:

- **Age Groups**: 17-24 years, 25-34 years, 35-44 years, 45+ years.
- **Education Level**: High school, undergraduate, postgraduate, professional training.
- **Socioeconomic Status**: Low, middle, and high-income groups.

The sample size was determined to ensure statistical significance, with a **total of 50 female respondents** targeted for the survey.

5. Data Collection Tool

The primary data collection method was a **structured questionnaire**, designed to gather quantitative data on respondents' awareness, beliefs, and attitudes toward the HPV vaccine. The questionnaire consisted of **closed-ended** and **Likert-scale** questions, enabling easy quantification and statistical analysis.

The questionnaire included the following sections:

- **Demographic Information**: Questions on age, education, and income level.
- **Awareness of the Vaccine**: Whether the respondent had heard of the HPV vaccine (Yes/No).
- **Beliefs about Vaccine Effectiveness**: Likert-scale questions on perceived effectiveness.
- **Sources of Information**: Multiple-choice questions to identify the sources of information (e.g., healthcare provider, media, friends/family).
- **Support for Government and School Campaigns**: Respondents' attitudes toward government-led and school-based immunization programs.
- **Perceived Community Awareness**: Views on how well-informed the community is about the vaccine.
- **Intention to Recommend the Vaccine**: Whether respondents would recommend the vaccine to others.
- **Barriers to Vaccination**: Open-ended questions to explore reasons for hesitation, such as safety concerns, myths, cost, or waiting for doctor's recommendations.

6. Data Collection Procedure

The data was collected using a **mixed-method approach** combining both **online** and **face-to-face** surveys to capture a broad range of respondents:

- **Online Surveys**: Distributed via social media platforms (e.g., WhatsApp, Facebook) and email to those with internet access.
- **Face-to-Face Surveys**: Administered in locations such as malls, healthcare centers, and educational institutions, where women from diverse backgrounds were more likely to participate.

8. Ethical Considerations

This study adhered to ethical guidelines in research:

- **Informed Consent**: All respondents were fully informed about the study's objectives, and their written consent was obtained.

- **Confidentiality**: Personal information was kept confidential, and responses were anonymized for analysis and reporting.
- **Voluntary Participation**: Participation in the study was voluntary, and respondents were given the right to withdraw at any point without penalty.

9. Limitations of the Study

The study has the following limitations:

- **Self-Reported Data**: The survey relies on self-reported responses, which could be subject to social desirability bias or inaccuracies in recall.
- **Non-Response Bias**: There could be a bias in the sample due to the non-response of certain groups, especially those without internet access.
- **Generalizability**: The study focuses solely on females in Ludhiana and may not reflect the views of women in rural or other urban areas of India.

5. DATA ANALYSIS & INTERPRETATION

1. Awareness of the Vaccine
   87% of respondents were aware of GARDASIL 9.
   13% were unaware.
   Interpretation: Awareness is relatively high but not universal. Outreach efforts have worked to an extent, but there's room to improve targeting the unaware population, especially those who may not interact regularly with healthcare systems.
2. Belief in Vaccine Effectiveness

- Agree: 41.3%
- Strongly Agree: 17.4%
- Neutral: 41.3%

Interpretation: While 58.7% lean toward believing the vaccine is effective, a large proportion (41.3%) are neutral—possibly due to limited scientific understanding or exposure to conflicting information. This suggests the need for stronger evidence-based education campaigns.

3. Source of Information
   Top responses:

- Healthcare Provider: 38.6%
- Friends/Family: 25.0%
- Advertisement/Media: 22.7%

Interpretation: Medical professionals are the most trusted and frequent source of vaccine awareness, followed by social and mass media. This highlights the value of empowering

doctors and nurses to act as vaccine ambassadors and also ensuring accurate messaging in media.

4. Support for Government Campaigns

- Strongly Agree: 41.3%
- Agree: 50%
- Neutral: 8.7%

Interpretation: An overwhelming majority (91.3%) believe that government-led campaigns can increase vaccine administration. This provides strong public support for policy-driven intervention such as awareness drives, subsidized doses, and free public vaccinations.

5. Support for School Immunisation

- Strongly Agree: 43.5%
- Agree: 37%
- Neutral: 19.6%

Interpretation: 80.5% of respondents favor including GARDASIL 9 in school immunisation programs. This indicates strong acceptance of the vaccine as part of early preventive healthcare and could guide public health officials toward school-based rollouts.

6. Perceived Community Awareness

- Neutral: 41.3%
- Agree: 26.1%
- Strongly Agree: 15.2%
- Disagree: 13%
- Strongly Disagree: 4.3%

Interpretation: Nearly 60% of respondents feel that community-level awareness is lacking or just average. Despite personal awareness, many believe others are uninformed—this points to a gap between individual knowledge and collective understanding, emphasizing the need for broader public campaigns.

7. Intention to Recommend the Vaccine

- Yes: 62.2%
- Can't Say: 35.6%
- No: 2.2%

Interpretation: Most respondents (62.2%) would recommend the vaccine, but over one-third remain unsure. This uncertainty likely stems from either safety concerns, cost, or a lack of complete understanding. Targeted education addressing these concerns could help convert the “Can’t Say” group into active advocates.

8. Barriers to Vaccination (optional deeper dive if data permits)
If your dataset includes open-ended or multiple-choice responses on reasons for hesitancy, such as:

- Cost of vaccine
- Belief it's too early for their child
- Myths about vaccine side effects
- Waiting for the doctor's recommendation

Then each of these can be analyzed further to tailor interventions like subsidies, myth-busting campaigns, or targeted educational outreach.

6. Suggestions

Based on the research data, here are some **measures** that could be implemented to improve **HPV vaccine awareness** and **acceptance** in Ludhiana (and possibly in other similar urban areas):

1. Strengthening Health Education and Awareness

- **Targeted Awareness Campaigns**: While **87%** of respondents were aware of the vaccine, **13%** were unaware. To address this gap, health education campaigns should target areas with lower awareness. Local healthcare centers, community health workers, and public health organizations can play a key role in reaching out to the **13%** who are unaware.
- **Integration of Evidence-Based Messaging**: Based on the fact that **41.3%** of respondents were neutral on the vaccine's effectiveness, clearer, evidence-based information about the **efficacy** and **safety** of the HPV vaccine should be disseminated. This can include informational pamphlets, social media posts, webinars with healthcare experts, and testimonials from women who have taken the vaccine.

2. Empowering Healthcare Providers

- **Training Healthcare Providers**: Given that **38.6%** of respondents rely on healthcare providers for vaccine information, it's essential to **train doctors, nurses, and healthcare professionals** to actively promote the HPV vaccine. They should be equipped with accurate, up-to-date information and be prepared to address questions and concerns about the vaccine.
- **Incorporating HPV Vaccine Information into Routine Health Checkups**: Including discussions about the HPV vaccine during regular health checkups, especially for women above 17, could normalize the conversation and encourage more women to take the vaccine.

3. Enhancing School-Based Immunization Programs

- **School-Community Partnerships**: Given that **80.5%** of respondents supported including the vaccine in school immunization programs, it would be beneficial to collaborate with schools to establish vaccination programs. These programs could target

adolescents and young adults in higher education institutions (colleges, universities) who may not have received the vaccine earlier.

- **Peer Education Programs**: To increase vaccine acceptance, schools could train **peer educators**—students who are well-informed about the HPV vaccine—to spread awareness among their peers. Peer influence can significantly boost vaccination rates.

4. Government-Led Campaigns

- **Expanding Government Outreach**: With **91.3%** of respondents supporting government-led campaigns, the government could initiate **nationwide or city-specific campaigns** that focus on both educating women about the vaccine's benefits and addressing common concerns (e.g., myths about side effects, cost, etc.). These campaigns can use various media, such as television, radio, and social media.
- **Subsidized Vaccination Programs**: A key barrier to vaccination may be the **cost of the vaccine**, as indicated by some studies. The government could introduce **subsidized or free vaccination programs**, especially for lower-income groups, to improve accessibility.

5. Utilizing Media and Digital Platforms

- **Media and Digital Campaigns**: Given that **22.7%** of respondents receive information from media sources, there's potential to use **advertisements, social media, and online platforms** for wider dissemination of vaccine-related information. Digital platforms (e.g., Instagram, Facebook, WhatsApp) could be leveraged for educational campaigns, including video stories, infographics, and fact-checking posts to dispel common myths.
- **Influencer Collaboration**: Partnering with **social media influencers** or **celebrities** to spread awareness about the vaccine can help reach younger audiences who may be more susceptible to media messages.

6. Addressing Hesitancy and Myths

- **Myth-Busting Campaigns**: There is still hesitancy around the vaccine, as shown by the **35.6%** of respondents who were unsure about recommending the vaccine. These uncertainties may stem from myths or a lack of understanding of the vaccine's safety. Targeted **myth-busting campaigns** can address common misconceptions, such as fears about side effects, fertility, and the belief that the vaccine is not necessary for older women.
- **Doctor-Patient Conversations**: Since **41.3%** of respondents were neutral about the vaccine's effectiveness, providing **clear, detailed communication** between healthcare providers and patients could increase confidence. Healthcare professionals should proactively ask women about their vaccination status during visits and educate them about the vaccine's importance in preventing cervical cancer.

7. Encouraging Peer Recommendations

- **Building Peer Networks**: Since **62.2%** of respondents would recommend the vaccine to others, leveraging **peer recommendations** can help encourage hesitant individuals. Creating **support groups** for vaccinated women to share their experiences could foster a sense of community and increase vaccine uptake among their peers.
- **Incentivizing Recommendations**: Offering small incentives or public recognition for individuals who advocate for vaccination in their communities could further promote word-of-mouth recommendations.

8. Improved Community Engagement

- **Localized Community-Based Interventions**: Despite high awareness at the individual level, **41.3%** of respondents perceive community-level awareness to be low. Therefore, **community-driven initiatives** such as workshops, awareness programs in local languages, or health fairs could be organized to engage individuals at the grassroots level.
- **Involvement of Local Leaders**: Collaborating with **local leaders**, **NGOs**, or community influencers can help spread vaccine awareness within local communities, as they often have trusted relationships with residents.

9. Monitoring and Feedback

- **Tracking Vaccine Uptake**: Regular **surveys** and **follow-up studies** to monitor vaccine uptake and the effectiveness of interventions will provide valuable insights into the evolving barriers to vaccine acceptance.
- **Continuous Feedback Loop**: Conducting regular feedback surveys after vaccine campaigns or school-based immunization drives will help identify areas of improvement, ensuring that public health efforts are continuously refined.

Conclusion

This study on HPV vaccine awareness and acceptance in Ludhiana highlights a high awareness level (87%) among the target population but reveals gaps in understanding and a significant portion of **neutral** or **unsure** responses regarding the vaccine's effectiveness. While healthcare providers are the most trusted source of information, there is also strong public support for government-led campaigns and school-based immunization programs.

Despite high individual awareness, many perceive **community awareness** as moderate, indicating the need for broader, **community-focused interventions**. To improve HPV vaccine uptake, a **multi-faceted approach** is necessary, including **strengthening health education**, **empowering healthcare providers**, expanding **school immunization programs**, and utilizing **media campaigns** to counter misinformation.

By addressing these gaps and promoting vaccine acceptance through targeted education and community engagement, it is possible to enhance public trust in the HPV vaccine and contribute to reducing cervical cancer rates in India.

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