Evaluation of the Impact of Nurses' Healthy Lifestyle Behaviors on Utilization from Breast Cancer Early Diagnosis Methods

Zeliha Koç¹, Pınar Çelebi², Ayşegül Memiş³, Zeynep Sağlam¹, Figen Beyhan²

¹Fundamental of Nursing, Ondokuz Mayıs University, Samsun Medical School, Samsun, Turkey

²Samsun Health Training and Research Hospital, Ondokuz Mayıs University, Samsun, Turkey

³Gazi State Hospital, Samsun, Turkey

ABSTRACT

Objective: This descriptive study was designed to determine the impact of nurses' healthy lifestyle behaviors on utilization from breast cancer early diagnosis methods.

Materials and Methods: The study was carried out with 236 (41.7%) nurses who agreed to participate out of 565 nurses who work in a university hospital from February 12th to February 15th 2011. Healthy Lifestyle Behaviors Scale was collected by using a questionnaire consisting of 41 questions. The Healthy Lifestyle Behaviors Scale was improved by Walker, Sechrist and Pender (1987) and was adapted to Turkish by Esin (1997). The data was evaluated by percentage calculation, one-way ANOVA, t-test and Tukey's test.

Results: The mean Healthy Lifestyle Behaviors Scale score was 129.09±19.82, the mean scores subscale scores of self-actualization, health responsibility, exercise, nutrition, interpersonal support and stress management were 38.52±6.28, 24.95±5.39, 9.41±3.24, 16.99±3.29, 21.22±3.39 and 17.99±3.66 respectively. It was found that Healthy Lifestyle Behaviors Scale total score was higher in nurses with sufficient level of breast cancer knowledge ($F=13.115$, $p=0.000$), who perform regular BSE ($t=3.191$, $p=0.002$) and who attended training on breast cancer ($t=3030$, $p=0.003$).

Conclusion: It was determined that although the mean total score of nurse's Healthy Lifestyle Behaviors Scale and their information on breast cancer prevention were above average, the utilization of breast cancer early detection services was not at the expected levels.

Key words: Knowledge, attitude, breast cancer, healthy lifestyle, application

Introduction

Breast cancer is the most common cancer in women (1). The incidence of 10 most common forms of cancer in women was reported as 41.7 per hundred thousand of the population for breast cancer, 14.3 for colorectal cancer, and 12.2 for thyroid cancer. In our country, the most common type of cancer was found as lung cancer in 2002, followed by breast, stomach, skin and bladder cancer in decreasing order (2, 3). In addition, it is estimated that the incidence of breast cancer increases more quickly in developing countries as compared with developed countries, and that the incidence will be 1,500,000 by 2010, and 2.5 million by 2020 (4). Due to these cancer incidence and mortality data, the importance of early diagnosis, diagnosis and treatment of cancer is of paramount significance in our country, as in the entire world (5).

Methods of early diagnosis in breast cancer are of great importance in reduction of cancer related deaths. The American Cancer Society and the American Cancer Institute recommend women to use breast cancer early detection methods such as mammography (MM), Clinical Breast Examination (CBE) and Breast Self-Examination (BSE) (6-9).

In several studies from our country and abroad it has been reported that nurses list methods of early diagnosis of breast cancer as BSE (78.9%), mammography (73%), specialist consultations (68.6%), ultrasonography (21.6%) and pathological examination of breast tissue (83.3%). It has been stated that 64% of the nurses have used at least one of these diagnostic methods, and 6% applied at least three methods. Nurses' age, education level, and features such as menopausal status did not affect the use of breast cancer follow-up programs (10). In another study it has been found that 93% of the nurses used "BSE beginning at 20 years", 94.3% had "mammography beginning at age 40", and 65.2% stated that "non-palpable masses can be identified with mammography" (11).

In order to reduce the increasing incidence of breast cancer in women, the level of awareness should be increased, women should be informed about screening for breast cancer and should be encouraged to acquire health improving behaviors. In this respect, it is of great importance to de-

termine the level of healthy lifestyle behaviors in health care professionals that may affect their knowledge and practices related to breast cancer, especially nurses who act as role models in the community (12, 13). Healthy lifestyle behaviors aim to improve their own health, and to increase control over their health. Healthy lifestyle behaviors cover all activities performed for improving health potential and well-being (14-16).

There are several studies regarding the knowledge and practices of nurses on breast cancer prevention, and utilization of early diagnostic methods both from our country and abroad (10-13, 17-28). However, a comprehensive study on the effect of nurses' healthy lifestyle behaviors on the utilization of breast cancer early diagnosis methods was not found. This observation has been the starting point of this research. Nurses, who are important members of the healthcare team, have responsibilities for their own health as well as taking care of individuals within the community (12), and they play an important role in the health education program of individuals, families and communities (13). In this respect, information on nurses' healthy lifestyle behaviors can help in increasing breast cancer-related knowledge, utilization of early detection services and breast cancer awareness status of both nurses and other women within the community.

This descriptive study was designed to determine the impact of nurses' healthy lifestyle behaviors on utilization from breast cancer early diagnosis methods. The answers to the following questions were sought :

1. What are the socio-demographic characteristics of the nurses who are included in the study (age, education level, marital status, working status)?
2. What is the level of information regarding breast cancer risk factors and symptoms among nurses?
3. What is the utilization status of methods for early diagnosis of breast cancer (BSE, CBE, MM) among nurses?
4. What is the level of healthy lifestyle behavior in nurses?
5. How do healthy lifestyle behaviors of nurses affect their utilization of early diagnosis methods in breast cancer?

Materials and Methods

This research was conducted at the Ondokuz Mayıs University Hospital. The study was conducted by participation of 236 (41.7%) volunteer nurses out of 565 who work at the hospital.

Data Collection Tool

Research data were collected by using an information form that was developed according to the related literature (11-13, 17-19, 29), and the Healthy Lifestyle Behaviors Scale formed by Walker et al (14) adapted to Turkish by Esin (15). Walker et al (14) have reported r-values of the scale as 0.93 for Total Healthy Lifestyle Behaviors and between 0.81 and 0.91 for sub-groups. Esin (16) evaluated the reliability of the scale by test-retest correlation, and reported the r values for scale sub-groups and its general as 0.99 for Healthy Lifestyle Behaviors, 0.98 for Health responsibility, 0.97 for Exercise, 0.98 for nutrition, 0.97 for Interpersonal support, and as 0.98 for Stress Management. Item-total correlations were evaluated to determine the internal consistency of the scale, and the lowest value was found to be 0.27 with the highest value of 0.55. Esin also determined alpha coefficients measured for the scale's internal consistency, as 0.91 for Total Healthy Lifestyle Behaviors, 0.77 for Self-Actualization, 0.74 for Health Responsibility, 0.71 for Exercise, 0.57 for Nutrition, 0.65 for Interpersonal Support and 0.63 for Stress Management. In this study, the Cronbach's alpha coefficient of the scale was found as 0.94.

In the original study of this scale performed by Walker et al (14) the total variance ratios were reported as 12.67% for Factor 1 and 3.15% for Factor 2, 1.2% for Factor 3, 1.57% for Factor 4, 1.4% for Factor 5, and 1.29% for Factor 6. According to the factor analysis results that measure the construction validity of the scale by Esin (16), in 6-factor analysis, 13-item factor 1 explained 19.7% of the total variance, 10-item factor 2 explained 6.1%, 5-item factor 3 explained 3.2%, 6-item factor 4 explained 2.8%, 7-item factor 5 accounted for 3.4%, and 7-item factor 6 explained 3.6% of the total variance.

The Healthy Lifestyle Behaviors Scale is used to measure the health promoting behaviors of an individual associated with a healthy lifestyle. The scale contains 48 items in 6 sub-groups including self-actualization, health responsibility, exercise, nutrition, interpersonal support and stress management. The total score of all the scale constitutes Healthy Lifestyle Behaviors Scale score. All items of the scale are positive. There are no negative items. The marks are made on a 4-point Likert-type scale. The lowest scale is 48, and the highest score is 192. The lowest and the highest scores have been reported in the original scale as 13-52 points for self-actualization, as 10-40 points for health responsibility, as 5-20 points for exercise, as 6-24 points for nutrition, as 7-28 points for interpersonal support and as 7-28 points for stress management sub-groups. A high score indicates that the individual applies health behaviors at a high level.

Data Collection

Researchers collected the data, after informing the nurses on the study aim, in the hospital setting, at an appropriate day and time for the nurses, by handing out an information form and the related scale. The scale is easy to use and to evaluate. Nurses have read and filled the information form and the scale individually. There was no time limit. The average response time was 12-15 minutes.

Study Ethics

A written Institutional Review Board permission was obtained from Ondokuz Mayıs University Health Education, Practice and Research Hospital (date 2/11/2011 and Issue: B.30.2.ODM.0.H1.00.00/929) and verbal consent was obtained from all nurses who participated in the study after providing relevant information. It was emphasized that the nurses are not obliged to participate in the study, that their names should not be written to the questionnaire, and that the data collected from this study will be used only for scientific purposes.

Statistical Analysis

The SPSS 15.0 statistical package (SPSS, Chicago, IL, USA) was used for evaluations with One-Way ANOVA, t-test and Tukey's test. Nurses' socio-demographic characteristics, their information and applications regarding breast cancer and early detection methods were expressed as numbers and percentages. In comparison of mean total scores of the two groups, the t test was used for independent samples to test the difference between two means, and one-way analysis of variance was used to compare the mean total scores of more than two groups. When there was a difference between more than two groups, the Tukey test was used in order to determine which group caused these differences. Statistically significance was accepted as $p < 0.05$.

Results

In this study, 61% of nurses had a bachelor's degree, 34.7% worked for 6-10 years and 66.5% were married, with a mean age of 30.73 ± 0.36 (Table 1). It was determined that 32.2% of nurses attended a train-

Table 1. Socio-demographic properties of nurses (n=236)

Property	n	%
Age group 30.73±0.36	19-25	44 18.6
	26-32	115 48.7
	33-39	61 25.9
	40-47	16 6.8
Education level	High School of Health	7 3.0
	Undergraduate	82 34.7
	Graduate	144 61.0
	Postgraduate	3 1.3
Occupation duration 9.19±0.39	1-5 year	72 30.5
	6-10 year	82 34.7
	11-15 year	45 19.1
	16-20 year	21 8.9
	21-25 year	16 6.8
Marital status	Single	79 33.5
	Married	157 66.5

ing session on the prevention of breast cancer, however, their breast cancer-related information was partially sufficient in 67.8%, and insufficient in 18.6%. 13.6% of close relatives of the participants had breast cancer, 36.4% were still smoking, and 11% received hormone replacement therapy. The mean age at first birth was 26.08±0.28, the mean duration of breastfeeding (in months) was 12.51±0.72 and the mean age at onset of was 13.04±0.09 (Table 2).

It was found that 76.7% nurses applied BSE but the number of nurses performing regular BSE was very low (26%), the frequency of breast examination was stated as “once a month” by 13.8%, and 21.5% performed the examination in 5-7th days of their menstrual cycle. The reasons for not performing routine BSE was listed as “negligence and laziness” by 87.2%, as “fear of possibly finding a mass” by 81.8%, as “forgetting” by 61.8%, as not finding the time by 52.7%, as not having any breast-related complaints by % 43.6 and the mean age of BSE onset was calculated as 23.55±4.84. Although 48.8% of the nurses thought that “every woman should have a CBE at least once a year”, only 25.8% had a CBE. The reasons for not having any CBE were listed as “not thinking CBE is necessary” by 90.2%, as “not having breast-related problems and complaints” by 76.6% and as “negligence” by 54.8%. It was determined that 2.5% of the nurses over age 40 had mammography. The frequency of mammography screening was stated as “whenever I think it is necessary” by 4.2%, the reasons for not having a mammography was listed as “not thinking mammography was necessary” by 85.4%, as “not being in the mammography age group” by 26% and as “thinking it is a painful method” by 14.6% (Table 2).

The breast cancer risk factors were listed as presence of breast cancer in close relatives (mother, sister, aunt) by 86.4% of the nurses, as alcohol and cigarette use by 69.5%, as not giving birth by 58.5%, as obesity and high-fat diet by 47%; and breast cancer symptoms were listed as breast mass by 97.5%, as nipple discharge by 87.7%, as abnormal growth in one of the breasts by 80.9%, as change in breast color by % 78.8 and as pitting in breast tissue by 75.4% (Table 3).

In this study, the mean total score was 129.09±19.82, mean subscale scores for self-actualization, health responsibility, exercise, nutrition, interpersonal support were 38.52±6.28, 24.95±5.39, 9.41±3.24, 16.99±3.29, 21.22±3.39, and 17.99±3.66 respectively (Table 4). In addition, mean total scores were significantly correlated with nurses’ level of knowledge on breast cancer, BSE performance, and breast cancer related training status. The total score of the scale was found to be higher in nurses with sufficient level of knowledge on breast cancer ($F=13.115$, $p=0.000$), in nurses who perform regular BSE ($t=3.191$, $p=0.002$), and in nurses who participated in breast cancer related training ($t=3.030$, $p=0.003$) as compared to those with insufficient level of knowledge, who do not perform regular BSE and who did not attend relevant training (Table 5).

Discussion and Conclusions

Several studies regarding knowledge and practices of nurses on breast cancer prevention from Turkey (11-13, 17-19) and abroad (10, 20-27) have showed significant differences in knowledge and application of BSE, CBE and mammography among nurses. These differences are thought to originate from research methodology, nurses’ socio-demographic (age, education level, marital status, etc.) and professional characteristics (working hours, related clinics, etc.).

76.7% of the nurses in this study performed BSE. BSE application rate of nurses varies between 17.7% and 93.7% (10-13, 17-19, 22-27, 31). In our study the number of nurses implementing regular BSE was very low (26%), the literature data supports our finding on this issue by reporting that the number of women is not at desired levels (10, 17, 22, 23, 25, 30, 31). Leight et al (32) have reported that very few numbers of women apply routine BSE according to its technique, although BSE is recommended to support CBE and mammography in the USA. The relatively low rate of BSE among nurses in our study suggests that their awareness on this issue is low.

In this study, nurses stated the reasons for not doing routine BSE as negligence and laziness (87.2%), fear of possibly finding a mass (81.8%), forgetting (61.8%), not finding the time (52.7%) and not having any breast-related complaints (43.6%). Other studies have reported similar reasons for not applying BSE, consistent with these findings: negligence, laziness, fear of finding something related to breast cancer and anxiety, not experiencing complaints associated with breast, forgetting, lack of time, lack of information on research findings, not convinced about or not believing in the importance of BSE, finding BSE unnecessary and not knowing how to perform BSE (13, 17, 19, 25, 31, 33). Performing BSE for the early diagnosis of breast cancer does not increase survival rate (34). However, women may detect breast masses early and can therefore start treatment early with BSE (35). BSE is simple, inexpensive, does not require invasive procedures, and is a benign application (36-39). Given that first symptom of breast cancer is usually revealed by a palpable mass, the importance of BSE in detecting a breast mass early is obvious. Mammography and CBE are the most important early diagnosis methods in reducing the mortality rate of breast cancer, and the American Cancer Society recommends women to start BSE from the age of 20 (6, 7, 40).

It was observed that although 48.8% of nurses thought that “every woman should have a CBE at least once a year”, only 25.8% had a CBE. Nurses CBE performance rate varies between 11.2-54.1% (10, 13, 17, 18, 24, 25), the rates from our study were lower than the reported rates from other countries (10, 24). The reasons for not having

Table 2. Knowledge and practices of nurses on breast cancer prevention (n=236)

Properties		n	%
BSE performance status	Yes	181	76.7
	No	55	23.3
If yes, how often is BSE performed? (n=181)	Regular	47	26.0
	Irregular	134	74.0
*If no, reasons for not performing BSE (n=55)	Forgetting	34	61.8
	Not having breast related complaints	24	43.6
	Anxiety of probability of finding a mass	45	81.8
	Not finding the time	29	52.7
	Negligence	48	87.2
BSE frequency (n=181)	Once a month	25	13.8
	Once every 6 months	4	2.2
	Whenever it comes to mind	152	84.0
When BSE is performed (n=181)	Any day of the menstrual cycle	3	1.6
	5-7 days of menstrual cycle	39	21.5
	Every shower	29	16.0
	Whenever I want to	102	56.4
	When I wake up	1	0.6
	First day of the month	7	3.9
CBE status	Yes	61	25.8
	No	175	74.2
*Reasons for not having CBE (n=175)	Not thinking it is necessary	158	90.2
	Not finding the time	24	13.7
	Being ashamed	16	9.1
	Not having breast related complaints	134	76.6
	Negligence	96	54.8
Thoughts on CBE frequency	Must have one in case of suspicion	44	18.6
	Once a year is enough	115	48.8
	Should have it annually after the age of 20	50	21.2
	Should have one once every 2-3 years	27	11.4
Mammography status	Yes	16	2.5
	No	220	97.5
* Reasons for not having mammography (n=220)	Not thinking it is necessary	187	85.4
	Not finding the time	8	3.6
	Negligence	22	10.0
	Thinking it is painful	32	14.6
	Not being in the MM screening age group	57	26.0
Hormone replacement therapy status	Yes	26	11.0
	No	210	89.0
Smoking status	Yes	86	36.4
	No	139	58.9
	Quitted	11	4.7
Family history of breast cancer	Yes	32	13.6
	No	204	86.4
Status of breast cancer prevention information	Sufficient	32	13.6
	Insufficient	44	18.6
	Partially sufficient	160	67.8
Status of attending training on breast cancer prevention	Yes	76	32.2
	No	160	67.8
Age at first birth	26.08±0.28		
Total lactation period mean (in months)	12.51±0.72		
Mean menarche age	13.04±0.09		
Mean BSE onset age	23.55±4.84		

*More than one answer was obtained. BSE: Breast self examination; CBE: Clinical breast examination; MM: Mammography

Table 3. Information of nurses on breast cancer risk factors and symptoms (N=236)

Properties Breast Cancer Risk Factor	Yes		No	
	n	%	n	%
Aging	59	25.0	177	75.0
Obesity	111	47.0	125	53.0
Not giving birth	138	58.5	98	41.5
First birth over the age of 30 years	68	28.8	168	71.2
Late menopause (after the age of 50)	66	28.0	170	72.0
Radiation exposure	156	66.1	80	33.9
Early first menarche	59	25.0	177	75.0
Alcohol/tobacco use	164	69.5	72	30.5
History of benign breast disease	91	38.6	145	61.4
Hormone replacement therapy	96	40.7	140	59.3
History of breast cancer	155	65.7	81	34.3
Not exercising	32	13.6	204	86.4
Family history of breast cancer (mother, aunt, daughter, sister)	204	86.4	32	13.6
Breast Cancer Symptoms				
Bloody nipple discharge	207	87.7	29	12.3
Breast lump	230	97.5	6	2.5
Puckering of breast tissue	121	51.3	115	48.7
Dimpling of the breast	178	75.4	58	24.6
Change in breast color	186	78.8	50	21.2
Abnormal growth of one breast	191	80.9	45	19.1
More ptosis of one breast than the other	122	51.7	114	48.3
Lymph node enlargement in proximity to the breast	219	92.8	17	7.2
Abnormal swelling of the upper arm	148	62.7	88	37.3

Table 4. Healthy Lifestyle Behaviors Scale mean total and subgroup scores

Healthy Lifestyle Behaviors Scale and Subgroup Scores	(x±S)
Self-actualization sub-score	38.52±6.28
Health responsibility sub-score	24.95±5.39
Exercise sub-score	9.41±3.24
Nutrition sub-score	16.99±3.29
Interpersonal support sub-score	21.22±3.39
Stress management sub-score	17.99±3.66
Total Score	129.09±19.82

any CBE were listed as not thinking CBE is necessary (90.2%), as not having breast-related problems and complaints (76.6%) and as negligence (54.8%). Other studies also support these findings and report reasons for nurses not to have CBE as not having problems associated with breast, lack of time, being ashamed of having CBE, negligence, not thinking CBE is necessary, feeling unwell when talking or thinking about breast cancer despite research findings and not remembering (13, 18, 25). Elshamy and Shoma (25) have reported in their study among Egyptian nurses that although 60.2% believed that early diagnosis of breast cancer results in an effective treatment, only 25.6% have stated that "women between the age of 20-39 should have CBE once in every 3 years". Özdemir and Bilgili (13) have also reported that

the rate of correctly answering the questions like when, to whom and how frequently CBE should be done is quite low. These findings suggest that although nurses believe that early detection of breast cancer would result in a more effective treatment, they do not want to undergo CBE until emergence of symptoms of disease, and they do not take responsibility for their personal health. Yet, the American Cancer Society recommends women to take CBE at periodic intervals (6, 7, 40).

It was determined that 2.5% of the nurses over age 40 had mammography, and 4.2% stated the frequency of mammography screening as "whenever I think it is necessary". Mammography ratio among nurses varies between 7.3-50.2%, and the rate found in this study was lower

Table 5. Healthy lifestyle behaviors scale scores according to properties related to breast cancer

Properties	n	%	(HLBS) (x±S)	Test, P value
BSE Performance Status				
Yes	181	76.7	131.32±19.26	t=3.191,
No	55	23.3	121.76±20.06	p=0.002
Status on breast cancer prevention information				
Sufficient	32	13.6	139.06±21.55	F=13.115,
Insufficient	44	18.6	117.47±14.62	p=0.000
Partially sufficient	160	67.8	130.29±19.33	
Status of attending a training on breast cancer prevention				
Yes	76	32.2	134.67±19.57	t=3.030,
No	160	67.8	126.44±19.45	p=0.003

BSE: Breast self examination; HLBS: healthy lifestyle behaviors scale

than previous reports from both our country and abroad (10, 13, 17, 24, 26). The reasons for not having a mammography was listed as not thinking mammography was necessary (85.4%), as not being in the mammography age group (26%) and as thinking mammography is a painful method (14.6%). In the literature, it is reported that nurses did not have adequate information the fact that majority of non-palpable masses can be determined by mammography, and that 17.6% of the nurses think mammography is a painful method, similar to our findings (11, 18). The low rate of mammography detected in our study can be explained by the finding that 93.2% of the nurses were under the age of 40.

Özdemir and Bilgili (13) have reported that nurses correctly responded the questions of 'to which age group and how often should mammography be done?' that 55% had mammography at least 1 year ago, and in accordance with this study's findings, they have stated the reasons for not having mammography as not being at the mammography age group (42.4%), negligence (27%), and not thinking it is necessary. Oche et al (26) have conducted a study in northern Nigeria to demonstrate knowledge, attitude and practices of women related to breast cancer and mammography, and have stated that participants were aware that mammography is an important diagnostic tool in this type of cancer (84%), that they had enough information about mammography (56%). They reported the reasons not to have mammography as not being aware that this diagnostic test is available at that hospital (69%) and as financially not being able to afford it (5%).

The breast cancer risk factors were expressed as presence of breast cancer in close relatives (mother, sister, aunt) (86.4%), as alcohol and cigarette use (69.5%), as not giving birth (58.5%), and as obesity and high-fat diet (47%). Results of other studies support our findings: breast cancer risk factors have been reported as never given birth, low fertility rate, late pregnancy, early menstruation, late menopause, history of breast disease, advanced age, physical inactivity and lack of exercise, fat-rich diet, smoking, alcohol intake, family history of breast cancer, obesity, prolonged use of contraceptives, high socioeconomic status and working women (10, 11, 13, 20, 21, 23, 25). Although the level of information of the nurses regarding breast cancer risk factors vary according to studies, Ahmed et al (20) have reported this level among nurses in Karachi from 7 hospitals as 35% good, 40% moderate, and 25% poor.

As reported in the literature, a lot of factors could lead to the development of breast cancer, but the most important risk factor is the pres-

ence of history of breast cancer in the family/close relatives (mother, sister, aunt) (41). In this study, 13.6% of nurses had a family history of breast cancer. In other studies conducted on this subject, the rate of breast cancer in close relatives has been reported to vary between 2.6-11% (12, 13, 25, 27). According to these findings, the nurses in this study carry a higher risk of breast cancer in terms of this particular factor and therefore are thought to benefit more from early detection and diagnostic methods. The mean age at first birth and first menstruation was found as 26.8±0.28 and 13.04±0.09, respectively. As mentioned in the literature, although there is a significant association between the age of onset of menstruation and regular cycles with breast cancer, this condition may be regarded as low risk for nurses (41).

It was determined that 32.2% of the nurses attended a training session on prevention of breast cancer, however, 67.8% of classified their breast cancer-related information as partially sufficient, and 18.6% as insufficient. Other studies conducted on this issue have reported that nurses evaluated their knowledge on breast cancer as sufficient, the information of doctors were better than nurses and nurses' information on early detection of breast cancer methods was limited (10, 13, 18, 26). Nurses have gained information related to breast cancer, early detection and diagnosis methods from written materials such as books, magazines, brochures, from media like television and radio, from nursing schools, in-service training programs and health professionals (12, 19, 26). In accordance with the findings obtained from this study, since the majority of nurses consider their breast cancer-related information as partially sufficient or insufficient, issues of breast cancer and early detection methods should be seriously emphasized as part of their education and training programs should address these issues in the post-graduation period.

Socio-demographic and occupational characteristics of the nurses in this study and knowledge and practice status for early diagnostic methods of breast cancer (BSE, CBE, MM) were not found to have a significant relationship. Consistent with these findings, Yaren et al (18) have reported that there was not a significant relationship between nurses' knowledge and attitude towards breast cancer risk factors, symptoms, follow-up methods and some features like age, marital status, and occupation. Despite these findings, it has been reported in some studies that awareness on breast cancer follow-up decreased with increasing age, the majority of those who practice BSE were married and those who had been working for more than 10 years, with training on breast cancer and mammography apply BSE better (23, 25, 26).

Haji-Mahmoodi et al (22) conducted a study to determine BSE knowledge, attitudes and practices of female health workers in Tehran, Iran. They reported a significant relationship between BSE and age, education level, occupation, history of breast problems, and knowing how to do the examination. The possibility of applying BSE was higher in women over the age of 50, with a high level of professional training, and with a history of breast disease, whereas marital status and family history of breast cancer did not significantly correlate with BSE performance status. Valizadeh et al (27) reported a significant relationship between nurses' perception of breast cancer and familial history of cancer and working at a cancer-related unit, their perception was not related to age, marital status, academic degree, occupational service, and body mass index, and that perception of seriousness of breast cancer was higher in the 30-39 age group, and gradually decreased over 50 years.

In this study, the mean total score was 129.09 ± 19.82 . Since the highest score that can be obtained in this scale is 192, it can be concluded that the nurses' healthy lifestyle behaviors in areas like self-actualization, health responsibility, exercise, nutrition, interpersonal support and stress management are moderate level. Although no studies that examined the relationship between nurses' knowledge and practice of prevention of breast cancer and healthy lifestyle behaviors could be found in the literature, Özen et al (30) reported that mean total score of nursing students' healthy lifestyle behaviors was 121.1 ± 15.9 , and their sub-group mean scores for health responsibility physical activity, nutrition, spiritual growth, interpersonal relations, and stress management were 18.8 ± 4.2 , 15.7 ± 4.2 , 18.2 ± 3.9 , 25.2 ± 4.1 , 24.1 ± 4.0 , 18.8 ± 15.9 respectively. They determined that the mean total score was not significantly different between age groups ($p > 0.05$), and awareness of breast cancer and the importance of early diagnosis in breast cancer showed a significant difference between the mean total scores ($p < 0.05$).

Callaghan et al. (28) conducted a study to determine Hong Kong nurses' health-related behaviors, and they reported that 45% performed BSE more than once a year, 55% once a year or none, 8% examined their breasts for lumps more than 10 times a year, 16% were smokers, 36% had been exercising regularly, 74% brushed their teeth twice or more, 56% sleep for 7-8 hours each night, 86% had a body weight in the normal range, 52% avoided fat-containing and 56% cholesterol-containing foods, 10% did not eat between meals, 57% had daily breakfast and 52% visited their dentist at least once a year.

In the literature, factors like exercise, physical activity, body mass index and weight loss have been reported to be useful but not absolutely effective in breast cancer prevention (8, 40, 42-44). A study from China has reported that women with low physical activity and high body mass index were at greater risk of breast cancer (45). Although factors such as exercise, diet and body weight are not proven to prevent cancer, it is recommended that women should perform activities like walking, running, swimming, and cycling and maintain a diet rich in fruits, vegetables, fiber and carotenoids (8, 42, 43).

In order to increase women's awareness on breast cancer, it is of utmost importance for nurses to develop positive healthy lifestyle behaviors first in themselves, to utilize breast cancer early detection and diagnosis methods effectively, and to complete their shortcomings of knowledge on this subject. Nurses play an important role in determining information needs of women diagnosed with breast cancer and in meeting these requirements. In this respect, it is believed that giving information to target age group of women in the community by health

care professionals on breast cancer risk factors and symptoms, teaching methods of early detection and diagnosis, and ensuring that women are taking responsibility for their own health care is beneficial in early diagnosis of breast cancer.

In this study, it was determined that 74% of nurses perform BSE irregularly, 25.8% had a CBE, 2.5% had a MM, and 67.8% defined their knowledge in breast cancer prevention as "partially sufficient". The mean total score was calculated as 129.09 ± 19.82 . Although nurses' mean total scores and their information on breast cancer prevention were above medium level, it was observed that the use of breast cancer early detection services were not at the expected level.

CBE, MM and BSE applications are of great importance in the early detection and diagnosis of breast cancer. Nurses play an important role in determining information needs of women diagnosed with breast cancer and in teaching breast cancer early detection and diagnosis methods. It is proposed that first nurses who are an important member of the healthcare team should be educated on breast cancer to encourage development of health promoting behaviors and awareness on breast cancer early detection and diagnosis methods as proposed by the American Cancer Society should be increased.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Ondokuz Mayıs University Health Education and Research Hospital.

Conflict of Interest: No conflict of interest was declared by the authors.

Informed Consent: Informed consent was taken from the nurses who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - Z.K., Z.S.; Design - Z.K., Z.S.; Supervision - Z.K., Z.S., P.Ç.; Funding - Z.K., Z.S.; Materials - Z.K., Z.S., P.Ç.; Data Collection and/or Processing - F.B., A.M., P.Ç., Z.K., Z.S.; Analysis and/or Interpretation - Z.K., Z.S., Literature Review - F.B., A.M., Z.K., Z.S., P.Ç.; Writer - Z.K., Z.S.; Critical Review - Z.K., Z.S., P.Ç., F.B., A.M.

Acknowledgements: We would like to thank the nurses for taking part in this study.

Financial Disclosure: The authors declared that this study has received no financial support

References

1. Parkin DM, Bray F, Ferlay J, Pisani P. Global cancer statistics, 2002. *CA Cancer J Clin* 2005; 55:74-108. (PMID:15761078) [CrossRef]
2. Boyle P, Levin B. World Cancer Report. Geneva: Who Press, 2008; 12-40, 101-105. (cited 2014 January 14) Available from: http://whqlibdoc.who.int/publications/2009/9789283204237_tur_p1-104.pdf
3. Yardım N, Mollahaliloğlu S, Başara BB. Cancer status in Turkey and Evaluation of Compatibility with International Parameters. In: Tuncer M, ed. *Türkiye'de Kanser Kontrolü*, Ankara: Koza Matbaacılık 2009; 51-63.
4. Özmen V. Breast Cancer in Turkey. In: Tuncer M, ed. *Cancer Control in Turkey*, Ankara: Koza Matbaacılık 2009; 385-391.
5. Yıldırım M, Parlak C, Yıldız M, Demirci H, Çetin HO, Akgül B. Cancer Risk Factors and Factors Affecting Cancer Awareness. *Gaziantep Med J* 2012; 18:17-20.

6. American Cancer Society. Cancer Reference Information. How Is Breast Cancer Found? (cited 2014 January 14) Available from: <http://cancer.org/cancer/breastcancer/detailedguide/>
7. National Cancer Institute (at the National Institutes of Health). Breast Cancer: Prevention, Genetics, and Causes. (cited 2014 January 14) Available from: <http://www.cancer.gov/cancertopics/prevention-genetics-causes/breast>
8. Baltzell K, Wrensch MR. Strengths and limitations of breast cancer risk assessment. *Oncol Nurs Forum* 2005; 32:606-613. (PMID:15897935) [\[CrossRef\]](#)
9. Simon CS. Breast cancer screening: cultural beliefs and diverse populations. *Health Soc Work* 2006; 31:36-43. (PMID:16550846) [\[CrossRef\]](#)
10. Odusanya OO, Tayo OO. Breast cancer knowledge, attitudes and practice among nurses in Lagos, Nigeria. *Acta Oncol* 2001; 40:844-848. (PMID:11859984) [\[CrossRef\]](#)
11. Soyer MT, Ciceklioglu M, Ceber E. Breast cancer awareness and practice of breast self examination among primary health care nurses: influencing factors and effects of an in-service education. *J Clin Nurs* 2007; 16: 705-717. (PMID:17402952) [\[CrossRef\]](#)
12. Karayurt Ö, Coşkun A, Cerit K. Status of Nurses regarding Breast Cancer and Self examination. *J Breast Health* 2008; 4:15-20.
13. Özdemir Ö, Bilgili N. Knowledge and practice of nurses from a training hospital on the early diagnosis of breast and cervix cancer. *TAF Prev Med Bull* 2010; 9:605-612. [\[CrossRef\]](#)
14. Walker SN, Volkan K, Sechrist KR, Pender NJ. Health promoting lifestyles of older adults: comparisons with young and middle aged adults, correlates and patterns. *Adv Nurs Sci*, 1988; 11:76-89. (PMID:3140723) [\[CrossRef\]](#)
15. Esin MN. Adaptation of healthy lifestyle behaviors scale into Turkish. *Hemşirelik Bülteni* 1999; 2:87-96.
16. Esin MN. Evaluation and Improvement of Health Behavior of Employees in Industrial Areas, İstanbul Üniversitesi Sağlık Bilimleri Enstitüsü Hemşirelik Anabilim Dalı Doktora Tezi 1997, İstanbul.
17. Çavdar İ, Akyolcu N, Özbaş A, Öztekin D, Ayoğlu T, Akyüz N. Determining female physicians' and nurses' practices and attitudes toward breast self-examination in İstanbul, Turkey. *Oncol Nurs Forum* 2007; 34:1218-1221. (PMID: 18024349) [\[CrossRef\]](#)
18. Yaren A, Ozkılinc G, Guler A, Oztop I. Awareness of breast and cervical cancer risk factors and screening behaviours among nurses in rural region of Turkey. *Eur J Cancer Care* 2008; 17:278-284. (PMID: 18419631) [\[CrossRef\]](#)
19. Demirkıran F, Balkaya NA, Memis S, Turk G, Ozvurmaz K, Tuncyurek P. How do nurses and teachers perform breast self-examination: are they reliable sources of information? *BMC Public Health* 2007; 7:96. (PMID: 17547778) [\[CrossRef\]](#)
20. Ahmed F, Mahmud S, Hatcher J, Khan SM. Breast cancer risk factor knowledge among nurses in teaching hospitals of Karachi, Pakistan: a cross-sectional study. *BMC Nurs* 2006; 5:6. (PMID: 16984630) [\[CrossRef\]](#)
21. Madanat H, Merrill RM. Breast cancer risk-factor and screening awareness among women nurses and teachers in Amman, Jordan. *Cancer Nurs* 2002; 25:276-282. (PMID: 12181496) [\[CrossRef\]](#)
22. Haji-Mahmoodi M, Montazeri A, Jarvandi S, Ebrahimi M, Haghighat S, Harirchi I. Breast Self-Examination: knowledge, attitudes, and practices among female health care workers in Tehran, Iran. *Breast J* 2002; 8:222-225. (PMID: 12100114) [\[CrossRef\]](#)
23. Alkhasawneh IM. Knowledge and practice of breast cancer screening among Jordanian nurses. *Oncol Nurs Forum* 2007; 34:1211-1217. (PMID: 18024348) [\[CrossRef\]](#)
24. Chong PN, Krishnan M, Hong CY, Swah TS. Knowledge and practice of breast cancer screening amongst public health nurses in Singapore. *Singapore Med J* 2002; 43:509-516. (PMID: 12587705)
25. Elshamy KF, Shoma AM. Knowledge and Practice of Breast Cancer Screening Among Egyptian Nurses. *Afr J Haematol Oncol* 2010; 1:122-128.
26. Oche MO, Ayodele SO, Umar AS. Breast cancer and mammography: current knowledge, attitudes and practices of female health workers in a tertiary health institution in Northern Nigeria. *Public Health Research* 2012; 2:114-119. [\[CrossRef\]](#)
27. Valizadeh S, Akbari N, Rasuli AS. Health Beliefs of Nurses about Breast Self-Examination. *J Med Sci* 2006; 6:743-750. [\[CrossRef\]](#)
28. Callaghan P, Fun MK, Ching Yee F. Hong Kong Nurses' health related behaviours: implications for nurses' role in health promotion. *J Adv Nurs* 1997; 25:1276-1282. (PMID: 9181427) [\[CrossRef\]](#)
29. Koç Z, Sağlam Z. Knowledge and practice of women regarding breast cancer protection measures and self-examination and efficacy of education. *J Breast Health* 2009; 5:25-33.
30. Özen B, Zincir H, Erten ZK, Özkan F, Elmalı F. Knowledge and attitudes of women about breast cancer, self breast examination and healthy life style behaviours. *J Breast Health* 2013; 9:200-204. [\[CrossRef\]](#)
31. Budden L. Registered nurses' breast self-examination practice and teaching to female clients. *J Community Health Nurs* 1998; 15:101-112. (PMID: 9631593) [\[CrossRef\]](#)
32. Leight SB, Deiriggi P, Hursh D, Douglas M, Leight V. The effect of structured training on breast self-examination search behaviors as measured using biomedical instrumentation. *Nurs Res* 2000; 49:283-289. (PMID: 11009123) [\[CrossRef\]](#)
33. Seif NY, Aziz M.A. Effect of breast self-examination training program on knowledge, attitude and practice of a group of working women. *Journal of The Egyptian National Cancer Institute* 2000; 12:105-115. [\[CrossRef\]](#)
34. Dundar PE, Ozmen D, Ozturk B, Haspolat G, Akyıldız F, Coban S, Cakiroğlu G. The knowledge and attitudes of breast self-examination and mammography in a group of women in a rural area in Western Turkey. *BMC Cancer* 2006; 6:43. (PMID: 16504119) [\[CrossRef\]](#)
35. Dorsay RH, Cuneo WD, Somkin CP, Tekawa IS. Breast self-examination: improving competence and frequency in a classroom setting. *Am J Public Health* 1988; 78:520-522. (PMID: 3354734) [\[CrossRef\]](#)
36. Foster R, Costanza MC. Breast self-examination practices and breast cancer survival. *Cancer* 1984; 53:999-1005 (PMID:6692297). [\[CrossRef\]](#)
37. Bailey B. The nurse's role in promoting breast awareness. *Nurs Stand* 2000; 14:34-36. (PMID: 11973892) [\[CrossRef\]](#)
38. Wei G, Borum ML. Breast self-examination in women in two primary care settings: an evaluation of the impact of insurance status. *J Women's Health Gend Based Med* 2000; 9:311-314. (PMID:10787227) [\[CrossRef\]](#)
39. Pillay AL. Rural and urban South African women's awareness of cancer of the breast and cervix. *Ethn Health* 2002; 7:103-114. (PMID: 12511197) [\[CrossRef\]](#)
40. Johnson MR. An approach to reducing disparities in breast cancer in the United States Virgin Islands. *ABNF J* 2006; 17:44-47. (PMID: 16596900)
41. Eroglu C, Eryılmaz MA, Cıvıçık S, Gurbuz S. Breast Cancer Risk Assessment: 5000 Cases. *UHOD* 2010; 1:27-33.
42. Vogel WH. The advanced practice nursing role in a high-risk breast cancer clinic. *Oncol Nurs Forum* 2003; 30:115-121. (PMID: 12515989) [\[CrossRef\]](#)
43. Young GP, Le Leu RK. Preventing cancer: dietary lifestyle or clinical intervention? *Asia Pac J Clin Nutr* 2002; 11:618-631. (PMID: 12492655) [\[CrossRef\]](#)
44. Baumann SL. Family systems genetic illness model-breast cancer. *Clin J Oncol Nurs* 2006; 10: 377-381. (PMID: 16789582) [\[CrossRef\]](#)
45. McLemore MR. activity levels and weight may affect women's risk for breast cancer. *Clinical J Oncol Nurs* 2005; 9:514.