

ORIGINAL RESEARCH**Knowledge, attitude towards human papillomavirus and hpv vaccine among female medical personnel of a tertiary care teaching hospital in India**

¹Dr. Shubha Shankari Manjunath, ²Dr. Krishi Gowdra Revannasiddappa, ³Dr. Ujjwala Sai Guttapalli, ⁴Dr. Sunila Rani Guttapalli, ⁵Dr Jasmine

¹Specialist Obstetrician and Gynaecologist, NMC Speciality Hospital, Abu Dhabi

²MRCOG. Specialist Obstetrician and Gynaecologist, Zulekha Hospital, Dubai

³NRI Academy of Medical Sciences, Vijayawada, Andhra Pradesh, India

⁴NMC Specialty Hospital, Consultant and Head, Department of Obstetrics and Gynaecology, Abu Dhabi

⁵First Year PG, Department of General Surgery, Gayatri Vidya Parishad Medical College and Hospital, Visakhapatnam, Andhra Pradesh, India

Corresponding author

Dr Jasmine

First Year PG, Department of General Surgery, Gayatri Vidya Parishad Medical College and Hospital, Visakhapatnam, Andhra Pradesh, India

Email: drjasminekalsi@gmail.com

Received: 13 October, 2022

Accepted: 16 November, 2022

ABSTRACT

Introduction: Cervical cancer is the second most prevalent cancer among Indian women, accounting for 6-29% of all cancers among Indian women. Human Papillomavirus (HPV) is the disease-causing agent. Recent technological advancements have led to the development of a vaccination to prevent HPV infection. The purpose of this study was to determine the level of knowledge about human papillomavirus (HPV) infections and vaccination among female medical personnel at a tertiary teaching hospital.

Materials and methods: A cross-sectional study was conducted among female medical personnel of a teaching hospital of a tertiary care. They were assured confidentiality and given a questionnaire regarding HPV infection and HPV vaccine.

Results: About 94.3% of participants identified HPV as the cause of cervical cancer, whereas 5.7% of participants were unaware of the association. About 72.1% were aware of the availability of the vaccination to prevent HPV infection, while 3.3% answered incorrectly and 24.6% were unaware. 31% of participants understood the correct age of vaccine initiation, 23% answered incorrectly, and 45.9% of participants did not know the answer. Only 4.1% of participants have had the HPV vaccination. 63.9 percent of participants did not agree to get vaccinated against HPV because they believed it would give them a false feeling of security, and 68.8 percent of participants were opposed to the systematic vaccination of the young Indian population against HPV because sexual exposure happens at a later age. 73% of participants cited a vaccination age of >25 years.

Conclusion: Insufficient medical personnel understanding leads to ignorance among public. Therefore, health personnel must be educated on the numerous components of

HPV, cervical malignancies, and their prevention.

Keywords: Human papillomavirus, Knowledge, Attitude, HPV vaccine, medical personnel

INTRODUCTION

HPV is one of the most prevalent causes of sexually transmitted diseases. Cervical cancer is the second most prevalent malignancy in women globally and a leading cause of female mortality.¹ Human Papilloma Virus (HPV) infection being the most common viral infection of reproductive tract is responsible for almost all cases of cervical cancer, 90% of anal, 78% of vaginal, 25% of vulvar, 50% of penile, 60% of oropharyngeal cancers. Large trials have demonstrated the safety, immunogenicity and high efficacy of the available bivalent, quadrivalent and nonavalent vaccines. In spite of this, globally the uptake of the HPV vaccines has been slow. In 2020 global coverage with 2 doses was only 13%. There is decline in HPV vaccination coverage globally between 2019 and 2021, from 25% to 15%. In India, cervical cancer remains the most prevalent female malignancy, with an annual incidence of around 1,32,000 cases.² Cervical cancer is the fourth most common cancer among women globally, with an estimated 604 000 new cases and 342 000 deaths in 2020. About 90% of the new cases and deaths worldwide in 2020 occurred in low- and middle-income countries. The identification of this deadly virus in cervical cancer has spurred the development of preventative vaccinations. In recent years, HPV vaccinations have been launched in several affluent nations. With the goal of achieving a large reduction in global cancer incidence, these measures have been implemented in many developing nations.³⁻⁷

Two types of HPV vaccines for preventive immunization have been developed and clinically assessed. *Gardasil* (Merck & Co., USA) and *Cervarix* (GladstoneSmithKline, Belgium) have been approved in numerous nations, including the United States, Australia, and the European Union. These have been approved for female use in India (primary vaccination at 10-12 years, catch-up up to 26 years).

Figure 1: Prevalence of Cervical Screening. The district's boundaries are as per the Census of India, 2011. Courtesy: Monica, Mishra R. An epidemiological study of cervical and breast screening in India: district-level analysis. BMC Women's Health 2020;20. <https://doi.org/10.1186/s12905-020-01083-6>.

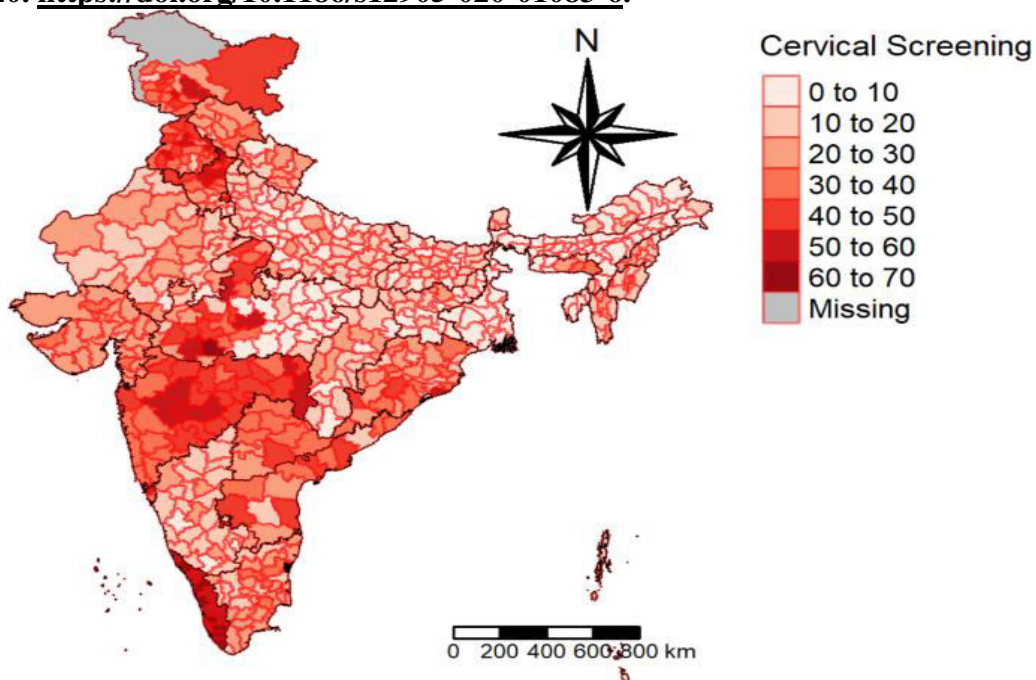
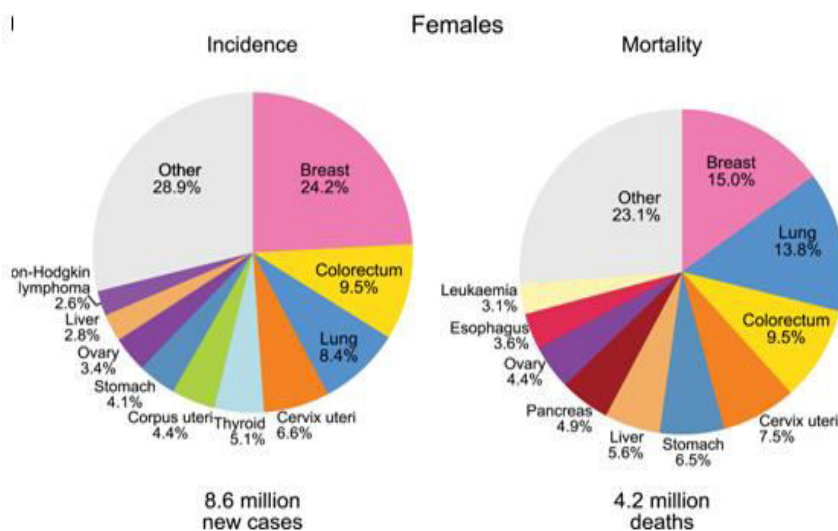


Figure 2: The area of the pie chart reflects the proportion of the total number of cases or deaths; nonmelanoma skin cancers are included in the “other” category. Source: GLOBOCAN2018.



Due to rising urbanization in nations like India, all of the target population should be aware of this viral infection and its preventative methods. It is essential to comprehend the impediments to immunization posed by adolescents' attitudes. The value of an educational campaign aimed at health care providers is very high.^{8,9} Because, in the future, these experts will be the first line of information resources and will play a crucial role in educating a diverse population. Therefore, this study was undertaken to evaluate the knowledge and attitudes of medical personnel, who are the most qualified individuals to distribute information on HPV and HPV vaccinations.

METHODS

A questionnaire-based cross-sectional study was undertaken with consent from the Institutional Ethics Committee among the women medical personnel of the tertiary care teaching hospital in India. All the women staff ranging from nurses, ANMs, doctors, specialists and dieticians were included in the current study. The education level of the included participants ranged from high school, graduate, post graduate, doctorate. The age groups ranged from 18 - 25, 25 - 34, 35 - 44, above 44. The study was conducted from March 2022-August 2022 for a period of 6 month. The only criterion for exclusion was the medical personnel refusal to participate in the study. The medical personnel's personal information and confidentiality were protected. A questionnaire comprised of nineteen questions was devised to collect data regarding knowledge and comprehension of the disease, the concept of vaccination, the level of acceptance and attitude toward vaccination. The questionnaire's was adapted from the study of Matranga et al.,¹⁰ and was modified. **Form 1** The questionnaire's validity was evaluated in a pilot research with interns and postgraduates. After analyzing the validity, the questionnaire was administered to the subjects. They were instructed to complete the questionnaire and return it during the same session. As cervical cancer is a significant health issue among women, the knowledge, awareness, was assessed.

STATISTICAL ANALYSIS

The collected data was analyzed using descriptive statistics, and frequencies and percentages were generated for each questionnaire item. Data was entered on excel sheet and was

analysed using Statistical Package for Social Sciences (SPSS) ver.21 software. Data was analysed using percentages and chi-square tests and results were obtained. In chi square tests, p value < 0.05 was considered significant.

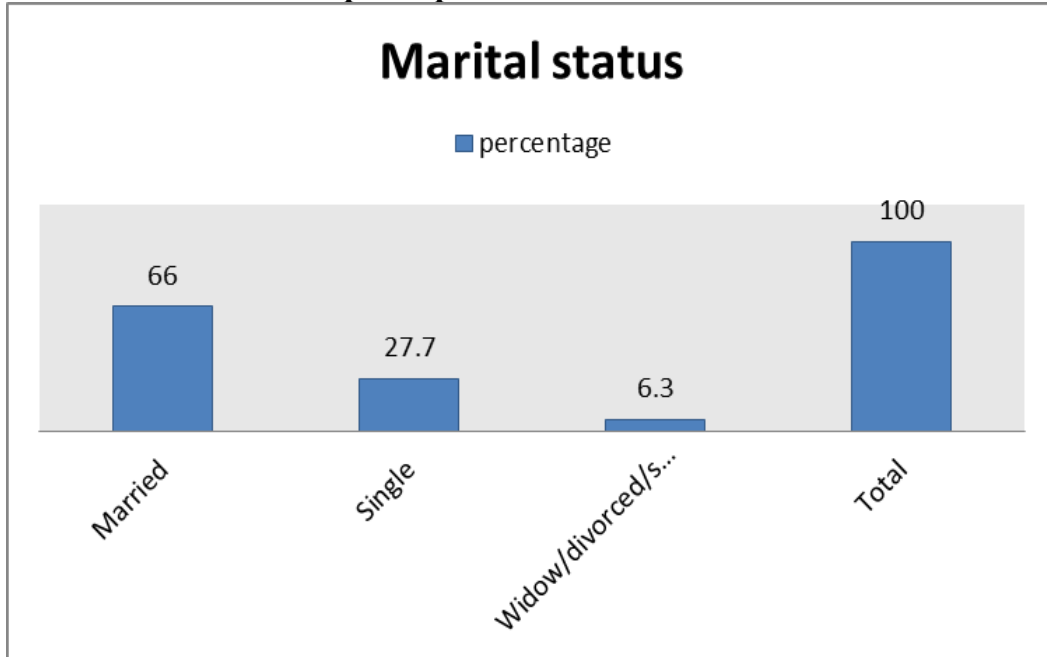
FORM 1: QUESTIONNAIRE	
<i>Age:</i>	
<i>Profession:</i>	
1. Are you aware of cervical cancer?	
<input type="checkbox"/> Yes	
<input type="checkbox"/> much	
<input type="checkbox"/> Somewhat	
<input type="checkbox"/> Little	
<input type="checkbox"/> no	
2. Are you aware of Pap smear?	
<input type="checkbox"/> Yes	
<input type="checkbox"/> much	
<input type="checkbox"/> Somewhat	
<input type="checkbox"/> Little	
<input type="checkbox"/> no	
3. Are you aware of Human Papilloma Virus?	
<input type="checkbox"/> Yes	
<input type="checkbox"/> much	
<input type="checkbox"/> Somewhat	
<input type="checkbox"/> Little	
<input type="checkbox"/> no	
4. Are you aware of vaccines for cervical cancer?	
<input type="checkbox"/> Yes	
<input type="checkbox"/> much	
<input type="checkbox"/> Somewhat	
<input type="checkbox"/> Little	
<input type="checkbox"/> no	
5. Do you know how effective the vaccine is in preventing cervical cancer	
<input type="checkbox"/> Yes	
<input type="checkbox"/> much	
<input type="checkbox"/> Somewhat	
<input type="checkbox"/> Little	
<input type="checkbox"/> no	
6. Are you aware of what age group can be vaccinated	
<input type="checkbox"/> Yes	
<input type="checkbox"/> much	
<input type="checkbox"/> Somewhat	
<input type="checkbox"/> Little	
<input type="checkbox"/> no	
7. Would you be willing to get vaccinated/ get your daughters vaccinated against HPV	
<input type="checkbox"/> Yes	
<input type="checkbox"/> much	

<input type="checkbox"/> Somewhat
<input type="checkbox"/> Little
<input type="checkbox"/> no
8. Do you think there is enough information out there regarding HPV and Consequences of contracting the infection
<input type="checkbox"/> Yes
<input type="checkbox"/> much
<input type="checkbox"/> Somewhat
<input type="checkbox"/> Little
<input type="checkbox"/> no
9. Do you know of any side effects of the HPV Vaccine
<input type="checkbox"/> Yes
<input type="checkbox"/> much
<input type="checkbox"/> Somewhat
<input type="checkbox"/> Little
<input type="checkbox"/> no
10. Are you aware of any long term problems with the Vaccine
<input type="checkbox"/> Yes
<input type="checkbox"/> much
<input type="checkbox"/> Somewhat
<input type="checkbox"/> Little
<input type="checkbox"/> no
11. Do you think the vaccination is effective even after an abnormal Pap smear report?
<input type="checkbox"/> Yes
<input type="checkbox"/> much
<input type="checkbox"/> Somewhat
<input type="checkbox"/> Little
<input type="checkbox"/> no
12. Has your GP/Gynaecologist educated you about the vaccine against Cervical cancer
<input type="checkbox"/> Yes
<input type="checkbox"/> much
<input type="checkbox"/> Somewhat
<input type="checkbox"/> Little
<input type="checkbox"/> no
13. Are aware of the cost of the 3 doses of the vaccine
<input type="checkbox"/> Yes
<input type="checkbox"/> much
<input type="checkbox"/> Somewhat
<input type="checkbox"/> Little
<input type="checkbox"/> no
14. Would you get your child vaccinated if the school offers it
<input type="checkbox"/> Yes
<input type="checkbox"/> much

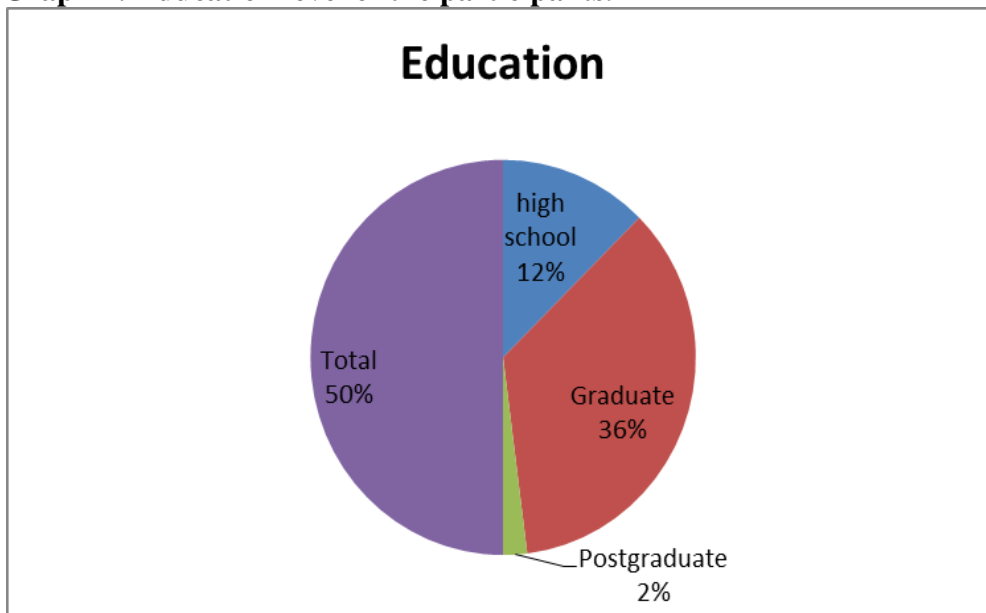
<input type="checkbox"/> Somewhat
<input type="checkbox"/> Little
<input type="checkbox"/> no
15. are you aware of the vaccine effectiveness in preventing genital warts
<input type="checkbox"/> Yes
<input type="checkbox"/> much
<input type="checkbox"/> Somewhat
<input type="checkbox"/> Little
<input type="checkbox"/> no
16. Do you think it to be included in the National Immunization Program?
<input type="checkbox"/> Yes
<input type="checkbox"/> much
<input type="checkbox"/> Somewhat
<input type="checkbox"/> Little
<input type="checkbox"/> no
17. Have you received at least 1 dose of HPV vaccination?
<input type="checkbox"/> Yes
<input type="checkbox"/> no
18. If not vaccinated, are you willing to take the vaccine / give it to your daughter?
<input type="checkbox"/> Yes
<input type="checkbox"/> much
<input type="checkbox"/> Somewhat
<input type="checkbox"/> Little
<input type="checkbox"/> no
19. If not willing for vaccination what is the reason?
A. Afraid of side effects
B. Do not have enough information
C. You feel Vaccination is not effective
D. Financial constraints
E. Other constraints like inability to access vaccine nearby, lack of time.

RESULTS

For this study, 150 medical personnel between the ages of 18 and above were polled. Only 122 medical personnel out of 150 responded and submitted the questionnaire in its entirety. 28 questionnaires were deemed insufficient and excluded from the analysis. These medical personnel had a mean age of 32 years. All the included subjects were women. 66% of the participants were married. Graph 1 There were medical personnel who were married and had children. 71 % subjects were graduates in the current study.

Graph 1: marital status of the participants.

Graph 2 One hundred eleven (90.9%) medical personnel were aware of the availability of the HPV vaccine, while nine percent had never heard of it.

Graph 2: Education level of the participants.

KNOWLEDGE OF HPV INFECTION

The responses were analyzed to determine the medical personnel awareness of the Human papillomavirus and its infection. One hundred fifteen participants (94.3%) inferred that HPV is a cervical cancer-causing agent. However, only seven (5.7%) pupils were unaware of the association. 75% of medical personnel believe that HPV infection spreads via sexual and nonsexual routes. 25% of medical personnel responded that HPV is exclusively transmitted sexually. Eighty-two percent of medical personnel were aware that HPV can cause genital warts and other precancerous lesions, whereas eighteen percent were unaware. Only 1 medical personnel provided the correct answer on the progression of HPV infection to cervical cancer.

KNOWLEDGE OF HPV VACCINATION

Eighty-eight medical personnel (72,1%) were aware that the HPV infection can be prevented with vaccination. However, four medical personnel (3.3%) provided an incorrect response, and thirty medical personnel (24.6%) were unaware that the vaccine was available. Only 6.6% of the medical personnel indicated that the HPV vaccine protects against cervical cancer-causing viruses. However, the majority of medical personnel (54.9%) were unaware of the prevention. Approximately 9.8% of the medical personnel responded that the vaccine could prevent other sexually transmitted diseases. 31% of medical personnel understood the correct age of vaccine initiation, 23% answered incorrectly, and 45.9% of medical personnel did not know the answer. Table 1 details the responses to the many questions asked of medical personnel in order to evaluate their understanding of the HPV vaccine.

Table 1: Knowledge about HPV vaccination

Questions parameters	Right answers (%)	Wrong answer (%)	Did not know (%)
Schedule of vaccination	23	8.2	68.9
Route of administration	59.8	5.7	34.4
Commercially available vaccines	12.3	6.6	81.1
Efficacy of the vaccines	23	7.1	69.9
Follow up anal/cervical screening	45.9	6.6	47.5

ATTITUDE TOWARD HPV VACCINATION

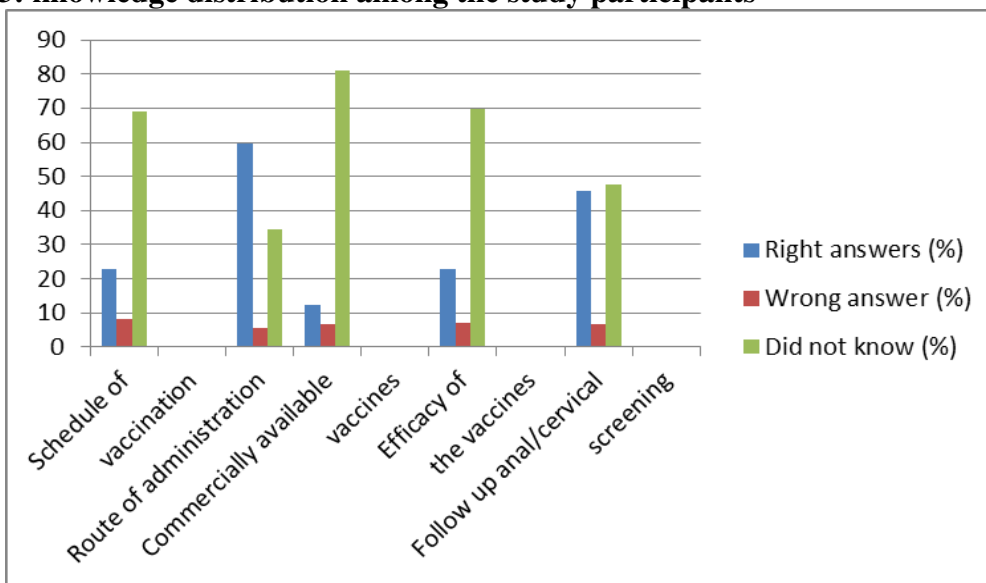
The questionnaire was developed to gauge medical personnel perspective on the HPV vaccine. Prior to this study, 95.9% of medical personnel were not vaccinated against HPV. About 4.1% of medical personnel have been immunized against HPV. However, just 36.1% of medical personnel were willing to consent to vaccination, compared to 63.9% who were opposed to vaccination. The majority of medical personnel (68.9%) stated that there is no need for systematic vaccination of the young Indian population because sexual exposure happens at a later stage of life, and 73% of medical personnel indicated that the age of immunization should be more than 25 years. However, 31.1% of medical personnel believed that routine vaccinations for young people are necessary. The reason for not getting vaccinated was shared between the options of the being Afraid of side effects (53.1%) and having constraints (40.0%). Regarding the price of the vaccine, 68.9% of respondents believed that it should cost 1,000 rupees to be affordable to the majority of people (Table 2).

Table 2: Attitude of the medical personnel for HPV vaccination

Parameters measured in the questionnaire		
Have you vaccinated with HPV before	Yes (4.1%)	No (95.9%)
Will you give consent for vaccination against HPV	Yes (36.1%)	No (63.9%)
HPV vaccine should be prescribed routinely to young population in India	Yes (31.1%)	No (68.9%)
If not willing for vaccination reason		
A. Afraid of side effects	53.1%	
B. Do not have enough information	2.8%	

C. You feel Vaccination is not effective	1.0%	
D. Financial constraints	3.1%	
E. Other constraints like inability to access vaccine nearby, lack of time.	40.0%	
Age of the vaccination 15-25 yrs.		
> 25 yrs.	12.3%	-
> 35 yrs.	73%	-
	14.8%	-
Cost of the HPV vaccine		
Rs 500	21.3%	-
Rs 1000	68.9%	-
Rs 2000	9.8%	-

Graph 3: knowledge distribution among the study participants



DISCUSSION

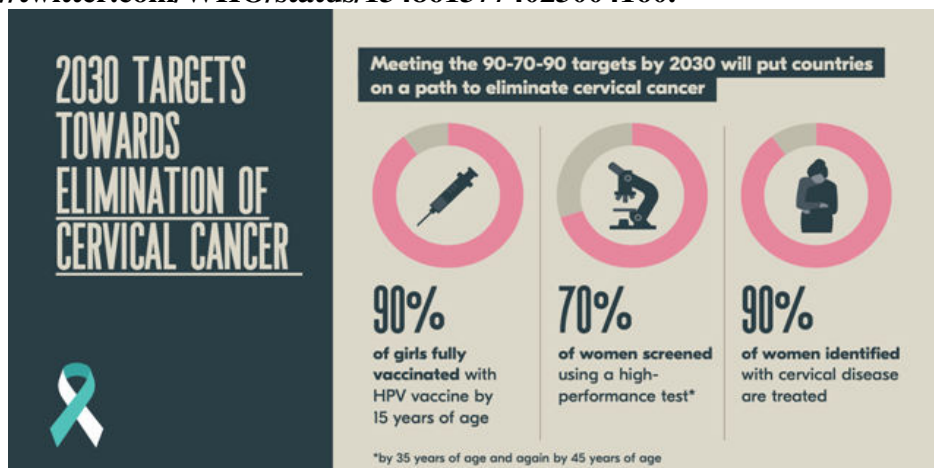
Cancer is an incurable condition that has tormented humanity for generations. There are a variety of cancer therapy methods. Currently, numerous studies are being conducted to develop a cancer-preventative vaccine. The morbidity and mortality associated with HPV-induced genital lesions and the low protection conferred by spontaneous infection have prompted the hunt for a preventative vaccination. The introduction of the HPV vaccine marked a significant step forward in the fight against cervical malignancies.¹⁰⁻¹² Currently, two preventative HPV vaccinations are available worldwide. This virus has gained prominence due to the interest of Indian pharmaceutical companies towards the development and commercialization of an HPV vaccine. Young Indians have a very limited understanding of the connection between Human papillomavirus and cervical cancer and the HPV vaccine's ability to prevent this disease. A study conducted by Saha et al. in India indicated that graduate and postgraduate students have a relatively low level of awareness.³ The average awareness of risk factors for cervical cancer among educated youth in India, Sri Lanka, and Nepal was found to be 66% in India, 58.8% in Nepal, and 57% in Sri Lanka.⁴ This survey was undertaken to determine the knowledge and perspective of women medical personnel of the tertiary care teaching hospital in India. The majority of women medical personnel were aware of the link between HPV and cervical cancer, as well as the virus' mode of

transmission. This was comparable to the results of a research conducted by Pandey et al.⁵ Another study has found that student understanding of HPV and the HPV vaccine is quite low.⁶ The study by Durusoy et al. on the knowledge and willingness of first-year students on the HPV vaccine indicated that just 11.6% of girls intended to be vaccinated.⁷ In current study, only 36.1% of women medical personnel were willing to be vaccinated against HPV, compared to 88% in Mehta S. et al.,⁶ study. A study conducted by Naki et al., on the awareness, knowledge, and attitudes related to HPV infection and vaccine among non-obstetrician-gynecologist healthcare providers revealed that physicians had significantly more HPV-related knowledge and were more willing to get vaccinated than non-physician staffs.⁸ According to a study by Gimet GD et al., 48% of the unvaccinated population is unlikely to get vaccinated for the following reasons: they are married and in monogamous relationships, and vaccinations are new and contain incorrect information.⁹ Similarly, in current study, the majority of participants were unwilling to consent to vaccination, citing the vaccine's false sense of security as the cause. They even responded that the immunization should be administered to those above the age of 25 because sexual contact is delayed in India.

Awareness and knowledge regarding HPV infection and vaccine were high among medical personnel in current study since the group consisted of majority participants who were graduates and doctors who were introduced to the subject but had limited clinical exposure. However, participants' attitudes about HPV vaccination were poor. The main barrier for the not getting vaccinated was the response given to be a fear of side effects in almost half of the study participants, while others have mentioned the constrains of the accessibility and time. The educational programs can help in the advertisements in such conditions to remove the fear, help understand the success of the vaccine and educate of the benefits of vaccination compared to the cost of vaccine. The educational programs can also encourage manufacturing of the vaccine in the country and thus reducing the costs, at the same time make it available in the health centers. The following goals must be achieved by 2030 for countries to be on the path to eliminating cervical cancer: **90-70-90**. A global strategy to accelerate the elimination of cervical cancer as a public health problem proposes:¹³

- a vision of a world where cervical cancer is eliminated as a public health problem;
- a threshold of 4 per 100 000 women-years for elimination as a public health problem; and the following 90-70-90 goals:
 - By the age of 15, 90% of females had received their complete HPV vaccination.
 - At the ages of 35 and 45, high-performance tests are administered to 70% of women.
 - 90% of women who are diagnosed with cervical disease undergo therapy (80% are treated for pre-cancer, and 90% are managed for invasive cancer).

Figure 3: WHO's 90-70-90 targets by 2030. Courtesy: Twitter. Twitter n.d. <https://twitter.com/WHO/status/1348613774023004160>.



With a mathematical model that highlights these short-term gains if the 90-70-90 objectives are met by 2030 in low- and lower middle-income countries:¹³

- The median cumulative number of cervical cancer deaths prevented will be 300 000 by 2030, over 14 million by 2070, and over 62 million by 2120.
- The median cervical cancer incidence rate will reduce by 42% by 2045 and by 97% by 2120, preventing more than 74 million new cases.

The general population would be considerably more misinformed, and acceptance would be extremely low.^{12,13} As medical staffs are the future health care professionals and health educators, this could be detrimental to the health of the community. Therefore, there is a need for an intensive health education program, seminars, group discussions, and interactive sessions with women addressing HPV and its association with cervical cancer and its prevention. Even pharmaceutical companies promoting the HPV vaccine and those involved in the creation of the HPV vaccine can initiate educational programs to raise awareness of HPV infections. Even the government is considering a strategy to incorporate this vaccine in the standard immunization schedule, but prior doing that, the public should be provided with accurate information. Current study was limited by the fact that the participants were from a single medical school and ranged from lower grade employees to consultants, who do not represent the knowledge of all medical staff. Future significance of this study will be enhanced by the inclusion of staff from additional programs, such as dental, nursing, and physiotherapy.

CONCLUSIONS

The present study is an effort to determine the level of knowledge among prospective healthcare professionals about one of the most talked topics of the moment, the cervical cancer vaccine. Knowledge, awareness and correct information from credible sources will play a critical role in increasing the uptake of HPV vaccination. Educational initiatives for healthcare personnel first and then socially and culturally sensitive awareness programs for the general public are crucial to achieve the WHO goal to eliminate cervical cancer by 2030.

REFERENCES

1. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2021;71:209–49. doi:10.3322/caac.21660.
2. Stelzle D, Tanaka LF, Lee KK, et al. Estimates of the global burden of cervical cancer associated with HIV. *Lancet Glob Health* 2020; published online Nov 16. DOI:S2214-109X(20)30459-9
3. *Cervical Cancer Elimination Day of Action: Together we can end cervical cancer.* (2022, November 17). Cervical Cancer Elimination Day of Action: Together We Can End Cervical Cancer. <https://www.who.int/southeastasia/news/detail/17-11-2022-cervical-cancer-elimination-together-we-end>.
4. Teresa J, Brijesh S, Chacchu B, Jenny C. Awareness of Cervix Cancer Risk Factors in Educated Youth: A Cross-Sectional, Questionnaire Based Survey in India, Nepal, and Sri Lanka. *Asian Pacific J Cancer Prev.* 2011;12:1707-12.
5. Pandey D, Vanya V, Bhagat S, VS B, Shetty J. Awareness and Attitude towards Human Papillomavirus (HPV) Vaccine among Medical Students in a Premier Medical School in India. *PLoS ONE.* 2012;7(7):e40619.
6. Mehta S, Rajaram S, Goel G, Goel N. Awareness about Human papilloma virus and its vaccine among medical students. *Indian J community medicine.* 2013;38:92-4.
7. Durusoy R, Yamazhan M, Tasbakan MI, Ergin I, Aysin M, Pullukcu H, et al. HPV

- vaccine awareness and willingness of first year students entering university in western Turkey. *Asian Pac J Cancer Prev.* 2010;11:1695-701.
8. Naki MM, Celik H, Api O, Celik H, Kars B, Yasar E et al. Awareness, Knowledge and attitude related to HPV infection and vaccine among non-obstetrician- gynaecologist healthcare providers. *J Turkish- German Gynecol Assoc.* 2010;11:16-21.
 9. Zimet GD, Weiss TW, Rosenthal SL, Good MB, Vichinin MD. Reasons for non-vaccination against HPV and future vaccination intentions among 19-26 year old women. *BMC womens Health.* 2010;10:27.
 10. Matranga D, Lumia C, Guarneri R, et al. The vaccinaTion & Hpv Knowledge (THinK) questionnaire: a reliability and validity study on a sample of women living in Sicily (southern-Italy). *PeerJ.* 2019;7:e6254. Published 2019 May 9. doi:10.7717/peerj.6254
 11. López, N., de la Cueva, I.S., Taborga, E. *et al.* HPV knowledge and vaccine acceptability: a survey-based study among parents of adolescents (KAPPAS study). *Infect Agents Cancer.* 2022; **17** (55):1-11 <https://doi.org/10.1186/s13027-022-00467-7>
 12. Zheng L, Wu J, Zheng M. Barriers to and Facilitators of Human Papillomavirus Vaccination Among People Aged 9 to 26 Years: A Systematic Review. *Sex Transm Dis.* 2021;48(12):e255-e262. doi:10.1097/OLQ.0000000000001407.
 13. Global strategy to accelerate the elimination of cervical cancer as a public health problem. Global Strategy to Accelerate the Elimination of Cervical Cancer as a Public Health Problem 2020. <https://www.who.int/publications/i/item/9789240014107>.