

Knowledge and Behavior of University Students toward Human Papillomavirus and Vaccination

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ABSTRACT

Objectives: Human papillomavirus (HPV) causes cervical cancer. This study aimed to determine the knowledge and attitude of university students toward HPV infection and vaccine prevention in Turkey. **Methods:** A total of 1563 female and male university students participated in the study. The study design was descriptive and cross-sectional. The study included students enrolled in the departments of faculties and vocational schools. **Results:** In total, 16.8% of students stated that they had heard of HPV. There was a statistically significant relationship between the mean awareness of HPV and different variables, such as age, gender, marital status, family history of cancer, and conversation about sexual matters ($P < 0.01$).

As the age of the students increased, the chance of hearing about HPV also increased. Of all the students, 1.5% took HPV vaccination. Furthermore, 87.7% of the female students stated that they had heard of cervical cancer. **Conclusions:** The depth of knowledge among Turkish university students toward cervical cancer, HPV infection, and vaccination was inadequate. It is important to provide educational and counseling services by nurses to make university students aware of HPV infection and vaccination.

Key words: Cervical cancer, human papilloma vaccination, human papillomavirus

Introduction

Human papillomavirus (HPV) is the most common sexually transmitted infection, and it has the strongest association with cervical cancer.^[1,2] The types of HPV contributing to cervical cancer show regional variations.

HPV-16 and HPV-18 are responsible for 70%–80% of the cases. It has been reported that 15-20 types of HPV show oncogenic potentials except HPV type 6 and 11, which can cause genital warts and respiratory papillomatosis.

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Genital warts are infectious and are very common.^[2,3] It is estimated that most sexually active males and females have experienced HPV infection at least once in their lifetime, with or without symptoms.^[4,5]

Based on the type, HPV infection causes various health problems, such as anal and penile cancers in males and anogenital, vaginal, vulvar, and anal cancers in females.^[6,7] HPV also responsible for genital warts and oropharyngeal cancer in both men and women.^[6] According to the 2012 World Health Organization (WHO) report, there were 528,000 new cases of cervical cancer and 266,000 cervical cancer-related deaths, of which >85% occurred in low- and middle-income countries.^[8] Worldwide, cervical cancer causes the death of one female in every 2 min. It is the eighth most common type of cancer in Turkey. An analysis performed by the International Agency for Research on Cancer has shown that HPV-related cancers account for 1% of cancers in males and 5%-10% of cancers in females. Data from Turkey have indicated that HPV-related cancers affect the females more frequently, the prevalence being approximately five times than in the males.^[9]

Most HPV infections are temporary and asymptomatic. It takes 15–20 years for cervical cancer to develop in females who have normal immunity. However, when the immune system is weakened, it can take only 5–10 years to develop.^[2] In recent years, the most important strategy for reducing the mortality and morbidity of HPV infection and related diseases is primary prevention, which includes both elimination of the sexual risk factors and improvisation of preventive vaccination.^[4] It is beneficial to vaccinate boys along with girls against oncogenic HPV infection.^[10]

By mid-2016, 65 countries (mostly the developing countries) introduced HPV vaccination.^[2] However, only a few developing countries where the incidence of cervical cancer is high have included HPV vaccination in their national vaccination program.^[11] HPV vaccines are licensed in Turkey and can be administered against a fee.^[12] The vaccine has not been included in the national vaccination program yet.

According to the 2016 data, individuals aged 15–24 years were defined as the young population and they constituted 16.4% of the total population in Turkey.^[13] For this reason, the university students who are at their adolescence ages are at risk of reproductive and sexual disorders.^[14] Moreover, the risk factors including a gradual decrease in the age for first sexual activity, multiple sex partner, and smoking have increased the risk of sexually transmitted diseases. Therefore, it is very important to inform the young population about HPV and HPV vaccination so that they can ensure primary prevention against cervical cancer.^[15] Effective vaccines are available and are recommended for both males and females in the adolescent age.^[16,17]

In the literature, most studies have been conducted among women, healthcare personnel, and students in the healthcare fields. The number of studies involving both female and male university students is limited.^[14,18-25] This study aimed to determine the knowledge and behavior of university students (male and female) about HPV and vaccination.

Methods

Study design and sampling method

The study included university students who were not studying in a health-related department. There were 12 faculties and two colleges who were providing education outside the field of health. Two departments were selected from each of these vocational schools and faculties by a simple random method. A total of 1729 students from these departments were sampled. A total of 1563 students who attended the classes on the days in which the data were collected and who agreed to participate in the survey were included. The researchers collected the data between 15 September and 15 December.

Data collection

The questionnaire form used for data collection was developed by the researchers after reviewing the literature. The questionnaire form consisted of two parts. In the first part, there were 14 items for the students and their families about their sociodemographic characteristics. The second part consisted of questions to assess the knowledge and attitudes about HPV infection, HPV vaccine, and cervical cancer. Only the female students were asked to respond to the questions related to cervical cancer.

Ethical approval from the ethics committee and official permission were obtained for conducting this study. The students were informed about the purpose of the study and their verbal consents were obtained. By visiting the classes, the questionnaire forms were distributed among the students who agreed to participate in the study. The questionnaire forms were returned by the students after answering. The data were analyzed using IBM SPSS Statistics 24.0 version. Numerical analyses, percentage calculations, and Chi-square test were performed.

Results

The mean age of the participants was 22.25 ± 2.05 years, and 57.5% of the participants were male. Among the students, 39.9% smoked cigarettes and 21.0% of them talked with their parents about sexual issues [Table 1].

83.2% of the students stated that they had not heard of HPV previously. Moreover, the route of HPV contamination was not known by 57.6%, risk factors by 53.8%, diagnostic

Table 1: Distribution of students according to different characteristics

Characteristics	n (%)
Age (years), mean±SD	21.25±2.05
Age groups	
20 years and under	598 (38.2)
21-22 years	678 (43.4)
23 years and over	287 (18.4)
Gender	
Female	665 (42.5)
Male	898 (57.5)
Marital status	
Married	38 (2.4)
Single	1525 (97.6)
Working status	
Yes	216 (13.8)
No	1347 (86.2)
Mothers' educational status	
Primary school	771 (49.3)
Middle school	322 (20.6)
High school	325 (20.8)
University	145 (9.3)
Fathers' educational status	
Primary school	406 (21.9)
Middle School	363 (23.3)
High school	505 (32.3)
University	289 (18.5)
Smoking status	
Yes	624 (39.9)
No	939 (60.1)
In sexual issues speaking with family	
Yes	329 (21.0)
No	1234 (79.0)
Total	1563 (100.0)

SD: Standard deviation

tests by 96.3%, and prevention methods by 71.3% of the students [Table 2].

Analysis of the knowledge of the participating students regarding HPV vaccine showed that 33.7% of them at least knew that it was a vaccine to prevent infection, but 91.6% had no idea whether the vaccine was covered by public insurance or not, and 69.7% did not know to whom this vaccination was offered. Of the participants, 73.4% reported that they wanted to be informed about the vaccine, and 1.5% stated that they were already vaccinated against HPV [Table 3].

The top three causes for increased risk were not paying attention to cleaning the sexual regions (59.9%), having multiple sex partners (53.5%), and smoking (36.4%). Among the female students, 62.8% did not know a preventive method, 76.5% did not know a vaccine for prevention, and 91.4% wanted to be informed about prevention [Table 4].

This study found a statistically significant relationship between the status of having heard of HPV and different

Table 2: Knowledge status of students about human papilloma virus

Characteristics	n (%)
Have you heard of HPV	
Yes	262 (16.8)
No	1301 (83.2)
How is the transmission of HPV?	
I do not know	900 (57.6)
Sexually transmitted	586 (37.5)
Digestive system	11 (0.7)
Respiratory system	17 (1.1)
With blood	24 (1.5)
By sexual pathway and blood	25 (1.6)
Do you know the HPV risk group	
I do not know	841 (53.8)
In both men and women	608 (38.8)
Only in men	23 (1.6)
Only in women	91 (5.8)
Is there any test?	
Yes	58 (3.7)
No	1505 (96.3)
Could it cause cancer?	
Yes	215 (13.8)
No	158 (10.1)
I do not know	1190 (76.1)
Can HPV be protected	
Yes	388 (24.9)
No	60 (3.8)
I do not know	1115 (71.3)
Which disease is visible?*	
Genital warts	159 (10.2)
Genital Herpes	117 (7.5)
Cervical cancer	252 (16.2)
Penis cancer	175 (11.2)
I do not know	1186 (75.9)
Total	1563 (100.0)

*More than one answer was given. HPV: Human papilloma virus

variables, such as age, gender, marital status, family history of cancer, and status of discussion of sexual issues within the family ($P < 0.01$). As the age of the students increased, their status of having heard of HPV also increased. Female students, married students, and students who could discuss sexual issues with their families had higher rates of hearing about HPV. After assessing the relationship between the status of having heard of HPV and other variables, a significant relationship was found only with gender. Female students heard of HPV vaccine more often than the male students ($P < 0.01$) [Table 5].

Discussion

It is important for university students to have access to adequate knowledge about HPV infection, HPV vaccine, and cervical cancer for their own health as well as the health of the entire community. Most of the young students

Table 3: Knowledge status of students about human papilloma virus vaccine

Characteristics	Say1	Percentage
Is there a HPV vaccine?		
Yes	527	33.7
No	1036	66.3
Do you know about the vaccination?		
Yes	113	7.3
No	1450	92.7
Social assurance fulfillment		
Yes	18	1.2
No	114	7.2
I do not know	1431	91.6
Who is vaccinated?		
I do not know	1089	69.7
Married women	58	3.7
Married men	23	1.5
Sexually active anyone	371	23.7
Adolescent girls	22	1.4
Is the vaccine harmful?		
Yes	159	10.2
No	1404	89.8
Would you like to get information about the vaccine?		
Yes	1148	73.4
No	415	26.6
From who*		
My family	116	7.4
Internet and TV	354	22.6
Health personel	1088	69.7
From school	168	10.7
My friend	76	4.9
Other	27	1.7
Are you vaccinated?		
Yes	23	1.5
No	1540	98.5
Total	1563	100.0

HPV: Human papilloma virus. *More than one answer was given

in the universities are in the premarital phase of life and are healthy young individuals who will become healthy parents and populate the future society, and thus, this issue is important.^[18]

This study found that most of the students could not discuss sexual issues with their parents, but that students who could discuss had a higher awareness of HPV. A study conducted by Arslan *et al.* reported that only 22.5% of the university students received information from their parents about sexually transmitted infections.^[14] Studies in Turkey have emphasized that university students mostly use internet, television, and media as sources of information on sexual health.^[22,26,27] Properly informing young individuals and raising their awareness about sexually transmitted diseases and sexual health issues, ensuring them to receive information from health care professionals, and training parents or peers rather than obtaining information from wrong sources are important.

Table 4: Knowledge of female students about cervical cancer (n=583*)

Characteristics	n (%)
Have you heard of cervical cancer	
Yes	501 (87.7)
No	82 (12.3)
Is it preventable	
Yes	332 (56.9)
No	251 (43.1)
What are cervical cancer risk factors?*	
Smoking	212 (36.4)
Intimate cleaning	349 (59.9)
Multiple births	186 (31.9)
Early sexual intercourse	200 (34.3)
Not using condoms	196 (33.6)
Warts in the genital region (around the labia major, minor or anal area)	136 (23.3)
Sexual intercourse with more than one partner	312 (53.5)
Is there a way to protect?	
Yes	196 (33.6)
No	21 (3.6)
I do not know	366 (62.8)
Is there a protective vaccine?	
Yes	137 (23.5)
No	446 (76.5)
Do you want to be informed about cervical cancer?	
Yes	533 (91.4)
No	50 (8.6)
Total	583 (100.0)

*Analyzed only with those who responded correctly, **More than one answer was given

In many societies, sexual issues cannot be discussed openly within the family, and this situation also prevails in Turkey.^[28] Premarital sex is not approved by Turkish society because of the influence of Islamic culture. In Turkey, an inhibitory attitude toward premarital sexual experiences still exists due to the traditional culture despite changing attitudes influenced by western culture.^[19] In this study, the married students were found to have heard HPV more frequently than the unmarried ones. Therefore, it can be concluded that married adolescents get consultations about sexual issues from their families and other sources, and their depth of knowledge was more.

This study found that the rate of hearing about HPV was quite low. This ratio was better among the female students compared to the males. Other studies conducted among the university students similarly found that the status of the students having heard of HPV was low.^[14,20,21,29] In Turkey, a study by Arslan *et al.* showed that 21.2% of the female students and 12.4% of the male students reported hearing about HPV.^[14] Durusoy *et al.* conducted a study with 1st-year university students receiving education in Ege University and found that one-fourth of the participating students (24.1%) had heard of HPV previously.^[21] In Koç's study, 12% of the female students receiving education

Table 5: Hearing status of human papilloma virus and human papilloma virus vaccine according to sociodemographic variables of students

Sociodemographic variables	HPV hearing				HPV vaccine hearing			
	Yes (n=262)		No (n=1301)		Yes (n=527)		No (n=1036)	
	Say1	Percentage	Say1	Percentage	Say1	Percentage	Say1	Percentage
Gender								
Female	138	20.8	527	79.2	271	40.8	394	59.2
Male	124	13.8	774	86.2	256	28.5	642	71.5
χ^2 , SD, P	13.20, 1, 0.000				25.6, 1, 0.000			
Marital status								
Married	16	42.1	22	57.9	16	42.1	22	57.9
Single	246	16.1	1279	83.9	511	33.5	1014	66.5
χ^2 , SD, P	17.92, 1, 0.000				1.22, 1, 0.268			
Diagnosis of cancer in the family								
Yes	57	23.0	191	71.0	93	37.5	155	62.5
No	205	15.6	1110	84.4	434	33.0	881	67.0
χ^2 , SD, P	8.17, 1, 0.004				1.88, 1, 0.169			
Age groups								
20 years and under	83	13.9	515	86.1	196	32.8	402	67.2
21-22 years	114	16.8	564	83.2	233	34.4	445	65.6
23 years and over	65	22.6	222	77.4	98	34.1	189	65.9
χ^2 , SD, P	10.68, 2, 0.005				0.39, 2, 0.824			
In sexual issues speaking with family								
Yes	85	25.8	244	74.2	107	32.5	222	67.5
No	177	14.3	1057	85.7	420	34.0	814	66.0
χ^2 , SD, P	24.58, 1, 0.000				1.22, 1, 0.268			

SD: Standard deviation, HPV: Human papilloma virus

in different departments of the university reported that they had already heard of HPV, although their depth of knowledge and awareness was low.^[20] Gul *et al.* found that among the female students who were receiving university education in Pakistan, the rate of having heard of HPV was 11.53%.^[29] However, studies conducted with the health education students showed that the depth of knowledge and awareness of the students about HPV were higher.^[18,30-35] A study conducted in Portugal exhibited that the students receiving education in health science departments had heard of HPV significantly more than the students of other departments.^[36]

It was determined that the rate of hearing about HPV was visibly increased in the countries where the National HPV Vaccination Program is in effect. In the United States of America, a study conducted in two northeastern universities showed that 90% of the female students and 76.3% of the male students had heard of HPV.^[23] Similarly, Barnard *et al.* indicated that this rate was higher in the female students, and most of the students had heard of HPV.^[37] Another study in Portugal showed that 64.1% of the participating female students and 40.2% of the participating male students had already heard of HPV.^[36] Donadiki *et al.* conducted a study with female university students in Greece and found a strong positive relationship between vaccination and knowledge level.^[38] Yanikkerem

et al.^[25] conducted an educational program on HPV and HPV-related diseases among university students. Before the program, 21.3% of the participating students had already heard of HPV, and this figure increased to 99.5% after the program. A similar study in Korea offered an educational program for university students and determined that HPV education was effective for both female and male students.^[22] Thus, these studies lead to the conclusion that education in health-related fields, inclusion of HPV in the national vaccination program, and performing planned training activities could improve the depth of knowledge of HPV. In this context, it is thought that approaches, such as elective courses, seminars, symposiums, conferences, and planning training activities about sexually transmitted diseases and HPV are important.

The present study also showed that consideration and knowledge among the participants about HPV infection were inadequate. More than half of the students reported that they did not know the mode of transmission and risk factors of HPV. This study also determined that the knowledge of the students regarding HPV as a cause of cancer, preventive methods, and diseases caused by HPV was not adequate. Similar studies in the literature found that the knowledge and awareness about HPV infection among the university students were low, and the students did not have adequate knowledge about this issue.^[14,20,21,25,29,39,40]

The lower depth of knowledge about HPV infection among the university students is important because this situation could lead to the spread of infection among the young students without conscious understanding of their actions resulting in a delay in prevention, diagnosis, and treatment. Informational activities should be instituted to protect the health of both young individuals and the community.

Regarding the results of HPV vaccination, the status of having heard of HPV as well as the knowledge and awareness about HPV was inadequate. In this study, 33.7% of the participating university students reported that they could be vaccinated against HPV and only 7.2% stated that they knew about the vaccination. Similarly, in Koç's study, this rate was 8.7% and the knowledge about vaccination was low.^[20] In Pakistan, the rate of having knowledge about HPV vaccine among the female university students was only 10.9%.^[29] In the study of Yilmazel and Duman, the depth of knowledge, beliefs, and attitudes about HPV infection, cervical cancer, and HPV vaccination among university students was low.^[40] According to the literature, the students of health education had heard more of HPV vaccination and had knowledge about the vaccine in more depth.^[18,31,41]

The WHO recommends vaccination for girls between the age of 9 and 13 years because this is the most cost-efficient and effective public health measure against cervical cancer.^[2] The present study showed that in Turkey, a country with no national vaccination program, only 1.5% of the participating students were vaccinated. Uzunlar *et al.*'s study in Turkey revealed that only 2.1% of the nursing students and 1.7% of the control group were vaccinated.^[32] The vaccination rate among female students according to Koç and Borlu *et al.* was 0.3%.^[18,20] In addition, a study in Poland, another country with no national vaccination program, determined that only 9.5% of the participating female students were vaccinated.^[42] The vaccination rates were higher in the countries having national vaccination programs for HPV. In Greece, it was indicated that 25.82% of 3153 female students aged between 18 and 26 years were vaccinated.^[38] A study conducted in two northeastern universities of the United States found that HPV vaccination was completed with three-vaccine series in 58.6% female students and 6.5% male students.^[23] In another study performed in the United States, 47.3% of the female students and 15.8% of the male students were vaccinated.^[37] Medeiros *et al.* stated that, as derived from the Portugal Ministry of Health data, 80% of the females aged <15 years were vaccinated, although vaccination was optional.^[36] In Berlin, 40% of the participating female students were vaccinated.^[23] According to the present study, the causes of not being vaccinated included unawareness about vaccination (84.1%) and refusal of the parents to get vaccinated (14.4%). Other studies in Turkey have shown that the vaccination rates were quite low. This situation could be

explained by the vaccine not being included in the national vaccination program. The vaccine was not cost-free and was expensive, and the knowledge and awareness about this issue were poor.

In this study, even though 87.7% of the female students reported that they had already heard of cervical cancer, their knowledge about cervical cancer was inadequate. In Koç's study, 76% of the female students, including those studying in the medical departments, reported that they had already heard of cervical cancer.^[20] A study conducted abroad found that the awareness rate among 440 female university students in South Africa was 58.9%.^[43] A study in Poland with 400 female university students reported that a high percentage of the students (95.5%) had heard of cervical cancer, although their general knowledge about cervical cancer was inadequate. It was stated that the knowledge regarding the role of HPV as a causal agent in cervical cancer among the female students was low (52%).^[42] The results of various studies conducted in different Muslim countries have shown that the awareness regarding cervical cancer among university students was low.^[29,33,39,44,45] The knowledge regarding cervical cancer among the female students was not adequate and the students wanted to be informed at higher levels. Many factors, including lack of a national cancer screening programs, low economic development level of the country, limited access to health services for women, conducting screening programs and health services without proper direction, and absence of regular monitoring and training programs, could result in a low level of knowledge and awareness about cervical cancer.

The present study determined that the female students had heard of HPV and HPV vaccine at higher levels than the male students. Similar studies in the literature have found that male students did not have adequate knowledge about this issue.^[14,18,22,24,39] Barnard *et al.* indicated that 92.4% of females and 82.9% of males had heard of HPV and 75.8% of females and 56.2% of males were aware of HPV.^[37] In a study evaluating the knowledge among multidisciplinary students in Pakistan, a significant difference was found across the genders for hearing about HPV.^[46] The females had greater awareness probably because HPV is associated with cervical cancer and HPV-related training programs mostly include female members.

Finally, we have found an association with the age of the students and the status of having heard of HPV. In many studies performed with university students, variables other than sex were less evaluated. In the study by Donadiki *et al.*, the depth of knowledge increased with increase in age among non-health students.^[38] Adejuyigbe *et al.* showed that there was a significant difference in the knowledge of students about HPV and HPV vaccination according to age

groups.^[41] During the promotion of health consciousness in society as a measure of health indicators, it is important to raise awareness about HPV infection and immunization at an earlier age during the educational period.^[34]

Limitations

This study included only health programs for university students. Furthermore, this study was a descriptive and a cross-sectional one, and hence, no causal relationships could be confirmed. In future studies, both the genders and all the departments could be compared. Studies evaluating causal relationships can also be planned.

Conclusion

This study showed that knowledge and awareness among the university students about HPV and HPV vaccine were low. Similarly, the female students had a lower depth of knowledge and awareness about cervical cancer. In addition, the students reported that they had a high desire to be informed about these issues. Thus, it is recommended that training programs, informational activities, and counseling services about sexual issues should be provided to younger individuals. This approach will enable young individuals to improve their quality of life, protect their future health, and produce healthy offspring.

Raising awareness among the young population is important for the prevention of HPV. It is thought that providing education will be effective in reducing the incidence of HPV infection and HPV-related cancers, such as cervical, vulvar, vaginal, penile, anal, and oral cancers. It can also affect the mortality rates related to these diseases. Therefore, to protect the health of the young population, it is highly important for the health staffs, especially the nurses, to have adequate knowledge so that they can provide proper service and raise awareness among about this issue.

Conducting educational programs about this issue for the students who do not obtain an education in medical departments in the university is important. It is also important to provide educational and counseling services by the nurses and inform the young population using a peer education model.

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Conflicts of interest

There are no conflicts of interest.

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