Knowledge and Beliefs about HPV Vaccination and Cervical Cancer Screening among Egyptian Female University Students

Randa M. Said[1], Ibrahim Fouda[2], Noha M. Abdelsalam[3] *

[1] Department of Family Medicine, faculty of medicine, Zagazig University, Egypt.

[2] Dermatology, Venereology and Andrology Department, Damietta faculty of medicine, Al-Azhar University

[3] Department of Community Medicine, faculty of medicine, Zagazig University, Egypt.

Abstract:

Background: Human Papillomavirus (HPV) vaccination and Pap smear testing can significantly protect against cervical cancer. **Objectives:** to assess Egyptian female university students' knowledge and health beliefs about these preventive services. **Methods:** An online survey was conducted on 1148 participants during July and August 2023 using an Arabic, self-administrated, close-ended questionnaire covering factors influencing the adoption of cervical Cancer preventive behaviors using the Health Belief Model (HBM). **Results:** only 2% of participants had received the HPV vaccine, while none had undergone Pap smear screening. They had a total knowledge score of 53.8%, only 62.7% considered themselves at risk for cervical cancer, and only 50% perceived the severity of cervical cancer and the benefits of preventive methods. Perceived barriers to obtaining an HPV vaccine and a Pap smear test were 53% versus 42.1%. A common barrier to getting both services were unknown service places (3.4± 0.9, 50% for HPV vaccination versus 3.2± 0.5, 37% for Pap smear testing). The cues to obtain both services were after doctor advice (62%), when becoming mandatory (53%), and after family advice (53%). The self-efficacy to obtain the HPV vaccine and a Pap smear test were 42.7% versus 37.8%, respectively. **Conclusion:** Lack of knowledge and low scores of all HBM constructs except perceived barriers regarding cervical cancer preventive services among Egyptian female university students should guide effective interventions such as marketing these services through physicians, incorporating HPV vaccination into national immunization programs, and Pap smear screening into the reproductive health program.

Keywords: Cervical cancer prevention, Health Belief Model, Online survey

Background

Cervical cancer is the 3rd most prevalent cancer in females worldwide. Most cervical cancer-related deaths take place in developing countries.[1] In Egypt, it ranks as the 13th most prevalent Cancer among females of all ages and the 9th most prevalent Cancer among females between 15 and 44 years of age.[2] A sexually transmitted infection with high-risk human papillomavirus is a leading cause in the pathogenesis of cervical cancer.[3,4]

For primary prevention of cervical cancer, the Advisory Committee on Immunization Practices routinely recommends two or three doses of HPV vaccine at age 11–12 years (can start at age nine years).[5] While two vaccines, Cervarix and Gardasil, which are safe and highly effective, are currently licensed in Egypt, they are not incorporated in the national immunization program.[7]

For secondary prevention of cervical Cancer, the United States Preventive Service Task Force strongly recommends screening with a Pap smear every three years in women aged 21 to 65 years. [7]

Because of the widespread application of this screening program in developed countries, the incidence and death related to cervical cancer have decreased.[8] However, due to the lack of screening programs in developing countries, including Egypt, most cases are discovered late and need extensive chemoradiation treatment.[9]

Numerous theories have been developed to explain the determinants of human behavior and help plan preventive programs. The Health Belief Model (HBM) is still one of the most used models to understand health behavior.

According to this model, the likelihood that a person will adopt preventive behavior is determined by numerous factors: *perceived susceptibility* to a specific health problem, *perceived severity* of this problem, *perceived benefits* of adopting the suggested behavior to prevent this health problem, *perceived costs and barriers* of adopting this behavior, *self-efficacy* which is the confidence that one can accomplish the behavior required, and *cues to action* which refers to factors that stimulate behavior adoption.[10, 11]

Previous studies based on the HBM have typically demonstrated it to be effective in expecting who will adopt several health behaviors, like breast cancer screening.[12, 13] Although studies based on the HBM to predict who will adopt cervical cancer screening and HPV vaccination remain scarce worldwide, including in Egypt, all have concluded that the HBM is valuable for assessing the main aspects that might affect either positively or negatively females' uptake of these preventive behaviors.[14, 15]

So, the objective of this study was to assess knowledge and health beliefs regarding cervical cancer preventive services among Egyptian university female students who are the target for these services using HBM constructs. This data will be crucial for policymakers in preventing cervical cancer.

Methods

Study design and setting: An online survey was conducted in Egypt during July and August 2023.

Sample size and sampling method: The sample size was measured by OpenEpi program depending on the following data: the total number of Egyptian female university students in the academic year 2022/2023 was 1,995 million students, the no of students heard about pap smear was 46.7% in previous study, [9] confidence limits 5 %, design effect 3 (to remove heterogenicity), at 95% confidence level, the calculated sample size was 1148 participants.

The sample selection was done through a multistage random sampling technique as follows:

1st stage: Egypt has 27 governmental universities; three were selected randomly.

2nd stage: The sample size was distributed equally between the three universities, and then the sample from each university was chosen based on the ratio between students in practical colleges to theoretical ones, which was equal to 1:3. So, four colleges, including one practical and three theoretical ones, were randomly selected from each university.

3rd stage: Each university's sample size was distributed equally among its colleges, and the sample from each college was selected randomly.

Inclusion criteria: Egyptian female university students who accepted to complete the online questionnaire.

Tools of data collection

A self-administered close-ended questionnaire consisting of 71 questions was developed in English, then translated into Arabic and validated through a back-translation technique and Pilot testing. It included the following sections:

Section I: the informed consent page contains a concise introduction to the study objectives, the voluntary nature of participation, and declarations of confidentiality.

Section II: socio-demographic characteristics such as age, residence, marital state, college, grade, income, family history of cervical Cancer, HPV vaccination status, and Pap smear screening status.

Section III included 26 questions to assess knowledge about cervical cancer prevalence, nature, risk factors, clinical presentations, and prevention methods. The questions were adapted from Al-Shaikh *et al.* in 2014.[9] The responses to these questions were valid, false, and don't know. One point was given for the correct answer,

and zero points were given for the wrong answer or the "don't know" option. A total knowledge score was calculated by summing the number of correct answers.

Section IV included 45 statements covering HBM constructs distributed as follows: Perceived susceptibility (four statements), Perceived severity (three statements), Perceived benefits of HPV vaccination (two statements) and Pap smear testing (three statements), Perceived barriers to HPV vaccination (seven statements) and Pap smear testing (10 statements), Cues to action for HPV vaccination (five statements) and Pap smear testing (five statements) and Self-efficacy for obtaining HPV vaccination (three statements) and Pap smear testing (three statements). The responses to these statements were measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), and a mean score was calculated. Higher scores above the mean indicate stronger beliefs about the dimension. These statements were adapted from two scales. The first scale was developed by Guvenc *et al.* in 2016 [16] for measuring health beliefs toward HPV vaccination and was modified by adding two sections about cues to action and self-efficacy and changing the evaluation scale from a four-point Likert scale to a five-

point Likert scale. The second scale was developed by Ma *et al.* in 2013 [15] for measuring health beliefs toward Pap smear testing and was modified by adding a section about cues to action.

Pilot study

It was conducted through an online survey of 10% of the sample (114 participants) to assess the questionnaire's validity and applicability. As modifications were made to the questionnaire after the pilot study, its results were excluded from the main study's results. The questionnaire's Cronbach's alpha coefficient was 0.87, indicating good internal consistency.

Fieldwork

The researchers got permission from the e-learning unit in each selected college to share the online questionnaire through the students' teams on the Microsoft Team platform, which is an official platform used in educational activities. The questionnaire was constructed using the Google Form App, and the created link was uploaded to the student teams. When the sample size was completed, we stopped accepting the students' responses.

Ethical aspects

The research protocol was approved by the IRB unit of the Faculty of Medicine, Zagazig University (reference no: 10833).

The students were informed that their participation was voluntary, and their implied consent was obtained through their Agreement to complete the online questionnaire.

Data management

The collected data was analyzed using SPSS (Statistical Package for the Social Sciences) version 20.0. The distribution and normality of the sample were assessed with the Kolmogorov-

Smirnov test. Qualitative data were represented as frequencies and percentages, and quantitative data were expressed as mean and standard deviation. Pearson correlation was used to measure the linear correlation between data.

Results

Table 1 shows the socio-demographic characteristics of 1148 participants; their mean age was 20.3±1.2 years, 69.9% were from rural areas, only 2.9 % were married, 75% were from theoretical colleges, and nearly all grades were representable. Most students belonged to the middle social class. Only 2% reported a positive family history of cervical cancer and their vaccination against HPV, while none of them had undergone Pap smear screening.

Table 2 shows the knowledge scores about cervical cancer and methods of its

prevention. Approximately one-third (31.9%) of participants documented cervical cancer as a common cancer, 52% counted it as a preventable disease, 58.4% identified HPV as a risk factor, and nearly 50% reported pelvic pains and irregular vaginal bleeding as symptoms of cervical cancer. In comparison, only 18.6% viewed that it may be asymptomatic. Regarding knowledge about pap smear, 47% recognized it as a sensitive way in early cervical cancer detection, small percent knew the correct age (35%) and frequency (22%) of the Pap smear, while only 10% thought that one Pap smear is not sufficient, and most of them considered it painful and having severe complications. Regarding knowledge about the HPV vaccine, only 26% could correctly distinguish the viral constituent of the vaccine, 29% could correctly report the additional uses of the vaccine, and only 17% could identify the proper age for vaccination.

Table 3 describes the details of HBM constructs. The statements which received the high agreement score were; "Likelihood of having advanced cervical cancer is high if not detected early by a Pap test (3.4± 1.0, 46%)" in perceived susceptibility construct, "My life would be damaged if I had cervical cancer (3.5± 1.0, 54%)" in perceived severity construct, "Getting HPV

vaccine can prevent cervical cancer (3.4± 0.8, 47%)" in perceived benefit for HPV Vaccine, and " Getting a Pap test regularly is worthy of staying as healthy as I can (3.6± 0.8, 55%)" in perceived benefit for Pap smear.

Regarding the perceived barriers to HPV vaccination, they were arranged as follows; "I do not know the place to go or the person to ask to get HPV vaccine (3.4± 0.9, 50%)", "Probable side effects of HPV vaccination worry me (3.4± 0.8, 44%)" and "I am unable to determine the appropriate age for HPV vaccination (3.1± 0.8, 33%)" while the perceived barriers for Pap smear were arranged as follow; "I do not realize what will happen during a Pap test (3.3± 0.6, 58%)", "getting a Pap test is embarrassing for me (3.2± 0.6, 54%)", " I do not know the place to go or the person to ask to have a Pap test (3.3± 0.6, 51%), and "Screening by a Pap test is not now an obligatory program (3.2± 0.5, 37%)".

Table (3 cont.) continues the description of details of HBM constructs. The cues to obtain the HPV vaccine and pap smear were similar, represented as follows: 1st, after advice from a doctor (62%); 2nd, if it became mandatory (53%), or after advice from family (53%).

All statements that assessed self-efficacy to obtain the HPV vaccine and pap smear did not exceed 20%, indicating a low self-efficacy level.

Table 4 shows the total scores of HBM constructs. 62.7% of participants considered themselves at risk for cervical cancer, and nearly 50% perceived the severity of cancer in the cervix and the benefits of preventive methods.

The perceived barriers to obtaining an HPV vaccine and a Pap smear test were 53% versus 42.1%, respectively. The self-efficacy to obtain an HPV vaccine and a Pap smear test was 42.7% versus 37.8%, respectively.

Table 5 shows a statistically significant positive correlation between self-efficacy in obtaining an HPV vaccine and a Pap smear test and both knowledge and perceived susceptibility.

Discussion

This study revealed that only 2% of participants had received the HPV vaccine, while none had undergone Pap smear screening. This could be explained by a lack of knowledge and low scores of all HBM constructs except perceived barriers, as explored in this study.

These findings were significantly lower than that reported in previous Egyptian studies, where about 1.5% of women from urban areas have routine Pap tests[17] and

uptake of the HPV vaccine reached (19.9%).[18] This could be attributed to different study samples.

Our results demonstrated knowledge deficits in all items related to cervical cancer and methods of its prevention. Similar results were found in other Egyptian studies targeting the general population, students, and even health care providers.

A population-based study of 7,518 Egyptian females aged 15–59 years from the 2015 Egypt Health Issues Survey (EHIS) reported unawareness of cervical Cancer screening services among 92.3% of studied females.[19]

Another study conducted on 500 nursing students at Beni-Suef University in 2018 showed that only 29% of students had sufficient knowledge about cervical cancer, and only 12.4% had sufficient knowledge about screening.[20]

Surprisingly, the knowledge deficit extended to Obstetricians and Gynecologists where a study conducted on 250 Egyptian attendees of a national Ob-Gyns professional conference in 2022 showed that nearly 45% of studied physicians had inadequate knowledge, 57% had negative attitudes toward HPV vaccination and Pap testing, and only 44%

versus 45% had performed Pap test and prescribed the HPV vaccine respectively during their professional practice.[21]

Knowledge deficit about cervical cancer and its preventive methods was not present only in Egyptian studies but also in many studies conducted in Saudi Arabia [9, 22, 23] and in many Western countries like Poland,[24] Greece,[25] and many others.

By evaluating the total score of HBM constructs, our results revealed that participants had low perceived susceptibility and severity to cervical cancer, low perceived benefits and high perceived barriers of preventive services, and low self-efficacy in obtaining these services.

It also revealed a statistically significant positive correlation between self-efficacy in receiving preventive services and knowledge and perceived susceptibility constructs.

This is consistent with a systemic review that concluded that adopting preventive services was positively related to higher susceptibility, severity, and benefits and was negatively related to perceived barriers.[26]

This study showed that 53% versus 42.1% of participants had perceived barriers to obtaining an HPV vaccine versus a Pap

smear test, respectively, and a common barrier was unknown places to receive both services.

This reflects the critical role of national marketing campaigns in providing information regarding the values, the technique, and where to get these services.

This result agrees with similar research conducted in Saudi Arabia, where 52% of the participants could not determine the place to get a Pap smear test, and a study conducted in Turkey where getting a Pap smear test was four times less if the places to get the test were unknown than if they were known.[27, 28]

Among the top perceived barriers to HPV vaccination were probable side effects of vaccination. This finding agrees with similar studies conducted in Saudi Arabia, where participants were concerned about vaccine safety.[9, 29]

Another top perceived barrier was the inability to determine the appropriate age for vaccination," which reflects the knowledge deficit problem and ensures that national campaigns play an important role in promoting preventive services.

Among the top perceived barriers to Pap smear screening were unknown techniques, the fact that it is not an obligatory program, and the unfelt need to obtain it if one is healthy. These barriers reflect the problem of knowledge deficit and ignorance regarding the concept of prevention, which pushes the healthy individual to seek preventive service without symptoms and ensures the vital role of mandatory national programs in promoting preventive services.

Also, feeling embarrassed about having a Pap smear test was a socio-cultural barrier that appeared in this study. Embarrassment was recorded frequently as a barrier to Pap smear testing programs among Arab Muslim women in Saudi Arabia [27] and the USA.[30]

This study revealed that the cues to obtain the HPV vaccine and pap smear were similarly represented as follows: 1st, after advice from a doctor; 2nd if it became mandatory or after advice from family.

This reflects again the critical role of compulsory national programs in promoting preventive services. These findings agree with a similar study conducted in Saudi Arabia, where most students put their confidence in physicians as a critical source of information about preventive services.[9]

Study strengths and limitations: although our study is one of few studies conducted to measure knowledge and health beliefs regarding cervical cancer prevention with a representative sample of Egyptian female

university students, the results may not be generalizable to all Egyptian females.

Secondly, the online survey using a self-administered questionnaire is a form of anonymous survey that has the advantage of avoiding interviewer bias and helps reduce the potential for response bias, as the questions are self-administered, making it easier for respondents to be honest without falling for example in social desirability bias.

On the other hand, a lack of guidance due to the absence of interviewers might lead to misinterpretation and wrong answers, but we tried to avoid this through the validation of study tools in the pilot study.

Furthermore, using the Likert scale resulted in the bias of extreme or neutral responses, and we could minimize this bias by adding open-ended questions to our survey, but we couldn't do this to avoid the undesirability to participate as explored in the pilot study.

Conclusion and Recommendations: this study revealed a lack of knowledge and low scores of all HBM constructs except perceived barriers regarding HPV vaccination and Pap smear screening among Egyptian female university students. Also, the lack of obligatory programs was the main barrier to obtaining these services. These findings will guide the development of effective interventions such as marketing these services through physicians, incorporating HPV vaccination into the national immunization programs, and Pap smear screening into the reproductive health programs to increase the rates of use of these services in Egypt.

Also, as this study was conducted only on female university students, further studies on women from different ages and backgrounds are recommended.

Declarations

References

1- Arbyn M, Castellsagué X, de Sanjosé S, *et al.* Worldwide burden of cervical cancer in 2008. Ann Oncol. 2011; 22(12): 2675-2686.

2- ICO/IARC Information Centre on HPV and Cancer. Egypt Human Papillomavirus and Related Cancers, Fact Sheet 2023 [Internet]. HPV Information Centre; 2023 Mar 10 [cited 2023 May 30]. Available from:

https://hpvcentre.net/statistics/reports/EGY_FS.pdf

3. Zur Hausen H. Papillomaviruses in the causation of human cancers-a brief historical account. Virology. 2009; 384: 260-265.

4. Muñoz N, Bosch FX, de Sanjosé S, *et al.* Epidemiologic classification of human papillomavirus types associated with cervical cancer. N Engl J Med. 2003; 348: 518-527.

5. Advisory Committee on Immunization Practices. Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger [Internet]. CDC; 2023 [cited 2023 May 30]. Available from: www.cdc.gov/vaccines/acip

6. Shaltout MF, Sallam HN, AbouSeeda M, *et al.* Prevalence and type distribution of human papillomavirus among women older than 18 years in Egypt: a multicenter, observational study. Int J Infect Dis. 2014; 29: 226-231.

7. United States Preventive Service Task Force. Cervical Cancer: Screening, 2022 [Internet]. USPSTF; 2022 [cited 2023 Jun 30]. Available from: https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/cervical-cancer-screening

8. Mathew A, George PS. Trends in incidence and mortality rates of squamous cell carcinoma and adenocarcinoma of the cervix--worldwide. Asian Pac J Cancer Prev. 2009; 10: 645-650.

9. Al-Shaikh GK, Almussaed EM, Fayed AA, *et al.* Knowledge of Saudi female university students regarding cervical cancer and acceptance of the human papillomavirus vaccine. Saudi Med J. 2014; 35(10): 1223-1230.

10. Rosenstock IM, Kirscht JP. The health belief model and personal health behavior. Health Educ Monogr.1974; 2:470–473.

11. Janz NK, Champion VL, StrecherVJ. The health belief model. In: Glanz K, Rimer BK, Lewis FM, editors. Health behavior and health education: theory, research, and practice. San Francisco, CA: Jossey Bass. 2002; pp. 45–66.

12. Champion VL. Revised susceptibility, benefits, and barriers scale for mammography screening. Res Nurs Health. 1999; 22: 341–348.

13. Wu TY, Yu MY. Reliability and validity of the mammography screening beliefs questionnaire among Chinese American women. Cancer Nurs. 2003; 26: 131–142.

14. Brewer NT, Fazekas KI. Predictors of HPV vaccine acceptability: a theory informed systematic review. Prev Med. 2007; 45: 107

15. Ma GX, Gao W, Fang CY, *et al.* Health beliefs associated with cervical cancer screening among Vietnamese Americans. J Women Health (Larchmt). 2013; 22(3): 276-288.

16. Guvenc G, Seven M, Akyuz A. Health Belief Model Scale for Human Papilloma Virus and its Vaccination: Adaptation and Psychometric Testing. J Pediatr Adolesc Gynecol. 2016; 29(3): 252-258.

17. el-All HS, Refaat A, Dandash K. Prevalence of cervical neoplastic lesions and human papillomavirus infection in Egypt: National Cervical Cancer Screening Project. Infect Agents Cancer. 2007; 2:12.

18. Yakout SM, Moawed S, Gemeay EM. Cervical cancer and screening test (PAP test): knowledge and beliefs of Egyptian women. Am J Nurs Sci. 2016; 5: 175–184.

19. Al-Rifai RH, Loney T. Factors Associated with a Lack of Knowledge of Performing Breast Self-Examination and Unawareness of Cervical Cancer Screening Services: Evidence from the 2015 Egypt Health Issues Survey.

Asian Pac J Cancer Prev. 2017; 18 (10): 2763-2769.

20. Mohamed AA, Hassan HE, Gamel WM, *et al.* Awareness about breast and cervical cancers among nursing students in Beni-Suef University. J Nurs Educ Pract. 2019; 9 (5): 44-52.

21. Mohamed ML, Tawfik AM, Mohammed GF, *et al.* Knowledge, Attitude, and Practice of Cervical Cancer Screening, and HPV Vaccination: A Cross-Sectional Study Among Obstetricians and Gynecologists in Egypt. Matern Child Health J. 2022; 26(3): 565-574.

22. Al-Darwish AA, Al-Naim AF, Al-Mulhim KS, *et al.* Knowledge about Cervical Cancer Early Warning Signs and Symptoms, Risk Factors, and Vaccination among Students at a Medical School in Al-Ahsa, Kingdom of Saudi Arabia. Asian Pac J Cancer Prev. 2014; 15: 2529-2532.

23. Sait KH. Knowledge, attitudes, and practices regarding cervical cancer screening among physicians in the Western Region of Saudi Arabia. Saudi Med J. 2011; 32: 1155-1160.

24. Kamzol W, Jaglarz K, Tomaszewski KA, *et al.* Assessment of knowledge about cervical cancer and its prevention among female students aged 17–26

years. Eur J Obstet Gynecol Reprod Biol. 2013; 166: 196-203.

25. Notara V, Soultatou P, Tselika A. Lay knowledge of HPV infection and the vaccine against HPV in Greece. J. Health Sci. 2012; 6: 270-279.

26. Tanner-Smith EE, Brown TN. Evaluating the health belief model: a critical review of studies predicting mammographic and pap screening. Soc Theory Health. 2010; 8:95–125.

27. Aldohaian AI, Alshammari SA, Arafah DM. Using the health belief model to assess beliefs and behaviors regarding cervical cancer screening among Saudi women: a cross-sectional observational study. BMC Women's Health. 2019; 19(1): 6.

28. Esin MN, Bulduk S, Ardic A. Beliefs about cervical cancer screening among Turkish married women. J Cancer Educ. 2011; 26: 510–515.

29. Darraj AI, Arishy AM, Alshamakhi AH, *et al.* Human Papillomavirus Knowledge and Vaccine Acceptability in Jazan Province, Saudi Arabia. Vaccines (Basel). 2022; 10(8): 1337.

30. Salman KF. Health beliefs and practices related to cancer screening among Arab Muslim women in an urban community. Health Care Women Int. 2012; 33: 45–74.

Table 1: Characteristics of studied students.

Characteristics	Frequency (%) (N=1148)
Age	
(X±SD)	20.3±1.2
Range	17-25
Residence	
- Rural	803 (69.9)
- Urban	345 (30.1)
Marital state	
- Single	1114 (97.1)
- Married	34 (2.9)
College	
- Theoretical	861 (75.0)
- Practical	287 (25.0)
Study grade:	
- 1st	138 (12.0)
- 2nd	160 (13.9)
- 3rd	353 (30.7)
- 4th	397 (34.6)
- 5th	100 (8.7)
Social class	
- Low	91 (8.0)
- Middle	1010 (88.0)
- High	47 (4.0)
Family history of cervical cancer	
- Yes	23 (2.0)
- No	838 (73.0)
- Don't know	287 (25.0)
HPV vaccination status	
- Vaccinated	23 (2.0)
- Not	1125 (98.0)
Pap smear screening status	
- Not done	1148 (100.0)

Table 2: Knowledge about cervical cancer and methods of its prevention among studied students.

Questions	Frequency of correct answers (%)
Cervical cancer is common among females	367 (31.9)
Cervical cancer is a preventable disease	597 (52.0)
Risk factors of cervical cancer include:	
Perianal warts	71 (6.2)
Contraceptive pills	348 (30.4)
Human Immune deficiency virus (AIDS)	577 (50.3)
Smoking	299 (26.0)
Obesity	200 (17.4)
Human papilloma virus	670 (58.4)
Sexually transmitted diseases	606 (52.8)
Immunosuppressive disorders	457 (39.8)
Old age	107 (9.3)
Symptoms of cervical Cancer include:	
Irregular vaginal bleeding	549 (47.8)
Vaginal discharges	513 (44.7)
Post-coital bleeding	406 (35.4)
Pelvic pains	577 (50.3)
Weight loss	228 (19.9)
Asymptomatic	214 (18.6)
Pap smear knowledge	
Pap smear is a sensitive way to diagnose cervical cancer early	540 (47.0)
Pap smear is painful	92 (8.0)
One pap smear is enough	115 (10.0)
Pap smear has serious complications	184 (16.0)
The most appropriate time to have a pap smear is from age 21 to 65 years	402 (35.0)
The best frequency of pap smears every three years	253 (22.0)
HPV vaccine knowledge	
Vaccine against cervical cancer contains Human Papilloma Virus	299 (26.0)
The vaccine is also protective against genital warts	333 (29.0)
The appropriate age to get the vaccine is 9-26 years	195 (17.0)
Total score (X±SD)	13.9±2.7
% of total correct answers	618 (53.8)

Table 3: Description of HBM constructs related to cervical cancer and methods of its prevention among studied students.

Statements	X±SD	% of Agreement
Perceived Susceptibility		
I believe I am at risk for cervical cancer.	2.6± 0.8	8.0
I am more prone than the ordinary woman to have cervical cancer.	2.4± 0.7	4.0
The likelihood of having cervical cancer is high if I am not vaccinated against HPV.	2.9± 0.9	22.0
The likelihood of having advanced cervical cancer is high if undetected early by a Pap test.	3.4± 1.0	46.0
Perceived Severity		
Cervical cancer would harm my relationship with my husband.	3.3± 1.0	37.0
Most women will die if they have cervical cancer.	3.2± 0.9	34.0
My life would be damaged if I had cervical cancer.	3.5± 1.0	54.0
Perceived Benefits of HPV Vaccine		
Getting the HPV vaccine can prevent cervical cancer.	3.4± 0.8	47.0
I trust the safety and efficacy of the HPV vaccine.	3.2± 0.8	31.0
Perceived Benefits of Pap Test		
Getting a Pap test is the best and safest method for early detection of cervical cancer.	3.5± 0.8	48.0
Getting a Pap test regularly is worth it to stay as healthy as possible.	3.6± 0.8	55.0
Getting a Pap test regularly will lower the possibility of dying from cervical cancer.	3.5± 0.8	50.0
Perceived Barriers for HPV Vaccine		
I doubt the safety and efficacy of the vaccine.	2.8± 0.7	10.0
I am unable to determine the appropriate age for HPV vaccination.	3.1± 0.8	33.0
HPV vaccine increases sexual curiosity and earlier exposure to sexual intercourse.	2.7± 0.6	5.0
HPV vaccination is expensive.	2.8± 0.7	18.0
HPV vaccination is no longer an obligatory program.	3.1± 0.7	28.0
I do not know the place to go or the person to ask to have the HPV vaccine.	3.4± 0.9	50.0
The probable side effects of HPV vaccination worry me.	3.4± 0.8	44.0
Perceived Barriers to Pap Test		
I do not realize what will happen during a Pap test.	3.3± 0.6	58.0
If I'm destined to have cancer, getting a Pap test will not stop this.	3.1± 0.6	28.0
Getting a Pap test is embarrassing for me.	3.2± 0.6	54.0
Screening by a Pap test is not now an obligatory program.	3.2± 0.5	37.0
I do not know where to go or the person to ask for a Pap test.	3.3± 0.6	51.0
I do not want to have a Pap test if I am well.	3.0±0.7	33.0
Getting a Pap test will be painful and unpleasant.	3.1± 0.5	29.0
Getting a Pap test will cost too much time.	2.9± 0.5	10.0
Getting a Pap test will be expensive.	3.1± 0.4	17.0
I am terrified to get a Pap test because I might discover that I have cancer.	2.9± 0.7	19.0

Table 3 cont.: Description of HBM constructs related to cervical cancer and methods of its prevention among studied students

Statements	HPV vaccine		Pap test	
	X±SD	% Of Agreement	X±SD	% Of Agreement
Cues to action				
I will get the service if it becomes mandatory	3.4± 0.6	54.0	3.3± 0.6	53.0
I will get the service after advice from a doctor	3.3± 0.5	63.0	3.4± 0.6	62.0
I will get the service after advice from my family	3.3± 0.6	51.0	3.4± 0.6	53.0
I will get the service after advice from friends	2.9± 0.7	22.0	3.1±0.7	27.0
I will get the service after watching media or TV reports promoting it	3.1± 0.7	32.0	3.1± 0.7	30.0
Self-efficacy				
I feel able to arrange to get the service.	3.6± 0.7	26.0	3.6± 0.7	28.0
I feel able to get the service.	3.6± 0.7	29.0	3.6± 0.7	27.0
I feel able to deal with any emotional distress produced by the service.	3.5± 0.7	22.0	3.6± 0.7	20.0

Table (4): Level of HBM constructs

Variables	Total	(Range) X±SD	Frequency, % of Agreement
Susceptibility	20	(4-19) 11.4± 2.6	720 (62.7)
Severity	15	(3-15) 9.9± 2.4	654 (57.0)
Benefits			
HPV vaccine	10	(2-10) 6.6± 1.5	585 (51.0)
Pap test	15	(3-15) 10.6± 2.3	586 (51.5)
Barriers			
HPV vaccine	35	(7-29) 21.7± 3.7	609 (53.0)
Pap test	50	(23-40) 31.3± 2.7	483 (42.1)
Self-efficacy			
HPV vaccine	15	(9-15) 10.8± 1.9	563 (49.0)
Pap test	15	(9-15) 10.8± 1.9	597 (52.0)

Table (5): Correlation between self-efficacy, knowledge, and other HBM constructs

Item	Self-efficacy			
	HPV vaccine		Pap test	
Knowledge	r = 0.88	P = **0.00***	r = 0.85	P = **0.00***
Susceptibility	r = 0.195	P = **0.01***	r = 0.211	P = **0.007***
Severity	r = - 0.02	P = 0.8	r = -0.01	P = 0.9
Benefits				
HPV vaccine	r = 0.03	P = 0.7	r = 0.02	P = 0.7
Pap test	r = 0.03	P = 0.7	r = 0.04	P = 0.6
Barriers				
HPV vaccine	r = -0.12	P = 0.12	r = -0.11	P = 0.15
Pap test	r = -0.01	P = 0.8	r = -0.03	P = 0.6

<div dir="rtl">

الملخص العربى

المعرفة والمعتقدات حول التطعيم ضد فيروس الورم الحليمي البشري وفحص سرطان عنق الرحم بين طالبات الجامعة المصرية

راندة محمد سعيد¹، ابراهيم فوده²، نهى محمد عبد السلام³

¹ قسم طب الأسرة، كلية الطب، جامعة الزقازيق، مصر.

² قسم الأمراض الجلدية والتناسلية والذكورة كلية طب دمياط جامعة الأزهر

³ قسم طب المجتمع، كلية الطب، جامعة الزقازيق، مصر.

الخلفية: يمكن أن يوفر الجمع بين التطعيم ضد فيروس الورم الحليمي البشري واختبار مسحة عنق الرحم أكبر قدر من الحماية ضد سرطان عنق الرحم. **الأهداف:** تقييم المعرفة والمعتقدات الصحية لدى طالبات الجامعات المصرية حول هذه الخدمات الوقائية. **الطرق:** تم إجراء استطلاع عبر الإنترنت على ١١٤٨ مشاركة خلال شهري يوليو وأغسطس ٢٠٢٣ باستخدام استبيان عربي , مغلق , ذاتي الإدارة , يغطي العوامل المؤثرة على تبني السلوكيات الوقائية من سرطان عنق الرحم باستخدام نموذج الاعتقاد الصحي (HBM). **النتائج:** تلقى ٢% فقط من المشاركين لقاح فيروس الورم الحليمي البشري بينما لم يخضع أي منهم لفحص مسحة عنق الرحم. حصلوا على مجموع معرفة قدره ٥٣,٨%، واعتبر ٦٢,٧% فقط أنفسهم معرضين لخطر الإصابة بسرطان عنق الرحم، و ٥٠% فقط أدركوا خطورة سرطان عنق الرحم وفوائد الطرق الوقائية. وكانت العوائق الملموسة للحصول على لقاح فيروس الورم الحليمي البشري واختبار مسحة عنق الرحم ٥٣% مقابل ٤٢,١% على التوالي. كان العائق المشترك أمام الحصول على كلتا الخدمتين هو أماكن الخدمة غير المعروفة (٣,٤ ± ٠,٩، ٥٠% للتطعيم ضد فيروس الورم الحليمي البشري مقابل ٣,٢ ± ٠,٥، ٣٧% لاختبار مسحة عنق الرحم). كانت مثيرات الحصول على كلتا الخدمتين هي بعد نصيحة الطبيب (٦٢%)، وعندما تصبح إلزامية (٥٣%)، وبعد نصيحة الأسرة (٥٣%). وكانت الثقة الذاتية للحصول على لقاح فيروس الورم الحليمي البشري واختبار مسحة عنق الرحم ٤٢,٧% مقابل ٣٧,٨% على التوالي. **الاستنتاج:** إن الافتقار إلى المعرفة وانخفاض الدرجات في جميع بنيات HBM باستثناء العوائق الملموسة المتعلقة بالخدمات الوقائية من سرطان عنق الرحم بين طالبات الجامعات المصرية يجب أن توجه التدخلات الفعالة مثل تسويق هذه الخدمات من خلال الأطباء، ودمج التطعيم ضد فيروس الورم الحليمي البشري في برنامج التحصين الوطني وفحص مسحة عنق الرحم ببرنامج الصحة الإنجابية.

</div>