

## ADOLESCENTS' KNOWLEDGE, ATTITUDE, BEHAVIOR AND BARRIERS REGARDING HUMAN PAPILLOMAVIRUS VACCINE AND CERVICAL CANCER

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### ABSTRACT

The study was conducted to investigate the knowledge, attitude, behavior and barriers of university students about Human Papillomavirus (HPV) vaccine and cervical cancer (CC). This descriptive study was conducted with 1007 students between September-November 2019. The "Information Questionnaire" was used as the data collection tool. The study was found that 58.6% of the students heard of HPV vaccine previously, 57.1% were undecided whether the HPV vaccine would protect against HPV. Of those who did not get the vaccine, 19.8% were not willing to receive it and 55.2% were undecided to receive it. When the reasons for students not to have HPV vaccine are examined; they stated that they did not have it because they did not have enough information about the vaccine, because they did not consider it necessary to have the vaccine, because they were afraid of its side effects, because it was expensive and because they thought it would not protect against HPV infection. Also, it was found that more than half of them did not consider that they were at risk for CC and did not know risk factors for CC. The participants' knowledge of CC and risk factors was inadequate.

**Keywords:** Human Papillomavirus, cervical cancer, vaccine, young people

## ADOLESANLARIN HUMAN PAPİLLOMAVİRUS AŞISI VE SERVİKAL KANSER İLE İLGİLİ BİLGİ, TUTUM, DAVRANIŞ VE ENGELLERİ

### ÖZET

Araştırma, üniversite öğrencilerinin Human Papillomavirus (HPV) aşısı ve servikal kanser ile ilgili bilgi, tutum, davranış ve engellerini araştırmak için yapılmıştır. Bu tanımlayıcı çalışma, Ekim-Kasım 2019 tarihleri arasında 1007 öğrenci ile yapılmıştır. Veri toplama aracı olarak "Tanılama Formu" kullanılmıştır. Çalışmada öğrencilerin % 58,6'sının daha önce HPV aşısı duyduğu, %57,1'inin HPV aşısını yapıp yaptırmama konusunda kararsız olduğu tespit edildi. Aşı yaptırmayanların %19,8'inin aşıyı yaptırmak istemedi ve %55,2'si aşıyı yaptırmama konusunda kararsızdı. Öğrencilerin HPV aşısını yaptırmama nedenleri incelendiğinde; aşı hakkında yeterli bilgisi olmadığı

için, aşığı yaptırmayı gerekli görmediğı için, yan etkilerinden korktuğı için, pahalı olduğı için ve HPV enfeksiyonuna karşı korumayacağını düşündüğü için yaptırmadıklarını ifade ettiler. Ayrıca, öğrencilerin yaridan fazlasının servikal kanser için risk altında olduğunu düşünmediğı ve servikal kanserin risk faktörlerini bilmediğı bulunmuştur. Katılımcıların servikal kanser ve risk faktörleri hakkında bilgileri yetersizdi.

Anahtar Kelimeler: Human Papillomavirus, servikal kanser, aşığı, genç bireyler

## **INTRODUCTION**

Cervical cancer (CC), one of the most common cancers in the world, can be diagnosed and thus prevented by performing simple tests. Approximately 270,000 women lose their lives due to CC each year and 85% of these cancer cases occur in developing countries (1). According to Globocan 2018 data published by the International Agency for Research on Cancer (IARC), CC is the fourth most common cancer type among women worldwide and ranks third in cancer-related deaths (2). In Turkey, CC ranks tenth in all women's cancers with an incidence of 4.2 per hundred thousand and third among the most common gynecologic cancers following the endometrium and ovarian cancers (3). Among many factors leading to CC are age, low socio-economic status and the number of sexual partners and Human Papillomavirus (HPV) infection is the most common of the sexually transmitted infections all over the world (4). It is reported that more than 70% of sexually active people have been exposed to HPV at some time in their lives and more than 70% of them are between the ages of 15-24. Therefore, high school and university students are most likely to be vulnerable to HPV infection (5). According to the 2014 cancer statistics in Turkey, CC incidence in Turkey is 2%, and it ranks tenth in women's cancers (6). However, in several studies, the prevalence of HPV 16/18 infection is 4.7% and the prevalence HPV infection in CC cases is 67.6% (7).

The risk of HPV infection is directly related to the age at the onset of sexual intercourse. Immunization with HPV vaccines during the period before the first sexual intercourse provides an effective and safe protection against HPV infection (8). If the best effect of the HPV vaccine is to be achieved, it is recommended that vaccination should be performed before the person is exposed to HPV and at a younger age (9-15 years of age) when immunogenicity is most effective. The most effective, practical and ethical solution to this problem is the vaccination of both adolescents and women against HPV (9).

Considering the possibility that males might be infected by HPV too, it is argued whether the vaccination of only girls would be adequate or whether males in the same age group should be

vaccinated as well. Recently, however, it has been recommended that males of the same age should be vaccinated against HPV because a large number of males are HPV carriers and because HPV vaccination would be a preventive measure against penile cancer (8). In 2017, WHO recommends the primary target population including girls aged 9-15 years should be vaccinated against HPV before they have their first sexual intercourse because it is the most cost-effective public health intervention to protect them against CC. The World Health Organization also recommends that males and females aged >15 who comprise the secondary target population should also be vaccinated since it is cost-effective. In the same year, WHO recommended that national immunization programs should include HPV vaccination (10). Upon this recommendation, in 2018, eighty countries around the world started to implement HPV vaccination programs within the national routine immunization program (11). In Turkey, there is no national HPV vaccination program targeting males or females.

The acceptability of a vaccine is defined as the willingness of a person to be vaccinated. Health seeking behaviors such as willingness to be vaccinated are determined by many factors such as awareness and knowledge. In fact, knowledge plays the leading role in making conscious decisions. Therefore, lack of knowledge is regarded as the most important barrier to vaccination acceptance (12). Therefore, the success and benefit of the control and prevention of HPV infection and CC is thought to be largely dependent on the level of awareness and knowledge of the different aspects of the disease and vaccine (12). HPV vaccines have been the primary means of preventing CC, and what is more, the HPV vaccine can prevent not only CC, vaginal cancer, vulvar cancer, but also genital warts. Although the prevalence of HPV is high, awareness of HPV has generally been inadequate in countries where young adults comprise the majority of the population (13,14). HPV has been reported to be a very common sexually transmitted infection especially among university students, because of their high-risk sexual activities. Young people's having inaccurate and inadequate knowledge of HPV is reported to adversely affect the incidence of CC and HPV infection, and their behaviors regarding the prevention of CC such as demand for HPV vaccine (8). A review of studies investigating people's awareness and knowledge of HPV and CC has demonstrated that young adolescents in Taiwan (15), nursing students in Turkey (16), and African American young men (17) have inadequate and inaccurate knowledge of HPV and CC. Lack of knowledge about HPV and CC reveals the fact that people's awareness of the issue should be raised. It is also recommended that people at risk for HPV infection and CC should be identified and that they should be

informed about HPV vaccine, avoiding risky behaviors, healthy lifestyle, and use of barrier contraceptives (18).

The purpose of this descriptive study was to investigate university students' knowledge, attitude, behavior and barriers of HPV vaccine and CC.

## **METHODS**

The study was done with 1007 university students studying at Vocational School of Health Services in a large public Middle East University between September-November 2019 in İzmir. The sample size was calculated using the sample size determination formula for known population. Of the 1200 questionnaires administered to the students, 193 were returned incomplete because students did not want to participate in the study. No sampling method was implemented in this study. Except for those who were not in the classroom when the study was performed and those who did not agree to participate in the study, all the other students in the study population were included in the study sample (The response rate was 83.9%).

The "Personal Information Questionnaire" developed by the researchers in line with the pertinent literature was used as the data collection tool. The questionnaire consists of 33 items questioning the participants' sociodemographic characteristics such as age, sex, income status. The questionnaire also questions whether they have heard of HPV infection and whether or not and why or why not they are willing to be vaccinated against HPV (16).

After the students included in the study sample were informed about the purpose of the study and told that participation in the study was voluntary and that they could withdraw from the study any time, they were asked to give their "Informed Consent Form" and to fill in the Personal Information Questionnaire on their own. The questionnaire was administered to the participants between September and October 2019. It took each participant to answer the items in the questionnaire approximately 15-20 minutes.

### ***Data analysis***

The data exported the data to a software program, namely Statistical Package for the Social Sciences (SPSS), version 22.0, for the analysis. The chi-square test was used to assess associations between the dependent-independent variables. The authors compared responses

given to the questions whether the participants had heard of HPV infection, identifying the resulting p value of .05 as the significant level at 95% confidence interval.

### *Ethical consideration*

This study was approved by a large public Middle East University Ethics Committee. We obtained written consent from all the students before beginning the data collection.

## RESULTS

The mean age of the students was  $19.91 \pm 1.21$  (min = 18, max = 22) years and 58.6% of them heard of HPV vaccine previously. While there was a statistically significant correlation between the item whether the participants had heard of HPV vaccine and the variables such as sex, income level, smoking, family type, family history of cancer and having sexual experience ( $p < .05$ ), there was no statistically significant correlation between the same item and the variables such as marital status, year at school, the longest place of residence, alcohol use and the current place of residence ( $p > .05$ ) (Table 1).

**Table 1.** Distribution of socio-demographic and some characteristics of participants according to their hearing of HPV vaccine (N=1007)

Variables	HPV Vaccine Hearing Status						X <sup>2</sup>	P
	Yes		No		Total			
	n	%	n	%	n	%		
Gender								
Woman	502	85.1	242	58.0	744	73.9	92.653	.001*
Male	88	14.9	175	42.0	263	26.1		
Marital Status								
Single	574	97.3	411	98.6	985	97.8	1.853	.173
The married	16	2.7	6	1.4	22	2.2		
Income status								
Good	52	8.8	44	10.5	96	9.5	39.488	.001*
Bad	83	14.1	123	29.5	206	20.5		
Middle	455	77.1	250	60.0	705	70.0		
Class								
1.class	220	37.3	151	36.2	371	36.8	.122	.727
2.class	370	62.7	266	63.8	636	63.2		
Longest lived area								
Province	340	57.6	254	60.9	594	59.0	1.472	.479
District	177	30.0	120	28.8	297	29.5		
Town / village	73	12.4	43	10.3	116	11.5		
Smoking use								

Yes	186	31.5	184	44.1	370	36.7	16.687	.001*
No	404	68.5	233	55.9	637	63.3		
Alcohol use								
Yes	174	29.5	125	30.0	299	29.7	.027	.868
No	416	70.5	292	70.0	708	70.3		
Family type								
Core	438	74.3	342	82.0	780	77.4	9.432	.009*
Broad	117	19.8	53	12.7	170	16.9		
Broken	35	5.9	22	5.3	57	5.7		
Where he is now								
Together with family	259	43.9	193	46.3	452	44.9	1.288	.732
Together with friends	104	17.6	76	18.2	180	17.9		
In the state dormitory	111	18.8	77	18.5	188	18.7		
Private residence	116	19.7	71	17.0	187	18.6		
Having a family history of cancer								
Yes	156	26.4	86	20.6	242	24.0	4.529	.033*
No	434	73.6	331	79.4	765	76.0		
Sexual experience								
Yes	123	20.8	158	37.9	281	27.9	35.272	.001*
No	467	79.2	259	62.1	726	72.1		

\*p<.05

Of the participants who heard of the HPV vaccine previously, 49.8% heard it from the health personnel, 57.1% were undecided whether the HPV vaccine would protect against HPV, 95.4% did not get the HPV vaccine. Of those who did not get the vaccine, 19.8% were not willing to receive it and 55.2% were undecided to receive it. As for the reasons why they did not want to get the HPV vaccine, 32.0% said they were not knowledgeable enough about the vaccine, 14.2% did not consider it necessary, 5.4% were afraid of its adverse effects, 4.5% said it was expensive and 3.9% did not think it would protect them against HPV infection. In addition, 62.5% of the participants thought that they were not at risk for HPV infection (Table 2).

**Table 2.** Investigation of HPV vaccine hearing based on some variables (N=590)

Variables	n	%
Where he heard about the HPV vaccine <sup>a*</sup>		
Health personnel	288	49.8
Internet / social media	253	43.0
Friends / family / relatives	68	11.5
Books / posters / brochures	27	4.6
Belief in the protection of HPV vaccine		
Yes	232	39.3
No	21	3.6
undecided	337	57.1
Taking the HPV vaccine status		
Yes	27	4.6
No	536	95.4
Status want to make the HPV vaccine <sup>b</sup> (n=536)		

Yes	134	25.0
No	106	19.8
undecided	296	55.2
Reasons for not wanting to have HPV vaccine / instability <sup>a,c</sup> *(n=402)		
Expensive	29	14.5
not protect them against HPV infection	23	13.9
not knowledgeable enough about it	188	42.0
afraid of its adverse effects	32	15.4
not consider it necessary	90	24.2
Taking the HPV vaccine free of charge status		
Yes	214	36.3
No	57	9.7
undecided	319	54.1
Risk seeing the situation regarding the HPV infection itself		
Yes	40	6.8
No	369	62.5
I am not sure	181	30.7
Which HPV infection causes		
I do not know	215	36.6
Genital wart	230	39.0
Vaginal discharge	123	20.7
Itching	22	3.7
Men do know that the HPV vaccine status		
Yes	165	28.0
No	425	72.0

<sup>a</sup>Marked Multiple choices. <sup>b</sup>Only those who do not receive the HPV vaccine are included. <sup>c</sup>Just do not want to make the HPV vaccine and has been included in unstable ones. \*Multiple options are selected.

The analysis of the participants' knowledge and opinions about CC demonstrated that they did not consider that they were at risk for CC (57.4%), and they did not know that the virus causing CC is sexually transmitted (64.0%) and that risk factors for CC were having sexual intercourse with a large number people (64.5%), having sex before the age of 18 (50.3%), smoking (54.6%) and malnutrition (60.0%) (Table 3).

**Table 3.** Investigation of participants' knowledge and opinions on CC (N=1007)

Variables	n	%
See yourself at risk for CC-related condition <sup>a</sup> (n=744)		
Yes	78	10.5
No	427	57.4
I am not sure	239	32.1
How the virus related to CC is infected		
With sexual intercourse	644	64.0
From mother to baby	35	3.5
With blood transfusion	9	0.9
Lifeless with objects	6	0.6
I do not know	313	31.1
How CC is diagnosed		
With X-rays	10	1.0
With Pap smear test	551	54.7

With blood test	49	4.9
With urine test	30	3.0
I do not know	367	36.4
Conditions necessary for the prevention of CC		
Delaying the age of first sexual intercourse	15	1.5
Annual pap smear	150	14.9
Condom use	117	11.6
all of the above	398	39.5
I do not know	327	32.5
Having sexual intercourse with a large number of people is a risk factor for CC		
Yes	650	64.5
No	14	1.4
No idea	343	34.1
Having sex before the age of 18 is a risk factor for CC		
Yes	395	39.2
No	106	10.5
No idea	506	50.3
Smoking is a risk factor for CC		
Yes	374	37.1
No	84	8.3
No idea	549	54.6
Malnutrition is a risk factor for CC		
Yes	291	28.9
No	112	11.2
No idea	604	60.0

<sup>a</sup> Only female students are included.

## DISCUSSION

This study, the university students' knowledge and opinions of HPV vaccine and CC were investigated. In our country, Turkey, the increase in the number of those having pre-marital sexual intercourse compared to that of the previous years and young people's lack of adequate knowledge about sexual and reproductive health have increased the importance of HPV infection day after day (19). Approximately half of the participants of the present study previously heard of the HPV vaccine, which is considered as the best and most effective method to prevent HPV infections and cancers likely to be caused by HPV infections. Similarly, in studies conducted with university students in Nepal (13), in Brazil (20), in India (21), 51.8%, 40.0%, 75.6% of the students respectively have heard of the HPV vaccine. In several studies conducted with university students in Turkey, Başar et al. (2018), Ratfish et al. (2015), Dönmez et al. (2018) found that 42.6%, 44.5%, 17.4%, and 8.7% of the students respectively heard about the HPV vaccine (16,18,19). Although the percentage of the participants who heard of the HPV vaccine in our study is slightly higher than that in other studies conducted in Turkey, we think that the students' awareness is still inadequate. In the literature, printed and visual media health education programs, friends-family, brochures, family doctors, health services, school and



education environment are regarded as important information providers about HPV (22,23). In our study, while 49.8% of the participants heard of HPV vaccination from health personnel, 43.0% heard of it from the internet/social media. Although the sources of information about HPV vary from student to student, we think that equipping health personnel with adequate information on HPV should be one of the primary targets of health policies, due to the undeniable role of healthcare workers in raising the awareness of the public.

The analysis of hearing of HPV vaccine in the present study reveals that the majority of those who have heard of the vaccine are women. Similar results have been obtained in the literature (12,22). In our study, the majority of the participants did not know that men should receive HPV vaccine too. In the light of this data, HPV infection should be regarded as a health problem involving both sexes because it is sexually transmitted, and therefore awareness should be raised. Approximately one third of the participants in our study had no knowledge about how HPV infection is transmitted, and about half of those who had not heard of the HPV vaccine had sexual experience. Moreover, the majority of them did not consider that they were at risk for HPV infection. Similarly, in a study conducted with Spanish adolescents, 61% of the participants did not think that they were at risk for HPV infection (24). In the current study, of the students who had previously heard of HPV vaccine, almost none immunization with the HPV vaccine. In studies conducted throughout Turkey, HPV vaccination rates range from 1.0% to 4.3% (18, 25, 26). The big difference between the vaccination rates in Turkey and those in the aforementioned countries stems from the fact that those countries included the HPV vaccine in their national immunization programs. In our study, only a quarter of those who did not receive the HPV vaccine were willing to receive the vaccine. The rate of those willing to receive the HPV vaccine is 44.3% in Karasu et al.'s study (25), and 32.6% in Koç's study (18). In the current study, approximately half of the participants who heard about the HPV vaccine were not sure whether the HPV vaccine would protect them against HPV. This data demonstrates the importance of obtaining more information on vaccine safety and efficacy, as the perceived benefits of HPV vaccines contribute significantly to the intention of being vaccinated are taken into account. The most important barrier to vaccine acceptance is the lack of information (21, 27). In the present study, approximately half of the participants did not want to have the vaccine because their knowledge of the HPV vaccine was not adequate. Similarly, many studies in the literature have indicated that being inadequately knowledgeable about vaccination is the cause of avoiding vaccination (21, 27). In Turkey, HPV vaccine is not included in the coverage of

current National Immunization Program implemented by the Ministry of Health, and the cost of vaccines is not covered by the Social Security Institution. In Touch and Oh's study, one of the reasons why young people do not want to receive a vaccine is the high cost of the vaccine (28). Similarly, in our study, approximately one-fifth of the participants stated that they did not want to receive the vaccine due to its high cost. Results of several studies in the literature are consistent with those of our study (8, 29). In our study, the participants also stated that they did not want to receive the HPV vaccine because they were afraid of the side effects and they did not think it would protect them against HPV infection. Similarly, in Koç's study conducted with students, the students state that they do not want to receive the HPV vaccine because they do not have enough information about the vaccine, they do not consider receiving the vaccine is necessary, and they think that the vaccine may have adverse effects (18). In Mascaro et al.'s study conducted with students, the reasons why the students do not want to receive the vaccine are that they believe that the vaccine is dangerous, not beneficial and not reliable, and has adverse effects (11). These barriers to HPV vaccine acceptance bring the need for training on HPV infection and vaccine to the forefront. One of the most serious consequences of HPV infection is CC. In the present study, one third of the participants stated that they did not know what the HPV infection would cause. Similarly, in the literature, it is stated that young people do not know that CC is associated with HPV infection (4,30). In the current study, more than half of the participants did not think they were at risk for CC. Particularly in studies conducted with women in developing countries, the majority of women think that they are not at risk for CC and that screening tests are not necessary if there are no signs or symptoms (5,31).

In addition to the Pap test and HPV vaccination, other prevention strategies for the early diagnosis and prevention of CC are delaying the onset of sexual intercourse, reducing the number of sexual partners and using condom (32). Approximately one third of the participants in our study stated that they did not know the other strategies for the prevention of CC. In a study conducted with medical students in India, 10.4% of the participants were unaware of the preventable nature of CC (21). One of the preventable natures of CC is the awareness of risk factors. In the present study, almost half of the students had no idea that having sexual intercourse with a large number of people and having sexual intercourse before the age of 18 were among the risk factors for CC. Similarly, in a study conducted with female university students and graduates, the respondents do not know or misinterpret CC risk factors (33). In a study conducted by Can et al., 44% of the participants do not know that having sexual

intercourse at a young age increases the risk of CC, and 20% do not know that having more than one sexual partner increases the risk of CC (34). In this study, more than half of the participants did not know that there is a relationship between smoking and nutrition, and CC, consistent with other findings in the literature (34, 35).

### ***Limitation***

There are some limitations to the study. The research was a cross sectional study. Therefore, it contains the limitations of a cross sectional research. It is as follows: This research is not free from recall biases. There is a potential response bias. There is also a selection bias as the study included only the volunteers. It is only effective when it represents the entire population. The sample included only one school in İzmir and 1007 student, results cannot be generalized.

### **CONCLUSION**

In conclusion, approximately half of the university students participating in the present study had never heard of the HPV vaccine before, of the students who had heard of it, more than half were undecided about the protection of the HPV vaccine, and almost none of the student's immunization with the HPV vaccine mostly due to the lack of information about the vaccine. In addition, the participants' knowledge of CC and risk factors was inadequate. Knowledge and awareness of HPV infection are the strong indicators of receiving vaccine or intention to be vaccinated. We think that young people's awareness of CC and the role of HPV in CC could be the most important encouraging factor for the development of vaccination behaviors. Therefore, in raising society's awareness of HPV and CC, primary responsibility lies with health professionals, regarded as the building blocks of society. Health personnel should raise awareness of young people, especially of those in at-risk groups through education and information and encourage them to receive vaccine, which may contribute to the reduction of the incidence of HPV infection and CC. Awareness about HPV and Cc should be increased in undergraduate education in health departments.

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