

# What do we know about cervical cancer and HPV vaccines? A cross-sectional questionnaire evaluated by midwives and nurses

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## Ethics Committee Approval

Ethics committee approval was obtained from the Clinical Research Ethics Committee of the University of Health Sciences, Bursa Yuksek Ihtisas Training and Research Hospital on 11.11.2020 with the number 2011-KAEK-25 2020/11-04.

All procedures in this study involving human participants were performed in accordance with the 1964 Helsinki Declaration and its later amendments.

## Conflict of Interest

No conflict of interest was declared by the authors.

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## Abstract

**Background/Aim:** Cervical cancer is a preventable disease by appropriate screening programs, treatment of pre-invasive lesions, and vaccination. Thus, the knowledge of healthcare providers about this issue is crucial. The purpose of this study was to evaluate the knowledge of nurses and midwives who were working in the obstetrics and gynecology department about cervical cancer, screening programs, and human papillomavirus vaccination.

**Methods:** The questionnaire comprising 17 questions about cervical cancer, screening programs, and the human papillomavirus that was created by the authors, was applied to midwives and nurses working in Bursa online. All participants were informed about the answers, cervical cancer and HPV vaccines adequately after finishing the questionnaire.

**Results:** The number of participants volunteering to answer the survey was 510. Of these, the rate of participants claiming that cervical cancer is a preventable disease was 97.4%. Approximately 74% of them answered that the reason for cancer was a virus, and 97.8% said that it is screened with a cervical smear. Sixty percent of the participants answered the onset age of the cervical cancer screening program wrongly. There is a great lack of knowledge about the type of vaccines, administration age, and the population vaccinated. Only 2% of the participants had been vaccinated and 34% had offered the vaccination to someone.

**Conclusion:** Midwives and nurses of the obstetrics and gynecology department working in Bursa have sufficient knowledge about cervical cancer, whereas they have a lack of knowledge about screening programmes and human papillomavirus vaccination. It is crucial to make everyone know that cervical cancer is preventable and that eradication is possible by vaccination. Community-based information about the cervical cancer screening program and HPV vaccines is essential.

**Keywords:** Cervical cancer, Human Papilloma Virus, Screening methods, Vaccination

## Introduction

Every two minutes, a woman dies due to cervical cancer worldwide [1]. Although cervical cancer is the third most common cancer in developing countries, it is the most common cancer among gynecological cancers in the world [2]. The latest data announced by the Ministry of Health of the Republic of Turkey states it is the 9<sup>th</sup> most common cancer among Turkish women, with an incidence of 3.4/100,000 [3]. The relationship between cervical cancer and Human Papilloma Virus (HPV) was shown about 40 years ago [4]. The human Papilloma Virus causes infection after entering the basal epithelial cells via micro traumatic regions, occurring during sexual intercourse. It can be eliminated by the immune system in two years. Women with persistent lesions and even those without any lesions can spread the disease. The time between the infection and the development of invasive cancer is approximately more than 10 years. It is also presented that the interval between HPV infection and precancerous lesions is 5 years, whereas it takes about 15 years for precancerous lesions to develop into invasive cancer. Preinvasive lesions are screened by the 'Pap smear test' (cervical smear). In Turkey, every woman is included in the screening program starting from the age of 30 years by the Ministry of Health, General Directorate of Public Health [5]. The community-based screening program, which starts at the age of thirty, is applied every five years with a cervical smear or HPV test. The screening program of the Ministry of Health of Turkey is presented in Table 1, and the screening program of the American Society of Obstetrics and Gynecology is presented in Table 2 [5, 6].

Table 1: Republic of Turkey, Ministry of health cervical cancer screening program  
Cervical Cancer Screening Program

- All women between the ages of 30-65 years
- Every 5 years, HPV DNA screening or Pap Smear
- Screening is terminated in 65-year-old women whose last two tests are negative.
- Women who have had a hysterectomy not for CIN II or CIN III do not need to be screened
- In cases where hysterectomy was performed due to CIN II and III; three documentable report screening should be discontinued in the absence of technically adequate negative cytology and an abnormal/positive result in the last 10 years.

Table 2: American Society of Obstetrics and Gynecology Cervical Cancer Screening Program

- American Society of Obstetrics and Gynecology Cervical Cancer Screening Program
- Screening recommends starting at age 21 years. Cytology is performed every 3 years between the ages of 21-29 years
  - Between the ages of 30-65 years, HPV DNA is screened every 5 years or Pap Smear is performed every 3 years
  - Screening is terminated at age 65 years (in the presence of 3 negative cytology or 2 negative HPV tests in the last 10 years and the last in the last 5 years) and benign hysterectomies
  - Continuation of screening for 20 years in patients with a history of CIN II and CIN III and Hysterectomy
  - Screening continues in those who have had the HPV vaccine

HPV is a non-enveloped DNA virus. More than 200 species have been identified. Approximately 40 types infect the genital tract [7]. It is classified as low-risk and high-risk based on oncogenicity risk. Low-risk HPV types, type 6 and 11, are especially responsible for genital condylomas, while high-risk types, 16, 18, 31, 33, 45, 52 are responsible for cervical cancers [8]. HPV vaccines are also utilized to prevent the infection. L1, which is the major capsid protein of the virus, and/or L2, which is the minor capsid protein, are used in HPV vaccines. Since it does not contain a viral genome, there is no risk of infection [9].

Increasing knowledge and experience about the cervical cancer screening program and HPV vaccines in our country is one of the most important steps in the eradication of cervical

cancer. The purpose of this study was to evaluate the knowledge and experience of midwives and nurses working in the field of gynecology and obstetrics in Bursa about cervical cancer screening and HPV vaccines, and to inform them.

## Materials and methods

Ethics committee approval was obtained from the Clinical Research Ethics Committee of the University of Health Sciences, Bursa Yuksek Ihtisas Training and Research Hospital on 11.11.2020 with the number 2011-KAEK-25 2020/11-04. After the approval of the ethics committee, the study was conducted on the midwives and nurses who were college graduates, and still working in a state hospital department of the obstetrics and gynecology unit in Bursa, via an online questionnaire. At the beginning of the study, the participants were informed about the study, and those who agreed to participate were administered a questionnaire created by the authors.

A total of 17 questions were present in the survey, evaluating the knowledge levels of the participants about cervical cancer, screening programs, and Human Papilloma Virus vaccines. After the questionnaire was finished, a form depicting the answers and useful information about the issue was presented.

All participants were experienced nurses and midwives working in the obstetrics and gynecology department. The personal information of applicants was not used, and the respondents were not disclosed in any way. Definitions that would harm personal privacy were not used in the questionnaire. The questions and answers are presented in Table 3.

Table 3: Questionnaire form about the awareness of cervical cancer and HPV vaccines among midwives and gynecology and obstetrics nurses

1. Is Cervical Cancer a significantly preventable disease?  
**A.Yes** B.No
- 2.At what age does screening start in the cervical cancer prevention program of the Ministry of Health?  
A.18 B.25 **C.30** D.35 E.40
3. What is the method used in cervical cancer screening?  
A.Blood Test B.Urine Test **C.Smear Test** D.Mammography
- 4.What is the most common cause of cervical cancer?  
A.Bacteria B.Parasite **C.Virus** D.Smoking
- 5.How many types of HPV vaccines are used to prevent cervical cancer?  
A.1 B.2 **C.3** D.4
6. How many doses of HPV vaccines are administered?  
A.1 B.2 **C.3** D.4
- 7.At what age (Target Audience) should the vaccine be administered?  
A.6-8 years **B.9-12 years** C.13-15 years D.16-20 years
- 8.If it is not administered in the target age range, at what age (Compensation -Catchup) is it still valuable for protection?  
A.10-20 years **B.13-26 years** C.30-40 years
- 9.Can HPV vaccine cause benign or malignant diseases of the cervix?  
A.Yes **B.No**
- 10.Do you know about the price of HPV vaccines?  
**A.Yes** B.No
11. Who can receive HPV vaccines?  
A. Only for women B.Only for men **C. Both women and men**
- 12.Do you think the HPV vaccine should be included in the Ministry of Health Vaccination Calendar?  
A.Yes **B.No**
- 13.Are any tests (smear, blood or urine test) required before HPV vaccination?  
A.Yes **B.No**
- 14.Should smear screening continue after HPV vaccination?  
**A.Yes** B.No
- 15.Can sexually active people get HPV vaccine?  
**A.Yes** B.No
16. Have you had the HPV vaccine?  
**A.Yes** B.No
- 17.Have you recommended the HPV vaccine to anyone?  
**A.Yes** B.No

\*The options marked in bold, underlined, and larger indicate the correct answer.

### Statistical analysis

After all the participants filled the questionnaire online, all answers were evaluated. The number of the answered questions and the frequencies of the answered options were reviewed.

### Results

A total of 510 participants were included in the study. Some questions were not included in the results because of the unanswered questions. Responses of the patients were demonstrated in Table 4

Table 4: The number of people who responded to the questionnaire on questioning the awareness of cervical cancer and HPV vaccines among midwives and gynecology and obstetrics nurses and their answers (N refers to the number of people who answered the question. The percentage of answers given to the question is indicated under the choices)

1. Is Cervical Cancer a significantly preventable disease? (n=508)
 

<u>A.Yes</u>	B.No
97.4%	2.6%
2. At what age does screening start in the cervical cancer prevention program of the Ministry of Health?(n=504)
 

A.18	B.25	<u>C.30</u>	D.35	E.40
24.2%	13.7%	38.1%	13.5%	10.5%
3. What is the method used in cervical cancer screening?(n=508)
 

A. Blood Test	B. Urine Test	<u>C.Smear Test</u>	D. Mammography
1%	0.4%	97.8%	0.8%
4. What is the most common cause of cervical cancer? (n=509)
 

A.Bacteria	B.Parasite	<u>C.Virus</u>	D.Smoking
16.2%	2.6%	73.7%	7.6%
5. How many types of HPV vaccine are used to prevent cervical cancer? (n=498)
 

A.1	B.2	<u>C.3</u>	D.4
22.9%	41.8%	30.6%	4.7%
6. How many doses of HPV vaccine are administered? (n=494)
 

A.1	B.2	<u>C.3</u>	D.4
14.4%	40.9%	40.9%	3.9%
7. At what age (Target Audience) should the vaccine be administered? (n=505)
 

A.6-8 years	<u>B.9-12 years</u>	C.13-15 years	D.16-20 years
2.4%	41.9%	13.1%	42.7%
8. If it is not administered in the target age range, at what age (Compensation -Catchup) is it still valuable for protection? (n=503)
 

A.10-20 years	<u>B.13-26 years</u>	C.30-40 years
9.3%	59.2%	31.5%
9. Can HPV vaccine cause benign or malignant diseases of the cervix? (n=507)
 

A.Yes	<u>B.No</u>
38.3%	61.7%
10. Do you know about the price of HPV vaccines? (n=503)
 

A.Yes	B.No
29.9%	70.1%
11. Who can receive HPV vaccines? (n=505)
 

A. Only for women	B.Only for men	<u>C. Both women and men</u>
40.8%	0.4%	58.8%
12. Do you think the HPV vaccine should be included in the Ministry of Health Vaccination Calendar? (n=507)
 

A.Yes	B.No
93%	7%
13. Are any tests (smear, blood or urine test) required before HPV vaccination? (n=510)
 

A.Yes	<u>B.No</u>
49.6%	50.4%
14. Should smear screening continue after HPV vaccination? (n=507)
 

<u>A.Yes</u>	B.No
94%	6%
15. Can sexually active people get the HPV vaccine? (n=507)
 

<u>A.Yes</u>	B.No
92%	8%
16. Have you had the HPV vaccine? (n=509)
 

A.Yes	B.No
2%	98%
17. Have you recommended the HPV vaccine to anyone? (n=508)
 

A.Yes	B.No
34%	66%

A total of 97.4% of the participants knew that cervical cancer was preventable, 73.7% had the knowledge that it was caused by a virus, and 97.8% answered that it can be scanned with cervical smear. Only 38% of the respondents gave the correct answer about the onset age of the cervical cancer screening program of the Ministry of Health. Considering the questions asked about Human Papilloma Virus vaccines, 30% of the respondents said that there were 3 types of HPV vaccines, 40.9% knew that they were administered in 3 doses, 41.9% were aware that the target group was between the ages of 9-12 years and 59.2% knew that it must be compensated between the ages

of 13-26 years if it was not applied at the target age. A total of 61.7% of the participants had the knowledge that the HPV vaccine would not cause malignant diseases, 8.8% answered that this vaccine could be applied to both girls and boys, 70.1% of the participants did not have information about the cost of HPV vaccines, but 93% argued that this vaccine should be included in the vaccination calendar. A total of 50.4% of the participants gave the correct answer to the question regarding the necessity of pre-vaccine examination. When we asked whether sexually active people can get HPV vaccine, 92% of the participants answered correctly. The rate of correctly answering the question of the necessity of continuing screening after vaccination was 94%. It was found that 98% of the respondents did not get vaccinated and only 34% recommended the vaccine to someone.

### Discussion

Cervical cancer is a preventable cancer because its etiopathology has been clearly identified. The cancer pathway consists of four steps [10]. The entry of HPV into the cervical epithelial cells is the first and the mandatory step. Approximately 75% of sexually active individuals encounter HPV at some point in their lives [11]. The persistence of HPV, which is usually eradicated from the body within 2 years by the immune system, constitutes the second step of the cancer pathway. The third step is conversion to precancerous lesions and the last step is progression to invasive cancer [10]. Although most respondents knew that cervical cancer is preventable, and caused by a viral pathogen, only 38% of the participants correctly answered the timing of the screening program. Awareness of the screening program of Turkey was also questioned in published survey studies. In a survey conducted among the healthcare professionals in our country, more than 50 percent of women stated that they had never had a cervical smear test [12, 13]. The participants in these studies reported excuses such as not seeing themselves in the risky group, having no symptoms, and abstaining from gynecological examination; however, emphasis should be placed on the fact that the screening programs should cover all the population. In the case of cervical cancer screening programs, every woman within the 30 – 65-year age range should be screened at 5-year intervals without exception [5]. No symptom or risk scoring is needed for the person to be included in screening, even if the women and her sexual partners are absolute monogamous. Many survey studies confirmed that the awareness of cervical cancer being a viral disease and the necessity of screening with smear was established, however, this awareness, unfortunately, did not make women undergo cervical smear tests [12, 14-16]. Avoidance of gynecological examination is a factor in the formation of this habit. By reaching and educating as many women as possible and providing favorable gynecologic examination conditions, establishing the practice of giving cervical smear specimens among women should be the primary concern of preventive medicine.

One of the questions in the survey was the opinion about whether the HPV vaccine could cause infection, precancerous lesions, or invasive cancer. Approximately 38% of the participants in the study thought that HPV vaccines could cause cervical diseases. The HPV vaccines consist of virus-like particles containing the L1 and/or L2 capsid protein. While these

proteins play the crucial role in the entering of the virus into the cervical epithelium, after the vaccine is administered to the person, these proteins are introduced the immune system. If the viruses even try to pass from the epithelium, the immune system can easily prevent them. Thus, the virus is rejected. Since they do not contain the virus genome, HPV vaccines do not cause any cervical lesions or cancer. Systemic immune response occurs after vaccination, so the post-vaccine immune response is stronger [17]. One of the essential points of this study was that HPV vaccines do not cause any diseases.

In 2006, the first HPV vaccine was approved by the American Food and Drug Administration (FDA). It contained virus-like particles of HPV types 16-18-6 and 11. In 2010, the vaccine containing viral particles of HPV types 16 and 18 was approved by the FDA. In 2014, the 9-valent vaccine containing HPV types 6-11-16-18-31-33-45-52-58 was approved, but it is currently unavailable in Turkey. Vaccines provide more than 90 percent protection against the viral types they contain [18, 19]. It is administered in three doses (0-1-6 months or 0-2-6 months) and no additional booster dose is required. While the American Center for Disease Control and Prevention (CDC) states that the target population should include girls and boys aged 11-12 years, The World Health Organization states that the target population of HPV vaccines should consist of girls aged 9-13 years [20, 21]. It is recommended that people who are not vaccinated at this age should be vaccinated until the age of 26 years. Although it is not routinely recommended after the age of twenty-six due to the high probability of encountering HPV types and the possibility of decreased protection, the American Food and Drug Administration (FDA) approved the use of HPV vaccine for women and men aged 27-45 years. Vaccination is not recommended during pregnancy. There is no indication for termination of pregnancy in patients who do not know that they are pregnant at the time of vaccination and routine pregnancy follow-up is recommended. No definite relationship was found between the vaccine and neonatal adverse events [22]. The HPV vaccine has been included in the national vaccination calendar of 65 countries, exclusively for girls. Both girls and boys are vaccinated in the United States, Australia, Switzerland, Austria, and Canada [23]. Our results revealed that there was a serious lack of information about HPV vaccines in the study group. Unfortunately, the level of knowledge on topics such as vaccine types and doses, the target population and age intervals were not at the desired level. In general, the participants state that HPV vaccines should be included in the vaccination calendar, but there is a lack of information about the cost. It is known correctly by the general majority that sexually active people can also be vaccinated. However, the question about the necessity of pre-vaccine examination was answered correctly by half of the participants. In studies in which the knowledge of current HPV vaccines in different populations was questioned, it was shown that most respondents had incomplete information, similar to our study [24-26]. In a survey of pediatricians, the recommendation level of HPV vaccines was high, but it was generally recommended for only girls [27]. In addition to cervical cancer, HPV can also cause diseases in men, such as genital condyloma and anal cancer. Vaccination of men should also be recommended, as men are carriers of HPV and are more likely to

have risky sexual relationships. In a study, some physicians stated that they did not recommend HPV vaccination because they thought that the vaccination might lead to risky sexual intercourse. The fact is that a physician should give adequate information to the patients, and it is unacceptable for a physician to reject to inform about the vaccination due to his or her false pretenses. Another drawback was the cost of vaccination. Although the vaccine might be assumed to have a high price in Turkey, it should not be a reason not to recommend the vaccine.

### Limitations

The limitation of the study was the lack of statistical comparison within the subgroups and the small number of participants. The aim was to achieve satisfactory knowledge in all participants, and not compare the knowledge. Although the number of participants could seem as a limitation, it was one of the largest in its field.

### Conclusion

The lack of information about cervical cancer and especially HPV vaccines is profound. Every family should be informed about this vaccine during the administration of their routine vaccinations. In schools, children between the ages of 9-12 years should be guided to receive information about HPV vaccines through their families from the pediatrician, gynecology and obstetrics, or family medicine practitioners. Compliance with the cervical cancer screening program must be ensured and supervised. During cervical cancer screening, information about HPV vaccines should be given to mothers for their children. All hospitals, health units, social media, national media should immediately start informing about cervical smear and HPV vaccines. It should be emphasized that cervical cancer is a preventable disease. HPV vaccination is one of the most essential issues of public health.

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