Relationship between Breast Cancer Fear and Prevention Behaviors of Female Healthcare Professionals

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ABSTRACT

Objective: The objective of this study was to investigate the relationship between breast cancer fear and breast cancer prevention behaviors of female healthcare professionals (HCPs). **Materials and Methods:** This descriptive correlational study involved a convenience sample of 338 nurses, midwives and physicians working at a state hospital in Turkey. Data were collected using Questionnaire Form, Breast Cancer Fear Scale (BCFS), and Scale of Factors Affecting Women's Breast Cancer Prevention Behaviors (ASSISTS). **Results:** The mean scores on BCFS and ASSISTS were 26.71 ± 7.65 and 123.36 ± 15.49 respectively, indicating breast cancer fear were high and breast cancer prevention behaviors were moderately. The higher breast cancer prevention behavior scores among the HCPs who were working longer years, working longer years in night shift, those having breast problems, and undergone breast biopsy, those performing breast self-examination, undergone clinical breast examination and mammography ($p < 0.05$). There was no significant association between breast cancer fear and breast cancer prevention behaviors ($p > 0.05$). **Conclusion:** Professional education and training in breast cancer prevention behaviors and addressing fear on breast cancer are likely to result in reduced barriers to develop prevention behaviors.

Keywords: Breast Cancer, Prevention Behaviors, Fear, Healthcare Professional.

Kadın Sağlık Profesyonellerinin Meme Kanseri Korkusu ile Önleme Davranışları Arasındaki İlişki

ÖZ

Amaç: Bu çalışmanın amacı, kadın sağlık profesyonellerinin meme kanseri korkusu ile meme kanseri önleme davranışları arasındaki ilişkiyi incelemektir. **Gereç ve Yöntem:** Bu tanımlayıcı ve ilişki arayıcı çalışma, Türkiye'de bir devlet hastanesinde çalışan 338 hemşire, ebe ve hekimin uygun örneklemini içermektedir. Veriler Anket formu, Meme Kanseri Korku Ölçeği (MKKÖ) ve Kadınların Meme Kanserinden Korunma Davranışlarını Etkileyen Faktörler Ölçeği (MEKÖD) kullanılarak toplanmıştır. **Bulgular:** MKKÖ ve MEKÖD puan ortalamaları sırasıyla 26.71 ± 7.65 ve 123.36 ± 15.49 olup meme kanseri korkusunun yüksek ve meme kanserini önleme davranışlarının orta düzeyde olduğunu göstermektedir. Daha uzun yıl çalışan, daha uzun yıl gece vardiyasında çalışan, meme sorunu olan, meme biyopsisi yaptıran, kendi kendine meme muayenesi yapan, klinik meme muayenesi yaptıran ve mamografi çektiren kadın sağlık profesyonellerinin meme kanserini önleme davranış puanları daha yüksektir ($p < 0.05$). Meme kanseri korkusu ile meme kanserini önleme davranışları arasında anlamlı bir ilişki bulunmamıştır ($p > 0.05$). **Sonuç:** Meme kanseri önleme davranışları ve meme kanseri korkusunu ele alma konusunda mesleki eğitim ve öğretim, önleme davranışlarının geliştirilmesine yönelik engellerin azaltılmasına katkı sağlayacaktır.

Anahtar Kelimeler: Meme Kanseri, Önleme Davranışları, Korku, Sağlık Profesyonelleri.

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INTRODUCTION

Over the world, the most common cancer is breast cancer and the second leading cause of cancer death after lung cancer (Ferlay et al., 2020). Female breast cancer ranks first as the most common cancer type and has a high rate in cancer-related mortality among females in Turkey (Ferlay et al., 2020). GLOBOCAN 2020 estimated the worldwide age-specific, standardized breast cancer prevalence as 47.8 per 100.000 and mortality as 13.6 per 100.000 (Sung et al., 2021). The breast cancer prevalence is 46.6 per 100.000 and mortality rate as 12.9 per 100.000 in Turkey (Sung et al., 2021).

Breast self-examination (BSE), breast self-awareness, clinical breast examination (CBE) and screening mammography can potentially increase early detection of breast cancer to improve treatment outcomes (Fitzgerald et al., 2015). National breast cancer screening standards covers BSE once a month, CBE once a year and mammogram every two years for women aged 40-69 years in Turkey (Turkey Cancer Control Programme, 2021). Besides, women over the age of 20 are recommended BSE once a month and CBE once a year for life. Screening is conducted by Family Health Centers and Cancer Early Diagnosis, Screening and Education Centers (KETEM) free of charge (Turkey Cancer Control Programme, 2021).

The increase in breast cancer rates reveals the concept of fear of breast cancer (FBC). FBC is a psychological and physiological response to the possibility of breast cancer (Secginli, 2012). Fear can occur as a preventive reason for being diagnosed with breast cancer, loss of the breast, other problems that may occur with cancer, pain and thoughts of death, and early diagnosis behaviors (Champion et al., 2004; Secginli, 2012). The most negative effect of FBC is the fact that it causes avoidance behavior. Developing avoidance behavior to cope with fear also prevents early diagnosis. For these reasons, fear of breast cancer is considered an important factor among reasons for delayed diagnosis and treatment (Awwad et al., 2022; Özkan & Taylan, 2021).

Being female is the major risk factor for developing breast cancer (Fitzgerald et al., 2015). In addition to the gender-related risk factors, female healthcare professionals (HCPs) work with many risk factors that increase the risk of breast cancer. Existing studies suggest that occupational exposures such as night shift, chemical exposures, and stress at work or ionizing radiation increase the risk for breast cancer (Shen, Hsieh, Pan, Wu and Chuang, 2021). In this context, female HCPs constitute an important group in terms of having high risk for breast cancer and their role in the prevention and early diagnosis of breast cancer (Shen et al., 2021). They should be aware of the factors that prevent and facilitate behaviors to develop positive behaviors in themselves and in the individuals to whom they provide health services (Mekonnen, 2020; Shen et al., 2021). It is also very important to explore the level of fear and plan the relevant interventions for this in developing early diagnosis behaviors for breast cancer. Therefore, our aim in this study was to investigate breast cancer fear and breast cancer prevention behaviors among female HCPs and to determine the relationship between breast cancer fear and breast cancer prevention behaviors.

Research questions

• What is the breast cancer fear level of women HCPs?
• What is the level of breast cancer prevention behaviors of women HCPs?
• Are there any differences between some characteristics of women HCPs and their breast cancer fear and breast cancer prevention behaviors?
• Is there a relationship between breast cancer fear and breast cancer prevention behaviors of women HCPs?

MATERIALS AND METHODS

Study type

This study is descriptive and correlational study design.

Place and time of the study

This study was conducted at a state hospital located in the northwest of Turkey between April and June 2021.

Population and sample

The study population consisted of 350 female HCPs, 242 of whom were nurses or midwives and 108 were physicians at a state hospital. The study was carried out on the whole population. The convenience sample of the study consisted of female HCPs who were at work at the hospital when the data collected, did not have breast cancer diagnosis and volunteered to participate in the study ($n_{nursing}$= 163, $n_{phsician}$= 100, $n_{midwife}$= 75). Five female HCPs who were on maternity leave when the study data was being conducted and four female HCPs who could not participate in the study due to workload, were not included in the study. A total of 338 women HCPs were included in the study and the participation rate was 97%.

Dependent and independent variables

Dependent variables of the research includes the scores of breast cancer fear scale (BCFS) and scale of factors affecting women's breast cancer prevention behaviors. (ASSISTS). Independent variables of the study includes socio-demographic characteristics, obstetric characteristics, breast cancer risk factors, and breast cancer early diagnostic behaviors.

Data collection tools

Questionnaire form

A self-constructed form was developed making use of the relevant literature (Bulut & Bulut, 2017; Cal, Kabatas Yildiz, Aydin and Avci, 2018; Ersin & Dedeoğlu, 2020). The form consisted of 29 questions about socio-demographic and obstetric characteristics, risk factors for breast cancer, and

breast cancer early diagnosis behaviors. Body mass index (BMI) was calculated based on the self-reported of participants via this formul $(kg)/[height(m)]^2$. A BMI of below 18.5 kg/m2 were defined as underweight; 18.5–24.99 as normal weight; 25.0–29.99 as overweight and 30 kg/m2 or over as obese (World Health Organization [WHO], 2014).

Breast cancer fear scale

The BCFS was developed by Champion (Champion et al., 2004) to examine the breast cancer fear by determining the emotional responses of women to breast cancer and screening. The Turkish validity and reliability test of the scale was conducted by Secginli (2012). The scale consists of eight items with 5-point Likert-type. Scoring between 8-15 on the scale indicates low breast cancer fear, scoring between 16-23 indicates moderate breast cancer fear, and scoring between 24-40 indicates a high level of breast cancer fear (min=8; max=40). In the study of Secginli (2012) the Cronbach alpha of the scale was 0.90. In our study, the Cronbach alpha was 0.89.

Scale of factors affecting women's breast cancer prevention behaviors

ASSISTS was developed by Khazaee-Pool et al., (2016) to determine the factors affecting breast cancer prevention behaviors of women. The Turkish validity and reliability test of the scale was conducted by Turan and Yiğit (2021). The scale consists of 33 items with 5-point Likert-type and seven sub-scales namely support systems, motivation, attitude, self-efficacy, self-care, stress management, and information seeking. Total scores range from 33 to 165. A high score indicates positive behavior in breast cancer prevention behaviors. Eight items (items 1, 2, 3, 18, 19, 21, 22 and 23) are reversely scored when answering the items in the scale. In the study of Turan and Yiğit (2021), the Cronbach alpha of the scale was 0.75. In our study, the Cronbach alpha was 0.85.

Data collection

Data were collected via face-to-face interviews. Interviews were made without causing any disruption in the routine treatment and follow-up hours and taking into account the social distance measures to ensure protection against coronavirus disease. Filling in the data collection forms lasted for 10 to 15 minutes.

Statistical analysis

Data were analysed using IBM SPSS, version 26 (IBM Corp., Armonk, NY, USA). Number, percentage, mean, and standard deviation were used as descriptive statistics. To compare the difference between variables with two measures and with more than two measures in independent samples were used independent t-test and one-way ANOVA with Tukey multiple comparison, respectively. Pearson's correlation analyses was used to investigate the relations between two independent continuous variables. Sstatistical significance level was p≤0.05.

Ethical considerations

The ethic committee approval from Non-Interventional Health Research Ethical Committee of a State University (Approval No. 2021/48, 15 February 2021), institutional permissions and permissions for using the scales were obtained. Verbal and written informed consent was obtained from the participants included in the study. The study conducted in accordance with the principles of the Declaration of Helsinki.

RESULTS

A total of 350 female HCPs were approached to participate in our study, 338 female HCPs (97%) were included in the data analysis. The mean age of the participants was 32.60±6.89 (min=23, max=49), the mean age at menarche was 13.41±1.85 (min=12, max=20), the mean age for the first delivery was 25.59±2.91 (min=20, max=35), the mean number of pregnancy was 2.05±0.94 (min=1, max=6) and the mean working period was 7.62±6.65 years.

Most participants were with a university diploma (52.1%), were nurses (48.2%), were married (58.9%) and had been working for 0-5 years (52.1%). Most participants had a child (47.3%), breastfeed after birth (94.4%), gave first delivery at the age of 30 or younger (95.6%), had two pregnancies (48.1%), and worked in a night shift (74.3%) for 0-5 years (65.3%). Approximately one in fifth of the participants were smokers (18.0%), 2.7% were alcohol users and 22.2% did regular physical activity. A breast-related health problem was reported by 9.2% of participants, 6.5% had a biopsy and 18.8% had family history of breast cancer.

Among the participants, 74.6% performed regular BSE, 33.1% undergone CBE and 13.6% had an at least one mammography. Among the reasons for not performing BSE, were mostly absence of complaints (53.5%) and were the fear of finding a breast lump (19.8%). Among the reasons for not undergone CBS, were mostly absence of complaints (41.6%) and were not expected to get breast cancer (31.4%). Among the reasons for not having a mammogram were mostly absence of complaints (66.8%) (Table 1).

The mean BCFS score of the participants in our study was 26.71±7.65 (min=8, max=40). Of all participants, 7.9% had low, 24.6% moderate and 67.5% high level breast cancer fear. The item with the highest mean of the scale items was "I am afraid when I think of breast cancer" with 3.87, and the item with the lowest mean was "I get angry when I think of breast cancer" with 2.38. The mean ASSISTS score of the participants in our study was 123.36±15.49 (min=81, max=160). The mean score of ASSISTS subscales were; supportive systems 14.90±3.88, motivation 18.04±2.19, attitude 29.02±4.89, self-efficacy 15.65±2.93, self-care 19.72±3.99, stress management 10.79±2.53, and information seeking 15.24±3.12, respectively (Table 2).

In the study, the ASSISTS scores of the participants showed statistically significant differences depending

on the variables of education status, working year, duration of work on night shift, BMI, breast problem, breast biopsy, BSE, CBE and mammography (p<0.05). Accordingly, the ASSISTS mean score of those with high school and associate degree education were statistically significantly higher than those with undergraduate or graduate degree (p=0.013). The ASSISTS mean score of those working for 11 years or more and above was statistically significantly higher than those between 0-10 years (p=0.010). Those who had worked at night shift for 11 years or more had a statistically significant higher ASSISTS mean score than those with a 0-10 year period (p=0.002). Those who were overweight and obese depending on their BMI score had higher ASSISTS mean score than those underweight (p=0.039). The ASSISTS mean scores of those who had breast problems were significantly higher than those who did not (p<0.001). The ASSISTS mean scores of those who had a biopsy were significantly higher than

those who did not have (p<0.001). The ASSISTS mean scores of those who did BSE were significantly higher than those who did not (p<0.001). The ASSISTS mean scores of those who had CBE were significantly higher than those who did not have CBE (p<0.001). The ASSISTS mean scores of those who had mammography were significantly higher than those who did not have (p<0.001). BCFS scores did not show a statistically significant difference according to the variables of age, occupation, working style, smoking and regular physical activity (p>0.05). In addition, the BCFS scores of the participants did not show a statistically significant difference by the variables of age, education status, profession, working year, shift pattern, duration of night shift work, smoking, regular physical activity, BMI, breast problems, breast biopsy, BSE, CBE and mammogram (p>0.05) (Table 3). Table 4 shows no statistically significant correlation between BCFS and ASSISTS total scores (r:-0.018; p>0.05).

Table 1. Distribution of breast cancer prevention behaviors (n=338).

Breast cancer prevention behaviors	n	%*
Breast self-examination		
Yes	252	74.6
No	86	25.4
Reasons for not doing BSE (n:86)		
No complaints	46	53.5
Fear of finding a breast lump	17	19.8
Not having time	9	10.5
Fear of feeling pain	9	10.5
Others (not necessary, boring)	5	5.8
Clinical breast examination		
Yes	112	33.1
No	226	66.9
Reason for not having/undergone clinical breast examination (n:226)		
No complaints	94	41.6
Not expecting to get breast cancer	71	31.4
Not having time	35	15.5
Fear of being diagnosed	20	8.8
Others (be ashamed, fear of feeling pain)	6	2.7
Mammography		
Yes	46	13.6
No	292	86.4
Reason for not having a mammography (n:292)		
No complaints	195	66.8
Not having time	31	10.6
Fear of being diagnosed	29	9.9
Exposure to radiation	18	6.2
Others (fear of feeling pain, be ashamed)	19	6.5

*Column percentage.

DISCUSSION

Our study was conducted to investigate breast cancer fear and breast cancer prevention behaviors among female HCPs and to determine the relationship between fear of breast cancer and breast cancer prevention behaviors. In the study, we found high

levels of breast cancer fear and moderate level of breast cancer prevention behaviors among female HCPs. The study results showed that there was a difference between the female HCPs' education, working year, night work duration, BMI, breast

problems, breast biopsy, BSE, CBE and mammography, and ASSISTS mean scores. The results also stated that the breast cancer fears of female HCPs have no relation with women's breast cancer prevention behaviors. In our study, 74.6% of female HCPs applied BSE, 33.1% had CBE and 13.6% had mammogram. Among female HCPs in Turkey, BSE rates range from 76.1% to 61.2%, CBE

rates to 53.7% to 6.7%, and mammogram rates to vary between 20.5% and 8.6% (Bulut & Bulut, 2017; Cal et al., 2018; Çakmak & Güler, 2017; Ersin & Dedeoğlu, 2020; Kulakçı-Altıntaş & Korkmaz-Aslan, 2019). A recent systematic review was reported BSE among women HCWs in Ethiopia between 80.7% and 32.5% (Mekonnen, 2020).

Table 2. The mean scores of BCFS and ASSISTS (n=338).

BCFS Items	Mean	SD	Min-Max
When I think about breast cancer, I get scared	3.87	1.18	1-5
When I think about breast cancer, I feel nervous	2.38	1.25	1-5
When I think about breast cancer, I get upset.	3.86	1.19	1-5
When I think about breast cancer, I get depressed.	2.85	1.34	1-5
When I think about breast cancer, I get edgy	3.74	1.20	1-5
When I think about breast cancer, my heart beats faster	2.75	1.37	1-5
When I think about breast cancer, I feel uneasy	3.56	1.31	1-5
When I think about breast cancer, I feel anxious.	3.71	1.27	1-5
Total of BCFS	26.71	7.65	8-40
Level of Breast Cancer Fear	**n**	**%**	
Low (score 8–15)	27	7.9	
Moderate (score 16–23)	83	24.6	
High (score 24–40)	228	67.5	
ASSISTS Subscales	**Mean**	**SD**	**Min-Max**
Supportive systems	14.90	3.88	5-20
Motivation	18.04	2.19	10-20
Attitude	29.02	4.89	14-40
Self-efficacy	15.65	2.93	6-20
Self-care	19.72	3.99	10-30
Stress management	10.79	2.53	4-15
Information seeking	15.24	3.12	7-20
Total of ASSISTS	123.36	15.49	81-160

BCFS: Breast Cancer Fear Scale; ASSISTS: Scale of Factors Affecting Women's Breast Cancer Prevention Behaviors

In the study of Andegiorgish, Kidane and Gebrezgi (2018), it was stated that 75.5% of the nurses in Eritrea had BSE, 30% had CBE and 11.3% had mammography. In the study of Heena et al., (2019), in Saudi Arabia, a total of female HCPs reported 74.7% practicing BSE, 24.1% had undergone CBE, and 18.7% had ever undergone mammography. The results of our study are consistent with the results of other studies. However, this shows that breast cancer prevention behaviors were not at a desirable level among female HCPs. The most important way to develop preventive health behaviors is to provide education programs to increase knowledge and create awareness. Therefore, greater efforts may be needed to strengthen HCPs' awareness of breast cancer. In this context, it could be said that in-service training

programs are necessary in order to improve awareness of female HCPs about breast cancer and their behaviors for preventing breast cancer. In our study, as a reason for not having a BSE, CBE and mammogram of female HCPs were mostly the absence of any complaint. In the literature, the main reason for not undergoing a BSE or CBE is also not having any complaint, and one reason for not having a mammogram, is also not considering it necessary (Azem et al., 2015; Çakmak & Güler, 2017; Heena et al., 2019). These results suggest that even if females are HCPs, they could not take responsibility for their own health as long as there are no sign nor symptom of breast cancer. In this context, it is needed to provide education about the barriers of female HCPs in the implementation breast cancer prevention behaviors, and to increase their knowledge and

awareness levels by ensuring that the importance of the behaviors is comprehended. In our study, female HCPs have high levels of breast cancer fear.

Our study finding suggests that the level of fear breast cancer may be unique, even among HCPs with a high level of awareness of breast cancer. The result of our study is consistent with the results of other studies (Cal et al., 2018; Emami et al., 2021). In the study of Ersin and Dedeoğlu (2020), it is seen that the breast cancer fear is moderately high among nurses. This results show that the level of fear triggered by breast cancer has not changed much, despite the positive epidemiological changes that have occurred in many developed countries.

In our study, the breast cancer prevention behaviors of female HCPs were moderately positive. This result is similar to the studies conducted Emami et al.

(2021), Gül and Büyükbayram (2022), Turan (2019). In addition, we found that the lowest subscale mean scores in our study were self-care and stress management. Self-care includes personal skills, abilities, behaviors, and habits that encourage engaging in preventative behaviors. Stress management includes approaches such as self-help, prayer, positive thinking, sleep and rest time, which aim to control the stress level. When we are aware of the importance of preventive behaviors, we will have more motivation to perform such behaviors (Khazaee-Pool et al., 2016; Turan, 2019). In this context, self-care and stress management issues should be included in the in-service trainings to be planned to increase the positive attitudes and awareness of female HCPs towards breast cancer prevention behaviors.

Table 3. The mean scores of BCFS and ASSISTS according to some characteristics (n=338).

Characteristics	n(%)	BCFS Mean±SD	Analysis	ASSISTS Mean±SD	Analysis
Age (years)					
≤29	144(42.6)	26.17±7.78		121.58±15.15	
30-39	118(34.9)	27.81±7.26		124.12±15.38	
40≥	76(22.5)	26.04±7.91	[a]0.155	125.57±16.14	[a]0.155
Education status					
College and associate degree	37(10.9)	28.32±8.24		130.43±17.60	
Undergraduate degree	176(52.1)	26.30±6.86		122.57±15.62	**[a]0.013***;
Postgraduate	125(37.0)	26.80±8.48	[a]0.339	122.36±14.18	1-2,3[c]
Profession					
Nurse	163(48.2)	25.90±7.57		123.95±15.18	
Midwife	75(22.2)	26.57±7.27		125.07±18.13	
Physician	100(29.6)	28.13±7.93	[b]0.071	121.12±13.66	[a]0.199
Working years					
0-10 years	237(70.1)	27.16±7.57		121.94±15.03	
11 years and more	101(29.9)	25.63±7.57	[b]0.091	126.68±16.11	**[b]0.010***
Shift patterns					
Day	87(25.7)	25.49±8.05		123.80±16.36	
Night	251(74.3)	27.13±7.48	[b]0.086	123.21±15.21	[b]0.757
Night shift work duration					
0-10 years	214(63.3)	27.43±7.51		121.95±14.80	
11 years and more	37(10.9)	25.35±7.6	[b]0.117	130.46±14.93	**[b]0.002***
Smoking					
Smokers	61(18.0)	26.66±7.74		123.02±17.31	
Non-smokers	277(82.0)	26.72±7.65	[b]0.951	123.44±15.10	[b]0.848
Regular physical activity					
Yes	75(22.2)	24.99±7.87		126.05±15.94	
No	263(77.8)	27.20±7.53	[b]0.848	122.59±15.31	[b]0.951
BMI[d] (n=140)					
Underweight (<18.5 kg/m^2)	16(11.5)	28.62±7.21		115.88±17.69	
Overweight and obese (>25 kg/m^2)	124(88.5)	25.50±9.98	[b]0.140	124.76±15.87	**[b]0.039***
Breast problem[e]					
Yes	31(9.2)	26.29±8.90		132.48±15.51	
No	307(90.8)	26.75±7.53	[b]0.749	122.44±15.22	**[b]<0.001****
Breast biopsy					
Yes	22(6.5)	25.91±9.89		133.68±12.49	
No	316(93.5)	26.77±7.49	[b]0.612	122.64±15.44	**[b]<0.001****

Table 3. (Continued) The mean scores of BCFS and ASSISTS according to some characteristics (n=338).

Characteristics	n(%)	BCFS Mean±SD	Analysis	ASSISTS Mean±SD	Analysis
Breast self-examination					
Yes	252(74.6)	26.61±7.54		127.58±14.52	
No	86(25.4)	27.00±8.01	[b]0.685	110.99±11.04	[b]**<0.001****
Clinical breast examination					
Yes	112(33.1)	26.79±7.23		132.92±14.52	
No	226(66.9)	26.67±7.87	[b]0.898	118.62±13.70	[b]**<0.001****
Mammography					
Yes	46(13.6)	28.26±7.88		136.43±12.80	
No	292(86.4)	26.47±7.60	[b]0.139	121.30±14.88	[b]**<0.001****

ASSISTS: Scale of factors affecting women's breast cancer prevention behaviors, BMI: Body Mass Index, *p<0.05; **p<0.001; [a]One-Way ANOVA, [b]Independent t-test, [c]difference between the groups, [d]normal BMI is not included, [e]breast lump and nipple discharge

Table 4. Pearson correlation analysis between BCFS and ASSISTS scores.

	Analyses	Breast Cancer Fear Scale
Scale of Factors Affecting Women's Breast Cancer Prevention Behaviors	r	-0.018
	p	0.740

BCFS: Breast Cancer Fear Scale, ASSISTS: Scale of Factors Affecting Women's Breast Cancer Prevention Behaviors, r: Pearson correlation coefficient

Working at night shifts and being exposed to artificial light cause irregularity in melatonin hormone secretion, which increases the risk for breast cancer among HCPs. It is stated that the risk level of breast cancer increases as the working year increases among female HCPs (Shen et al., 2021). In our study, it is seen that the breast cancer prevention behaviors of those with longer working years and longer working the night shift are higher. It can be thought that this situation is related to the increase in the awareness of being in the risk group with the increase in the age and stress factors, which are among the breast cancer risk factors, together with the increase in the working years of the HCPs.

Healthy lifestyle behavior education programs for prevention of breast cancer, such as regular exercise, adequate and balanced nutrition, and weight control especially after menopause, are important. Overweight and obesity is among the risk factors for breast cancer. Estrogen biosynthesis after menopause is catalyzed in adipose tissue. Being overweight or obese after menopause can increase the risk of breast cancer by increasing the estrogen level in women (Picon-Ruiz, Morata-Tarifa, Valle-Goffin, Friedman and Slingerland, 2017). In our study, it is seen that the breast cancer prevention behaviors of those with overweight and obese are higher. It can be thought that this situation is related to the fact that being in the risk group increases awareness about prevention behaviors. In our study, breast cancer prevention behaviors positively affected those who had breast problems and had a biopsy. This finding shows that it is effective in the positive development of early diagnosis behaviors, as it increases the risk perception of breast problems. In the study of Kulakçı-Altıntaş and Korkmaz-Aslan (2019), it is reported that those who have breast problems adopt breast cancer early diagnosis behaviors more.

The practice of breast cancer early diagnosis behaviors by HCPs is important in reducing breast cancer mortality and morbidity rates as a role model for the society (Mekonnen, 2020; Shen et al., 2021). In our study, regular BSE, CBE and mammogram had a positive effect on breast cancer prevention behaviors. Our study finding is compatible with the literature (Gül & Büyükbayram, 2022). These results are promising in terms of raising awareness of regular practice of breast cancer prevention behaviors and training on prevention of breast cancer and revealing the importance of early diagnosis and prevention of breast cancer.

In a recent meta-synthesis study conducted by Ozkan and Taylan (2021) the barriers to participation in breast cancer screening was identified as fear, perception of breast cancer and beliefs, embarrassment, lack of knowledge and motivation, negative experiences and socio-economic status. The "fear" was found to be one of the most important a barrier to participation in breast cancer screenings (Ozkan & Taylan, 2021). In our study, although it was found that as the breast cancer fear level increased, breast cancer prevention behaviors decreased, and there is not any relation found between. In the study of Ersin and Dedeoğlu (2020), it was found that, as

the level of breast cancer fear increases, there is an increase in early diagnosis behaviors. In the study of Emami et al., (2021), no relationship was found between breast cancer fear and mammogram screenings. In the study conducted by Abu Awwad, Hossain, Mackey, Brennan, and Adam (2022), fear of breast cancer was identified as both an enabling factor and a barrier to breast cancer screening. In this context, it seems that breast cancer fear has different effects on early diagnosis behaviors. Our study shows similarities and differences with the literature.

Strengths and limitations of study
To the best of our knowledge, this is the first study to investigate the relationship between breast cancer fear and breast cancer prevention behavior of women HCPs who are in the risk groups for breast cancer and having a key role in gaining early diagnosis behaviors. However, it also has a number of limitations. Firstly, ASSISTS scale does not include samples from the studies conducted in different societies. This limited the comparison of our study results with other studies. Secondly, the sample of the study was limited to the women HCPs who is nurse, midwife, and physician in a state hospital. Therefore, further multi-centered studies with larger populations are necessary, including other women HCPs. The final limitation is using of a sample from single-centered. Therefore, that would limit representativeness and generalizability of the results to the entire women HCPs of Turkey.

CONCLUSION
In conclusion, the study revealed that women HCPs had high levels of breast cancer fear and their breast cancer prevention behaviors were not sufficient. It was found that approximately three-quarters of women HCPs had BSE, two-fifth had CBE and one-fifth had mammograms. The study findings also indicated higher breast cancer prevention behavior scores among the HCPs who were working longer years and night shifts, those having breast problems, and undergone breast biopsy, those performing breast self-examination, undergone clinical breast examination and mammography. These results reveal that the importance of decreasing the fear and risk of breast cancer and developing breast cancer prevention behaviors, which may help reduce morbidity and mortality due to breast cancer is required. In this context, it is recommended to plan both undergraduate and postgraduate trainings in order to reduce the fear and risks of breast cancer, and to develop prevention behaviors of women HCPs who have a high risk of breast cancer and play a key role in gaining early diagnosis behavior.

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Conflict of Interest

Author Contributions

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Ethical considerations

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