

Knowledge of Cervical Cancer and Human Papilloma Virus among Medical Students in Suez, Egypt

Ahmed Sewidan^{1*}, Ahmed Yasser Shokry², Mohamed Ramadan², Hany Mahmoud Abd Elhamid³

¹Obstetrics and Gynecology Department, Faculty of Medicine, Suez University.

²Medical student at Faculty of Medicine, Suez University.

³Obstetrics and Gynecology Department, ELSahel Teaching Hospital

*Corresponding Author: Ahmed Sewidan, Phone No.: (+2) 01205533381,

E-mail: Ahmed.Sewidan@med.suezuni.edu.eg, ORCID ID: [0000-0002-6567-9988](https://orcid.org/0000-0002-6567-9988)

ABSTRACT

Background: Healthcare professionals, particularly the younger medical students, can be very helpful in advising patients on how to prevent or treat human papilloma virus (HPV)-related cervical cancer (CC). However, it is frequently noted that medical students, who provide first-line support for managing patients, have a poor awareness of CC and HPV.

Objective: To evaluate medical students' awareness and knowledge on cervical cancer by testing their understanding of clinical diagnosis and screening, risk factors, human papilloma virus, and other related topics in Suez, Egypt. The purpose of the study is to shed light on how this information might improve community awareness of cervical cancer.

Subjects and Methods: An organized online survey was used to conduct an observational cross-sectional study on people's knowledge of HPV and cervical cancer. 92 medical students from Suez University participated in the study.

Results: Of the total, 81.5% of the students were aware of the connection between the human papilloma virus and its role in cervical cancer; 93.5% knew it is sexually transmitted; 87.0% knew an HPV infection may not cause any symptom; 87.0% had heard of an HPV vaccine; and 41.3% believed that girls as young as 15 years old could receive it.

Conclusion: An acceptable degree of awareness and understanding regarding HPV, cervical cancer, and HPV vaccine was found in our study. We discovered that increasing knowledge of the etiology of cervical neoplasia, the availability of the HPV vaccine, and its preventive efficacy is positively impacted by medical education.

Keywords: Medical Students; Knowledge; Cervical Cancer; Human Papilloma.

INTRODUCTION

A serious health concern is cervical cancer. With an anticipated 604,000 new cases and 342,000 deaths worldwide in 2020, it is the fourth most common cancer identified globally and the fourth greatest cause of cancer-related deaths among women ⁽¹⁾.

99.7% of cervical cancer specimens have been confirmed to include HPV, a sexually transmitted virus. It is particularly prevalent in younger people, with the highest incidence among those in the 20–30 age range, which includes many college students ^(2–3). Between 50% and 80% of women who are sexually active are thought to have contracted the virus at least once in their lifetime. About 70% of all cases are of the most prevalent strains, HPV16 and HPV18 ^(4–5).

There are known risk factors for HPV infection and how it progresses to cervical cancer. These include long-term oral contraceptive pills (OCP) usage, cigarette use, multiple sexual partners, early initiation of sexual activity, immunosuppression, and diet ^(6–7).

Over the years, screening for cancer cervix has been made possible by the length of time that separates HPV infection from cancer cervix ⁽⁸⁾. As of right now, the World Health Organization recommends cervical screening, HPV vaccination, and broad education as part of a complete cancer prevention strategy ⁽⁹⁾.

Although medical students' knowledge of cervical cancer and HPV has been assessed in many different

countries, there have only been a few studies done in Egypt among medical students, and none of them included postgraduate medical students ^(10–11).

Our study aims to close this gap by focusing on medical students in Suez, Egypt, who play a crucial role in providing healthcare. Their thorough knowledge of HPV and cancer cervix offers promise for better patient education, early identification, and prevention. Our goal was to evaluate their awareness and knowledge on HPV and cervical cancer.

SUBJECTS AND METHODS

Study area and subjects

The investigation was carried out at Suez University. Medical students at Suez University were the target population.

This observational cross-sectional study evaluated the knowledge, response, and attitude regarding cervical cancer, HPV, and HPV vaccination using a structured online electronic survey. The survey assessed participants' knowledge of risk factors, clinical diagnosis, and screening of human papilloma virus to offer insights into the potential impact of such knowledge on raising cervical cancer awareness within the community.

It should take approximately ten minutes for each participant to complete the 26 questions on the online

survey. The researchers at Suez University's Faculty of Medicine used it to complete their research.

Ethical considerations:

The Suez University Faculty of Medicine Research Ethics Committee approved this study after it underwent assessment by the Obstetrics and Gynecology Department and obtained ethical clearance.

It was voluntary for the students to participate. "Filling out this electronic survey means you agree to be part of this study" was written at the top of the online survey form. Participants selected "yes I agree" when they wanted to participate. Before submitting their responses, participants may leave at any time for any reason to withdraw from the research by clicking the "Exit" button or shutting the browser. Every question was optional.

Nothing that may be used to directly identify a participant was gathered by us. The IP address of the participant was not saved. We took all appropriate precautions to guarantee the privacy of the data. This work has been conducted in compliance with the Declaration of Helsinki, the World Medical Association's code of ethics for human subjects' research.

Sample size and questionnaire

Under these conditions, there must be at least 92 students, if the population percentage (P) is equal to 50%, the margin of error is equal to 0.05, and the confidence level is set at 95%.

Statistical Analysis

The Statistical Package for the Social Sciences, version 23.0 (SPSS Inc., Chicago, Illinois, USA), was used to analyze the recorded data. The ranges and mean± standard deviation were displayed for the quantitative data. Additionally, percentages and numbers were used to represent qualitative characteristics.

RESULTS

The study showed that 51.1% of participants were females, with age mean ± SD 21.57±2.80 years, 96.7% of them were single, and 51.1% of them were at the 4th academic year, as shown in **table I**.

Table I: Demographic data distribution among study group (n=92)

Demographic data	No.	%
Gender		
Female	47	51.1
Male	45	48.9
Age "years"		
<20 years	22	23.9
>20 years	70	76.1
Mean±SD	21.57±2.80	
Marital Status:		
Divorced	2	2.2
Married	1	1.1
Single	89	96.7
In which academic year are you currently enrolled?		
1	11	12.0
2	10	10.9
3	12	13.0
4	47	51.1
5	12	13.0

Of the total, 77.2%, 83.7% and 42.4% of the students had knowledge about relation between cervical cancer and each of age, multiple sexual partners, and hereditary respectively. 84.8% and 83.7% of them knew that it is related to smoking and alcohol consumption respectively. Female had significantly higher knowledge compared with males. They were also more eager to get vaccinated in the future and had excellent understanding about CC screening and prevention strategies as illustrated in **table II**.

Table II: Risk factors distribution among study group (n=92)

Risk factors	No.	%
Is cervical cancer age-related?		
No	21	22.8
Yes	71	77.2
Is cervical cancer related to multiple sexual partners?		
No	15	16.3
Yes	77	83.7
Is cervical cancer hereditary?		
No	53	57.6
Yes	39	42.4
Does smoking increase the chances of cervical cancer?		
No	14	15.2
Yes	78	84.8
Does alcohol increase the chances of cervical cancer?		
No	15	16.3
Yes	77	83.7
Do early sexual relations and early marriage increase the chances of developing cervical cancer?		
No	26	28.3
Yes	66	71.7
Which of the following groups has the highest incidence of cervical cancer in Egypt?		
Less than 20 years old	7	7.6
20 to 30 years old	37	40.2
From 30 to 40 years	26	28.3
Older than 40 years	22	23.9
Which of the following two groups has the highest rates of cervical cancer?		
High socioeconomic level	20	21.7
Low socioeconomic level	72	78.3
Which of the following has a role in cervical cancer?		
Infection with a specific bacterium.	13	14.1
Infection with a specific virus	70	76.1
None of them are related.	9	9.8
Do combined birth control pills have a role in cervical cancer?		
No	37	40.2
Yes	55	59.8
Does estrogen play a role in cervical cancer?		
No	22	23.9
Yes	70	76.1

The majority of the participated students knew that bleeding after intercourse and offensive vaginal discharge are symptoms of cervical cancer. This study found correlations between age, sex, family history, parents' occupation, and education as shown in **table III**.

Table III: Symptoms distribution among study group (n=92)

Symptoms	No.	%
Is bleeding after intercourse a symptom of cervical cancer?		
No	19	20.7
Yes	73	79.3
Is offensive vaginal discharge a symptom of cervical cancer?		
No	30	32.6
Yes	62	67.4

The study showed that 81.5% of the students had knowledge about relation between human papilloma virus and its role in cervical cancer, 93.5% of the them knew it is sexually transmitted, 87.0% of the them knew that HPV infection may be asymptomatic and 87.0% of the them heard that there is a vaccine against HPV and 41.3% of the them said that vaccine could be given at 15 years old girls as shown in **table IV**.

Table IV: HPV and Vaccination distribution among study group (n=92)

HPV and Vaccination	No.	%
Do you know about human papilloma virus (HPV) and its role in cervical cancer?		
No	17	18.5
Yes	75	81.5
Is HPV sexually transmitted?		
No	6	6.5
Yes	86	93.5
Can HPV infection be asymptomatic?		
No	12	13.0
Yes	80	87.0
Have you heard that there is a vaccine against HPV?		
No	20	21.7
Yes	72	78.3
Is this vaccine useful in reducing the chances of HPV virus and cervical cancer?		
No	8	8.7
Yes	84	91.3
At what age can this vaccine be given?		
5 years	14	15.2
7 years	5	5.4
9 years	35	38.0
15 years	38	41.3

In the study, 26.1% of students reported that age of starting the cervical cancer screening is after the age of 21 years. Older students had superior understanding about HPV vaccination and cervical cancer. Screening should be repeated for the woman with low risk factors

every 3 years as reported by 56.5%. Most refused to consent to immunization as shown in **table V**.

Table V: Screening distribution among study group (n=92)

Screening	No.	%
What is the age of starting the cervical cancer screening?		
After the age of 21 years	24	26.1
At the age of 21 years	53	57.6
Less than 21 years old	15	16.3
Every how many years should screening be repeated for the woman with low risk factors?		
every year	12	13.0
Every 3 years	52	56.5
Every 5 years	28	30.4
Do you think cervical tissue biopsy is one of methods could be used to diagnose cervical carcinoma?		
No	4	4.3
Yes	88	95.7
Is Pap smears one of the methods used in screening against cervical cancer?		
No	6	6.5
Yes	86	93.5

DISCUSSION

Cancer is an incurable illness, with gynecological cancer (CC) being the most frequent type that affects women in the 15–44 age range. There are several approaches to treating cancer. According to research, vaccinations may be useful in preventing some types of cancer. However, Indian medical students have limited understanding about HPV, its link to CC, and preventive measures⁽¹²⁾.

The individuals in this study had an average age of 21.57 ± 2.80 years. The majority of students learned about the HPV vaccine's availability from various sources, including magazines, the internet, and word-of-mouth. This result was in line with the research conducted by **Pandey et al.**⁽¹³⁾.

Durusoyet al. found that while most students in their study were aware of the vaccine and some had already received it, and more than two thirds of subjects knew about Pap smears, the study on HPV vaccine awareness and willingness of first-year students found that the knowledge among them was poor and only 11.6% of females intended to be vaccinated⁽¹⁴⁾.

Only 85.55% of the students in the survey conducted by **Singh and Baliga**⁽¹⁵⁾ expressed a readiness to have an HPV vaccination, compared to 88% in a study conducted by **Mehta et al**⁽¹⁶⁾.

According to **Zimet et al.**'s survey, 48% of the population who had not had vaccinations stated that they were married and in a monogamous relationship as their reasons for not being vaccinated⁽¹⁷⁾.

In a similar vein, the majority of students in this study refused to consent to immunization because they questioned the vaccine's effectiveness.

Compared to MBBS II-year students, MBBS III-year students had superior understanding about HPV vaccination and cervical cancer in the study. Similar conclusions were covered in the research done by **Tripathy and colleagues**⁽¹⁸⁾.

Compared to male students, female medical students scored significantly higher on knowledge tests. They were also more eager to get vaccinated in the future and had excellent understanding about CC screening and prevention strategies. Studies by **Fu et al.**, **Boehner et al.**, **Blumenthal et al.**, and **Wong** found similar results, with female students correctly answering the majority of the questions and demonstrating a positive attitude about HPV vaccination^(19–22).

This study found correlations between age, sex, family history, parents' occupation, and education that matched the findings of **Swarnapriya et al.**⁽²³⁾.

CONCLUSION

An acceptable degree of awareness and understanding regarding HPV, cervical cancer, and HPV vaccine was found in our study. We discovered that increasing knowledge of the etiology of cervical neoplasia, the availability of the HPV vaccine, and its preventive efficacy is positively impacted by medical education.

Supplemental Appendix 1 "Questionnaire about HPV and cervical cancer"

1. How old are you?

- Less than 20
- 20 to 30
- From 30 to 40

2. Marital status:

- single
- Married
- Divorced
- Widow

3. You are in which academic year?

- 2
- 3
- 4
- 5

4. Is cervical cancer age-related?

- Yes
- No

5. Is cervical cancer related to multiple sexual partners?

- Yes
- No

6. Is cervical cancer hereditary?

- Yes
- No

7. Does smoking increase the chances of cervical cancer?

- Yes
- No

8. Does alcohol increase the chances of cervical cancer?

- Yes
- No

9. Do early sexual relations and early marriage increase the chances of developing cervical cancer?

- Yes
- No

10. Which of the following groups has the highest incidence of cervical cancer in Egypt?

- Less than 20 years old
- 20 to 30 years old
- From 30 to 40 years
- Older than 40 years

11. Which of the following two groups has the highest rates of cervical cancer?

- Low socioeconomic level
- High socioeconomic level

12. Which of the following has a role in cervical cancer?

- Infection with a specific virus
- Infection with specific bacteria.
- None of them are related.

13. Do combined birth control pills have a role in cervical cancer?

- Yes
- No

14. Does estrogen play a role in cervical cancer?

- Yes
- No

15. Is bleeding after intercourse a symptom of cervical cancer?

- Yes
- No

16. Is offensive vaginal discharge a symptom of cervical cancer?

- Yes
- No

17. Do you know about human papilloma virus (HPV) and its role in cervical cancer?

- Yes
- No

18. Is HPV sexually transmitted?

- Yes
- No

19. Can HPV infection be asymptomatic?

- Yes
- No

20. Have you heard that there is a vaccine against HPV?

- Yes
- No

21. Is this vaccine useful in reducing the chances of HPV virus and cervical cancer?

- Yes
- No

22. At what age can this vaccine be given?

- 5-10 years
- 7-15 years
- 9-21 years
- 15-25 years

23. What is the age of starting the cervical cancer screening?

- At the age of 21 years
- Less than 21 years old
- After the age of 21 years

24. Every how many years should screening be repeated for the woman with low risk factors?

- Every year
- Every 3 years
- Every 5 years

25. Is simple tissue removal from the cervix to be studied one of the methods used to diagnose cervical cancer?

- Yes
- No

26. Is Pap smears one of the methods used in screening against cervical cancer?

- Yes
- No

- **Acknowledgments:** Authors would like to thank Suez University
- **Funding:** No funding sources.
- **Conflict of interest:** None declared.

REFERENCES

1. **Sung H, Ferlay J, Siegel I et al. (2021):** Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: a Cancer Journal for Clinicians*, 71(3): 209-249.
2. **Walboomers M, Jacobs M, Manos M et al. (1999):** Human papillomavirus is a necessary cause of invasive cervical cancer worldwide. *The Journal of Pathology*, 189(1): 12-19.
3. **Songthap A, Pitisuttithum P, Kaewkungwal J et al. (2009):** Knowledge, attitudes, and acceptability of a human papillomavirus vaccine among healthcare providers. *Southeast Asian Journal of tropical medicine and Public Health*, 40(5): 1048.
4. **Hoque E, Hoque M (2009):** Knowledge of and attitude towards cervical cancer among female university students in South Africa. *Southern African Journal of Epidemiology and Infection*, 24(1): 21-24.
5. **Muñoz N, Bosch X, De Sanjosé A et al. (2003):** Epidemiologic classification of human papillomavirus types associated with cervical cancer. *New England Journal of Medicine*, 348(6): 518-527.
6. **Castellsagué X (2008):** Natural history and epidemiology of HPV infection and cervical cancer. *Gynecologic Oncology*, 110(3): S4-S7.
7. **Castellsagué X, Munoz N (2003):** Chapter 3: Cofactors in human papillomavirus carcinogenesis—role of parity, oral contraceptives, and tobacco smoking. *JNCI Monographs*, 2003(31): 20-28.
8. **Fontham T, Wolf A, Church T et al. (2020):** Cervical cancer screening for individuals at average risk: 2020 guideline update from the American Cancer Society. *CA: a Cancer Journal for Clinicians*, 70(5): 321-346.
9. **World Health Organization (2017):** Human papillomavirus vaccines: WHO position paper, May 2017. *Weekly Epidemiological Record*, 92(19): 241-268.
10. **Adejuyigbe F, Balogun B, Sekoni A et al. (2015):** Cervical cancer and human papilloma virus knowledge and acceptance of vaccination among medical students in Southwest Nigeria. *African Journal of Reproductive Health*, 19(1): 140-148.
11. **Dawson B, Trapp R (2004):** Basic & clinical biostatistics. In *Basic & Clinical Biostatistics*. pp, 438-438.
https://books.google.com.eg/books/about/Basic_Clinical_Biostatistics_4_E_EBOOK.html?id=p6hu-qU2zpsC&redir_esc=y
12. **Rashid S, Labani S, Das B (2016):** Knowledge, awareness and attitude on HPV, HPV vaccine and cervical cancer among the college students in India. *PLoS One*, 11(11): e0166713.
13. **Pandey D, Vanya V, Bhagat S et al. (2012):** Awareness and attitude towards human papillomavirus (HPV) vaccine among medical students in a premier medical school in India. *PLoS One*, 7(7): e40619.
14. **Durusoy R, Yamazhan M, Taşbakan M et al. (2010):** HPV vaccine awareness and willingness of first-year students entering university in Western Turkey. *Asian Pac J Cancer Prev.*, 11(6): 1695-701.
15. **Singh J, Baliga S (2021).** Knowledge regarding cervical cancer and HPV vaccine among medical students: A cross-sectional study. *Clinical Epidemiology and Global Health*, 9: 289-292.
16. **Mehta S, Rajaram S, Goel G et al. (2013):** Awareness about human papilloma virus and its vaccine among medical students. *Indian Journal of Community Medicine*, 38(2): 92.
17. **Zimet G, Weiss T, Rosenthal S et al. (2010):** Reasons for non-vaccination against HPV and future vaccination intentions among 19–26-year-old women. *BMC Women's Health*, 10(1): 1-6.
18. **Tripathy S, Mohapatra S, Muthulakshmi M et al. (2015):** Knowledge, attitude towards human papillomavirus and HPV vaccine among medical students of a tertiary care teaching hospital in India. *Int J Reprod Contracept ObstetGynecol.*, 4(6): 1771-4.
19. **Fu C, Pan X, Zhao Z et al. (2014):** Knowledge, perceptions and acceptability of HPV vaccination among medical students in Chongqing, China. *Asian Pacific Journal of Cancer Prevention*, 15(15): 6187-6193.
20. **Boehner C, Howe S, Bernstein D et al. (2003):** Viral sexually transmitted disease vaccine acceptability among college students. *Sexually Transmitted Diseases*, 774-778.
21. **Blumenthal J, Frey M, Worley M et al. (2012):** Adolescent understanding and acceptance of the HPV vaccination in an underserved population in New York City. *Journal of Oncology*, 2012: 904034.
22. **Wong L (2011):** Knowledge and attitudes about HPV infection, HPV vaccination, and cervical cancer among rural southeast Asian women. *International Journal of Behavioral Medicine*, 18: 105-111.
23. **Swarnapriya K, Kavitha D, Reddy M (2016):** Knowledge, attitude and practices regarding HPV vaccination among medical and para medical in students, India a cross sectional study. *Asian Pacific Journal of Cancer Prevention*, 16(18): 8473-8477.