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Original Research Article

What is the level of knowledge of first year dentistry students about human papillomavirus? a cross-sectional study

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ABSTRACT

Background: Epidemiological studies have shown increasing trends of HPV-associated oral cancers worldwide. HPV-related diseases are a new public health problem that negatively affects the field of dentistry. The aim of this study is to determine the knowledge levels of first-year dentistry students about HPV.
Methods: The study population consisted of 130 students enrolled in the first year of the Faculty of Dentistry in the academic year of 2023 and 2024. The Human Papilloma Virus Knowledge Scale (HPV-KS) was used to determine students' HPV knowledge levels. In the analysis of the data, the t test, and Mann-Whitney U test were used.
Results: 53.6% of the students were female and 96% were in the 18-21 age group. The HPV-KS score of the students was found to be 10.60±7.27 (0-33). 58.4% of the students stated that they had heard of HPV before, 57.6% had heard of the HPV test before, and 50.4% had heard of the HPV vaccine before. Furthermore, female students scored significantly higher than male students in the HPV vaccine knowledge questions sub-dimensions (p=0.037).
Conclusions: Considering the knowledge levels of students in the first grade, it can guide the educational programs to be prepared. In order to protect public health, it is recommended to increase the knowledge of dentistry students about HPV and HPV-related diseases.

Keywords: Dental student, HPV, Knowledge level

INTRODUCTION

Human papillomavirus (HPV) is the most common pathogen of sexually transmitted diseases worldwide, and HPV infection is recognized as the most common sexually transmitted disease among both men and women.[1,2] HPV causes a range of diseases, from benign lesions such as asymptomatic infections and genital warts to more serious diseases such as anogenital, cervical, neck, and head cancers and oropharyngeal (throat and tonsils) cancers.[3-5] In addition to being an oncogenic virus, HPV causes a significant socioeconomic burden due to the recurrence of benign lesions, the lack of a definitive treatment option that provides a complete cure, and the high cost of treatment. The global incidence of HPV infection is increasing, especially among young and sexually active individuals.[1] In addition, it has been reported that HPV infection may also be associated with non-sexual routes because HPV DNA has been detected in placental cells, reproductive cells, and blood, as well as in children, infants, and people who have never had sexual intercourse.[4]

HPV infections are often asymptomatic, unrecognized, and underestimated. The majority of sexually active individuals are infected with HPV at least once in their lifetime, often unknowingly and without symptoms.[2] High-risk HPV types such as HPV 16 and 18 are etiologic agents for cervical and anogenital tract cancers, as well as oropharyngeal cancers (OPC), a subset of head and neck squamous cell carcinomas.[6] Approximately 63% of oropharyngeal cancers are associated with HPV infection.[4] Concurrent infections in the oropharynx and genitals is rare. Oral HPV infection occurs independently

of cervical HPV lesions.[2] Although the prevalence of oral HPV is relatively low, oropharyngeal cancer due to HPV is increasing.[7,8]

Screening for early HPV-induced premalignant changes in cervical cells can be performed using the Papanicolaou smear (pap smear), an effective cancer prevention tool. An equivalent procedure to the Pap smear for screening oropharyngeal cancers is currently lacking. However, the pap smear cannot detect all HPV-related changes. Therefore, robust preventive measures rely heavily on vaccination. HPV vaccination is recommended for both sexes several years before sexual debut.[5] With the development of vaccines that prevent HPV infection, the World Health Organization has made eliminating HPV and related cancers a priority, and countries that have implemented adequate vaccination programs have shown a decrease in HPV prevalence.[8]

Although human papillomavirus-associated oropharyngeal cancers (HPV-OPCs) are on the rise, HPV awareness among dental professionals remains low. HPV-induced OPC is an emerging public health problem that negatively impacts the field of dentistry. Dentists can play an important role in preventing and early diagnosing HPV and HPV-associated OPC by educating their patients about HPV and risk factors and encouraging vaccination and screening for HPV-associated diseases.[9] Therefore, dental professionals need comprehensive and up-to-date HPV-related information to provide accurate advice to their patients.[7] Previous studies have emphasized that dental students have inadequate knowledge about HPV, HPV vaccine and HPV-related diseases (oral cancer), which hinders interventions in OPC primary prevention efforts.[5,7,9-11] However, in one study, most dental students agreed that it was important to discuss HPV and the HPV vaccine with patients.[12] Dentistry students with a high level of HPV knowledge will effectively raise public awareness and protect health in the future. Determining first-year dental students' HPV knowledge level can provide insight about the students and can direct the training to be given to the students on this subject. Therefore, this study aims to determine the level of HPV knowledge of 1st-year dentistry students, who are future health professionals, and to raise awareness on this issue.

METHODS

Study design

This descriptive and cross-sectional study was conducted with first-year students enrolled in the Faculty of Dentistry at a state university, in Turkey. The target audience of the research is 130 students enrolled in the first year of dentistry in the spring semester of the 2023 and 2024. There were a total of 88 students in the first grade in the 2023 spring academic year, and a total of 42 students in the first grade in the 2024 spring academic year.

Inclusion criteria

Inclusion criteria were being enrolled in the spring semester of the first year and agreeing to participate in the study. Students were informed about the purpose of the study and voluntary participation.

Exclusion criteria

Students who refused to participate and those who completed the form incompletely were not included in the study.

The study was completed with 125 students. Data were collected through an online survey (Google Forms) between August 2023 and May 2024. The data collection form was shared in students' class WhatsApp groups to collect data. Two types of forms were used to collect the research data. The 'Personal Information Form' and the 'Human Papilloma Virus Knowledge Scale (HPV-KS)' were used.

Personal information form

This form consisted of questions to determine some descriptive characteristics of the participants. It included questions such as gender, age, marital status, knowledge of sexually transmitted diseases (STDs), having heard of HPV, having heard of HPV testing, having heard of HPV vaccination, and having received HPV vaccination.

Human Papilloma Virus Knowledge Scale (HPV-KS)

Waller et al developed the HPV-KS scale (cronbach alpha = 0.83) to measure the level of knowledge about HPV, HPV vaccine, and screening tests.[13] The Turkish validity and reliability study of the scale was conducted by Demir Bozkurt and Özdemir in 2023. The scale adapted to Turkish consists of 33 items and four sub-dimensions. Each item of the HPV scale is marked by the participants as "Yes," "No," and "I do not know." Correct answers are scored with 1, incorrect answers and do not know answers are scored with 0, and a total score is calculated. The total score from this scale is between 0-33. High scores indicate a high level of knowledge on the subject. The cronbach alpha of the HPV-KS was calculated as 0.96 for the total scale.[14] Analyses were performed using the statistical package program SPSS (IBM SPSS for Windows, ver.26). Normality assumptions of numerical variables were evaluated by Kolmogorov Smirnov and Shapiro-Wilk normality tests (see Table 2). The t-test and the Mann-Whitney U were used to analyze two variables. Results were evaluated at a 95% confidence interval and $p<0.05$ level.

RESULTS

The descriptive characteristics of the first-year dentistry students who participated in the study are presented in Table 1.

Table 1: Descriptive characteristics of participants (n=125).

Variables	N	Frequency (%)
Gender		
Female	67	53.6
Male	58	46.4
Age		
18-21	120	96.0
22-25	5	4.0
Do you have health insurance?		
Yes	101	80.8
No	24	19.2
Heard about HPV		
Yes	73	58.4
No	52	41.6
Heard about HPV test		
Yes	72	57.6
No	53	42.4
Heard about HPV vaccine		
Yes	63	50.4
No	62	49.6
Vaccinated against HPV		
Yes	4	3.2
No	121	96.8
STD knowledge level		
Sufficient	86	68.8
İnsufficient	39	31.2

STD: Sexually transmitted diseases, HPV-Human papillomavirus

Among the students, 53.6% were female, and the majority (96.0%) were in the 18-21 age group. When the student's marital status was analyzed, it was seen that all of them were single, so this information was not included in the table. 80.8% of the students had health insurance. Again, 68.8% of the students stated they had information about sexually transmitted diseases (STDs). Among the 1st year dentistry students, 58.4% stated that they had heard of HPV before, 57.6% had heard of the HPV test before, and 50.4% had heard of the HPV vaccine before. When the HPV vaccination status of the students was examined, it was determined that four students (3.2%) had received HPV vaccination (Table 1).

The scores obtained from the HPV-KS according to the descriptive characteristics of the students were analyzed using a t-test and Mann-Whitney U test; the results are shown in Table 3. Accordingly, it was found that the scores of students in the 18-21 age group (10.60±7.22), and 22-25 age group (10.60±9.31) were close to each other and the difference was not significant (p=1.000). The scores of female students (11.13±6.49) were higher than those of male students (9.98±8.08), but the difference was insignificant (p=0.387). According to the scale sub-dimension scores, female students scored significantly higher than male students in the HPV vaccine knowledge questions (p=0.037) sub-dimensions. Again, having health insurance affected the HPV vaccine availability items score of the students (p=0.001). The HPV knowledge scale scores of the students who had heard about HPV, HPV vaccine, and HPV test were found to be significantly higher (p<0.001). Those with sufficient knowledge of STDs scored significantly higher than the HPV-KS, general HPV knowledge, HPV testing knowledge questions, HPV vaccine knowledge questions and HPV vaccine availability sub-dimensions (p<0.05) (Table 3).

Table 2: Descriptive statistics of the measurement tool used (HPV-KS) (n=125).

	Item	Total Score±SD	95% CI	Min-max	Skewness		Kurtosis	
HPV-KS total	33	10.60±7.27	9.31-11.88	0-27	0.009	0.217	-1.123	0.430
General HPV knowledge	16	6.80±4.15	6.07-7.54	0-14	-0.268	0.217	-1.047	0.430
HPV testing knowledge questions	6	1.05±1.20	0.84-1.26	0-6	1.285	0.217	1.752	0.430
HPV vaccine knowledge questions	5	1.86±1.73	1.55-2.17	0-5	0.222	0.217	-1.412	0.430
HPV vaccine availability ıtems	6	0.87±1.27	0.64-1.09	0-5	1.285	0.217	0.573	0.430

HPV-KS: Human Papilloma Virus Knowledge Scale, CI: Confidence interval, SD: Standard Deviation

Table 3: Distribution of participants' HPV-KS scores according to descriptive characteristics.

	HPV-KS total score (Cronbach's α= 0.945)	General HPV knowledge score (Cronbach's α=0.907)	HPV testing knowledge questions score (Cronbach's α= 0.763)	HPV vaccine knowledge questions score (Cronbach's α= 0.826)	HPV vaccine availability ıtems score (Cronbach's α=0.824)
Age (years)					
18-21	10.60±7.22	6.82±4.13	1.04±1.18	1.85±1.73	0.87±1.29
22-25	10.60±9.31	6.40±5.12	1.40±1.67	2.00±2.00	0.80±0.83
P value	1.000	0.824	0.680	0.859	0.898

Continued.

	HPV-KS total score (Cronbach's α= 0.945)	General HPV knowledge score (Cronbach's α=0.907)	HPV testing knowledge questions score (Cronbach's α= 0.763)	HPV vaccine knowledge questions score (Cronbach's α= 0.826)	HPV vaccine availability ıtems score (Cronbach's α=0.824)
Gender					
Male	9.98±8.08	6.56±4.53	1.08±1.39	1.51±1.74	0.81±1.27
Female	11.13±6.49	7.01±3.82	1.02±1.01	2.16±1.68	0.92±1.28
P value	0.387	0.557	0.594	0.037	0.617
Do You have health insurance?					
Yes	11.00±7.34	7.00±4.15	1.05±1.21	1.94±1.76	1.00±1.35
No	8.87±6.86	5.95±4.16	1.04±1.16	1.54±1.61	0.33±0.63
P value	0.197	0.267	0.989	0.314	0.001
Heard about HPV					
Yes	13.53±6.33	8.49±3.42	1.35±1.24	2.41±1.65	1.27±1.41
No	6.48±6.51	4.44±3.96	0.63±1.01	1.09±1.56	0.30±0.75
P value	0.000	0.000	0.000	0.000	0.000
Heard about HPV test					
Yes	13.51±6.61	8.48±3.61	1.31±1.25	2.47±1.70	1.23±1.38
No	6.64±6.22	4.52±3.76	0.69±1.03	1.03±1.42	0.37±0.90
P value	0.000	0.000	0.001	0.000	0.000
Heard about HPV vaccine					
Yes	14.61±5.70	9.09±3.03	1.49±1.26	2.76±1.52	1.26±1.37
No	6.51±6.38	4.48±3.85	0.61±0.94	0.95±1.45	0.46±1.03
P value	0.000	0.000	0.000	0.000	0.000
STD knowledge level					
Sufficient	12.00±7.02	7.77±3.89	1.12±1.20	2.09±1.76	1.00±1.41
İnsufficient	7.51±6.93	4.66±3.95	0.89±1.18	1.35±1.58	0.58±0.84
P value	0.001	0.000	0.200	0.028	0.047

Mann-Whitney U, t test

DISCUSSION

Future dental professionals need to have adequate HPV knowledge to help reduce the HPV-OPC burden.[9,11] This study aimed to determine first-year dentistry students' general knowledge level about HPV. In this study, 58.4% of students stated that they had heard of HPV before, 57.6% had heard of the HPV test before, and 50.4% had heard of the HPV vaccine before. In another study, 62% of students had heard of HPV infection and 57% had heard of the HPV vaccine.[5]

Based on the findings of the study, the HPV-KS score of the students was 10.60±7.27. There are various studies in the literature to determine dental students' knowledge level about HPV, HPV vaccine, and HPV-related oropharyngeal cancers. In their study, Lorenzo-Pouso et al stated that dental students have significant knowledge deficiencies about HPV, which hinders primary prevention interventions for oropharyngeal cancers.[7] In a study conducted with dental students, Sallam et al found that basic knowledge about HPV and knowledge about HPV-related oral cancer was insufficient in students.[15] Again, in a study conducted with female dentistry students, students' lack of awareness about HPV, cervical cancer, and pap smear screening was emphasized.[16] Additionally, studies conducted in various countries, including the United States, Malaysia, Netherlands, and Saudi Arabia, have reported a lack of HPV knowledge among dental students and highlighted the need for implementation of educational materials.[6,10,12,17] This study supported the literature that there are gaps in the HPV knowledge level of students. Some studies have found that improvement in HPV knowledge is associated with progress in curriculum years.[5,18] On the other hand, one study found that clinical year students had significantly higher HPV knowledge scores than preclinical students.[6] Considering that students are generally in the early stages of the first year of which they typically focus on acquiring basic medical knowledge, HPV knowledge scores are expected to be low, but knowing the students' knowledge levels about HPV can guide the training programs to be prepared.

Furthermore, looking at the studies conducted with medical students, it was reported that there was insufficient knowledge about cervical cancer and screening among medical students.[19] In one study, it was reported that there was a deep lack of knowledge about the role of HPV in oropharyngeal cancer among medical students.[5] It is expected that the HPV knowledge level of students of dentistry, medicine, or other health

departments is generally high. It may be possible to overcome the knowledge gaps identified in students with effective training.

In this study, the rate of HPV vaccination was determined as 3.2%. In the study of Lorenzo et al the vaccination rate of dental students against HPV was found to be 48.7%, and in the study of Alsharif and Alsahafi, the vaccination rate was found to be 23.3%.[7,20] In the study conducted by Farsi et al, 9% of the students reported being vaccinated.[6] In this study, the vaccination rate of students was found to be lower than in other studies. According to Adıgüzel et al, the most common reason for the low HPV vaccination rate in Turkey is that HPV vaccines are not included in the national vaccination program.[21] Additionally, it is stated that insufficient awareness about HPV infection and vaccine in Turkey is due to the high cost of the vaccine.[22] Therefore, vaccination rates among dentistry students may be low. It is important to include the HPV vaccine in national vaccination programs to increase immunity against HPV.

This study found that students who had heard about HPV, HPV vaccine, and HPV test before and students who had received HPV vaccine before had significantly higher HPV-KS scores. This revealed the importance of raising awareness against HPV. The importance of HPV can be emphasized by reaching larger masses with various campaigns, advertisements, brochures, and educational programs. These results also reflect low public awareness. It can be said that it is necessary to raise public awareness of this issue.

In this study, when HPV-KS scores were evaluated in terms of gender, no significant difference was observed. According to the scale sub-dimension scores, female students scored significantly higher than male students in the HPV vaccine knowledge questions sub-dimensions. In one study, while women showed better knowledge about the HPV vaccine, men showed better knowledge about HPV and its relationship with OPC, and these differences were found to be statistically significant.[23] Despite positive reports on the efficacy of the HPV vaccine, social and societal barriers to vaccination may hinder public health efforts to prevent diseases caused by HPV. For example, it is difficult to increase awareness, knowledge, and compliance among men, and HPV is seen as a pathogen that primarily affects women, making it difficult to increase HPV awareness.[24] However, in a study, it was mentioned that almost one in every three men worldwide is infected with genital HPV type and that men should be included in comprehensive HPV prevention strategies in order to reduce HPV-related morbidity and mortality in men and ultimately eliminate cervical cancer and other HPV-related diseases.[25] It is thought that these points should also be emphasized when planning HPV-related training.

The curriculum can be rechecked to ensure that dental students are aware of HPV virus-associated diseases, have knowledge about prevention methods, and overcome their lack of knowledge on this subject. In previous studies, the authors stated that various interventions should be made, including the inclusion of HPV information in the dental curriculum, curriculum review, curriculum changes including HPV-OPC linkage, education and awareness campaigns.[7,15,26] According to Sallam et al, lack of knowledge can negatively affect early detection and prevention of cancer.[5] However, it is underlined that more specific information may be needed in microbiology and immunology courses in dentistry to increase awareness and knowledge about the safety and efficacy of vaccines, including the HPV vaccine.[24] HPV basic knowledge among dental students is an important area of emphasis as it will enhance their contribution to the primary prevention of HPV-associated OPCs.[9,12,18,27,28]

The limitations of this study include the fact that it was conducted in a single center and the results cannot be generalized due to the small sample size. More robust results could be obtained with a larger sample size. Another limitation of this study is that students' knowledge of HPV-related diseases was not investigated.

CONCLUSION

In this study, it was observed that there were gaps in 1st year dentistry students' general HPV knowledge. It was revealed that students lacked knowledge about HPV. However, in order to protect public health, it is recommended to increase the knowledge of dental students about HPV and HPV-related diseases and to eliminate any deficiencies in the existing curricula in this direction. This study may give an idea about the HPV knowledge of dental students at the beginning of their dental education and give direction to the curriculum and the training to be prepared.

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