

A case-control study to evaluate awareness level of human papillomavirus among women healthcare professionals in tertiary health care facility

Healthcare workers and HPV

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Abstract

Aim: Human Papilloma Virus ranks first in the etiology of sexually transmitted diseases. In this study, it was aimed to determine factors affecting the knowledge and attitudes of female health care professionals about Human Papillomavirus (HPV) infection and vaccine.

Material and Methods: Between February and June 2020, 245 female healthcare professionals working in Health Sciences University Istanbul Training and Research Hospital, including doctors, nurses and midwives, participated in this observational, analytical and case-control study. The case group included 90 participants, and the control group included 155 participants. In the online questionnaire, socio-demographic and gynecological characteristics were evaluated using 21 questions, and awareness of HPV infection and vaccination using 49 questions.

Results: Physicians accounted for 71.1% in the case group and 49.7% in the control group. The median age was 28 (min.23-max.51) years in the case group and 28 (min.21-max.59) years in the control group, and there was no significant difference between the two groups ($p=0.189$); 90.2% of the participants knew about HPV and 87.2% about the HPV vaccine. One hundred ninety-one participants answered all questions about HPV and its vaccine. The reason for those who did not want to be vaccinated in both groups was that it was expensive.

Discussion: The knowledge levels of the participants about HPV and HPV vaccine were higher in the case group, and awareness of HPV infection and cervical cancer was insufficient in both groups. In order to prevent HPV-related infections and cancers, education should be given to increase the knowledge level among healthcare professionals.

Keywords

HPV, HPV Vaccine, Cervical Cancer, Women Healthcare Professionals

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Introduction

Human papillomaviruses (HPV) are small, non-enveloped, double-stranded circular DNA viruses, belonging to the Papillomaviridae family. They show tropism to the cutaneous and mucosal squamous epithelium [1]. The main and best-known mode of transmission is sexual contact. Anogenital HPV infection is the most common sexually transmitted disease worldwide. Clinical manifestations caused by HPV range from benign skin lesions to cancers of the anogenital region and head and neck region. Cervical cancer, which is an important cause of morbidity and mortality all over the world, is almost always associated with HPV [2].

Cervical cancer is the third most common type of cancer in women worldwide and is the fourth most common fatal cancer among women [3]. In our country, the Ministry of Health planned a 5-year screening program in 2014 to screen women between the ages of 30 and 65 for cervical cancer and until January 2018, HPV typing was carried out in 3.2 million women across the country. As a result of this study, the HPV positivity rate was found to be 4.1% [4].

In recent years, thanks to HPV vaccines and cancer screening programs, cervical cancer has gradually ceased to be a deadly disease. In our country, HPV vaccines are not included in the routine vaccination program and can be applied privately. However, many factors such as lack of information, financial concerns, and social stigmas prevent widespread use of the vaccine [5]. Studies show that informing about HPV vaccines by health professionals and vaccination promotion studies play an important role in the vaccination of the society. In this study, it was aimed to determine the knowledge and attitudes of women healthcare professionals about HPV infections and the HPV vaccine, and to increase HPV awareness in society.

Material and Methods

This observational, analytical, case-control study was conducted between February and June 2020 with women healthcare professionals working at Health Sciences University Istanbul Training and Research Hospital. The total number of female health workers was 848, and they constituted the universe of the study. The sample size was calculated as a minimum of 234 people, with a 5% margin of error at a 95% confidence interval. In June 2020, 245 participants were reached and online data collection was terminated. Participation in the study was on a voluntary basis, and verbal consent was obtained from the participants. The participants were divided into case and control groups. Case group included female physicians, nurses and midwives who frequently encounter HPV infection in the clinic (gynecology and obstetrics, family medicine, infectious diseases and dermatology). Health workers working in branches other than these clinics were considered a control group.

The survey questions consisted of three parts and a total of 60 questions. In the first part, the participants were asked 21 questions about socio-demographic and gynecological characteristics. Participants who had heard of HPV before continued the second part and answered 19 questions measuring the level of knowledge about HPV. People who had heard of the HPV vaccine before were asked to complete the third part of the questionnaire and were asked 20 questions.

Statistical analysis was done with SPSS (Statistical Package for Social Sciences) 25.0 package program. In the analysis of continuous data, mean and standard deviation were used for the normal distribution, median and minimum-maximum values were used for non-normal distributions. Categorical data were presented with frequency and percentage. The Mann-Whitney U test was used for non-normal distribution in two-group comparisons of continuous data. Levene's test was used to evaluate the homogeneity of variances, the Chi-square test and Fisher's exact test were used to compare categorical data, and the Spearman correlation test was used for the relationship of continuous data. All tests were bilateral, and statistical significance was accepted as $p < 0.05$.

Results

A total of 245 female healthcare workers participated in the study, 90 of which were in the case group and 155 in the control group. The ages of the case and control groups were 28 (min.23-max.51) years and 28 (min.21-max.59) years, respectively, and there was no significant difference between the ages of the participants ($p = 0.189$). The duration of duty was 2.5 years (min.0-max.22) in the case group and 3 years (min.1-max.33) in the control group, and a significant difference was found between the participants ($p = 0.043$). The first gestational age was 28 (min.19-max.37) in the case group and 27 (min.18-max.31) in the control group, and a significant difference was found between the two groups ($p = 0.043$); 31.1% of patients in

Table 1. Socio-demographic and Gynecological Characteristics of Patients (n=245)

	All participants (n=245)	Case (n=90)	Control (n=155)	p
Age Median (Minimum-maximum)	28 (21-59)	28 (23-51)	28 (21-59)	0,189 ¹
Year of Profession Median (Minimum-maximum)	3 (0-33)	2,5 (0-22)	3 (1-33)	0,043 ¹
Marital status n (%)				
Single	154 (62.9%)	54 (60%)	100 (64.5%)	0,481 ²
Married	91 (37.1%)	36 (40%)	55 (35.5%)	
Smoking n (%)				
No	179 (73.1%)	69 (76,7%)	110 (71%)	0,082 ²
Yes	45 (18.4%)	18 (20%)	27 (17.4%)	
Quit smoking	21 (8.6%)	3 (3.3%)	18 (11.6%)	
First gestational age (n=23/33) Median				
(Minimum-maximum)	28 (18-37)	28 (19-37)	27 (18-31)	0,043 ¹
Contraceptive method n (%)				
No	26 (16.7%)	14 (24.6%)	12 (12.9%)	0,114 ²
Yes	124 (83.3%)	43 (75.4%)	81 (87.1%)	
STD history n (%)				
No	237 (96.7%)	90 (100%)	147 (94.8%)	0,028 ³
Yes	8 (3.3%)	0 (0%)	8 (5.2%)	
Pap-smear history n (%)				
No	175 (72.6%)	62 (68.9%)	113 (74.8%)	0,167 ²
Yes, regular	28 (11.6%)	15 (16.7%)	13 (8.6%)	
Yes, irregular	38 (15.8%)	13 (14.4%)	25 (16.6%)	
HPV-DNA test history n (%)				
No	230 (94.7%)	82 (92.1%)	148 (96.1%)	0,185 ²
Yes	13 (5.3%)	7 (7.9%)	6 (3.9%)	

1 Mann-Whitney U test, 2 Chi-square test, 3 Fisher exact test (STD: Sexually Transmitted Disease)

the case group and 25.2% of patients in the control group had at least one pap-smear test. There was no significant difference between the groups in terms of having Pap smear (p=0.167). While there was no history of sexually transmitted disease in the case group, it was present in 5.2% of the control group, and this difference was statistically significant (p=0.028). The number of healthcare workers who had HPV DNA test was 13. There was no significant difference between the groups in terms of age, marital status, smoking and using the birth control method (p>0.05).

Table 2 shows that the least correct answer to the questions about HPV was the transmission route. The rate of those who knew correctly that there was contamination from infected surfaces was 38.9% in the case group and 19.4% in the control group, and the difference between them was significant (p=0.001); 22% of the participants thought that HPV could be transmitted through blood and 7% through respiratory tract. The rate of those who knew all transmission routes was 18.9% in the case group and 10% in the control group; 91.1% of the case group and 73.8% of the control group answered 'yes' to the question about HPV DNA control in cervical cancer screenings, and the difference between the groups was significant (p=0.006). When the participants were asked whether they had heard of HPV, all of the case group did, while 21 people from the control group did not, and this difference was statistically significant (p=0.001).

When the participants were asked whether they had heard of

Table 2. Levels of knowledge of participants about HPV

	All participants n (%)	Case n (%)	Control n (%)	P
Rate of having heard about HPV	221 (90.2%)	90 (100%)	131 (84.5%)	0.001
Tick the mode of HPV transmission you know		(n=90)	(n=129)	
From mother to baby: True (yes)	156 (71.2%)	64 (71.1%)	92 (71.3%)	0.973 ¹
Wrong	63 (28.8%)	26 (28.9%)	37 (28.7%)	
Infected surfaces: True (yes)	60 (27.4%)	35 (38.9%)	25 (19.4)	0.001 ¹
Wrong	159 (72.6%)	55 (61.1%)	104 (80.6%)	
Through the blood: True (yes)	171 (78%)	73 (81.1%)	98 (76%)	0.365 ¹
Wrong	48 (22%)	17 (18.9%)	31 (24%)	
Respiratory: True (yes)	204 (93%)	81 (90%)	123 (95.3%)	0.123 ¹
Wrong	15 (7%)	9 (10%)	6 (4.7%)	
HPV DNA can be check by screening of for cervical cancer				
True (yes)	178 (81%)	82 (91.1%)	96 (73.8%)	0.006 ¹
False (no)	15 (6.8%)	3 (3.3%)	12 (9.2%)	
Does not know	27 (12.2%)	5 (5.6%)	22 (16.9%)	
HPV only infects women				
True (no)	191 (88.4%)	82 (91.1%)	109 (86.5%)	0.339 ²
False (yes)	18 (8.3%)	7 (7.8%)	11 (8.7%)	
Does not know	7 (3.2%)	1 (1.1%)	6 (4.8%)	
HPV can cause oral and anal cancers				
True (yes)	195 (89%)	84 (93.3%)	111 (86%)	0.074 ²
False (no)	6 (2.7%)	3 (3.3%)	3 (2.3%)	
Does not know	18 (8.2%)	2 (3.3%)	15 (11.6%)	
HPV infection disease is frequently transmitted via sexual contact				
True (yes)	161 (73.5%)	65 (72.2%)	96 (74.4%)	0.883 ¹
False (no)	31 (14.2%)	14 (15.6%)	17 (13.2%)	
Does not know	27 (12.3%)	11 (12.2%)	16 (12.4%)	

1 Chi-square test, 2 Fisher's exact test

the HPV vaccine before, 97.8% of the case group and 79.7% of the control group stated that they had heard of the HPV vaccine before, and this difference was found to be significant (p<0.001). Those who knew that there were two types of HPV vaccine in Turkey accounted for 69.3% in the case group and 66% in the control group, and there was no statistical difference between the two groups (p=0.454). When asked which groups of women could be administered the HPV vaccine, 78.4% of the case group and 70.6% of the control group answered 'sexually active women'. When the same question was asked for men, 52.3% of the case group and 37.3% of the control group stated that sexually active men can get vaccinated. The least known issue about the HPV vaccine; The fact that the vaccine could be administered to men and the rate of correct answers to this question was significantly different between the two groups (p=0.038); 59.1% of the case group and 43.1% of the control group gave the correct answer to the HPV vaccine application to adolescent boys, and a significant difference was found between the groups (p=0.028).

Those previously vaccinated against HPV accounted for 17%

Table 3. Knowledge Levels of Participants on HPV Vaccine

	Case n (%)	Control n (%)	P
Rates of having heard of HPV vaccine	86 (%97,8)	82 (%79,7)	0,001
There are 2 types of HPV vaccine in our country.			
True (yes)	61 (%69,3)	68 (%66)	0,454 ¹
False (no)	8 (%9,1)	6 (%5,8)	
Does not know	19 (%21,6)	29 (%28,2)	
In our country, the HPV vaccine is applied within the scope of reimbursement.			
True (yes)	70 (%79,5)	64 (%62,1)	0,023 ²
False (no)	1 (%1,1)	3 (%2,9)	
Does not know	17 (%19,3)	36 (%35)	
Who can get the HPV vaccine?			
Sexually active women			0,219 ¹
True (yes)	69 (%78,4)	72 (%70,6)	
Wrong	19 (%21,6)	30 (%29,4)	
Sexually active men			0,038 ¹
True (yes)	46 (%52,3)	38 (%37,3)	
Wrong	42 (%47,7)	64 (%62,7)	
Adolescent girls			0,237 ¹
True (yes)	80 (%90,9)	87 (%85,3)	
Wrong	8 (%9,1)	15 (%14,7)	
Adolescent boys			0,028 ¹
True (yes)	52 (%59,1)	4 (%43,1)	
Wrong	36 (%40,9)	58 (%56,9)	
Have you received/gotten the HPV vaccine?			0,938 ¹
No	73 (%83)	85 (%82,5)	
Yes	15 (%17)	18 (%17,5)	
Reasons for not getting the HPV vaccine			0,033 ¹
I have not been informed about the vaccine	7 (%11,1)	19 (%25,3)	
The vaccine is expensive	26 (%41,3)	24 (%32)	0,259 ¹
I don't know the side effects of the vaccine	5 (%7,9)	14 (%18,7)	0,068 ¹
I don't think the vaccine is protective	3 (%4,8)	2 (%2,7)	0,660 ²
Other	31 (%49,3)	37 (%49,4)	
Who can get the HPV vaccine?			0,015 ¹
True (4/4)	38 (%43,2)	27 (%26,5)	
Wrong	50 (%56,8)	75 (%73,5)	

1 Chi-square test, 2 Fisher exact test

in the case group and 17.5% in the control group; 11.1% of the case group and 25.3% of the control group gave the answer "I was not informed about the vaccine" as the reason for not vaccinating, and a significant difference was found between the groups ($p=0.033$). The most common reason for not vaccinating was that the vaccine was expensive, and a significant difference was found between the groups ($p=0.259$)

Discussion

In our study, it was determined that the case group had more information about HPV and HPV vaccine compared to the control group. There was no significant difference between the groups in attitudes towards HPV vaccine and awareness of HPV; 9.8% of women healthcare professions participating in the study had not heard of HPV before. The rate of those who had heard of HPV but never heard of the HPV vaccine was 12.8%. In a study conducted by Sevinç et al. (2021) with 312 male university personnel, 86.2% of the participants had not heard of the HPV vaccine before [6]. We think that the fact that our study was conducted with female healthcare professionals significantly increased the number of people who have heard of the HPV vaccine before.

The rate of participants' awareness of cervical cancer screening methods was 95.9% for the pap-smear test and 81% for the HPV-DNA test; 72.6% of the participants had never been screened for cervical cancer; 15.8% of healthcare professionals had regular pap-smear tests, and no significant difference was found between the groups in this regard. In the study by Eke et al. (2016), 49.6% of female physicians had never had a pap-smear test, and 20.6% had a regular pap-smear test [7]. In the study by Satılmışoğlu et al. (2018) regarding nurses, 32% of the participants stated that they had regular pap-smear tests [8]. The low cervical cancer screening rate in our study may be due to the fact that the participants were young and not sexually active.

It was determined that 38.4% of the participants over 30 years of age and sexually active for at least three years had never had a pap-smear and/or HPV-DNA test. Sevinç et al. (2020) in their study with 507 female participants found that 48.5% of married women over the age of 40 had never had a pap-smear test before [9]. The reason for this low rate in our study may be that the participants were healthcare workers. Social screenings aim to reach 60% of sexually active women and higher rates among health professionals. The current rates in our study were that health workers were not at the targeted level during the awareness and implementation phase.

The rate of participants who knew that HPV is the most common sexually transmitted disease was 73.5%, and 27.4% had sufficient information about transmission and prevention methods. Yuksel et al. found a significant difference between groups in the questions about infection in the study in which they measured the knowledge levels of healthcare professionals about HPV infection and vaccine. In their study, physicians were the group with the highest level of knowledge, with a rate of 76.6% [16].

The rate of knowledge among participants about the applicability of the vaccine to sexually active men accounted for 44.2% and 50.5% about its applicability to adolescent men.

Adiguzel et al. (2018) found that the rate of those who knew that HPV vaccine could be administered to men was 41% in their study with pediatric residents. Ozbakir Acar et al. (2019) found that 43% of healthcare professionals knew that HPV vaccine can be administered to both men and women in family health centers. Similar results were found in our study [11].

In our study, the rate of physicians who wanted to have HPV vaccine was 67.8%, and in the study of Naki et al. (2010), it was 84.3% [12]. The reason for this low rate in our study can be explained by the fact that 22.1% of the physician participants had been previously vaccinated.

Studies have shown that healthcare professionals have a more positive attitude towards getting their children vaccinated against HPV. Vaccination of girls is more approved than that of boys in the general population [12-15]. In our study, 90.9% of the case group and 85.3% of the control group had positive thoughts about the vaccination of adolescent girls.

Yuksel et al. (2015) determined the rate of doctors who want to vaccinate their girls as 84.9%, the rate of nurses as 64%, the rate of doctors who want to vaccinate their boys as 58.4%, and the rate of nurses as 46% [16]. In our study, while 89.7% of the doctors and 49% of the nurses and midwives wanted to vaccinate their girls, this rate was 74.2% for boys and 38% for nurses and midwives. In both studies, doctors were more likely to vaccinate their children than other healthcare professionals. In both studies, the HPV vaccine was more widely accepted for girls. The reason for this situation may be that HPV is the most important known cause of cervical cancer and it is not believed to cause cancer in men.

The biggest obstacle in vaccinating children in our study was the concern of side effects and unnecessary use of the vaccine. Studies have supported that sexually transmitted diseases are not increased in those who are vaccinated with HPV [17]. Naki et al. (2010) stated that barriers preventing the participants from vaccinating their children were lack of knowledge and fear of side effects, while the cost of vaccination remained in the background [12]. Adiguzel et al. (2018) stated in their study that the obstacles that pediatricians see in vaccination are that they find the vaccine unnecessary and that the vaccine is not included in the vaccination program of the Ministry [10]. The participants' concerns about vaccinating their children against HPV were similar to our study, but the biggest obstacle to vaccinating their children was the cost of the vaccine, with a rate of 36.2%.

Studies have shown that physicians recommend vaccines to their patients in proportion to their knowledge of HPV infection and vaccine, but the high cost of the vaccine is a factor that reduces their motivation [10,18,19]. In addition, families' concerns about social stigma, risky sexual behaviors, and early sexuality prevent physicians from recommending vaccines [10,18-21]. Studies have shown that families do not do not vaccinate their children against HPV due to lack of knowledge rather than cost [15], and vaccination rates increase in families who receive education [22,23].

Conclusion

The level of knowledge and awareness of healthcare professionals about cervical cancer, screening methods, HPV and HPV vaccine is not sufficient. This situation prevents

the vaccination incentives of health professionals and the acceptance of vaccinations by families. Training activities for healthcare personnel should be increased in order to increase awareness of cervical cancer and HPV and to spread HPV vaccines. In-service training should be increased especially for doctors, nurses and midwives working in primary care and the importance of preventive health services should be emphasized. In order to prevent the spread of this most sexually transmitted virus, it should be stated that HPV is not a virus that only affects women and polygamy should be prevented. In addition, parents should be informed about the period when the vaccine provides the most antibodies and protection in individuals, and their children should be vaccinated before their active sexual life begins.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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