

# A CROSS SECTIONAL STUDY AMONGST ALLIED HEALTHCARE STUDENTS REGARDING CANCER VACCINE KNOWLEDGE, AWARENESS AND ATTITUDE

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## **ABSTRACT:**

**Background:** Cancer is a public health problem globally with an annual incidence of 19.3 million cases in 2020. This rising cancer incidence makes cancer prevention and treatment a priority. Allied Healthcare workers are the most important and the largest section of the paramedical workforce. It had been reported that allied healthcare professionals are not adequately educated or aware about cancer risk factors, risk assessment, cancer vaccines and cancer prevention.

**Aim:** This cross-sectional questionnaire-based study was conducted with the aim of assessing the level of knowledge, awareness and attitude of allied healthcare students in our institution about cancer prevention, cancer vaccines, HPV vaccines and attitude towards willingness to get vaccinated.

**Results:** Out of 151 students 90% knew about Cancer Vaccines. Only 10% knew about the therapeutic and preventives types of cancer vaccines. Only 2/3<sup>rd</sup> had the knowledge that HPV causes cancer, cancer can be prevented by use of vaccine and were willing to take cancer vaccine. Only 40% were aware about HPV vaccine and its names. Majority (95%) of them were willing to take cancer vaccine if government provides free of cost.

**Conclusion:** There was limited knowledge of cancer prevention and specific cancer vaccines. Awareness and Educational activities must be strengthened to increase the lacunae in knowledge and improve the attitude of allied healthcare students about cancer vaccine.

**Keywords:** Cancer Vaccine, Knowledge, HPV vaccine, Cancer prevention

**Introduction:**

The changing population demographics in India is declining fertility and increasing life expectancy. As the life expectancy at birth increases proportionately the percentage of older people also rises. Higher incidence of non-communicable diseases, especially cancer is positively associated with percentage of aged population of a country.<sup>1</sup> Increase in life expectancy, containment of infectious diseases and adoption of western lifestyles are making more people vulnerable to cancer.<sup>2</sup>

Cancer is a public health problem globally with an annual incidence of 19.3 million cases and mortality of 10.0 million in 2020. In India the International Agency for Research on Cancer had estimated an incidence of 1.4 million cases.<sup>3</sup> In Uttar Pradesh, a large densely populated state of Northern India, age standardized cancer mortality rate is 108.2/100,000 population.<sup>4</sup> Cervical cancer is the fourth most frequently diagnosed cancer and the fourth leading cause of cancer death in women, with an estimated 604,000 new cases and 342,000 deaths worldwide in 2020. Cancer cervix is the most common malignancy in females in rural India. By 2040, the global burden of new cancer cases is expected to grow to 28.4 million with cancer deaths increasing to about 16 million. Among these, about 70% of deaths are estimated to occur in low and middle income countries like India.<sup>3,4</sup>

This rising cancer incidence makes cancer prevention and treatment a priority. Paramedical workers (Paramedical workers) are the most important and the largest section of the paramedical workforce. In our setting these healthcare workers are posted in the hospitals, health centers as well as in community. They have a good connection with people and deep penetration within the rural and the most deprived sections of the population. Many a times they are the first and the only point of contact with general population. The skilled oncologists are still a scarcity in a country like India especially in rural part. If the nurses and paramedical workers are trained and knowledgeable, they are equipped to spread the message of cancer prevention and promote healthy life style practices in the rural and urban populations. It had been reported that allied healthcare professionals including Radiology Imaging Technology students are not adequately educated or aware about cancer risk factors, risk assessment, cancer vaccines and cancer prevention.<sup>5</sup>

Vaccine approaches for cancer differ from traditional vaccine approaches for infectious disease in tending to focus on clearing active disease rather than preventing disease. Cancer vaccines may be therapeutic and preventive especially against the cancer-causing viruses namely Human Papilloma Virus (HPV). Preventive vaccines are for community use and prevent people from getting cancer. Hence, knowledge, awareness and attitude is an important aspect in the implementation and effectiveness of community based cancer vaccine programs.

**Aim & Design:**

The aim of the study was to assess the level of knowledge, awareness and attitude of allied healthcare students in our institution about cancer prevention, cancer vaccines, Human Papilloma Virus related cancers, HPV vaccines and attitude towards willingness to get vaccinated..

**Material and Methods:**

All students who were accessible on the day of visit were enrolled in the study. The respondents were 151 students. This was a cross sectional study conducted among the Paramedical students who came to attend classes and postings in various departments of Uttar Pradesh university of Medical Sciences, Saifai, Etawah, (U.P.) India at the time of the study. Informed written consent and institutional ethical committee clearance was obtained.

A pre-tested, pre-coded, semi-structured questionnaire was used to assess the level of knowledge, awareness and attitude of cancer vaccine, HPV infection related cancer and HPV vaccine. The language was English and it was translated verbally in Hindi if the student could not understand it. The participants were instructed not to guess the answers and in case of open ended questions instructed to offer only a single response. If the respondents gave multiple responses for these types of questions, the response written first was considered. Anonymity of the students was maintained by not seeking the name of the respondent in the survey.

**Statistical Analysis**

Knowledge and awareness regarding prevention and control of cancer, knowledge of cancer vaccines and attitude towards willingness for cancer vaccines were tabulated in separate tables. The data was collected, systematically tabulated and percentages were calculated using Microsoft Excel 2019.

**Results:**

One hundred fifty-one students were accessible and evaluated for the questionnaire. Ninety-nine were male and 52 were female. As shown in Table-1, 2/3<sup>rd</sup> of the students were of the opinion that cancer can be prevented and detected in early stage with suitable screening and investigations. Sixty percent think that early detection is beneficial in improving the outcome of the disease. Only 10% think that less than 1/3<sup>rd</sup> of cancer cases is detected in early stage in our country and 60% responded that more than 2/3<sup>rd</sup> of the cancers is detected at a late stage in our country.

**Table-1**  
**Knowledge Regarding Prevention and Control of Cancers**  
**N = 151**

<b>Knowledge about prevention and control</b>	<b>Percentage (%)</b>
<b>Prevention</b>	
Possible	67
Not Possible	27
Not knowing	6
<b>Early Detection</b>	
Possible	67
Not Possible	27
Don't know	6

	Beneficial	60
	Not Beneficial	30
	Not Knowing	10
<b>Detected at a Late Stage</b>		
	Less than 1/3rd	10
	1/3rd – 2/3rd	27
	More than 2/3rd	60
	Don't know	3

It was observed that out of total 151 students 90% knew about Cancer Vaccines. Only 10% knew about the therapeutic and preventives types of cancer vaccines. Two third of students were of the opinion that cancer vaccines can prevent cancer. Majority of them i.e 82% were aware that cervical cancer is the most common genital malignancy in females. Only 2/3<sup>rd</sup> had the knowledge that HPV causes cancer and is also responsible for causing cervical cancer. Only 40% knew that HPV can also cause oropharyngeal or head and neck cancer. Forty percent had the knowledge that HPV causes cancer. Only 40% knew about HPV vaccines and know the name of at least one HPV vaccine available in India. Table-2 shows the knowledge regarding cancer among the study subjects.

**Table-2**  
**Knowledge Regarding Cancer Vaccines Among Study Subjects**  
**N = 151**

Question	Knowledge (%)
Heard about cancer vaccines?	90%
Aware of types of vaccines- therapeutic/preventive?	10%
Can cancer vaccine prevent cancer?	67%
Most common genital cancers in females in India?	82%
Does Human Papilloma virus cause cancer?	67%
Does HPV cause cervical cancer?	67%
Oropharyngeal cancer caused by HPV virus?	40%

Attitude towards willingness for cancer vaccines are shown in Table-3. Only 60% of the subjects had heard about HPV vaccines and know the name of at least one of the HPV vaccines. On asking "Have you even taken any cancer vaccine?" all of them responded in negative. Most of them had taken Hepatitis B Vaccine (HBV) which is also a preventive cancer vaccine but they were not aware of it. Only 2/3<sup>rd</sup> were willing to take cancer vaccine, whilst on adding "if the government recommends and provides it free of cost" willingness rose to 95%.

**Table-3**  
**Attitude Towards willingness for cancer vaccine**  
**N = 151**

Causes of Cancers*	Percentage (%)	
	Yes	No
Have you ever heard of HPV vaccines?	40%	60%
Do you know Name of any HPV vaccines?	40%	60%
Have you Taken any cancer vaccine?	Nil	100%
Willing to take cancer vaccine?	67%	23%
Willing to take cancer if government provides free of cost	95%	5%

### Discussion:

Different types of vaccines and adjuvants that have been investigated for the purpose of controlling cancer burdens in patients, some of which are approved for clinical use or in late-stage clinical trials, such as the personalized dendritic cell vaccine sipuleucel-T (Provenge) and the recombinant viral prostate cancer vaccine PSA-TRICOM (Prostvac-VF). Vaccines against human viruses implicated in the development and progression of certain cancers, such as human papillomavirus in cervical cancer and oropharyngeal cancers come under preventive vaccines.<sup>6</sup> There are 2 types of vaccines that prevent cancer approved by the U.S. Food and Drug Administration (FDA).

Hepatitis B vaccine: This vaccine protects against the hepatitis B virus (HBV). This virus can cause liver cancer.

HPV vaccine: The vaccine protects against the Human Papillomavirus (HPV). If this virus stays in the body for a long time, it can cause some types of cancer. The FDA has approved HPV vaccines to prevent: HPV related cervical cancer, vaginal cancer, vulval cancer, oropharyngeal cancer (and other head & neck cancers) and anal Cancer.<sup>7</sup>

Nearly 2/3<sup>rd</sup> of the study subjects knew that prevention of cancers is possible and that In India, about 70% of cancer patients present in advanced stages. Sixty seven percent of the students were aware about the possibility of early detection and only 60% knew that it is beneficial. Knowledge regarding this fact needs to be improved a lot because prevention or treatment of more than two-third of cancers is possible if detected in early stages.<sup>8</sup> They should be knowing about the different cancer screening programs which could greatly assist detection of cancer at early stages. One of the main problems in India in the control of cancer is lack of knowledge about lifestyles and societal practices related to cancer causation. Increased awareness of possible warning signs of cancer, among physicians, nurses and other health care providers as well as among the general public, can have a great impact on outcomes in this disease.<sup>9</sup>

Low knowledge or lack of training reported in other studies also.<sup>10</sup> Not only in India but studies from other countries also show that there is lack of training amongst health care workers either because they themselves lack the enthusiasm for new knowledge.<sup>11</sup>

In a study by Radhika et al, the results of awareness and knowledge about the HPV vaccine are

interpreted in percentage. In this study, 76% of study subjects were aware that cancer cervix is preventable, 80% of the study subjects were aware about the association between the causation of cancer cervix by HPV. Majority of the study subjects about 72% were aware about the vaccines for HPV but, awareness about the cost and efficacy of the vaccine was low only about 30% and 10% respectively. However, importantly students had a positive attitude to educate people regarding HPV vaccination and also to clear myths and misconceptions.<sup>12</sup>

Sager et al conducted a cross-sectional observation study about Knowledge and Awareness about Cervical Cancer Vaccine (HPV) in 400 subjects and observed that 78.3% of the population had heard of CC, 41.3 % of HPV, and 36.5% of the HPV vaccine. Among them, the percentages of the correctly answered knowledge-related questions were found to be 66.2%, 50.9% and 52.1% for CC, HPV and HPV vaccine, respectively. 76.6% of parents were willing to vaccinate their daughters. The percentage increased to 92.9%, if the ministry of health (MOH) recommended the vaccine. Similar attitude was observed in our study where 95% expressed willing to take cancer vaccine if government recommends it and makes it free of cost.<sup>13</sup>

Shazia et al in a study about Knowledge, Awareness and Attitude on HPV, HPV Vaccine and Cervical Cancer among the College Students in India, reported that girls had more knowledge about cervical cancer (82.45%,  $p < 0.001$ ), HPV (45.61%,  $p < 0.001$ ) and HPV vaccines (44%,  $p < 0.001$ ) when compared to those in boys. However, knowledge about the types of HPV and vaccines was poor. Interestingly, students from biology-major had more knowledge and awareness about cervical cancer (81.89%,  $p < 0.001$ ) and HPV (46.58%,  $p < 0.001$ ) when compared to non-biology students. Girls from both biology and non-biology group had higher awareness compared to boys. Analysis of odds ratio (ORs) along with 95% CI showed older girls with 1.2 to 3 fold ( $p < 0.05$ ) higher knowledge than boys. All students agreed that girls should get vaccinated against HPV ( $p < 0.001$ ).<sup>14</sup>

In a cross-sectional study about Cervical cancer awareness and HPV vaccine acceptability among females in Delhi, majority of the participants (85.11%) were aware of cervical cancer and were willing to undergo diagnosis by Pap test (84.6%). As far as vaccination was concerned, 63.14% found the HPV vaccine acceptable for their daughters. However, very few participants were willing to vaccinate themselves against HPV. Our results are comparable to the high acceptance of HPV vaccine reported among parents in Delhi, Mysore, India and also to the actual vaccine coverage rates reported in a vaccine delivery pilot project in Andhra Pradesh and Gujarat.<sup>15</sup>

Nurses and paramedical workers make a huge workforce of allied healthcare professionals in our country. They can play an important role in mass education, through specially designed educational programs in the clinical setting, as well as, through community outreach strategies. In addition, they constitute an important source of information within their social networks.<sup>16</sup>

There is an opportunity to increase their knowledge of cancer as a whole, cancer vaccine, human papillomavirus, its link to cervical cancer, and the ability of the HPV screening and vaccine to prevent cervical cancer. This opportunity should be utilized to outreach and develop community awareness and encourage acceptance and adherence to cancer vaccine.<sup>17</sup>

**Conclusion:**

Awareness among allied healthcare students regarding cancer prevention and specific cancer vaccine (HPV vaccine) was limited in our study. Majority of them were aware about cancer vaccine and willing to take cancer vaccine. As nurses and allied healthcare workers have a major influence on the help-seeking behaviour of patients, they need to be aware of cancer preventive measures and the importance of early detection through screening. They can be an ambassador of the message of cancer vaccines and also provide an insight that making free cancer vaccination may increase the acceptability, hence there is a need to increase their awareness and improve the attitude about cancer vaccine through training and educational activities. However, studies with a large number of subjects and also from community is warranted to study the outcomes that may be helpful in making cancer immunization programme.

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