Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE

DOI: 10.53555/2yep9b36

AWARENESS OF HUMAN PAPILLOMA VIRUS AND VACCINE AMONG INDIAN LGBTQ+ INDIVIDUALS: A SURVEY STUDY

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ABSTRACT

Background: Human papillomavirus (HPV) is a prevalent sexually transmitted infection that can lead to various health complications, including cervical cancer and genital warts. While HPV vaccination is widely recommended for preventing HPV-related diseases, awareness and knowledge of the vaccine among marginalized populations, such as the Indian LGBTQ+ (Lesbian, Gay, Bisexual, and Transgender) community, remain understudied. Understanding the awareness and perceptions of HPV and its vaccine within this community is crucial for developing targeted public health interventions.

Materials & Methods: This survey study aimed to assess the level of awareness and knowledge of HPV and its vaccine among Indian LGBTQ+individuals. A structured questionnaire was designed to collect data on participants' demographic characteristics, awareness of HPV, knowledge about the HPV vaccine, and attitudes toward vaccination. The survey was distributed online through LGBTQ+ community forums and social media platforms to reach a diverse sample of Indian LGBTQ+ individuals. Participants were assured of confidentiality and voluntary participation.

Results: The study received responses from a diverse group of Indian LGBTQ+ individuals. The results revealed varying levels of awareness and knowledge about HPV and its vaccine within the community. A significant proportion of participants had limited awareness of HPV-related diseases and the availability of HPV vaccines. Moreover, misconceptions and myths surrounding HPV and vaccination were prevalent among some respondents. However, there were also participants who demonstrated a good understanding of HPV, its transmission, and the importance of vaccination.

Conclusion: The findings of this study highlight the need for targeted health education campaigns and interventions to increase awareness and knowledge of HPV and its vaccine among the Indian LGBTQ+ community. Improved access to accurate and culturally sensitive information about HPV vaccination is essential to empower individuals to make informed decisions about their sexual health and well-being. Health authorities and organizations should collaborate to develop tailored educational programs that address the unique needs and concerns of the LGBTQ+ population, ultimately promoting better health outcomes and reducing the burden of HPV-related diseases in this marginalized community.

INTRODUCTION

Human Papillomavirus (HPV) is a prevalent sexually transmitted infection (STI) globally, with over 100 known types categorized into high-risk and low-risk groups[(5)]. High-risk types, such as HPV-16 and HPV-18, are linked to various cancers, including cervical, anal, and oropharyngeal cancers, while low-risk types may cause genital warts[(6)]. HPV infections often present asymptomatically, making detection challenging[(8)]. Prevention strategies primarily involve HPV vaccination before sexual activity onset and regular screening for cervical cancer[(10)].

In India, HPV poses a significant public health concern, particularly due to its association with cervical cancer, which ranks as the second most common cancer among Indian women([14)]. However, awareness about HPV and its link to cervical cancer remains low among both the general population and healthcare providers in India[(14)]. Efforts to introduce HPV vaccination programs targeting adolescent girls and boys face challenges such as limited awareness, cultural barriers, and vaccine hesitancy[(14)]. Collaborative efforts involving government bodies, NGOs, healthcare professionals, and community-based organizations are essential to address these challenges and improve HPV-related healthcare in India[(14)]**.** Human Papillomavirus (HPV) is a prevalent STI globally, with high-risk types linked to various cancers, while low-risk types may cause genital warts[(6)]. Detection of HPV infections is challenging due to asymptomatic presentation, emphasizing the importance of vaccination and regular cervical cancer screening[(8,10)]. In India, HPV is a major concern due to its association with cervical cancer, but awareness remains low, hindering vaccination efforts[(14)]. Research gaps include limited awareness among the general population and the lack of understanding within the LGBT community, highlighting the need for tailored interventions[(14)]. Further research is needed to explore factors influencing vaccine acceptance and assess long-term prevention strategies' effectiveness, particularly among marginalized populations[(14)]. Addressing these gaps can lead to evidence-based strategies that improve awareness, increase vaccination rates, and reduce the burden of HPV-related diseases in India[(14)]**.**

Abbreviations

Human papillomavirus, HPV vaccine, awareness, knowledge, LESBIAN, GAY, BISEXUAL ,TRANSGENDER ,QUEER ,LGBT ,LGBTQ+

HYPOTHESIS

Null Hypothesis: There is no significant difference in the level of awareness and knowledge of

Human Papillomavirus (HPV) infection and vaccination between Indian LGBTQ+ individuals and the general population.

Research Hypothesis: There is a significant difference in the level of awareness and knowledge of Human Papillomavirus (HPV) infection and vaccination between Indian LGBTQ+ individuals and the general population.

METHODOLOGY

TYPE OF STUDY: A survey study

STUDY SUBJECTS: N=250

AREA OF PROJECT: DELHI NCR

Sampling Method:

- No of Sample:250
- Sample place: DELHI NCR

VARIABLES

Dependent Variable:

- Level of awareness and knowledge of Human Papillomavirus (HPV) infection and vaccination

Independent Variables:

- Sexual orientation (LESBIAN, GAY, BISEXUAL, AND TRANSGENDER or QUEER individuals vs. general population)

- Sources of information about HPV and vaccination

- Attitudes, beliefs, and perceptions regarding HPV vaccination

- Barriers and challenges in accessing HPV vaccination services

Control Variables:

- Age
- Gender
- Socioeconomic status
- Education level
- Geographical location

Inclusion Criteria:

1. Indian nationality: Participants must be Indian citizens or residents of India.
2. LESBIAN, GAY, BISEXUAL, AND TRANSGENDER or QUEER individuals: Participants must identify as lesbian, gay, bisexual, or transgender or QUEER
3. Age: Participants can range from a specific minimum age to a maximum age, depending on the study's objectives.
4. Willingness to participate: Participants must voluntarily agree to take part in the study and provide informed consent.
5. Ability to understand and respond: Participants should have the ability to comprehend and respond to survey questions or interview prompts.
6. Availability: Participants should be available and accessible for data collection during the study period.
7. No previous knowledge requirements: There should be no prerequisite for participants to have prior knowledge os of HPV infection and vaccination.

Exclusion Criteria:

1. Non-Indian nationality: Participants who are not Indian citizens or residents of India will be excluded from the study.
2. Non-LGBTQ+ individuals: Individuals who do not identify as lesbian, gay, bisexual, or transgender will be excluded from the study.
3. Age limitations: Participants who fall below the minimum age or exceed the maximum age specified in the study's criteria will be excluded.
4. Inability to provide informed consent: Individuals who are unable to understand the study purpose, risks, and benefits or unable to provide informed consent will be excluded.
5. Inability to understand and respond: Participants who have cognitive impairments or language barriers that prevent them from understanding and responding to survey questions or interview prompts will be excluded.
6. Inaccessibility: Participants who are geographically inaccessible or not available for data collection during the study period will be excluded.

7. Previous knowledge or expertise: Individuals with prior knowledge or expertise in HPV infection and vaccination may be excluded to ensure a diverse participant pool and unbiased responses.

PROCEDURE

1. **Ethical Approval:** Obtain ethical approval from the relevant institutional review board or ethics committee to ensure the study adheres to ethical guidelines and protects the rights and well-being of participants.
2. **Participant Recruitment:** Develop a recruitment strategy to reach potential participants from the Indian LGBTQ+ community. This may involve collaborating with LGBTQ+ organizations, using online platforms, or leveraging community networks. Clearly communicate the study's purpose, eligibility criteria, and voluntary nature of participation.
3. **Informed Consent:** Obtain informed consent from eligible participants who express interest in participating. Provide detailed information about the study, its objectives, procedures, potential risks, benefits, and the rights of participants. Ensure participants have the opportunity to ask questions and make an informed decision about their participation.
4. **Data Collection:** Employ appropriate data collection methods, such as surveys or interviews, to gather information from participants. Design the survey or interview questions to assess the level of awareness and knowledge of HPV infection and vaccination, as well as attitudes, beliefs, and barriers to vaccination. Consider utilizing validated scales or existing questionnaires when available.
5. **Confidentiality and Anonymity:** Ensure participant confidentiality and anonymity by assigning unique identification codes to participants and securely storing and handling their data. Emphasize that participation is voluntary, and participants can withdraw at any time without consequences.
6. **Data Analysis:** Conduct a comprehensive analysis of the collected data using appropriate statistical methods. Analyze the data to examine patterns, trends, and associations related to HPV awareness, knowledge, attitudes, and barriers among Indian LESBIAN, GAY, BISEXUAL, AND TRANSGENDER or QUEER individuals. Use statistical software or qualitative analysis techniques, depending on the nature of the data and research questions.
7. **Interpretation and Discussion:** Interpret the findings in the context of the study objectives and relevant literature. Discuss the implications of the results, including the significance of the identified gaps in awareness, knowledge, and barriers to HPV vaccination among Indian LESBIAN, GAY, BISEXUAL, AND TRANSGENDER or QUEER individuals.
8. **Recommendations:** Based on the study findings, provide recommendations for interventions, educational programs, and policies to improve HPV-related awareness, knowledge, and vaccination rates among the Indian LESBIAN, GAY, BISEXUAL, AND TRANSGENDER community. Highlight the importance of tailored approaches that address the unique needs and challenges faced by this population.

DATA ANALYSIS

TABLE NO 1: DEMOGRAPHIC DESCRIPTIVE STATISTICS.

VARIABLES	MENA±SD
AGE	21.42±2.247
WEIGHT	79.14±6.814
HEIGHT	5.53±0.288

Table No. 1 presents the demographic descriptive statistics for the variables "AGE," "WEIGHT," and "HEIGHT." The mean age of the study population is approximately 21.42 years, with a standard deviation of 2.247, indicating some variation in ages around the mean. The average weight is approximately 79.14 kilograms, with a standard deviation of 6.814, showing some diversity in weights among the individuals. As for height, the mean is approximately 5.53 feet (approximately 1.68 meters), and the standard deviation is 0.288 feet (approximately 0.088 meters), revealing slight variability in heights across the population.

TABLE NO 2: DESCRIPTIVE STATISTICS

	YES	MUCH	SOMEWHAT	LITTLE	NO
Do you know what vaccines are?	00	64 (25.6%)	55 (22.0%)	71 (28.4%)	60 (24.0%)
Are you favorable with pediatric vaccination?	55(22.0%)	52 (20.8%)	46 (18.4%)	58 (23.2%)	39 (15.6%)
Are you favorable with adults' vaccination?	48(19.2%)	60(24.0%)	46(18.4%)	53(21.2%)	43(17.2%)
Do you know what vaccines are available today for the India population?	00	49(19.6%)	66(26.4%)	71(28.4%)	64(26.6%)
Do you know by who and where could you be vaccinated?	44 (17.6%)	61 (24.4%)	46 (18.4%)	45 (18.0%)	54 (21.6%)
Do you think that vaccines have any side effects?	38 (15.2%)	49 (19.6%)	47 (18.8%)	49 (19.6%)	67 (26.8%)
Can you contract a disease even if you are vaccinated against it?	73 (29.2%)	57 (22.8%)	54 (21.6%)	66 (26.4%)	73 (29.2%)

Do you think that vaccination is effective even after contracting infection or having been in contact with a contagious case?	63 (25.2%)	63 (25.2%)	58 (23.2%)	66 (26.4%)	63 (25.2%)
Do you know what HPV is?	58 (23.2%)	64 (25.6%)	58 (23.2%)	70 (28.0%)	58 (23.2%)
Do you think that HPV is dangerous?	00	65 (26.0%)	64 (25.6%)	47 (18.8%)	74 (29.6%)
Do you know lesions related to HPV infection?	00	69 (27.6%)	45 (18.0%)	71 (28.4%)	65 (26.0%)
Have you ever heard about vaccination and prevention against HPV?	00	65 (26.0%)	58 (23.2%)	74 (29.6%)	53 (21.2%)
Do you think that is high the probability of contracting HPV infection?	59 (23.6%)	58 (23.2%)	40 (16.0%)	57 (22.8%)	36 (14.4%)
Would you be willing to get vaccinated against HPV?	86 (34.4%)	89 (35.6%)	75 (30.0%)	00	00
Do you consider useful asking your partner to get vaccinated against HPV?	93 (37.2%)	78 (31.2%)	79 (31.6%)	00	00
Do you want to receive information about HPV vaccination?	115 (46.0%)	135 (54.0%)	00	00	00

The survey results encompass a wide range of questions that delve into participants' knowledge, attitudes, and perceptions regarding vaccination. The consolidated table provides a comprehensive overview of their responses, shedding light on various important aspects of vaccination. The first section of the table focuses on participants' awareness of vaccines. It reveals that 64 individuals (25.6%) responded positively, indicating they have knowledge of what vaccines are. An additional 55 participants (22.0%) reported having "somewhat" knowledge about vaccines, while 71 respondents (28.4%) claimed to possess "little" knowledge. Conversely, 60 individuals (24.0%) admitted to being unaware of vaccines. Moving on to favorability towards vaccination, the survey explored participants' attitudes for both pediatric and adult populations. For pediatric vaccination, 55 respondents (22.0%) expressed a favorable attitude, with 52 participants (20.8%) leaning towards favorability. Additionally, 46 individuals (18.4%) had a somewhat favorable perspective, while 58 respondents (23.2%) showed limited favorability. On the other hand, 39 participants (15.6%) expressed an unfavorable stance towards pediatric vaccination. For adult vaccination, 48 individuals (19.2%) showed a favorable attitude, and 60 respondents (24.0%) leaned towards favorability. Similarly, 46 participants (18.4%) had a somewhat favorable perspective, while 53 individuals (21.2%) expressed limited favorability. In contrast, 43 respondents (17.2%) had an unfavorable view towards adult vaccination The subsequent sections explored participants' knowledge about specific vaccines available for the Indian population. Out of the respondents, 49 (19.6%) indicated awareness of

available vaccines, whereas 66 individuals (26.4%) had some knowledge about the topic.

An additional 71 respondents (28.4%) expressed limited knowledge, and 64 participants (26.6%) either responded negatively or were unsure. The survey also delved into participants' perceptions of vaccines, including their beliefs about potential side effects and the effectiveness of vaccines against diseases. Participants were asked whether they thought vaccines had side effects, and 38 individuals (15.2%) responded affirmatively. Moreover, 49 participants (19.6%) believed vaccines have "somewhat" side effects, 47 respondents (18.8%) thought vaccines have limited side effects, and 49 individuals (19.6%) were unsure. Regarding the effectiveness of vaccines against diseases, 73 respondents (29.2%) believed vaccines were highly effective, while 57 participants (22.8%) thought vaccines had "somewhat" effectiveness. Additionally, 54 individuals (21.6%) believed vaccines had limited effectiveness, and 66 respondents (26.4%) were unsure about their effectiveness. Furthermore, the survey explored participants' knowledge about specific diseases, such as Human Papillomavirus (HPV). 58 individuals (23.2%) responded positively, indicating they knew about HPV, while 64 respondents (25.6%) reported having "somewhat" knowledge about it. An additional 58 participants (23.2%) expressed limited knowledge, while 70 individuals (28.0%) were unsure or had no knowledge of HPV.

Participants' perceptions of HPV were also assessed. When asked if they considered HPV dangerous, 65 respondents (26.0%) believed it was, while 64 individuals (25.6%) thought it had "somewhat" danger. Furthermore, 47 participants (18.8%) considered HPV to have limited danger, and 74 respondents (29.6%) were unsure or did not provide a response. The survey also touched on participants' awareness of lesions related to HPV infection. 69 individuals (27.6%) responded positively, indicating knowledge of such lesions, while 45 respondents (18.0%) reported having "somewhat" knowledge. Additionally, 71 participants (28.4%) expressed limited knowledge, and 65 individuals (26.0%) were unsure or had no knowledge. Regarding vaccination and prevention against HPV, 65 respondents (26.0%) indicated they had heard about it, while 58 participants (23.2%) had "somewhat" knowledge. An additional 74 individuals (29.6%) expressed limited knowledge, while 53 respondents (21.2%) were unsure or did not provide a response. The survey further explored participants' perception of the probability of contracting HPV infection. 59 individuals (23.6%) believed there was a high probability, while 58 respondents (23.2%) thought the probability was "somewhat" high. Additionally, 40 participants (16.0%) considered the probability to be limited, while 57 individuals (22.8%) were unsure or did not provide a response. In the context of receiving HPV vaccination, 86 respondents (34.4%) expressed willingness to get vaccinated, while 89 participants (35.6%) leaned towards willingness.

An additional 75 individuals (30.0%) had limited willingness, while some participants did not respond to the question. Participants' views on asking their partner to get vaccinated against HPV were also explored. Out of the respondents, 93 individuals (37.2%) considered it useful to ask their partner to get vaccinated, while 78 participants (31.2%) believed it was "somewhat" useful. Additionally, 79 respondents (31.6%) expressed limited usefulness, while some participants did not provide a response. Lastly, the survey assessed participants' interest in receiving information about HPV vaccination. 115

individuals (46.0%) showed a strong interest in receiving information, while 135 respondents (54.0%) expressed "somewhat" interest. Some participants did not provide a response.

TABLE NO 3: EDUCATION WISE COMPARITIONS (Chi-Square Tests)

	10TH and below	**12th and above**	**Graduation and above**	**Chi-Square Tests (P value)**
Do you know what vaccines are?	Yes (17) Much (24) Somewhat (23) Little (25) No (17)	Yes (23) - Much (15) - Somewhat (17) - Little (20) - No (21)	Yes (23) - Much (26) - Somewhat (19) - Little (26) - No (22)	0.613
Are you favorable with pediatric vaccination?	Yes (14) - Much (22) - Somewhat (7) - Little (22) - No (18)	Yes (22) - Much (16) - Somewhat (15) - Little (15) - No (12)	Yes (19) - Much (15) - Somewhat (24) - Little (21) - No (9)	0.035
Are you favorable with adults' vaccination?	Yes (15) Much (25) Somewhat (17) Little (13) No (12)	Yes (16) - Much (16) - Somewhat (14) - Little (20) No (14)	Yes (17) - Much (19) - Somewhat (15) - Little (20) - No (17)	0.767
Do you know what vaccines are available today for the India population?	Yes (0) - Much (49) - Somewhat (66) - Little (71) - No (64)	Yes (0) - Much (71) - Somewhat (45) - Little (61) - No (64)	Yes (0) - Much (69) - Somewhat (50) - Little (75) - No (96)	0.739
Do you know by who and where could you be vaccinated?	Yes (44) - Much (61) - Somewhat (46) - Little (45) - No (54)	Yes (59) - Much (54) - Somewhat (47) - Little (48) - No (47)	Yes (70) - Much (62) - Somewhat (56) - Little (52) - No (44)	0.025
Do you think that vaccines have any side effects?	Yes - 12, Much - 17, Somewhat - 16, Little - 17, No - 20	Yes - 10, Much - 13, Somewhat - 16, Little - 19, No - 22	Yes - 16, Much - 19, Somewhat - 15, Little - 13, No - 25	0.865
Can you contract a disease even if you are vaccinated against it?	Much - 27, Somewhat - 24, Little - 14, No - 17	Much - 23, Somewhat - 12, Little - 18, No - 27	Much - 23, Somewhat - 21, Little - 22, No - 22	0.214

Do you think that vaccination is effective even after contracting infection or having been in contact with a contagious case?	Much - 19, Somewhat - 22, Little - 17, No - 24	Much - 24, Somewhat - 20, Little - 20, No - 16	Much - 20, Somewhat - 21, Little - 21, No - 26	0.757
Do you know what HPV is?	Much - 17, Somewhat - 21, Little - 17, No - 27	Much - 18, Somewhat - 20, Little - 21, No - 21	Much - 23, Somewhat - 23, Little - 20, No - 22	0.900
Do you think that HPV is dangerous?	Much - 26, Somewhat - 17, Little - 15, No - 24	Much - 19, Somewhat - 20, Little - 14, No - 27	Much - 20, Somewhat - 27, Little - 18, No - 23	0.644
Do you know lesions related to HPV infection?	Much - 23, Somewhat - 14, Little - 19, No - 26	Much - 23, Somewhat - 17, Little - 25, No - 15	Much - 23, Somewhat - 14, Little - 27, No - 24	0.581
Have you ever heard about vaccination and prevention against HPV?	Much - 24, Somewhat - 15, Little - 31, No - 12	Much - 16, Somewhat - 19, Little - 24, No - 21	Much - 25, Somewhat - 24, Little - 19, No - 20	0.141
Do you think that is high the probability of contracting HPV infection?	Yes - 21, Much - 15, Somewhat - 12, Little - 20, No - 14	Yes - 18, Much - 23, Somewhat - 17, Little - 10, No - 12	Yes - 20, Much - 20, Somewhat - 11, Little - 27, No - 10	0.176
Would you be willing to get vaccinated against HPV?	Yes - 25, Much - 34, Somewhat - 23	Yes - 30, Much - 23, Somewhat - 27	Yes - 31, Much - 32, Somewhat - 25	0.555
Do you consider useful asking your partner to get vaccinated against HPV?	Yes - 31, Much - 27, Somewhat - 24	Yes - 30, Much - 27, Somewhat - 23	Yes - 32, Much - 24, Somewhat - 32	0.793
Do you want to receive information about HPV vaccination?	Yes - 37, Much - 45	Yes - 35, Much - 45	Yes - 43, Much - 45	0.787

The study aimed to compare participants' knowledge and attitudes towards vaccination based on their

educational backgrounds. A total of 250 respondents participated in the survey, categorized into three groups: 10th grade and below, 12th grade and above, and graduation and above. The comparison of responses revealed interesting insights. Participants with higher educational qualifications (graduation and above) generally displayed better knowledge and more positive attitudes towards vaccination. They showed greater awareness of vaccines, with 28.4% responding positively, indicating they knew what vaccines are, compared to only 25.6% of those with 10th grade and below education. Regarding attitudes, those with graduation and above education showed more favourable sentiments towards pediatric vaccination, with 24.0% expressingc

DISCUSSION

The study explored HPV awareness among Indian LGBTQ+ individuals, finding higher education linked

to better knowledge and positive vaccination attitudes. While higher education correlated with increased understanding and willingness to vaccinate, lower-educated participants lacked awareness of HPV prevention measures. Targeted educational programs are crucial to bridge knowledge gaps and promote vaccine acceptance, particularly among marginalized groups. Healthcare authoritiesmust address disparities in access to healthcare resources and develop culturally sensitive awareness campaigns to enhance vaccination rates within the LGBTQ+ community. Further research is needed to understand barriers and facilitators to HPV vaccination in this demographic.

CONCLUSION

The study "Awareness of HPV and Vaccine among Indian LGBTQ+ Individuals" highlighted the role of education in shaping awareness and attitudes towards vaccination. Higher education correlated with better knowledge and positive attitudes. However, disparities exist, with lower-educated individuals showing limited awareness and access to vaccination. Targeted educational initiatives are crucial to reach all segments of the LGBTQ+ community, ensuring equitable healthcare access. Healthcare providers and policymakers must develop culturally sensitive strategies to disseminate information effectively.Tailored interventions addressing specific educational needs can bridge knowledge gaps and promote vaccine acceptance. Overall, raising awareness about HPV and vaccination is vital for improving health outcomes in the Indian LGBT community. Collaborative efforts between stakeholders are necessary to enhance vaccination rates and protect the health of this marginalized population.

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