

## Original Article

## Evaluation of Awareness, Behavior, and Knowledge Levels of Female Healthcare Professionals About Breast and Cervical Cancer in Southern Turkey

## Türkiye'nin Güneyindeki Kadın Sağlık Çalışanlarının Meme ve Rahim Ağzı Kanseri Konusundaki Farkındalık, Davranış ve Bilgi Düzeylerinin Değerlendirilmesi

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## ABSTRACT

**Purpose:** This study aimed to measure the level of knowledge of female healthcare professionals about breast cancer and cervical cancer.

**Methods:** This cross-sectional study including 310 female healthcare staff working in Hatay Training and Research Hospital was conducted between January 2020 and June 2020. The Turkish version of breast cancer and cervical cancer awareness measure questionnaires were used for the study.

**Results:** The age of the 310 participants varied from 17 to 62 years, 16.5% of the participants were doctors, 48.1% of them were nurses and midwives, 13.9% of them were laboratory workers and technicians, 16.5% of them were secretaries, and 5.2% of them were students. Regarding breast cancer screening, 63.5% underwent breast self-examination (BSE) routinely. Of the participants, 60.3% never underwent mammography (MMG) and ultrasonography (USG), 27.7% never went for a gynecological examination, and 58.4% had never received a Pap smear test.

**Conclusions:** The level of knowledge about breast cancer was sufficient among especially doctors and nurses but their attitudes and behaviors were not of the expected level.

**Keywords:** Breast cancer; cervical cancer; HPV; pap smear; questionnaire

## ÖZET

**Amaç:** Bu çalışma ile amacımız, kadın sağlık çalışanlarının meme ve serviks kanseri hakkındaki bilgi düzeylerini ölçmektir.

**Gereç ve Yöntem:** Bu kesitsel çalışmada Ocak 2020 ile Haziran 2020 arasında Hatay Eğitim ve Araştırma Hastanesinde çalışan 310 kadın sağlık çalışanı çalışmaya dahil edildi. Çalışma için meme kanseri ve serviks kanseri farkındalık anketlerinin Türkçe versiyonu kullanıldı.

**Bulgular:** 17-62 yaş aralığındaki 310 katılımcının (ort: 34.3 ± 8.8) %16.5'i doktor, %48.1'i hemşire ve ebe, %13.9'u laboratuvar çalışanı ve teknisyen, %16.5'i sekreter ve %5.2'si öğrencidir. Meme kanseri taramasına yönelik %63.5'i rutin kendi kendine meme muayenesi (KKMM) yaptı. Katılımcıların %60.3'ü hiç mamografi (MMG) ve ultrasonografi (USG) yaptırmadı, %27.7'si hiç jinekolojik muayene olmadı ve %58.4'ü hiç pap smear test aldırmadı.

**Sonuç:** Özellikle doktor ve hemşirelerin meme kanseri hakkındaki bilgileri yeterli olmakla birlikte tutum ve davranışları yeterli düzeyde değildi.

**Anahtar Kelimeler:** Meme kanseri, serviks kanseri, HPV, pap smear, anket

## Introduction

According to the 2018 data of the Global Cancer Observatory, 18.1 million people were diagnosed with cancer worldwide and 10 million people died of it. In 2018, breast cancer ranked first among all cancers in women worldwide with 2 million (24.2%) cases, while cervical cancer ranked fourth with 569,000 (6.6%) cases. Similarly, breast cancer ranked first in terms of death rate with 626,000 (15%) cases and cervical cancer fourth with 311,000 (7.5%) cases [1]. Mammography (MMG) is the gold standard in breast cancer screening. The American Cancer Society (ACS) and the American Institute for Cancer recommend a regular breast self-examination (BSE) at the age of 20–40 years and an annual medical examination and MMG after the age of 40 years [2,3]. In Turkey, the Ministry of Health also recommends undergoing an MMG every 2 years for women aged more than 40 years [4]. Smith et al. [5] reviewed eight randomized controlled trials and reported that MMG decreased mortality to 20% in the age group 40–74 years, to 15% in the age group 40–49 years, to 22% in the age group 50–74 years, and to 30% in all age groups.

More than 85% of deaths due to cervical cancer occur in low- and middle-income countries [6]. The most important risk factor in the development of cervical cancer is the human papillomavirus (HPV) infection [7]. HPV has more than 150 subtypes, and 12 of them lead to cervical cancer. The most common types are HPV-16 and HPV-18; it is known that 300 million people worldwide carry this virus [8,9]. In 2012, the ACS recommended cervical cancer screening for women after 3 years of sexual experience or from the age of 21 years, whether sexually active or not, using the Pap smear test [10,11]. This study aimed to measure the level of knowledge of doctors, nurses, laboratory workers, secretaries, and students, who work in hospitals and have various socioeconomic,

cultural, and educational levels, about breast cancer and cervical cancer, which are detectable and preventable diseases, to evaluate their attitudes and habits.

## Materials and Methods

This was a cross-sectional study sample consisting of 310 female healthcare staff working aged 17–65 years, including doctors, nurses, midwives, laboratory workers, technicians, students, and secretaries conducted in the Hatay Training and Research Hospital between January 2020 and June 2020.

The Turkish version of breast cancer [12] and cervical cancer [13] awareness measure questionnaires were used for the study. The purpose of the study was explained before distributing the questionnaire forms, and the participants were told not to write their names and identities on the form. The filled-in questionnaires were collected 10–15 min later. The questionnaire comprised 42 items and 3 subparts. The first part consisted of 12 questions regarding sociodemographic characteristics, which included age, body mass index (BMI), educational status, occupation, place of residence, marital status, chronic disease history, smoking and alcohol use, sports activity, menopausal status, and family cancer history. The second part, which consisted of six questions, included the sources of information about cancers, whether the participants underwent BSE, ultrasonography (USG), and MMG and their results, and the frequency of going for a gynecological examination and doing a Pap smear. The third part consisted of 24 questions, including the knowledge level about breast cancer, cervical cancer, Pap smear, and HPV vaccine.

Inclusion criteria were being a healthcare staff worker for at least 1 year and being between ages 17-65 years. Exclusion criteria were females that declined participation.

### Ethical approval

Ethics committee approval was obtained at the meeting of Mustafa Kemal University Tayfur Ata Sökmen Medical Faculty Non-Invasive Clinical Research Ethics Committee (meeting number: 15, decision number: 17) on December 26, 2019. The principles of the Helsinki Statement have been followed. A voluntary informed consent form was signed, stating that the data obtained from the participants of the study would be kept confidential and not be shared with anyone.

### Statistical analysis

Mean, standard deviation, median, lowest, highest, frequency, and ratio values were used in the descriptive statistical analysis of data. The distribution of variables was measured using the Kolmogorov–Smirnov test. The Mann–Whitney U test was used for analyzing quantitative independent data, while the chi-square test was used for analyzing qualitative independent data. The Fisher test was used when the chi-square test conditions were not met. Statistical significance was accepted as  $P < 0.05$ . IBM SPSS Statistics for Windows, version 25.0 (IBM Corp., Armonk, N.Y., USA) was used for statistical analyses

### Results

The age of the 310 participants, who filled in the questionnaire, varied from 17 to 62 years, and the mean age was  $34.3 \pm 8.8$  years. All sociodemographic characteristics are shown in Table 1. Behaviors and attitudes about breast and cervical cancer screening of all participants are shown in Table 2.

Regarding questions about breast cancer, the highest rate of a correct answer was 97.7% to the question "There are screening centers for breast cancer" and the lowest rate of a correct answer was 49.7% for the question "The most common symptom of breast cancer is a pain in the breast." Regarding the questions about cervical cancer, the highest rate of a correct

answer was 96.5% to the question "Cervical cancer is a disease that can be diagnosed and screened early" and the lowest rate of a correct answer was 36.1% to the question "Pap smear scan begins 3 years after the first sexual experience." All questions and correct answer rates for measuring breast and cervical cancer knowledge levels are shown in Table 3.

The answers with statistically significant differences between the doctors/nurses and other staff groups to the questions about BSE, USG, MMG, gynecological examination, Pap smear, and breast and cervical cancer knowledge level are shown in Table 4. Table 5 shows the comparison between the groups aged  $\leq 39$  years and  $\geq 40$  years, and Table 6 shows the same between those with and without a family history of cancer.

### Discussion

Cervical and breast cancers have a high chance of being cured when diagnosed early. The importance of scanning methods increases every day. The literature states that BSE, USG, and MMG for breast cancer, gynecological examination and with pap smear test for cervical cancer facilitate early diagnosis, thus increasing survival rates [7,14]. The present study found that the rate of having knowledge about early diagnosis and screening was 95.8% for breast cancer and 96.5% for cervical cancer. This knowledge was mostly (61.9%) obtained from healthcare professionals, followed by conferences/seminars (20.0%). Acikgoz et al. [15] reported, in their study on female workers in hospitals, that information was obtained at the highest rate from healthcare workers (35.4%) and then from friends/neighbors (19.3%). Discigil et al. [16] found, in their study on females living in the Aegean region, that the most common information source was the television (64.7%). In the present study, the sample consisted of hospital employees, and hence the most common information source was healthcare personnel.

Table 1. Distribution of hospital staff by sociodemographic characteristics ( $n = 310$ )

<b>1. Age, year (mean <math>\pm</math> sd)</b>		34.3 $\pm$ 8.8		
<b>2. BMI (mean <math>\pm</math> sd)</b>		23.8 $\pm$ 4.1		
		<b><i>n</i></b>	<b>%</b>	
<b>3. Education status</b>				
Secondary school		3	1.0	
High school		54	17.4	
University		253	81.6	
<b>4. Job</b>				
Doctor		51	16.5	
Nurse/midwife		149	48.1	
Labor/technician		43	13.9	
Student		16	5.2	
Secretary		51	16.5	
<b>5. Living place</b>		Village	7	2.3
		Town	42	13.5
		City	261	84.2
<b>6. Marital status</b>		Married	181	58.4
		Single	116	37.4
		Divorced	10	3.2
		Widow	3	1.0
<b>7. Chronic diseases</b>		Yes	60	19.4
		HT	10	3.2
		DM	8	2.6
		Others	42	13.5
		No	250	80.6
<b>8. Smoking</b>		Yes	75	24.2
		No	210	67.7
		Ex-smokers	25	8.1
<b>9. Alcohol intake</b>		Yes	103	33.2
		No	207	66.8
		Every day	2	0.6
		Occasionally	5	1.6
		Sometimes	96	31.0
<b>10. Doing sports</b>		Yes	59	19.0
		No	127	41.0
		Irregular	124	40.0
<b>11. Menopause status</b>		Postmenopausal	18	5.8
		Premenopausal	292	94.2
<b>12. Family history of cancer</b>		Yes	60	19.4
		First degree	23	7.4
		Second degree	25	8.0
		Third degree	12	3.8
		No	250	80.6

BMI, Body mass index; DM, diabetes mellitus; HT, hypertension.

Table 2. Behaviors and attitudes about breast and cervical cancer screening ( $n = 310$ )

	<i>n</i>	%
<b>13. Where did you get information about early diagnosis and screening?</b>		
TV/radio	31	10.0
Magazine/newspaper/brochure	21	6.8
Doctors/nurses/midwives	192	61.9
Friends/neighbors/relatives	4	1.3
Conference/seminar	62	20.0
<b>14. Do you conduct BSE for breast cancer screening?</b>		
Yes	197	63.5
No	37	11.9
Sometimes	76	24.5
<b>15. How often do you undergo MMG and breast USG?</b>		
Never	187	60.3
Once a year	37	11.9
Twice a year	22	7.1
Irregular	64	20.6
<b>16. What is the result of your last USG and MMG?</b>		
No information	17	13.8
Normal results (control after 1 year)	40	32.5
Normal results (control after 2 years)	40	32.5
Benign breast diseases (cyst, fibroadenoma)	23	18.7
Suspicious mass (biopsy result is normal)	3	2.4
<b>17. How often do you go for the gynecology examination?</b>		
Regularly	44	14.2
In case of complaint	180	58.1
Never	86	27.7
<b>18. How often do you undergo a Pap smear test?</b>		
Never	181	58.4
Once a year	34	11.0
Twice a year	17	5.5
At intervals of 3–5 years	32	10.3
Irregularly	46	14.8

BSE, Breast self-examination; MMG, mammography; Pap smear, Papanicolaou smear

Table 3. Knowledge levels about breast and cervical cancer ( $n = 310$ )

No	Questions	Correct information	
		<i>n</i>	%
19	Breast cancer is a disease that can be diagnosed and screened early.	297	95.8
20	The most common cause of breast cancer is pain in the breast.	254	49.7
21	Breast cancer occurs only in advanced age.	291	93.9
22	Breast cancer occurs only in women.	246	79.4
23	Turkey has screening centers for breast cancer.	303	97.7
24	Biopsy is absolutely necessary because every mass in the breast makes you think of cancer.	183	59.0
25	Surgery is performed only in the last stage of the breast cancer.	263	94.8
26	Cervical cancer is a disease that can be diagnosed and screened early.	299	96.5
27	Turkey has screening centers for cervical cancer.	292	94.2
28	Early starting of sexual activity is a risk factor for cervical cancer.	215	69.4
29	Multiple partners for cervical cancer are a risk factor.	260	83.9
30	Increased number of pregnancies increases the risk of cervical cancer.	119	38.4
31	Compliance with genital hygiene rules reduces the risk of cervical cancer.	250	80.6
32	HPV is an important factor in the development of cervical cancer.	260	83.9
33	Cervical cancer can be prevented with HPV vaccine.	232	74.8
34	HPV vaccine is available in Turkey.	270	87.1
35	HPV vaccine is available for free.	168	54.2
36	HPV vaccine is administered only for women.	145	46.8
37	For HPV vaccination, sexual experience is required.	222	71.6
38	Men do not get sick with HPV; they are only carriers.	117	37.7
39	HPV has only one type, and it only settles in the genital area.	211	68.1
40	The Pap smear test starts at the age of 21 years.	118	38.1
41	The Pap smear test is started after 3 years of the first sexual activity.	112	36.1
42	Pap smear test is not required after the HPV vaccine.	263	84.8

HPV, Human papilloma virus; Pap smear, Papanicolaou smear.



Table 4. Comparison of the attitudes and statistically significant knowledge levels of the doctors/nurses group and other staff group about breast and cervical cancer

No	Questions	Doctors/nurses (n = 200)		Other staff (n = 110)		P
		n	%	n	%	
14	<b>Do you conduct BSE for breast cancer screening?</b> Yes No Sometimes	136 17 47	68.0 8.0 23.5	61 20 29	55.5 18.2 26.4	<b>0.027</b>
15	<b>How often do you undergo MMG and breast USG?</b> Never Once a year Twice a year Irregular	120 23 15 42	60.0 11.5 7.5 21.0	67 14 7 22	60.9 12.7 6.4 20.0	0.967
17	<b>How often do you go for the gynecology examination?</b> Regular In case of complaint Never	30 118 52	15.0 59.0 26.0	14 62 34	12.7 56.3 30.9	0.619
18	<b>How often do you undergo a Pap smear test?</b> Never Once a year Twice a year At intervals of 3–5 years Irregular	114 21 13 21 31	57.0 10.5 6.5 10.5 15.5	67 13 4 11 15	60.9 11.8 3.6 10.0 13.6	0.819
19	<b>Breast cancer is a disease that can be diagnosed and screened early.</b> Correct information Incorrect information	195 5	97.5 2.5	102 8	92.7 7.3	<b>0.045</b>
20	<b>The most common cause of breast cancer is pain in the breast.</b> Correct information Incorrect information	111 89	55.5 44.5	43 67	39.1 60.9	<b>0.006</b>
22	<b>Breast cancer occurs only in women.</b> Correct information Incorrect information	170 30	85.0 15.0	76 34	69.1 30.9	<b>0.001</b>
24	<b>Biopsy is absolutely necessary because every mass in the breast makes you think of cancer.</b> Correct information Incorrect information	135 65	67.5 32.5	48 62	43.6 56.4	<b>0.000</b>
25	<b>Surgery is performed only in the last stage of the breast cancer.</b> Correct information Incorrect information	177 23	88.5 11.5	86 24	78.2 21.8	<b>0.015</b>
34	<b>HPV vaccine is available in Turkey.</b> Correct information Incorrect information	180 20	90.0 10.0	90 20	81.8 18.2	<b>0.040</b>
35	<b>HPV vaccine is available for free.</b> Correct information Incorrect information	120 80	60.0 40.0	48 62	43.6 56.4	<b>0.006</b>
37	<b>For HPV vaccination, sexual experience is required.</b> Correct information Incorrect information	154 46	77.0 23.0	68 42	61.8 38.2	<b>0.005</b>
38	<b>Men do not get sick with HPV; they are only carriers.</b> Correct information Incorrect information	84 116	42.0 58.0	33 77	30.0 70.0	<b>0.037</b>
39	<b>HPV has only one type and it only settles in the genital area.</b> Correct information Incorrect information	149 51	74.5 25.5	62 48	56.4 43.6	<b>0.001</b>
41	<b>The pap smear test is started after 3 years of the first sexual activity.</b> Correct information Incorrect information	64 136	32.0 68.0	48 62	43.6 56.4	<b>0.041</b>
42	<b>Pap smear test is not required after the HPV vaccine.</b> Correct information Incorrect information	180 20	90.0 10.0	83 27	75.5 24.5	<b>0.001</b>

$\chi^2$ , Chi square test.

BSE, Breast self-examination; HPV, human papilloma virus; MMG, mammography; Pap smear, Papanicolaou smear; USG, ultrasonography.

Table 5. Comparison of the attitudes and statistically significant knowledge levels of ≤39 years age group and ≥40 years age group about breast and cervical cancer

No	Questions	≤39 years age group (n = 209)		≥40 years age group (n = 101)		P
		n	%	n	%	
14	<b>Do you conduct BSE for breast cancer screening?</b>					<b>0.008</b>
	Yes	124	59.3	73	72.3	
	No	33	15.8	4	4.0	
	Sometimes	51	24.4	24	23.8	
15	<b>How often do you undergo MMG and breast USG?</b>					<b>0.000</b>
	Never	151	72.2	36	35.6	
	Once a year	14	6.7	23	22.8	
	Twice a year	6	2.9	16	15.8	
	Irregular	38	18.2	26	25.7	
17	<b>How often do you go for the gynecology examination?</b>					<b>0.002</b>
	Regular	25	12.0	19	18.8	
	In case of complaint	113	54.1	67	66.3	
	Never	71	34.0	15	14.9	
18	<b>How often do you undergo a Pap smear test?</b>					<b>0.000</b>
	Never	154	73.7	27	26.7	
	Once a year	16	7.7	18	17.8	
	Twice a year	6	2.9	11	10.9	
	At intervals of 3–5 years	10	4.8	22	21.8	
	Irregular	23	11.0	23	22.8	
20	<b>The most common cause of breast cancer is pain in the breast.</b>					<b>0.017</b>
	Correct information	94	45.0	60	59.4	
	Incorrect information	115	55.0	41	40.6	
35	<b>HPV vaccine is available for free.</b>					<b>0.024</b>
	Correct information	104	49.8	64	63.4	
	Incorrect information	105	50.2	37	36.6	

$\chi^2$ , Chi square test.

BSE, Breast self-examination; HPV, human papilloma virus; MMG, mammography; Pap smear, Papanicolaou smear; USG, ultrasonography.



Table 6. Comparison of the attitudes and statistically significant knowledge levels of the groups with and without a family history of breast and cervical cancer

No	Questions	Family history of cancer + (n = 60)		Family history of cancer – (n = 250)		P
		n	%	n	%	
14	<b>Do you conduct BSE for breast cancer screening?</b> Yes No Sometimes	39 5 16	65.0 8.3 26.7	158 32 59	63.2 12.8 23.6	0.603
15	<b>How often do you undergo MMG and breast USG?</b> Never Once a year Twice a year Irregular	28 11 3 18	46.7 18.3 5.0 30.0	159 26 19 46	63.6 10.4 7.6 18.4	<b>0.037</b>
17	<b>How often do you go for the gynecology examination?</b> Regular In case of complaint Never	8 36 16	13.3 60.0 26.7	36 144 70	14.4 57.6 28.0	0.943
18	<b>How often do you undergo a Pap smear test?</b> Never Once a year Twice a year At intervals of 3–5 years Irregular	28 5 5 7 15	46.7 8.3 8.3 11.7 25.0	153 29 12 25 31	61.2 11.6 4.8 10.0 12.4	0.071
22	<b>Breast cancer occurs only in women.</b> Correct information Incorrect information	54 6	90.0 10.0	192 58	76.8 23.2	<b>0.023</b>
29	<b>Multiple partners for cervical cancer are a risk factor.</b> Correct information Incorrect information	56 4	93.3 6.7	204 46	81.6 18.4	<b>0.026</b>
30	<b>Increased number of pregnancies increases the risk of cervical cancer.</b> Correct information Incorrect information	31 29	51.7 48.3	88 162	35.2 64.8	<b>0.019</b>

$\chi^2$ , Chi square test.

BSE, Breast self-examination; HPV, human papilloma virus; MMG, mammography; Pap smear, Papanicolaou smear; USG, ultrasonography.

### Breast Cancer

The rate of performing BSEs regularly was 63.5%, while that of performing BSEs irregularly was 24.5% in this study. In the literature, the rate of performing BSEs regularly was 4.3%–38.8%, which were higher compared with the results of the present study [15]. The rate of performing BSE irregularly ranged from 29.5% to 34.5%, which were lower compared with the results of the present study [17].

The rate of performing BSE was significantly higher in doctors/nurses compared with the other personnel and significantly higher in the  $\geq 40$  years age group compared with the  $\leq 39$  years age group in this study. No significant difference was found between the participants with and without family history of cancer in this study. In a similar study by Nahcivan et al. [18] performing BSE was not affected by educational status or family history of cancer; married females and those aged more than 40 years had a higher rate of performing BSEs.

Dundar et al. [17] did not find a significant difference between the age groups. In another study, the BSE ratio was found to be significantly higher in nurses than in doctors and other personnel, but no difference was found between age groups. [19] Although the literature supports the lack of effect of family history of cancer on BSE rates, no consensus existed on the effect of age and occupational groups. In this study the rate of undergoing breast USG and MMG was found to be 39.7%. The rate of undergoing them every year was 11.9%. The rate of undergoing regular breast USG and MMG was 3.2% in a study examining women aged 20 years and older, who applied to a family health center [20]; 20% in a study examining hospital employees [15]; and 44% in a survey for other healthcare professionals [19]. The low rate of performing screening tests may be attributed to the low mean age of the participants. In the present study, the USG and MMG performance rate was 64.4% in females aged 40 years and older, 21.8% in females aged 39 years and younger, 53.3% in those with a family history of cancer, and 36.4% in those without a family history of cancer; these differences were found to be statistically significant. Also, 40% of the doctors/nurses and 39.1% of the other staff group underwent USG and MMG, but no significant difference was found between these two groups. In the study by Özcam et al. [19], the screening rates increased as the mean age increased, but no significant difference was observed in relation to the family cancer history and education levels. Another study evaluated females aged between 40 and 69 years. As age increased, the rate of undergoing USGs and MMGs also increased. In addition, those in the 40–49 years age group with a family history of cancer had more USGs and MMGs compared with those without a family history of cancer, and those with higher education undergo USGs and MMGs more often compared with those with lower education; these differences were found to be significant. In the 50–69 years' age group, no

significant difference was observed in relation to the education level and family history of cancer [21]. It found that as the mean age increased and the participants had a family history of cancer, they were prone to have breast cancer screenings more regularly, and these findings were consistent with the literature. However, the lack of difference between professions in the present study was attributed to the fact that the mean ages were close to each other.

In the present study, among the seven questions asked for measuring breast cancer knowledge levels, the most correct answer was given to the question "There are screening centers for breast cancer" (97.7%). The question with the lowest rate of correct answers was the question about the method of application of breast cancer, with a rate of 49.7%. Doctors and nurses answered all seven questions more correctly compared with the other staff. A statistically significant difference was observed in the questions regarding early diagnosis, method of application, sex-related difference, biopsy indications, and treatment options. However, no significant difference was noted in questions about screening centers and age of occurrence. Participants aged  $\geq 40$  years answered all the questions about breast cancer more correctly compared with those aged  $\leq 39$  years. Despite a statistically significant difference in the question regarding the most frequent method of application, no significant difference was observed in other questions with respect to age. Participants who did not have a family history of cancer answered the question regarding the method of application more correctly compared with those who did have a family history of cancer. Those with a family history of cancer answered the other six questions more correctly. Although the rate of giving correct answers to the question about the possibility of breast cancer in both sexes was significantly higher than in those with a family history of cancer, no difference

was observed in other questions. In a study, the participants were asked to list the admission symptoms of breast cancer, and the most common answer was “palpable swelling in the breast,” with a rate of 72.4% [22]. Discigil et al. [16] reported the rate of those who had information about the age of occurrence of breast cancer was 51.7%, and the rate of those who knew that breast cancer could develop in males was 49.8%. In another study, females aged 30–70 years were examined in four groups, and their knowledge about breast cancer was questioned. Their knowledge was found to decrease with age, but they underwent more screening [23]. In the present study, correct answers were obtained at rates close to those in the literature regarding the questions about admission symptoms and cancer screening. Contrary to the literature, the rate of correct answers increased with age, but these increased rates did not differ statistically. It was believed that doctors and nurses with a high level of education had more information about breast cancer, education level had less effect on basic issues, and the presence of a family history of cancer did not affect the level of knowledge.

### Cervical Cancer

In the present study, no significant difference was found in the rates of undergoing gynecological examination and Pap smear test according to occupational groups and family history of cancer but it was found significantly higher in the age group of more than 40 years. In a study conducted on healthcare professionals, the rate of undergoing a Pap smear test at least once was reported as 43.5%, and the rate of having it done regularly at 1-year intervals was 31.5% [19]. The same study found that doctors and nurses had undergone significantly fewer smear tests compared with other personnel, and that positive family history of cancer had no effect on smear tests [19]. Pinar et al. [24] reported, in their study on nurses aged 20–43 years, that the rate of undergoing regular gynecological exam-

inations was 26.4%, and the rate of undergoing regular Pap smear tests was 30.4%. In another study, the rate of undergoing regular gynecological examination was 30.3%, and the rate of undergoing a Pap smear test was 45.2% [25]. A study conducted in Africa in 2003 found that only 18.7% of healthcare professionals underwent a Pap smear test [26]. In a study conducted with Korean–American females aged more than 60 years, the rate of undergoing a Pap smear test at least once in their life was 58.5%. Participants aged more than 70 years had significantly more Pap smear tests compared with those aged 60–69 years, those who were married underwent more Pap smear tests compared with those who were not, and those who had higher education underwent more tests compared with those who did not [27]. The rate of undergoing a Pap smear test had different distribution ranges in many scientific studies, and the increase in this rate in advanced age groups in this study was in accordance with the literature. Besides the close ratios in employees with different education levels was attributed to in-hospital interaction.

An effective way to prevent cervical cancer is the prophylactic administration of the HPV vaccine. In America, vaccination started for girls aged 9–26 years in 2006. The Food and Drug Administration recommended three doses of vaccination for boys of the same age group in 2009 to protect boys from genital warts and anal cancers [28].

The participants were asked 17 questions to measure their knowledge about cervical cancer. Doctors/nurses answered 14 of 17 questions most correctly, while the other 3 questions regarding the number of pregnancies being a risk factor and screening start age were answered most correctly by the other personnel. A statistically significant difference was observed in 6 of the 14 questions to which doctors/nurses gave more correct answers, and in 1 of the 3 questions to

which the other personnel gave more correct answers. No significant difference was observed in the other questions according to the occupational group. The age group 40 years and older gave more correct answers to 11 questions, and the age group 39 years and younger to 6 questions. A statistically significant difference was found only in the answers to the question "HPV vaccine is available free of charge" among the questions that the age group 40 years and older gave more correct answers to. No significant difference was found in the other 16 questions according to age. Those with a family history of cancer answered 9 questions more correctly, and those without a family history of cancer answered 8 questions more correctly. Despite a statistically significant difference in the two questions that those with a family history of cancer answered more correctly, no significant difference was observed in the other questions according to the family history of cancer. In a survey conducted on female healthcare professionals, it was reported that those who underwent a Pap smear test had given more correct answers, compared with those who did not undergo a Pap smear test, regarding the vaccine protects from cancer, HPV is a risk factor for cervical cancer, and that the age of first sexual intercourse and multiple sexual partners increase the risk [29]. In another study conducted to measure the knowledge level of hospital staff, more than 90% of the doctors gave correct answers to the questions about HPV infection and the mode of

transmission. No significant difference was observed between nurses and doctors [30]. In a similar study conducted on nurses in Thailand, 81.8% of the participants knew that having sexual intercourse at a young age was a risk factor, 85.6% knew that having multiple sexual partners was a risk factor, and 72.2% knew that HPV infection was a risk factor [31]. The low mean age and the small number of participants were among the limitations of this study. Large studies questioning more parameters are needed.

### Conclusion

The frequency of performing BSE, MMG, and USG increased with age in all occupational groups, but this increase was found to be insufficient. Although doctors and nurses were found to have a high level of knowledge on basic issues about cervical cancer and risk factors, their attitudes and behaviors were not at the expected level. Moreover, the attitudes and knowledge level of other personnel were low. The level of knowledge of all hospital staff, regardless of their age and family history of cancer, was found to be low on specific issues such as the supply of HPV vaccine, when it should be administered, and to whom it could be administered. The HPV vaccine should be included in the vaccination program; audio, visual media, and social media should be used effectively. The informed staff could ensure that correct information was conveyed to their immediate surroundings and thus to the whole society.

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