

## Original Article

# Awareness of HPV and HPV vaccination in undergraduate students in the North West region of Turkey: Near future outlook

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## Abstract

**Introduction:** Cervical cancer is the second most common cancer affecting women in the world. Human papillomavirus (HPV) is the most common sexually transmitted infection worldwide. The aim of this study was to evaluate the awareness about HPV, risk perception, cervical cancer, and HPV vaccines.

**Methodology:** The sample of this descriptive cross-sectional study consisted of 396 undergraduate university students from Turkey. Sociodemographic characteristics, reproductive health, knowledge about HPV, and HPV vaccination were questioned.

**Results:** The percentage of university students with an active sexual life was 10.6%. The knowledge level of families about HPV, and HPV vaccination were not adequate. The awareness of the fact that HPV was a cause of cervical cancer in women and penile cancer in men tended to increase with the increase in the educational level of parents. Those who knew about HPV vaccines were predominantly females.

**Conclusions:** The results of this study demonstrated that more active education is needed to decrease HPV infections among undergraduate students. Increasing awareness of HPV makes it easier to develop positive behaviors in fighting against it. In order to increase the contribution of young people to educational activities for the community, information about HPV and HPV vaccines should first be included in training programs at universities. To support the development of effective and high-quality public health interventions, young people should be educated so that obstacles to HPV vaccination in various cultural groups can be eliminated. Our findings suggest that awareness about HPV, cervical cancer, and HPV vaccines should be increased.

**Key words:** human papillomavirus; human papillomavirus vaccination; university students; developing country.

*J Infect Dev Ctries* 2019; 13(6):516-525. doi:10.3855/jidc.11405

(Received 27 February 2019 – Accepted 31 May 2019)

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## Introduction

Cervical cancer is the second most common cancer affecting women in the world and the third leading cause of cancer-related deaths in women [1]. Human papillomavirus (HPV) is often diagnosed in young people today. HPV is the most common sexually transmitted infection worldwide; however, the majority of HPV infections do not cause symptoms, which causes easy transmission and rapid spread of the virus [2]. New strains are added to the already determined HPV strains. HPV 16 and 18 strains were detected to be responsible for approximately 70% of cervical cancers. HPV 6 and 11 strains account for approximately 90% of genital warts [3,4].

Gynecologic cancers are among the leading causes of death in women worldwide. Cervical cancer is the third leading cause of mortality among gynecologic cancers. HPV does not cause cancer in every infected person, but is causal in approximately 4% of cervical

cancers [5]. Treatment options for cancer are ever increasing. However, early diagnosis is most beneficial for patients with cancer. Cervical cancer may be diagnosed at an early stage and may benefit from early treatment, especially with the help of Papanicolaou (Pap)-stained vaginal smears. Vaccination is an important method to prevent diseases, and the currently available vaccines help protect people against certain microorganisms. HPV vaccines protect against HPV viruses, which are among the causes of cervical cancer.

Several vaccines have been developed for HPV. The advantages of HPV vaccination include protection against HPV infection, cervical cancer, and chronic vaginitis. Gardasil also prevents against HPV-induced genital warts [6]. HPV vaccines are routinely recommended for boys and girls aged 11 to 12 years. Vaccines are recommended for both young people and adults. Only one vaccine (Gardasil) is recommended for males [7]. Vaccines provide protection against HPV

type 16 and 18, which account for 70% of invasive cervical cancers. Gardasil also establishes immunization against HPV 6 and 11, which cause genital warts [8,9].

HPV is a sexually transmitted disease, and it is the most common viral disease of the reproductive system. Approximately 99% of cervical cancers are related to HPV. Cervical cancer is the most common gynecologic cancer and the fourth most prevalent cancer in women. Each year 530,000 new cases of cervical cancer and 266,000 deaths related to these cancers are seen worldwide [1,10].

#### Research question and objectives

Our study aimed to evaluate the awareness about HPV, risk perception, cervical cancer, and HPV vaccines among undergraduate students.

## Methodology

### Study design and participants

The sample of this descriptive cross-sectional study consisted of 396 undergraduate students from Trakya University in the north west region of Turkey. The study was conducted from August to December 2018. The age range of the students was 18-29 years.

### Data sources

The sociodemographic characteristics, reproductive health and lifestyle behaviours, and knowledge about HPV and HPV vaccination of the students were assessed using self-report forms. We received written informed consent from the students who participated voluntarily in the study.

**Table 1.** Sociodemographic features of the participants and knowledge, awareness of nursing students about cervical cancer, HPV, pap test.

Parameters	Feature	N	%
Gender	Female	246	62.1
	Male	150	37.9
Place of residence during school	Dormitory	325	82.1
	House	71	17.9
Economic status of the family	Moderate	58	14.6
	Good	338	85.4
Size of the family	Nuclear family	346	87.4
	Extended family	50	12.6
Maternal education	Secondary school or below	238	60.1
	Above secondary school	158	39.9
Paternal education	Secondary school or below	162	40.9
	Above secondary school	234	59.1
Smoking status	Yes	115	29.0
	No	281	71.0
Do you have an active sexual life?	Yes	42	10.6
	No	354	89.4
Do you think using a condom can provide total protection against contagious diseases?	Yes	279	70.5
	No	117	29.5
Does he/she know that HPV causes cervical infection in females?	Yes	238	60.1
	No	158	39.9
Does he/she know anyone around him/her with a cervical cancer?	Yes	188	47.5
	No	208	52.5
What is his/her anxiety level about having cervical/penile cancer in the future?	Low	240	60.6
	Moderate	134	33.8
	High	22	5.6
Does he/she know vaginal smear (Pap test)?	Yes	204	51.5
	No	192	48.5
Did his/her mother have a Pap test in last 5 years?	Yes	87	22.0
	No	309	78.0
Does he/she know that HPV causes genital wart?	Yes	169	42.7
	No	227	57.3
Does he/she know that HPV causes cervical cancer in females?	Yes	237	59.8
	No	159	40.2
Does he/she know that HPV causes penile cancer?	Yes	157	39.6
	No	239	60.4

\*N: Number of participants, %: Percentage.

**Table 2.** Knowledge level and worries of nursing students about HPV.

Knowledge and awareness questions	Yes		No		I do not know	
	N	%	N	%	N	%
Does HPV infect only women?	40	10.1	212	53.5	144	36.4
Does HPV infect only men?	29	7.3	224	56.6	143	36.1
Is HPV transmitted from carriers?	175	44.2	60	15.2	161	40.7
Is HPV prevalent in the population?	111	28.0	70	17.7	215	54.3
Do you have worries about the future risk of having cervical/penile cancer due to HPV?	109	27.5	170	42.9	117	29.5

\*N: Number of participants, %: Percentage.

*Ethical considerations*

The study was approved by the ethics committee of Trakya University Medical Faculty (Decision No: 2018/341). We received informed consent forms from volunteer students who participated in the study.

*Data analysis*

The SPSS (Statistical Package for the Social Sciences) 20.0 package program was used in all statistical analyses to evaluate the collected data.

Appropriate descriptive statistics were used to summarize data. Numeric variables were analyzed using mean and standard deviation. Categorical variables were evaluated using frequency and percentage. The normality of the distribution of data was analyzed using the Shapiro-Wilk test. Student's t-test was used for binary comparisons of the groups. The Chi-square test was used for relationships between categorical variables. Descriptive statistics for numeric variables are given as mean and standard deviation.

**Table 3.** Knowledge of participants about HPV vaccination.

Knowledge parameters	Answer	N	%
Have you ever heard about HPV vaccine?	Yes	217	54.8
	No	127	32.1
	No idea	52	13.1
Where did you get information about HPV vaccine?	No information	158	39.8
	Media, social contacts, friends	119	30.05
	Doctor, nurse, healthcare worker	119	30.05
When was the HPV vaccine applied?	Knows	171	43.2
	Does not know	225	56.8
What do you think the most important method to prevent HPV?	HPV vaccine	208	52.5
	Vaginal smear	108	27.3
	Avoiding sexual contact with multiple partners	80	20.2
Who should have HPV vaccine?	Only females	59	14.9
	Only males	4	1
	Both sexes	333	84.1
Have you ever had HPV vaccine?	Yes	17	4.3
	No	379	95.7
If you had HPV vaccine, would you like to be vaccinated?	Yes	156	39.4
	No	76	19.2
	No idea	164	41.4
Do you think HPV vaccination is beneficial?	Yes	225	
	No	24	6.1
	No idea	147	37.1
Do you think HPV vaccination has multiple side effects?	Yes	60	15.2
	No	93	23.5
	No idea	243	61.4
Is HPV vaccine expensive?	Yes	68	17.2
	No	71	17.9
	No idea	257	64.9
Will you have an HPV vaccine if your doctor or nurse recommends to do so?	Yes	264	66.7
	No	30	7.6
	No idea	102	25.8

\*N: Number of participants, %: Percentage.

**Table 4.** Level of knowledge of nursing students about HPV, HPV vaccination and cervical pathology according to maternal and paternal education levels and economic status of families.

Parameters	Economic status			p	Maternal education level		p	Paternal education level		p
	Bad N %	Good N %	Total N %		Secondary school and lower N %	Above secondary school N %		Secondary school and lower N %	Above secondary school N %	
<b>How can HPV be prevented?</b>										
Vaccine	30 51.7%	178 52.7%	208 52.5%		129 54.2%	79 50.0%		92 56.8%	116 49.6%	
Smear	18 31%	90 26.6%	108 27.3%		56 23.5%	52 32.9%		39 24.1%	69 29.5%	
Avoiding multiple sexual partners	10 17.2%	70 20.7%	80 20.2%	0.72	53 22.3%	27 17.1%	0.09	31 19.1%	49 20.9%	0.34
Total	58 100%	338 100%	396 100%		238 100%	158 100%		162 100%	234 100%	
<b>Has he/she previously heard vaginal smear?</b>										
Yes	27 46.6%	177 52.3%	204 51.5%		112 47.1%	92 81.4%		76 46.9%	128 54.7%	
No	31 53.4%	161 47.7%	192 48.5%	0.24	126 52.9%	66 76.6%	0.01*	86 53.1%	106 45.3%	0.15
Total	58 100%	338 100%	396 100%		238 100%	158 100%		162 100%	234 100%	
<b>Does he/she know that HPV causes cervical cancer?</b>										
Yes	34 58.6%	203 60.1%	237 59.8%		139 58.4%	98 62.0%		96 59.3%	141 60.3%	
No	24 41.4%	135 39.9%	159 40.2%	0.89	99 41.6%	60 38.0%	0.34	66 40.7%	93 39.7%	0.68
Total	58 100%	338 100%	396 100%		238 100%	158 100%		162 100%	234 100%	
<b>Does he/she know that HPV causes penile cancer?</b>										
Yes	19 32.8%	138 40.8%	157 39.6%		88 37.0%	69 43.7%		61 37.7%	96 41.0%	
No	39 67.2%	200 59.2%	239 60.4%	0.15	150 63.0%	89 56.3%	0.20	101 62.3%	138 59.0%	0.28
Total	58 100%	338 100%	396 100%		238 100%	158 100%		162 100%	234 100%	
<b>Does HPV infect women more commonly?</b>										
Yes	6 10.3%	34 10.1%	40 10.1%		24 10.1%	16 10.1%		17 10.5%	23 9.8%	
No	32 55.2%	180 53.3%	212 53.5%		121 50.8%	91 57.6%		85 52.5%	127 54.3%	
No idea	20 34.5%	124 36.7%	144 36.4%	0.94	93 86.5%	51 32.3%	0.36	60 37.0%	84 35.9%	0.93
Total	58 100%	338 100%	396 100%		238 100%	158 100%		162 100%	234 100%	
<b>Does HPV infect men more commonly?</b>										
Yes	10 17.2%	19 5.6%	29 7.3%		17 7.1%	12 7.6%		12 7.4%	17 7.3%	
No	30 51.7%	194 57.4%	224 56.6%		131 55.0%	93 58.9%		91 56.2%	133 56.8%	
No idea	18 31.0%	125 37.0%	143 36.1%	0.007*	90 37.8%	53 33.5%	0.68	59 36.4%	84 35.9%	0.99
Total	58 100%	338 100%	396 100%		238 100%	158 100%		162 100%	234 100%	
<b>Did you hear about HPV vaccine?</b>										
Yes	-	-	-		125 52.5%	92 58.2%		83 51.2%	134 57.3%	
No	-	-	-		81 34.0%	46 29.1%		62 38.3%	65 27.8%	
No idea	-	-	-	-	32 13.4%	20 12.7%	0.51	17 10.5%	35 15.0%	0.06
Total	-	-	-		238 100%	158 100%		162 100%	234 100%	
<b>Do you think condom use can prevent HPV infection?</b>										
Yes	-	-	-		157 66.0%	122 77.2%		103 63.6%	176 75.2%	
No	-	-	-	-	81 34.0%	36 22.8%	0.01*	59 36.4%	58 24.8%	0.09
Total	-	-	-		238 100%	158 100%		162 100%	234 100%	

\*Statistically significant.

Descriptive statistics for categorical variables are given as percentage and frequency. The significance level was determined as 5% in all statistical analyses.

## Results

This study demonstrated the knowledge level of undergraduate health science students in a Turkish university about HPV infection and HPV vaccines. Among the 396 subjects, 246 (62.1%) were females and 150 (37.9%) were males. More first and second year students were willing to participate in the study than third and fourth year students. The study comprised 119 (30.1%) first year students, 118 (29.8%) second year students, 94 (23.7%) third year students, and 65 (16.4%) fourth year students. The sociodemographic characteristics of the students were evaluated (Table 1).

University students were selected for this study because they constitute a well-educated sector of society. Acceptance or understanding the importance of vaccination is easier for educated individuals. The percentage of university students with an active sexual life was 10.6%. This result was thought to reflect the acceptance of sexual life among young people by our nation. In addition, 29.5% of the participants said they

did not know that using a condom could protect them from HPV.

The knowledge level of the students about the prevention of cervical cancer was also evaluated. Just over half (51.5%) of the young participants knew that a vaginal Pap smear was a cervical cancer screening tool. Twenty-two percent of the students reported that their mothers had undergone a Pap smear during the last 5 years (Table 2).

The percentage of the students who thought that HPV only infected women was 10.1% and the percentage of who thought that HPV only infected men was 7.3%; it was reassuring that most of the students knew that HPV infected both sexes (Table 3).

The percentage of young people vaccinated against HPV was 4.3%. The percentage of students whose opinion was favourable for vaccination but had not been vaccinated was 39.4%. We tried to identify factors that supported HPV vaccination and the barriers to vaccination; 14.9% of the students stated that only women should be vaccinated. On the other hand, the percentage of students who believed that both sexes aged over 18 years should be vaccinated was 84.1%. The percentage of young people who thought the HPV

**Table 5.** Knowledge level of participants about HPV, and HPV vaccine according to gender.

Parameters	Gender		P
	Female N (%)	Male N (%)	
<b>Are you worried about future risk of HPV?</b>			
Yes	138 (56.1%)	102 (68.0%)	
No	97 (39.4%)	37 (24.7%)	<b>0.008*</b>
No idea	11 (4.5%)	11 (4.5%)	
Total	246 (100%)	150 (100%)	
<b>Has anyone in your family or social contacts talked about HPV?</b>			
Yes	168 (68.3%)	77 (51.3%)	
No	78 (31.7%)	73 (48.7%)	<b>0.001*</b>
Total	246 (100%)	150 (100%)	
<b>Does HPV cause genital warts?</b>			
Yes	124 (50.4%)	45 (30.0%)	
No	122 (49.6%)	105 (70.0)	<b>&lt; 0.005*</b>
Total	246 (100%)	150 (100%)	
<b>Does condom use protect from HPV infection?</b>			
Yes	157 (63.8%)	122 (81.3%)	
No	89 (36.2%)	28 (18.7%)	<b>&lt; 0.005*</b>
Total	246 (100%)	150 (100%)	
<b>Have you ever seen someone with cervical cancer?</b>			
Yes	46 (18.7%)	17 (11.3%)	
No	200 (81.3%)	133 (88.7%)	<b>0.034*</b>
Total	246 (100%)	150 (100%)	
<b>Have you ever heard about HPV vaccine?</b>			
Yes	149 (60.6%)	68 (82.2%)	
No	67 (27.2%)	60 (48.1%)	<b>0.001*</b>
No idea	30 (12.2%)	22 (19.7%)	
Total	246 (100%)	150 (100%)	

\*Statistically significant.

vaccine was useful was 58.2%, 15.2% thought that the vaccine had adverse effects, and 64.9% had no idea about the price of the vaccine (Table 4).

There was no significant difference in the economic levels of the families of health science students according to primary protection against HPV. There was no significant increase in HPV vaccination with the increase in the educational level of parents. This shows that the knowledge levels of families about HPV and HPV vaccination in Turkey were not adequate. However, the difference in maternal education level was significant in terms of the students having knowledge that the Pap test was used in cervical cancer screening ( $p = 0.01$ ). This may be an indicator for the favourable opinion about Pap tests in the Turkish population. The awareness of the fact that HPV was a cause of cervical cancer in women and penile cancer in men tended to increase with an increased education level of the parents. It was observed that participants with better socioeconomic status had better knowledge that HPV did not only infect males ( $p = 0.007$ ). Awareness that condom use protected against HPV increased with increasing maternal education ( $p = 0.01$ ) (Table 5).

Parameters that were significantly different between males and females were evaluated. Men were more worried about encountering HPV in the future ( $p = 0.008$ ). The parents of the females had warned against HPV more than the parents of the males ( $p = 0.001$ ). Females knew better that HPV caused genital warts ( $p < 0.05$ ). Males had a stronger belief that condoms had a vital role in HPV protection ( $p < 0.05$ ). The female students knew more women with cervical cancer in their family or social circle than the male students ( $p = 0.034$ ). Those who knew about HPV vaccines were predominantly females ( $p = 0.01$ ) (Table 5).

## Discussion

The main purpose of this study was to determine the acceptance of the HPV vaccine by university students by evaluating perceptions about HPV, cervical cancer, and HPV vaccination. The results demonstrated that more active education is needed to decrease HPV infections among undergraduate students.

The initial results of the Cervical Cancer Screening Programme of Turkey showed that the prevalence of HPV infection was 3.5%. It was stated that the most common HPV genotypes were 16, 51, 31, 52, 18. Among the 37,515 HPV-positive women in this large screening study, the cytological abnormality rate was found as 19.1%. Among the HPV-positive women, 16,962 cases had oncogenic HPV types with abnormal

cytology [11,12]. The results of 1 million women including the evaluation of 13 HPV genotypes with respect to prevalence, geographic distribution, and abnormal cytology results showed that HPV DNA could be used in primary level settings to have a high-quality screening program with good coverage and was very effective compared with conventional Pap smears. For  $521 \geq \text{CIN}3$  lesions, cytologic results were *in situ* malignancy 4.6% ( $n = 24$ ), ASC-US 14.2% ( $n = 74$ ), LSIL in 22.3% ( $n = 116$ ), HSIL in 7.9% ( $n = 41$ ), ASC-H in 1% ( $n = 5$ ), AGC in 2.7% ( $n = 14$ ), chronic infection in 188 (36.2%), and insufficient in 58 (11.1%). Apart from these facts, their evaluation shows that the existing data are sufficient to make an extrapolation and evaluate the efficacy of the HPV DNA screening for Turkey. When the study evaluated 521 women who were  $\geq \text{CIN}3$ , it revealed a detection rate of 48.2% for Pap smears, and 87.3% for HPV 16 and 18 genotyping. This program demonstrated the feasibility of an HPV-based screening program in a developing country with a large population in varied geographic conditions in a more effective way compared with conventional cytology [11].

An Italian study demonstrated that young people had limited awareness of cervical cancer prevention; 76.7% of young females knew that the Pap smear test was a tool for the early diagnosis and treatment of cervical cancer, 43.3% believed that vaccination of females only was adequate, and 53.3% of students aged over 18 years believed that both sexes should be vaccinated [13]. In our study, 51.5% of the students knew that the Pap smear was a screening tool for cervical cancer. The percentage of students who knew that both females and males should be vaccinated was high (84.1%) (Table 5).

In a similar study, 93.3% of young women knew that HPV caused cervical cancer, and 16.7% were aware that it caused genital warts in females. The same study demonstrated that 6.7% did not know that HPV could cause cancer. One-third (33.3%) of the students had heard about HPV vaccination from written publications, 26.7% from the television or radio, 23.3% from a gynaecologist, and 23.3% from their general practitioner [13]. In our study, 60.1% of participants were aware that HPV was a cause of cervical cancer, and 39.6% knew that HPV caused penile cancer. An evaluation of the sources from where they received information about HPV revealed that 39.8% had no information about HPV. The rate of obtaining information from media and social contacts was 30.05%, and the rate of getting information from health

science professionals, doctors, and healthcare centres was 30.05% (Table 5).

Studies that examined the information level of university students about HPV infection, HPV vaccine, and cervical cancer revealed that they did not have adequate information. Wong *et al.* demonstrated that 21.7% of participants knew about HPV and 10.3% knew of the presence of the HPV vaccine [14]. In a Brazilian study that included 538 participants, 40% knew about HPV infection, and 8.6% were aware of the HPV vaccine [15]. An evaluation of our data revealed that the level of awareness of Turkish graduate health science students was moderate. In the present study, 31.7% of the female students and 48.7% of the male students were unaware of HPV infection and its contagiousness. In particular, more male students had no information about this virus compared with females; 68.3% of the females were found to have previous knowledge about the virus, which was better than the 21% awareness of HPV reported in a previous study [14]. However, similar to our results, a study in Germany demonstrated that 50% of males and 27% of females had previously heard about HPV infection [16]. In previous studies, female students had more information and awareness about HPV infection and vaccine.

In our study, the rate of health science students who knew about the HPV vaccine was 54.8%. Unlike our study findings, only 17.7% of students from a Nigerian university reported that they had heard about HPV infection and only 14.4% had heard of HPV vaccines [17]. The awareness and knowledge of HPV infection and HPV-related diseases among our student cohort were considered to be limited. In some studies, the level of knowledge about HPV infection, HPV vaccine, and cervical cancer were found to be wholly insufficient, even at the level of university students. In some studies, 21.7% of the total students were found to have heard of HPV and only 10.3% knew of the existence of the HPV vaccine [14].

It is becoming more and more important to increase the awareness and information of young people about cervical cancer. In our study, 50.4% of young women knew that HPV was a cause of genital warts, whereas only 30% of men knew that HPV was a cause of genital warts. The difference between the males and females was found to be significant ( $p < 0.05$ ). Recent studies evaluated the level of knowledge about HPV and HPV-related diseases, but new studies are needed. The results of various studies demonstrated that the awareness of young people with regard to HPV and cervical cancer was insufficient [18,19].

One of the ways to prevent cervical cancer is to pay attention to healthy lifestyle changes. Young people should be advised to avoid risky sexual intercourse. Introducing the HPV vaccine at an earlier age increases the benefit obtained from the vaccine because the cervix is sensitive to HPV at young ages. Previous studies have shown that the earlier the vaccination is performed, the higher is the chance of prevention from cervical cancer. Vaccination with HPV should not preclude cervical cancer screening, and people should be encouraged to attend regular gynaecologic check-ups [20,21]. In our study, participants stated that the rate of Pap tests among their mothers was 22%.

Having up-to-date information about cervical cancer and HPV vaccines is beneficial for the whole population. Public awareness should be improved regarding HPV and cervical cancer. Cervical cancer prevention programs should be organized, aiming to promote vaginal cytological assessment or HPV vaccine. Undoubtedly, the place of health science students in universities is unique for campaigns that will attract the attention of the public and create awareness. Efforts to increase awareness have provided substantial benefit in the interest levels of women both for HPV vaccinations and for cytologic examinations as a cancer screening tool.

This study shows that female health science students have general information about cervical cancer, HPV, and HPV vaccines. It also underlines that they have sufficient information about secondary prevention of cervical cancer and vaginal Pap tests as a screening tool. In our study, 27.3% of the participants stated that they knew that the Pap test as a screening tool for the prevention of cervical cancer, and 52.5% reported that the HPV vaccine was the most effective method to prevent cervical cancer, which can be considered as a positive trend.

HPV vaccinations should be performed for the primary prevention of HPV. The opinion of the participants in the study is that HPV should be performed more for women. The feasibility of HPV vaccines shows regional differences in the world. In some developed nations it is performed to specific age groups for free. Work is in progress for the worldwide generalized use of the HPV vaccine, which can prevent cancer [22,23]. In many countries around the world, nationally funded vaccination programs target specific age groups. Even though national funding is not available for all ages, vaccines against HPV are included in vaccination programs for women and men [24,25]. In our study, 14.9% of the participants thought that only women should be vaccinated. Most (84.1%)

argued that both sexes should be vaccinated. Also, 27.5% of the participants worried about the future risk of developing HPV-related cervical/penile cancer.

Our aim is for a positive attitude in the population towards the prevention of cervical cancer and HPV vaccines. Access of the population to qualified information under the guidance of students who have been educated in healthcare is a priority in the fight against HPV. Previous studies have shown that providing adequate information is important for the adoption of HPV and cervical cancer prevention programs by women. Guidance of healthcare providers and students of healthcare professions seem to be important in minimizing the risk of cervical cancer [26].

Our study demonstrated that 30% of young females stated that they obtained information about HPV vaccine by media tools such as journals and television. Some other studies demonstrated that young females received information about HPV and HPV vaccinations from gynaecologists and media tools such as magazines and television [13]. There are effective methods to encourage vaccination of people in populations with high risk of infection with HPV. Spreading awareness starting from university students is very important for protection against HPV and cervical cancer [27,28]. Healthcare providers and healthcare students must take part as team leaders to raise awareness in communities around the world. New information is obtained every day about cervical cancer and vaccines. In light of this information, education and the publicity efforts must be open to continuous innovation.

HPV vaccination programs, if timely and adequate, have the potential to decrease cervical cancer in the community. Whether vaccination decreased women's desire to visit gynaecologists and negatively affect cervical screening programs has been questioned; however, studies have demonstrated no detrimental effect of vaccination programs on screening programs [27,29]. Another finding of both our study and previous trials was that HPV vaccination did not promote sexual behaviour. Explaining the benefits of HPV vaccination to the community increases the number of vaccinated individuals. In our study, like in previous studies, one of the leading factors that affected the acceptability of HPV vaccines was the concern about the safety of the HPV vaccine.

Mothers' attitudes are important in the determination of young people's attitudes toward HPV vaccines. The presence of gynecologic cancers in the family, campaigns in society, and favourable opinions of mothers about vaccines affect attitudes towards vaccination. Like our study, previous studies also

demonstrated that the support of the family for vaccination played an important role. In many previous studies, one of the main concerns of parents who opposed vaccination was the promotion of sexual behaviour among young people after vaccination [30,31].

Studies are ongoing in the determination of factors that are important in increasing the prevalence of HPV vaccination. One of the most important challenges for a more widespread implementation of the HPV vaccine is that it is not included in vaccination programs and thus cannot be reached free of charge. For the primary prevention of cervical cancer, free vaccination programs should be provided for young people.

#### *Limitations*

Our study is limited by the small sample size; future studies should evaluate this issue using larger sample sizes.

#### **Conclusions**

Increasing the awareness of HPV makes it easier to develop positive behaviours in the fight against HPV. To increase the contribution of young people in educational activities for the community, information about HPV and HPV vaccines should be included in education programs at universities. To support the development of effective and high-quality public health interventions, young people should be educated such that obstacles to HPV vaccination in various cultural groups can be eliminated.

According to our study, young people believed that the vaccine provided protection against cancer and they thought it was safe. Most young people knew about cervical cancer and were aware that the Pap test, a cancer screening test, should be performed regularly. We observed that, information about HPV was mostly obtained from the media, not from healthcare workers. Our findings suggest that awareness about HPV, cervical cancer, and HPV vaccines should be increased. The inclusion of this information in university education programs will make a significant contribution to the increased awareness of the entire population. Although the vaccine is not available to the population in vaccination programs, it is of great importance for those who had access and this could stimulate government actions to supply the vaccine for population in the future.

#### **Acknowledgements**

We would like to thank Trakya University undergraduate students for their participation in the study.

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**Conflict of interests:** No conflict of interests is declared.