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# Assessment of Awareness, Knowledge, and Attitude of Suez University medical students towards Human Papilloma Virus vaccine (HPV): A Cross-sectional Study

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## **Abstract**

**Background:** Cervical neoplasm is the second most common type of malignancy in female genital organs worldwide, and it affects quality of life in most cases. The most important risk factor for cervical cancer is exposure to Human Papilloma Virus types 16 and 18. Although vaccines are available and eliminate HPV infection, there is a lack of awareness regarding them. Therefore, the present study has been proposed.

**Objective:** was to study the awareness of human papilloma virus (HPV) vaccination among the medical students at Suez University.

**Methods:** An observational cross-sectional study through a structured online questionnaire about HPV Awareness.

**Results :** The study included 157 Suez University medical students. They were classified according to their gender (male vs. female), Marital status (single, married, divorced, and widowed), and residence (rural vs. urban areas). The medical colleges included faculty of Medicine students who were also classified according to their age ( $\leq 21$  years vs.  $> 21$  years). Of the total medical students, female students showed higher knowledge about the HPV but no statistical difference (68.1%,  $p = 0.08$ ), and the diseases caused by it (84.1%,  $p = 0.18$ ), and also showed significantly higher awareness about the mode of HPV transmission (79.1%,  $p = 0.04$ ). Female students also showed higher knowledge about the presence of a vaccine against the HPV (75.8%,  $p = 0.75$ ), as well as the safety of the vaccine (74.7%,  $p = 0.48$ ) compared to male students, but with no statistical difference.), and also showed significantly higher awareness about the mode of HPV transmission (79.1%,  $p=0.04$ ), female students also showed higher knowledge about the presence of a vaccine against the HPV (75.8%,  $p =0.75.8$ ) as well as the safety of the vaccine (74.7%,  $p =0.48$  ) compared to male students but with no statistical difference.

**Conclusion:** Our study revealed an appreciable level of awareness about the HPV infection and the vaccination. Females had better awareness regarding the infection as

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well as the vaccine. We found that medical education has a positive impact on raising awareness regarding the causes of cervical cancer, the availability of the vaccine, and its protective efficacy.

## **Introduction**

Human papillomavirus (HPV) can affect different parts of the body in males and females [1].

There are over 100 sub-types of HPV, including types that cause skin warts, especially on the hands, feet, and face. About 30 HPV strains can affect the anogenital region, including the cervix, vagina, vulva, penis, and scrotum, in addition to the rectum and anus. [2].

The different sub-types of the virus can be subclassified into low-risk and high-risk according to their ability to induce dysplasia [3].

The low-risk HPV types (6 and 11) are non-oncogenic and are associated with anogenital warts, cutaneous warts, and recurrent respiratory papillomatosis [4,5].

However, high-risk types (16 and 18) are oncogenic and are associated with cervical, vaginal, vulvar, anal, penile, and oropharyngeal cancers [6].

Regular screening and treatment of precancerous lesions can prevent the progression of cervical cancer. Identification of precancerous lesions has been primarily achieved by cytologic screening of cervical cells (Pap testing), HPV primary screening, and HPV co-testing and cytology [7].

The HPV vaccine could dramatically reduce the number of new cases of cervical cancer and other malignancies caused by HPV exposure. Globally, there are three types of vaccines available on the market: bivalent, quadrivalent, and nonavalent [8].

The Quadrivalent vaccine protects against four HPV types (6, 11, 16, and 18), and the

bivalent vaccine guards against 16 and 18. Finally, the nonavalent (nine-valent) vaccine offers protection against five HPV types: 31, 33, 45, 52, and 58, in addition to the types covered by the quadrivalent vaccine [8].

WHO has recommended that the HPV vaccine be given to girls and boys at the age of 9. It's ideal to receive at least one dose of the vaccine before sexual contact [9].

It has been reported that HPV types 6, 11, 16, and 18 have decreased by approximately 90%, with a reduction in condyloma acuminata of approximately 90% and high-grade cervical lesions of approximately 85%. The estimated vaccine compatibility with one dose or more of the HPV vaccine was 83–96.1% [10].

Studies have reported that all three vaccines are tolerated excellently with no to minimal side effects [13]. The most commonly encountered adverse effects were injection-site reactions such as pain and swelling, headaches, and fatigue. Fever, dizziness, nausea, vomiting, and diarrhea have also been reported [11].

Despite the protective and preventive value of the HPV vaccine, not all people are aware of it, so we aim to assess the awareness, knowledge, and attitude of Suez University medical students towards the Human Papilloma Virus vaccine (HPV).

## **Materials and Methods**

### **Study area and subjects**

The study was conducted during May and June 2023 at Suez University. The targeted population was Suez University medical students. A structured online questionnaire designed by the lecturers of the OBS & GYN department of Suez University is used in this observational cross-sectional study to assess the awareness, knowledge, and attitude of Suez University medical students toward the Human Papilloma Virus vaccine. (HPV). The questionnaire consisted of 15 questions:

4 questions assessing the demographic information (age, marital status, residence, gender), 2 questions assessing the knowledge about HPV (Do you know HPV? Do you know about diseases caused by the virus?), four questions assessing awareness about HPV (Do you know about the mode of transmission of HPV? To your knowledge, Is there a vaccine for protection from HPV? What do you know about the safety of the vaccine? Do you know from where you can buy it?), and two questions assessing the attitude towards HPV (If there is a vaccine, Will you accept to receive it?). If you know that the price is around \$937 per dose, will you think about receiving it? The questionnaire was in English. You can access the online form of the questionnaire through this link.

[https://docs.google.com/forms/d/12ESF48-WCJdKxmRae32cMEo\\_HDOExeu01itORKBic/edit?usp=drivesdk](https://docs.google.com/forms/d/12ESF48-WCJdKxmRae32cMEo_HDOExeu01itORKBic/edit?usp=drivesdk)

### **Consent**

It was written at the top of the online form of the questionnaire. "Filling out this **Questionnaire** means you agree to be part of this study."

### **Sample size and questionnaire**

For a confidence level of 95%, the margin of error equals 0.05, and assuming the population proportion (P) equals 50%, these conditions require at least 384 students. 157 questionnaires were collected. Students were categorized into groups based on three factors: age, gender, and residence, in order to examine which of these factors is strongly associated with their knowledge, awareness, and attitude towards HPV.

### **Statistical Analysis**

Statistical analysis was done using SPSS application version 26.0. Demographic and other qualitative variables were expressed in frequencies and percentages. Data was described as mean +/- SD, and categorical data was analyzed using the Chi-square test. A P-value  $\leq 0.05$  is considered statistically significant.

## **Results**

The study included 157 Suez University medical students. They were classified according to their gender (male vs. female), Marital status (single, married, divorced, and widowed), and residence (rural vs. urban areas). The medical colleges included a faculty of medicine. Students were also classified according to their age ( $\leq 21$  years vs.  $> 21$  years), as shown in **Table I**.

Of the total medical students, female students showed higher knowledge about the HPV but no statistical difference (68.1%,  $p=0.08$ .) and the diseases caused by it (84.1%,  $p=0.18$ .), and also showed significantly higher awareness about the mode of HPV transmission (79.1%,  $p=0.04$ ), female students also showed higher knowledge about the presence of vaccine against it (75.8%,  $p=0.75.8$ ), the safety of the vaccine (74.7%,  $p=0.48$ ) as well as from where to get the vaccine (11.0%,  $p 0.06$ ) compared to male students but with no statistical difference as illustrated in **Tables II & III**.

## **Discussion**

Carcinoma of the cervix is the second most common female malignant tumor worldwide and has a high incidence of morbidity and mortality. The lady is usually diagnosed in a locally advanced stage, so most cases will not be candidates for surgery at the time of the diagnosis [12].

It has been proven that high-risk HPV types are the main cause of cervical cancer [13].

According to the WHO and the International Agency for Research on Cancer (IARC), there were 529,000 new cases of cervical cancer globally in 2008. In developing countries, the prevalence of cervical cancer was 452,000 and ranked second among malignancies in female patients [14].

Conversely, the number of new cases of cervical cancer was 77,000 among developed countries and ranked tenth among female malignancies. Recently, the incidence of cervical malignancy has increased without a corresponding increase in awareness regarding screening programs, vaccinations, reporting

any abnormal symptoms, and early detection.

A screening program of the cervix plays an essential role in prevention and detection of early cellular changes and can diagnose pre-invasive lesions along with HPV infection [15].

The present study was carried out at Suez University to get information regarding the level of Awareness, Knowledge, and Attitude of Suez University medical students towards the Human Papilloma Virus vaccine (HPV). The study participants included undergraduate medical students at our medical school. In the present study, there were 58% female and 42% male medical students; only one participant was married at the time of the study, and more than half (60.55%) were aged more than 21 years. [Table 1] Among the study participants, 84.1% were aware of HPV-related diseases and cancers caused by HPV infections. This result was higher compared to the results reported by Netra G et al. (72.4%) and Mehta et al. (50%) and low compared to the studies held by Panday et al. (81.5%) and Joshi et al. (96%) [16, 17, 18, 19].

This difference might be because the majority of the participants in our study were from the 3rd year of medical students who were aware of the infection, compared to other studies in which the majority of the participants were from the first academic year and might not be aware of the infection yet [17].

The awareness regarding modes of transmission of HPV was lower in the present study (77.7%) when compared to the study done by Nagasireesha Challa et al. (81.1%) [20]. The awareness regarding the availability of vaccines is low in this study (75.2%) compared to the results reported in the study by Nagasireesha Challa et al. (90.5%) [20].

The awareness is higher than in the study performed by Snigdha Kamini et al. (50.4%) [21].

Awareness regarding the mode of transmission of HPV infection and availability of vaccines for female students is higher than for male students (77.7% and 75.8%), and the same results were reported by Priya et al.'s study

(99.7% and 78.8%) [22]. This may be attributed to the higher number of female students participating in our study.

With the increase in the study year, the knowledge has been increasing, indicating that the study curriculum also plays a vital role in creating awareness, which will help to increase the knowledge provided to the general population. Moreover, the present study showed a greater percentage of students (77%) lack knowledge regarding how they can get the vaccine, and about 1.3% are worried about the safety of the vaccine. These findings were like those of Mehta et al. and Kamini et al. [17, 21].

The power of our study was that we had continuous data collection, and we held an awareness session about the HPV vaccination. The limitation of our study was that we could not approach all the students as they were occupied in exam preparation and due to their absence during data collection. The level of knowledge, information, and awareness regarding HPV hazards should be raised through awareness campaigns, audio-visual programs, and flyers. It is suggested that HPV vaccination should be a part of the national immunization program in order to eliminate cervical cancer.

## **Conclusion**

Our study revealed an appreciable level of awareness regarding the HPV infection and vaccination. Females had better awareness regarding the infection as well as the vaccine. We found that medical teaching had a positive impact on awareness regarding the etiology of cervical cancer, the availability of the vaccine, and its protective efficacy. This will have a positive impact on increased awareness and knowledge among the general population in the near future.

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**Table I: Baseline demographic characteristics of the participants (N = 157)**

| Characteristics       | Categories     | Number (N) | Percentage % |
|-----------------------|----------------|------------|--------------|
| <b>College</b>        | <b>Medical</b> |            |              |
| <b>Gender</b>         | Male           | 66         | 42.0         |
|                       | Female         | 91         | 58.0         |
| <b>Marital status</b> | Single         | 156        | 99.4         |
|                       | Married        | 1          | 0.6          |
|                       | Divorced       | 0          | 0            |
|                       | Widow          | 0          | 0            |
| <b>Residence</b>      | Urban          | 94         | 59.9         |
|                       | Rural          | 63         | 40.1         |
| <b>Age</b>            | ≤ 21           | 95         | 60.5         |
|                       | > 21           | 62         | 39.5         |

Mean ± SD (Min – Max)

**Table II: Knowledge of Suez University medical students about the Human Papilloma Virus (HPV) based on their medical background**

| Parameter  |            | (N = 157)     |                 |                | P-value |
|--|------------|---------------|-----------------|----------------|---------|
|  |            | Male<br>N (%) | Female<br>N (%) | Total<br>N (%) |         |
| <b>1. Do you find HPV infection related to evident health problems in EGYPT?</b>                       | Yes        | 47 (71.2%)    | 62 (68.1%)      | 109 (69.4%)    | 0.08    |
|  | No         | 10 (15.2%)    | 19 (20.9%)      | 29 (18.5%)     |         |
|  | Abstinence | 9 (13.6%)     | 10 (11.0%)      | 19 (12.1%)     |         |
| <b>2. Are cervical, anal, vulvar and oropharyngeal cancers can be directly caused by HPV infection</b> | Yes        | 52 (78.8%)    | 80 (87.9%)      | 132 (84.1%)    | 0.18    |
|  | No         | 11 (16.7%)    | 5 (5.5%)        | 16 (10.8%)     |         |
|  | Abstinence | 3 (4.5%)      | 6 (6.6%)        | 9 (5.7%)       |         |

X<sup>2</sup>; Chi-Square test**Table III: Awareness of Suez University students about the Human Papilloma Virus (HPV) based on their medical background**

| Parameter   |              | Male<br>N (%) | Female<br>N (%) | Total<br>N (%) | P-value      |
|---|--------------|---------------|-----------------|----------------|--------------|
|   |              |               |                 |                |              |
| <b>1. Do you know about mode of transmission of HPV?</b>  | Yes          | 50 (75.8%)    | 72 (79.1%)      | 122 (77.7%)    | <b>0.04*</b> |
|   | No           | 12 (18.2%)    | 14 (15.4%)      | 26 (16.6%)     |              |
|   | Abstinence   | 4 (6.1%)      | 5 (5.5%)        | 9 (5.7%)       |              |
| <b>2. Many countries have adopted HPV vaccine in their routine programs</b>                                 | Yes          | 49 (74.2%)    | 69 (75.8%)      | 118 (75.2%)    | 0.78         |
|   | No           | 8 (12.1%)     | 8 (8.8%)        | 16 (10.2%)     |              |
|   | I don't know | 9 (13.6%)     | 14 (15.4%)      | 23 (14.6%)     |              |
| <b>3. To your knowledge, HPV infection can be prevented by 2 or 3 doses of HPV vaccine</b>                  | Yes          | 44 (66.7%)    | 50 (54.9%)      | 94 (59.9%)     | 0.19         |
|   | No           | 5 (7.6%)      | 15 (16.5%)      | 20 (12.7%)     |              |
|   | I don't know | 17 (25.8%)    | 26 (28.6%)      | 43 (27.4%)     |              |
| <b>4-To your knowledge, Cost of HPV vaccine (1 dose = 937EGP) is too much for average Egyptian families</b> | Yes          | 50 (75.8%)    | 77 (84.6%)      | 127 (80.9%)    | 0.37         |
|   | No           | 7 (10.6%)     | 6 (6.6%)        | 13 (8.3%)      |              |
|   | I don't know | 9 (13.6%)     | 8 (8.8%)        | 17 (10.8%)     |              |
| <b>5. Do you know from where you can buy it?</b>  | Yes          | 12 (18.2%)    | 10 (11.0%)      | 22 (14.0%)     | 0.06         |
|   | No           | 47 (71.2%)    | 78 (85.7%)      | 125 (79.6%)    |              |
|   | I don't know | 7 (10.6%)     | 3 (3.3%)        | 10 (6.4%)      |              |
| <b>6. HPV vaccine can be given in national projects supplied by governments</b>                             | Yes          | 51 (77.3%)    | 71 (78.0%)      | 122 (77.7%)    | 0.34         |
|   | No           | 9 (13.6%)     | 7 (7.7%)        | 16 (10.2%)     |              |
|   | I don't know | 6 (9.1%)      | 13 (14.3%)      | 19 (12.1%)     |              |
| <b>7. What do you know about the safety of the vaccine?</b>   | Safe         | 50 (75.8%)    | 68 (74.7%)      | 118 (75.2%)    | 0.48         |
|   | Unsafe       | 0 (0%)        | 2 (2.2%)        | 2 (1.3%)       |              |
|   | I don't know | 16 (24.2%)    | 21 (23.1%)      | 37 (23.6%)     |              |