

## CERVICAL CANCER AND HPV VACCINATION: FROM THE FEMALE HEALTH CARE WORKERS' PERCEPTION

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### Abstract

#### Aim:

Cervical cancer may be prevented by adequate and satisfactory preventive health services. Vaccination is one of the most useful primary care prevention applications. As the health care workers lead an important role in preventing cancers, it is crucial to focus on their knowledge and attitude and perception. This study aimed to evaluate knowledge levels on cervical cancer and HPV vaccination, perception and the attitude of female health care workers in our university hospital, thus contributing to vaccination and primary prevention researches and applications.

#### Materials and Method:

This cross-sectional, questionnaire-based study was performed during 01st July-31st December, 2020. A questionnaire (prepared with the current literature knowledge) was applied to volunteer female health workers (doctors, nurses, other health personnel) who were working at Adnan Menderes University Hospital. Data were evaluated with the SPSS 22.0 package program.  $p < 0.05$  was considered as statistically significant.

#### Results:

The mean age of the participants was  $31.1 \pm 6.8$  years with a mean duration of work as  $5.9 \pm 5.7$  years. The median knowledge score of the participants was 15 out of 22, 11, and 8 among doctors, nurses, and other health care personnel, respectively ( $p < 0.001$ ). All of the doctors, 31% of the nurses, and 44% of the other health personnel stated that they had recommended HPV vaccination to their social environment. Although ten participants (5 doctors and 5 nurses) had been vaccinated for HPV, all of the participants' relatives were unvaccinated. Among participants, 65.9% of the doctors, 36.2% of the nurses and 23.5% of the allied health personnel stated that they were planning to recommend vaccination to their relatives.

#### Conclusion:

Despite the high levels of recommending HPV vaccine to their social environment, low rates of vaccinated participants and their relatives were determined in this study. The knowledge levels about cervical cancer and prevention methods of healthcare professionals should be increased with educational programs to affect their attitudes towards HPV vaccination. With increased knowledge, healthcare workers will be able to guide the society correctly and adequately, and vaccination rates can be increased among the community.

**Keywords:** HPV, vaccination, cervical cancer, healthcare.

## INTRODUCTION

Although cervical cancer is a type of cancer that can be prevented by primary and secondary prevention methods, it is seen with increasing frequency in the world and also, in our country. According to the World Health Organization (WHO) Global Cancer Observatory (GLOBOCAN) 2018 data, cervical cancer ranks fourth after breast cancer, lung cancer and colon cancer in women (1). According to the Public Health Turkey Cancer Statistics 2016 data, among the most common cancers in women of all age groups, cervical cancer ranks ninth with a rate of 2.4% (2). As it is a preventable one, this type of cancer should be focused on.

Cervical cancer risk factors are; low socioeconomic status, sexual intercourse at an early age, multiple partners, smoking, obesity, advanced age, multiparity, long-term combined oral contraceptive (COC) use, not having a pap smear test (3,4). Among all cervical cancer cases, 99.7% of patients have HPV. HPV 16 and 18 are responsible for 70% of cases. With the use of HPV vaccination, we can prevent 90% of HPV-related infections and 70% of cervical cancers (5). Bivalent vaccine (Cervarix™) against HPV 16 and 18, quadrivalent HPV vaccine (Gardasil™) against HPV 6,11,16,18 and 9-valent HPV vaccine (Gardasil 9™) against HPV 6, 11, 16, 18, 31, 33, 45, 52, 58 are available effective vaccinations. These HPV types make 90% of cervical cancer cases (5). The most effective, inexpensive and easy-to-apply method of cancer prevention is primary prevention. Primary prevention can be achieved by knowing the etiological factors in cervical cancer and applying the effective and safe HPV vaccine (6,7). HPV vaccine has been administered since April 2007, but not in the National Vaccination Program (NVP) in our country (8). Major setbacks to wide HPV vaccination coverage in our country may be the lack of information about the vaccine and the cost of the vaccine (9). Pap smear test, which is used in cervical cancer screening, provides early diagnosis and improves prognosis. This test has reduced the incidence of cervical cancer by 79% and mortality by 70% since 1950 (10). Although cervical cancer screening with Pap smear is included in national screening programs, most of the women do not comply with screening programs and that keeps cervical cancer-related death toll high (5).

Physicians, nurses and allied health personnel (AHP) can play roles in increasing public awareness about vaccination and screening. Cervical cancer and HPV vaccine knowledge levels of AHP were found to be low in Turkey (11,12). Although physicians had a high level of knowledge about the HPV vaccine, the frequency of getting vaccinated and recommending the HPV vaccine to patients was high in former studies (10,13,14).

The aim of our study was to assess the level of awareness and knowledge of female health workers in our hospital about cervical cancer that can be prevented by emphasizing effective and easily applied vaccines and screening, as well as to learn about their practices, behaviors, and thoughts on the subject. Our secondary goal is to draw the attention of health professionals, who have a significant impact on leading society, on this subject.

## MATERIALS and METHOD

This is a voluntary-based, descriptive, cross-sectional, prospective study to determine the knowledge levels of cervical cancer and HPV vaccine and attitudes of female health care professionals (resident physicians, nurses, AHP) in our university hospital. Anonymous questionnaires were applied to 252 participants who agreed to participate in the study. Incomplete 6 questionnaires were excluded, and 246 questionnaires were evaluated for statistical analysis.

The questionnaire, which was prepared by the researchers according to the literature, included 36 questions, regarding the sociodemographic features, knowledge levels and attitudes about cervical cancer and HPV vaccine. The questionnaire form was applied to 20 female healthcare workers in the first step. After the pilot study, necessary updates to the questionnaire were made according to their feedback. Then, the questionnaire was applied face-to-face to female employees during 01st July-31st December, 2020.

In the first part of the questionnaire, there were ten questions designed to determine sociodemographic characteristics. Knowledge assessment questions included 22 questions on HPV infection transmission route, diagnosis method, risk factors, etc. (10 questions of multiple-choice-item on cervical cancer, and 12 true/false questions on cervical cancer and HPV vaccine). Each correct answer got 1 point with a total of 22 points. In order to assess the participants' attitudes, questions were asked about having been educated or trained about gynecological cancers, the desire to get education, the status of having a smear for cancer prevention, reasons for not having a smear, the status of getting HPV vaccination/reasons for not having it, the status of having a daughter/sibling vaccinated, the status of recommending vaccination to people in their immediate environment, and whether they suggested HPV vaccination to be included in NVP.

Frequency, percentage, mean, standard deviation, and median were used to represent the data. Chi-square, Mann Whitney-U, Kruskal Wallis, Student T, One-way ANOVA the

Post Hoc Tukey tests and Spearman correlation analysis were used for the analyses. Statistical significance was accepted as  $p < 0.05$ .

This study was approved by the Ethical Council (Date: 18.06.2020, Nr: 53043469.050.04.04). Although it was voluntary-based questionnaire study, each participant was informed and verbal consent was obtained from the participants.

## RESULTS

In total 252 participants joined to the study, but six incomplete ones were excluded. A total of 246 female health workers [82 (33.4%) physicians, 130 nurses (57.9%),

34 (13.7%) AHP] agreed to participate in our study. The mean age of the participants was  $31.1 \pm 6.8$ . When subgroups were analyzed, the mean age of the physicians was  $29.8 \pm 3.6$ ; nurses  $30.4 \pm 7.4$  and health personnel  $36.7 \pm 8.1$ .

While all of the physicians answered positively to the question "Would you recommend HPV vaccine to people around you?", this rate became 60.8% of the nurses and 44.1% of the AHP ( $p < 0.001$ ). While 164 (66.7%) of the participants stated that HPV vaccine should be included in the NVP, this situation was significantly different from other groups with a rate of 89% in physicians ( $p < 0.001$ ). Despite these data, only a total of 10 (4.1%) participants, 5 of 82 (6.1%) physicians and 5 (3.8%) of 130 nurses, had HPV vaccination ( $p < 0.001$ ) (Table 1).

**Table 1. Attitude/Behavioral Findings by Occupation**

		Physician		Nurse		AHP		Total		p value
		n	%	n	%	n	%	n	%	
Cervical cancer education or training	No	21	25.6	73	56.2	20	58.8	114	46.3	<b>&lt;0.001</b>
	Yes	61	74.4	57	43.8	14	41.2	132	53.7	
Desire to receive education about gynecological cancers	No	23	28	21	16.2	17	50	61	24.8	<b>&lt;0.001</b>
	Yes	59	72	109	83.8	17	50	185	75.2	
Being involved in activities aimed at preventing cancer	No	57	69.5	114	87.7	32	94.1	203	82.5	<b>&lt;0.001</b>
	Yes	25	30.5	16	12.3	2	5.9	43	17.5	
Recommendation for HPV vaccine	No	0	0	51	39.2	19	55.9	70	28.5	<b>&lt;0.001</b>
	Yes	82	100	79	60.8	15	44.1	176	71.5	
Should the HPV vaccine be included in the national vaccination program?	No	5	6.1	10	7.7	1	2.9	16	6.5	<b>&lt;0.001</b>
	Yes	73	89	72	55.4	19	55.9	164	66.7	
	No idea	4	4.9	48	36.9	14	41.2	66	26.8	
Availability of HPV vaccination	No, I don't think I will	29	35.4	82	63.1	26	76.5	137	55.7	<b>&lt;0.001</b>
	No, I'm thinking of doing it	48	58.8	43	33.1	8	23.5	99	40.2	
	Yes	5	6.1	5	3.8	0	0	10	4.1	
Vaccination status of your daughter/sister	No, I don't think I will	7	8.5	56	43.1	17	50	80	32.5	<b>&lt;0.001</b>
	No, I'm thinking of doing it	54	65.9	47	36.2	8	23.5	109	44.3	
	No idea	21	25.6	27	20.8	9	26.5	57	23.2	
Total		82		130		34		246		

Reasons why 236 people who were not vaccinated were as follows: Lack of information about cervical cancer vaccine: 95 (38.6%), not considering that the vaccine as protective: 13 (5.2%), thinking that they were not in the cervical cancer risk group: 46 (18.6%), the cost of the vaccine: 58 (23.5%), fear of the side effects of the vaccine: 29 (11.7%), lack of accessibility to the vaccine: 49 (19.9%). Other reasons were negligence and lack of time.

When we evaluated the rate of having smears among sexually active participants, it was 55.2% among AHP; 55.1% in nurses and 32.7% among physicians, which was statistically significant ( $p=0.028$ ). The reasons for not having a smear ( $n: 160$ ) were as follows: not being sexually active: 70 (43.75%), not having any complaints: 45 (28%),

not seeing themselves in the risky group: 22 (13.75%), refraining from gynecological examination: 33 (20.62%), planning to it in the future: 62 (38.75%), not time for screening: 4 (0.25%).

The answers for the questions about the diagnosis of cervical cancer, transmission route, risk factors and information about cervical cancer and HPV vaccine were scored and their knowledge levels were measured over 22 points. The medians of knowledge scores were 15 for physicians, 11 for nurses and 8 for AHP (Table 2). The median scores of risk factor knowledge scores were 6 for physicians, 6 for nurses and 5 for AHP. Frequencies of responses to cervical cancer risk factors shown in Table 3.

**Table 2. Cervical Cancer and HPV Vaccine Knowledge Scores**

		<b>Risk factors score (max: 10 points) Median (25-75)</b>	<b>Knowledge score (max: 12 points) Median (25-75)</b>	<b>Total knowledge score (max: 22 points) median (25-75)</b>
Physician		6 (5-7)	9 (7-10)	15 (13-16)
Nurse		6 (5-7)	5 (3-6)	11 (10-14)
AHP		5 (3-6)	3 (0-4.5)	8 (5-11.25)
P value	Physician-Nurse	>0.05	<b>&lt;0.001</b>	<b>&lt;0.001</b>
	Physician-AHP	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>
	Nurse-AHP	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>

**Table 3. Responses on Cervical Cancer Risk Factors**

Risk factors		Physician		Nurse		AHP		Total		p
		n	%	n	%	n	%	n	%	
Smoking	No	9	11	20	15.4	9	5.3	38	15.4	>0.05
	Yes	73	89	110	84.6	25	73.5	208	<b>84.6</b>	
Sexual contact at an early age	No	6	7.3	59	45.4	12	61.8	86	35	<b>&lt;0.001</b>
	Yes	76	92.7	71	54.6	13	38.2	160	<b>65</b>	
Multiple sexual partners	No	1	1.2	18	13.8	15	29.3	34	13.8	<b>&lt;0.001</b>
	Yes	81	98.8	112	86.2	19	55.9	212	<b>86.2</b>	
Nulliparity	No	11	13.4	30	23.1	5	14.7	46	<b>18.7</b>	>0.05
	Yes	71	86.6	100	76.9	29	85.3	200	81.3	
Number of births >3	No	40	48.8	84	64.6	23	67.6	147	59.8	<b>0.044</b>
	Yes	42	51.2	46	35.4	11	32.4	99	<b>40.2</b>	
Obesity	No	22	26.8	42	32.3	8	23.5	72	29.3	>0.05
	Yes	60	73.2	88	67.7	26	76.5	174	<b>70.7</b>	
Family history of cervical cancer	No	24	29.3	17	13.1	14	41.2	55	22.4	<b>&lt;0.001</b>
	Yes	58	70.7	113	86.9	20	58.8	191	<b>77.6</b>	
Long-term use of OCS	No	50	61	90	69.2	30	88.2	170	69.1	<b>0.015</b>
	Yes	32	39	40	30.8	4	11.8	76	<b>30.9</b>	
Early menopause	No	18	22	48	36.9	8	23.5	74	30.1	<b>0.046</b>
	Yes	64	78	82	63.1	26	76.5	172	<b>69.9</b>	
Low intake of fruits and vegetables	No	38	46.3	26	20	3	8.8	67	27.2	<b>&lt;0.001</b>
	Yes	44	53.7	104	80	31	91.2	179	<b>72.8</b>	

## DISCUSSION

In our study, the knowledge level of physicians was significantly higher than nurses and AHP. All of the physicians, two-thirds of the nurses and less than half of the AHP stated that they recommended HPV vaccine to the people around them. In terms of administering HPV vaccine to own's relative, the rates were below our expectations. Only half of the participants had a screening test.

Our study revealed that the rate of receiving postgraduate education (vocational seminars, etc.) related to cervical cancer was higher in physicians compared to other occupational groups. The desire to receive education was found at the highest rate in nurses. In a similar study, nurses at a rate close to that in our study (61.7%), stated that they were not educated about HPV infection and vaccine (15). In a study among nursing students, 90% of the students in the Aegean Region and 80% of the students in the Eastern Anatolia stated that they wanted to be educated about HPV (16). Postgraduate seminars could be planned and repeated at regular intervals, especially for the demands of nurses on this subject. In another study, 20 female (5.6%) and 6 (4%) male participants had HPV vaccination, with a mean vaccination rate of 4.3%. Although the low vaccination rate, 44.3% of the participants stated that they were considering getting vaccinated (17). In our study, a total of ten participants (4.1%), five physicians and five nurses, had been vaccinated, and the desire to be vaccinated was less than half. In studies conducted with healthcare professionals, HPV vaccination rates were generally around 4%, with similar data obtained in our study (17). In the general population, the rate of HPV vaccination varies between 1.0-4.3% (18), which is similar to our study. None of the healthcare professionals participated in our study had their daughter or sibling vaccinated against HPV. Half of the participants stated that they were considering HPV vaccination to their relatives. Physicians were twice as likely to consider having their relatives vaccinated compared to other occupational groups. In the study of Oz et al., 30.5% of health workers stated that they or their relatives had HPV vaccination, 65.8% of them stated that they could have HPV vaccination for themselves and 71.6% for their daughters (19). In another study, 73.5% of nurses were either undecided or thought negatively about HPV vaccination, and nurses' thoughts about vaccination seemed positive through in-hospital.

training (20). Agirman et al. investigated the attitudes of healthcare professionals to prevent cancer and 21.6% of healthcare professionals stated that they had their children vaccinated against HPV (21). In a cross-sectional study conducted with nurses in Istanbul, 52.8% of the participants stated that they could have their girls vaccinated with HPV vaccine (17). In the study of Naki et al., there was no difference between physicians and other occupational groups in terms of getting HPV vaccination, and the desire to have their children vaccinated was significantly higher in physicians (22). As a result of the studies, although there are regional differences, more than half of the health care workers tend to recommend their relatives for vaccination. In our study, less than half of the AHP, two-thirds of the nurses and the total of the physicians stated that they would recommend vaccination to their relatives, neighbors, etc. The reason for not being vaccinated while recommending to the others maybe because they do not see themselves at risk. 1/5 of our participants cited not being at risk as the reason for not getting vaccinated. In a study among Chinese and Korean doctors and nurses, 36.7% of the participants stated that they recommended vaccination to their female patients, and there was no difference between both occupations (23). Two-thirds of our participants suggested HPV vaccine should be included in the NVP and this was significantly higher in physicians. In another study, these rates were 73.9% in the total, 71.7% of the physicians, 80% of the nurses, and 70% of the AHP (24). According to the results of another study among nurses, this rate was 45.9% (17). A study, carried out in three centers with 1405 mothers, 25% of the participants stated that they can have their child vaccinated if it was included the NVP (25). The fact that the vaccine is not included in the NVP and the cost are the primary reasons why physicians do not adequately recommend the vaccine to society (26). However, considering the cost of treatments, initiatives to reduce the morbidity and mortality of diseases and cancers, vaccination seems a reasonable cost-effective method. For instance, if all 12-year-old girls in the USA are vaccinated, more than 200,000 HPV infections, 100,000 abnormal cervical cytology and 3300 cervical cancer cases can be prevented annually, thus a cost-effectiveness rate of 43,000 dollars can be gained for each healthy life year (27). When the ten-year data of the countries that integrated the vaccine into their NVP were examined, a significant decrease was found in the incidence of HPV-related diseases and cancers (28).

It is crucial to include the vaccine in the NVP in order to cover the entire population and also, to increase the awareness of the society is essential in order to encourage the HPV vaccination, which is not yet in our NVP.

According to the results of our study, half of the sexually active participants did not have a smear. Interestingly, the rates of AHP and nurses were over 50%, whereas only 1/3 of the physicians had undergone cervical smears. Although the knowledge level of physicians was higher, nurses and AHP were more compatible with having (routine cervical) smears. In a study held with primary and tertiary healthcare professionals, higher smear rates (75.6%) were found than our study (29). In another study, 87.4% of the primary health care workers stated that they had heard of the Pap smear test, while the rate of those who had the test was only 45.2% (30). In another study, this rate was 34.8% (31). The low Pap smear rates in our study may be due to the lower mean age. As expected, the level of knowledge among physicians was higher than other groups in our study. In a similar study, the average knowledge score out of 20 points was 12 for doctors, 8.4 for nurses, and 7.2 for other healthcare professionals, and a significant difference was also observed (32). The most important step in the fight against cancers is to identify and to prevent risk factors. Most of our participants had an average knowledge of risk factors. In another study participants got low knowledge scores (12). In terms of knowledge scores, significance was observed among groups. It was about three fold in physicians comparing with AHP. In a similar study among primary care physicians, the average knowledge score of physicians was  $7.29 \pm 3.02$  (min:0, max:18) (33). In another study, the mean score of physicians was  $4.88 \pm 0.77$  out of six points, and  $4.07 \pm 0.73$  for other health personnel (22). In another study, the mean knowledge score was  $4.27 \pm 1.79$  (min:0, max:10) among nursing students (34). As it was not a population-based study, our results do not reflect the whole female health care workers. This can be a limitation of our study, whereas it can be considered as a preliminary study as we could not reach any other studies regarding our staff.

## CONCLUSION

Although healthcare professionals got high knowledge scores and were highly sensitive about recommending vaccines to their patients, seemed to be more hesitant about smear testing and vaccination in terms of themselves and their relatives.

They also strongly suggested HPV vaccination should be included into the NVP. Educational programs should be organized for both health workers and the society, and knowledge about cancer risk factors and prevention methods should be increased. Curriculums for preventive health services in medical, midwifery and nursing schools should be reviewed, and up-to-date information on cervical cancer and HPV vaccine should be conveyed to healthcare professionals.

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