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RESEARCH ARTICLE

BREAST CANCER RISK ASSESSMENT AMONG RURAL WOMEN IN TURKEY

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Abstract

Background: Breast cancer is the most prevalent cancer type in women both Turkey and worldwide. In order to construct screening programs correctly, to identify breast cancer at the early stage and to reduce the burden of disease after diagnosis; first, women's risk levels should be determined.

Aim: The aim of this study is to identify women's breast cancer risk levels, the frequency of BSE, and affecting factors in rural women in Turkey.

Method and Material: This cross-sectional study was included 280 adult women. As data collection tools were used "The Sociodemographic Characteristics Questionnaire" and "Breast Cancer Risk Assessment Tool".

Results: Women's mean breast cancer risk level was found as 137.69±67.56. 91.1 % of women were found to be in a low-risk group. When women's mean scores related to Breast Cancer Risk Assessment Tool and sociodemographic variables were compared and a statistically significant difference was detected between vocational status, education level and smoking status. The vast majority of women take place in the low-risk group in terms of breast cancer.

Conclusions: The effects of community-based and opportunistic national breast cancer screenings on mortality rates and their cost-effectiveness must be assessed. Primarily, individual breast cancer risk evaluations must be done instead of community-based screenings, useful tools must be selected for risk evaluation, screening programs must be performed according to the risk and women should be invited to health organizations for screenings.

Keywords: Risk assessment, rural women, breast cancer, health screening.

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INTRODUCTION

Breast cancer is the most prevalent cancer type in women both Turkey and worldwide.[1] In 2020, there were 2.3 million women diagnosed with breast cancer and 685 000 deaths globally, making it the world's most prevalent cancer.[1] The median age for receiving breast cancer diagnosis is 53 years in our country, 44.5% of women who were diagnosed with breast cancer are between 50 and 69 years of age and 40.6 % are between 25 and 49 years of age.[2]

"To be a woman" is considered one of the most powerful and fundamental risk factors. Other risk factors are age, genetic predisposition, dense breast structure, history of atypical hyperplasia, hormonal factors, nourishment habits, use of cigarette and alcohol.[3-5]

In recent years, breast cancer-related mortality rates are decreasing due to advanced therapy methods and screening programs performed.[6-8] When the projections related to breast cancer screening programs in Turkey and worldwide are evaluated, it is observed that age is used as a basic risk factor for the development of breast cancer and the screenings are performed a woman at risk by using age.[4,9] In Europe mammography is recommended biennially beginning 50 years of age,[10] whereas in USA screenings based on age are recommended by different organizations annually or biennially.[3] In our country mammography is recommended every two years beginning 40 years of age and additionally, to increase its effectiveness, clinical breast examination is also recommended.[2]

Moreover, to raise awareness in the community, each woman should be provided with consultancy service related to breast-self-examination (BSE) after 20 years of age.[2] Mammography is considered a gold standard in the early diagnose of breast cancer;[11] however, to raise awareness about breast health and to establish palpable BSE is recommended for the women living in underdeveloped and developing countries.[12]

Gonzales, Alzaatreh, Mari, Saleh & Alloubani (2018) found that only 7.8% of women practiced BSE regularly each month in the past year.[13] Al-Zalabani et al., (2018) reported that 38.5% of women performed BSE.[14] In our country where the incidence of breast cancer is considerably high, it is well known that the coverage rate of opportunistic breast cancer screenings is between 20 and 30%,[15] and the frequency of BSE is between %20.9 and 32.1%.[16-18] In several studies found that BSE was affected by factors such as education, marital status, use of oral contraceptive and residing place.[16,17,19]

In risks of screening programs is a possibility extra cancer (due to radiation), and over diagnoses (due to ductal carcinoma in situ-DCIS).[4,20] Although mammography is considered a gold standard in breast cancer screenings worldwide, in each two-million women (50 years of age and older) who screened with single mammography, there is a possibility to develop extra cancer due to radiation given to breast 10 years later.[4] Another risk in screening programs is the determination of otherwise undetectable clinically negligible cancers (low grade in situ cancer) through mammography. These cancers that are histologically invasive but not growing, lacking potential of metastasis, staying stagnant lifelong and called DCIS are revealed on screen mammography rather than diagnostically.[20] The incidence rate of DCIS which is associated with mammography screening has been increasing rapidly over recent years.[21] In a compilation by EUROSCREEN group overdose rate varied between 0%-10%;[22] in a study carried out in England, women between 50 and 69 years old were screened, it was observed that extra diagnoses were made in one of each 77 women who was invited to screening for 20 years long.[7]

Although early diagnose of breast cancer is possible through screenings, individualization of screening programs is recommended. In women with average risk for breast cancer, mammography screening should start beginning from 45 years of age; for women who have familial cancer history or atypical breast biopsy, annual mammography screening is recommended. For women who are known to carry familial breast cancer gene, and having dense breast structure and being within the higher risk group, another method should be added to screening program besides mammography.[23,24] The population included in the scope of breast cancer screenings should be classified according to the risk with the help of robust modeling tools. Women with very low breast cancer risk should be included in the screening programs after they were informed of the risks of screenings.[23] In order to construct screening programs correctly, to identify breast cancer at the early stage and

to reduce the burden of disease after diagnosis; first, women's risk levels should be determined. The aim of the study to identify women's breast cancer risk levels, the frequency of BSE and affecting factors among rural women in Turkey. The research would provide basic data for breast cancer risk level for needed to configure breast cancer screenings in developing countries and rural regions.

METHODOLOGY

Study population

A cross-sectional design was used. This study carried out from, January to June, 2018 in a rural region of Izmir province. Convenience sampling was used to recruit participants. Participants who met the following criteria were invited to participate: (a) women (18 older and over), (b) able to understand and communicate in Turkish, (c) able to provide informed consent. The sample size was calculated with the sampling formula:[25]

Z: 1.96 (for the level of confidence of %95)

P: 0.24

d: 0.05

$$n = \frac{Z^2 P(1-P)}{d^2} = 280$$

A total of 280 women who accepted to participate were included in this research.

Data collection

Data were collected in areas where women density is relatively high in the district of Odemiş affiliated with Izmir through face-to-face survey method. Data were collected during six months from January to June 2018. As data collection tools were used "The Sociodemographic Characteristics Questionnaire" and "Breast Cancer Risk Assessment Tool". The Sociodemographic Characteristics Questionnaire comprised of 8 questions including age, vocational status, civil status, education level, income status, smoking history, using oral contraceptive and performing BSE.

Breast Cancer Risk Assessment Tool was developed by the American Cancer Society and accepted and recommended by the Republic of Turkey Ministry of Health.[26,27] This tool is comprised of six sections and 22 questions (Table 1). The sections were divided into age, the history of familial breast cancer, personal breast cancer history, childbearing age, menstrual history, and body structure.

1. Age: This involves five subcategories as under 30years old, between 30-40 years old, between 41-50 years old, between 51-60 years old and over 60 years old.

2. Family History of Breast Cancer: It involves five subcategories which are composed no one, an aunt or a grandmother, a mother or a sister, a mother and a sister, a mother, and two sisters.

3. Personal breast cancer history: It involves two subcategories that are being previous breast cancer and no previous breast cancer

4. Childbearing age: It involves three subcategories as first birth before 30 years old, first birth after 30 years old and no child

5. Menstrual history: It involves three subcategories as menarche age 15 and above, menarche age between 12-14, menarche age 11 and under.

6. Body structure: It involves three subcategories that are underweight, moderate weight, overweight according to the Body Mass Index.

According to the scores obtained from "Breast Cancer Risk Assessment Tool"; scores 400 and over are evaluated as "The Highest Risk", score between 301 and 400 as "High Risk", score between 201 and 300 as "Medium Risk", score 200 and below as "Low Risk".

Data analysis

Data were evaluated using the Statistical Package for Social Sciences (SPSS) 21.0 package program. During determining the frequency of BSE and breast cancer risk level, descriptive statistics (number, percentage, average) were used. Whether data showed normal distribution was assessed through the Kolmogorov-Smirnov Test. Breast cancer risk level and sociodemographic variables were compared using the Kruskal-Wallis Test and the Mann Whitney U Test. Multiple Regression Analysis was utilized for evaluation of BSE frequency and affective factors. A p-value of <0.05 was considered significant.

Ethical considerations

Ethics approval for this study was received from Ethics Committee of the University (Approval Number:156-2017). The partici-

pants were informed that the involvement was completely voluntary and anonymous. Informed consent was be gained from all women.

RESULTS

A total of 280 women (18 years old and older) who accepted to participate were included in research. Their mean age is 39.20±13.78 years. Of them 68.9 % are married, 45 % had university and above graduate degree, 50.4 % are employed, 0.4% have expense equal to income. Defining features of the women included in research are shown in Table 2.

When women's scores obtained from "Breast Cancer Risk Assessment Form" were evaluated, 91.1 % of them were found to be in a low risk group; 6.4 % in medium risk group; 0.4 % in high risk group and 2.1 % in highest risk group (Table 3).

When women's mean scores related to "Breast Cancer Risk Assessment Tool" and sociodemographic variables were compared and a statistically significant difference was detected between vocational status (t=-4.22, p= 0.00), education level (F= 47.41, p=0.00) and smoking status (F=7.44, p=0.02) (Table 4). In the advanced analysis performed it was observed that unemployed women had significantly higher breast cancer risk level than employed women; women who have elementary education level or below had significantly higher breast cancer risk level than women of other education level; women who former smoker had significantly higher breast cancer risk level than those already smoking and not smoking.

It was established that among the women included in the research, only 36.1% perform regular BSE once a month. Table 5 shows the results of the regression analysis. At the end of regression analysis a low and statistically significant relationship was found between frequency of BSE and age, education level, presence of familial breast cancer history, use of oral contraceptive and breast cancer history (*Nagelkerke* R^2=0.07; $p \leq 0.05$). Regression coefficient (β) demonstrates that variables such as education level (β=0.351) and the use of contraceptive (β=-0.576) affect the frequency of BSE statistically and significantly.

DISCUSSION

In the study, a total of 280 women's breast cancer risk level, the frequency of BSE and affecting factors were evaluated. Women's mean of breast cancer risk level was found as 137.69±67.56 (50-500). Of the women included in study 91.1 % were in lower risk group; 6.4 % in medium risk group; 0.4 % in the high-risk group and 2.1 % in the highest risk group. In a study by Kutlu & Biçer (2017),[18] where they evaluated the breast cancer risk level of 867 women (20 years old and older), they found their mean of breast cancer risk level as 131.26±45.11. At the same study, 87.3 % of women were found to be in low breast cancer risk group; 12.6 % in medium risk group; 0.1 % in the high-risk group.[18] In a study carried out by Gür et al., (2014), women's mean scores were found as 135.64±61.33. In that study, 94.1 % of women were found to be in the low-risk group; 4.1 % in medium risk group; 0.1.2 % in a high risk group and 0.6 % in the highest risk group.[17] It can be seen in this study that, women's risk average shows similarity with other studies carried out in our country and the vast majority of women take place in the low-risk group in terms of breast cancer. However, apart from other studies, the number of women taking part in the highest risk group seems higher than those in studies carried out in our country. In recent years, international guidelines recommend inclusion of a screening program according to women's risk level.

In this study, the breast cancer risk level of women who have elementary or below education level, unemployed women and those quit smoking has been found statistically significant compared to other groups. When the breast cancer screenings are compared with other countries, any study that evaluated the effect of breast cancer screenings on mortality rate could not be encountered in our country. In a meta-analysis study by Yiğit & Erdem (2017) where they evaluated the effects of mammography and breast cancer screenings carried out in different countries on mortality, they concluded that in women between 39 and 49 years of age breast cancer screening had no effect on mortality (*OR-RR*= 0.98 (0.74, 1.29); it can be recommended that the screening program being applied to this age interval in Turkey be reviewed.[10] American Cancer Society (2017) recommends that women with an average risk of breast cancer should undergo regular screening mammography starting at age 45 years.[3] In European countries such as England,[28] Holland,[29] Norway[30] and Finland[31] breast cancer screenings start at 50 years of age. Although, Breast cancer incidence of women in the UK

(26.7%) is over than Turkey (24.4%),[32] in England women are included in breast cancer screening program after 50 years old and screening programs are actualized in line with breast cancer risk levels.[28] In our country where vast majority of women with breast cancer take place in the low-risk group, screening programs should be reconstructed in order to reach women with higher breast cancer risk level; especially, those individuals having higher risk levels, unemployed and lower education levels must be included in screening programs and screenings should be performed according to their risk levels.[20]

In the study, the frequency of making BSE once a month was found as 36.1%. According to recent studies, the frequency of BSE in the different country varies between 7.8% and 27.9%.[13,14,33] Although the results obtained from this study are similar to those found in other studies carried out in our country in recent years, the frequency of BSE seems quite low. In order to raise awareness in the community in line with standards of national breast cancer screening program performed, consultancy services should be provided for women (20 years old) to perform BSE. Besides, for the first time, 15-49 age-follow-ups should be applied to women in fertility period and during these follow-ups, BSE should be taught.[2] In screening programs carried out at the national level and generally by the public, maximum benefit is aimed and screening activities are executed with available resources. That is, these screening programs aim to screen women population in terms of breast cancer, within the scope of available resources in different countries.

The screenings recommended in screen guideline, their frequency, and screen initiation age and national screening programs usually do not match.[34] Therefore, although in international guidelines BSE is not recommended for breast cancer screenings, BSE still protects in importance within our country's national screening programs and is recommended.[34] However, despite the most prevalent cancer type in our country is breast cancer and BSE takes place in national screening programs, the frequency of BSE does not seem at the desired level.

When the factors affecting frequency of BSE were evaluated it was observed that education and use of oral contraceptives had a significant influence on the frequency of BSE. In a study by Gür et al., (2014), it was found that frequency of BSE was affected by education level and marital status.[17] In a study by Başak (2016), it was discovered that BSE was not performed by women older than 55 years of age, illiterate and residing in rural region.[16] It was found in this study in a similar manner that education level was influential on the frequency of BSE and the frequency of BSE increases as education level elevates.

In Sohbet & Karasu's (2017) study there was a statistically significant difference between use of oral contraceptive and frequency of BSE.[19] In that study, use of oral contraceptives has affected the frequency of BSE; frequency of BSE in women using oral contraceptives was higher. National Cancer Institute (NIH) (2012) declared that some of birth control methods containing hormones may increase breast cancer risk and breast cancer risk is higher in women taking oral contraceptives compared to those not taking.[35] In our country, in provision of family planning the breast examination comprises one of the steps in consultancy service and also BSE is taught.[2] Since women taking oral contraceptive receive training on this topic during family planning consultancy and consider themselves in the risk group, they perform BSE more often.

The present study had several limitations. The study sample included only women in a certain region of Izmir, and thus generalizability is limited to sex and region. The study was a cross-sectional study, future studies should employ a longitudinal design to confirm the findings and investigate the causality of relationships.

CONCLUSION

It was concluded in the study that vast majority of women had the lower level of breast cancer risk and in those unemployed and having lower education level the cancer risk levels were higher compared to other groups. It was established that the frequency of BSE is highly low in women and the frequency of BSE has affected by education and the use of oral contraceptive. In line with the results obtained from the study, although breast cancer risk level is higher in women who have a low education level, the frequency of BSE seems insufficient. Therefore, during breast cancer screenings importance and priority must be given to those women who are unemployed and having a lower education level. The effects of community-based and opportunistic

national breast cancer screenings on mortality rates and their cost-effectiveness must be assessed. Primarily, individual breast cancer risk evaluations must be done instead of community-based screenings, useful tools must be selected for risk evaluation, screening programs must be performed according to the risk and women should be invited to health organizations for screenings. Women taking place in the low-risk group should be included in screening programs and final choice has to be left them after their advantages and disadvantages are told.

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ANNEX

TABLE 1. Breast Cancer Risk Assessment Tool

Section	Score
Age	
• Under 30	10
• 30-40	30
• 41-50	75
• 51-60	100
• Over 60	125
History of Familial Breast Cancer	
• None	0
• An aunt or grandmother	50
• A Mother or a sister	100
• A Mother and a sister	150
• Mother and two sister	200
Personal Breast Cancer History	
• There is no breast cancer	0
• There is a breast cancer	300
Childbearing age	
• First birth before 30 years of age	0
• First birth after 30 years of age	25
• No child	50
Menstrual History	
• First menstruation age ≥15 years	15
• First menstruation age 12-14	25
• First menstruation age ≤11	50
Body Structure	
• Underweight	15
• Moderate weight	25
• Overweight	50
Score Category	
• 200 and below	Low Risk
• 201-300	Medium Risk
• 301-400	High Risk
• 401 and more	The Highest Risk

TABLE 2. Women's Characteristics (N=280)

Variables	Women	
	n	%
Age (years; x±Sd)	39.20	13.78
Civil Status (%)		
Married	**193**	**68.9**
Single	87	31.1
Education Status(%)		
İlliterate	5	1.8
Literate	6	2.1
Elementary School	58	20.7
Junior High School	85	30.4
University and above	**120**	**45.0**
Vocational status (%)		
Employed	**141**	**50.4**
Unemployed	139	49.6
Income Status (%)		
Expense equal to income	**169**	**60.4**
Expense more than income	46	16.4
Expense less than income	65	23.2
Smoking Status (%)		
Smoke	65	23.2
Don't Smoke	**200**	**71.4**
Quit smoke	15	5.4

TABLE 3. Distiribution of Breast Cancer Risk Level (N=280)

Risk Level	Women	
	n	%
Low Risk (200 point and below)	255	91.1
Medium Risk (201-300 point)	18	6.4
High Risk (301-400 point)	1	0.4
The Highest Risk (400 point and more)	6	2.1

TABLE 4. The Comparison of The Women's Breast Cancer Risk Level According To Charecteristics

Variables	X±SS	kw/U	p
Vocational status			
Employed	125.53±67.75	**-4.22[a]**	**0.00***
Unemployed	150.03±65.32		
Civil Status			
Married	142.09±72.82	-1.54[a]	0.12
Single	127.93±53.18		
Education			
İlliterate	236.00±128.66		
Literate	194.16±39.42		
Elementary School	163.62±61.62	**47.41[b]**	**0.00***
Junior High School	137.05±77.35		
University and above	119.60±51.59		
Income Status			
Expense equal to income	136.95±61.40		
Expense more than income	132.39±71.14	1.617[b]	0.44
Expense less than income	143.38±79.92		
Smoking Status			
Current Smoker	137.15±83.61		
Never Smoker	135.62±62.05	**7.44[b]**	**0.02***
Former smoker	167.66±59.97		
Oral Contraceptive Use			
Yes	147.18±94.11	-0.22[a]	0.823
No	134.55±56.30		
Regularly Breast-Self Examination			
Yes	144.55±87.40	-0.04[a]	0.964
No	133.82±53.11		

*p<0.05
[a]Mann-Whitney U test.
[b]Wilcoxon test.

TABLE 5. Multiple regression analysis for factors predicting Breast Self-Examination

Variables	BSE	
	β	p
Age	0.012	0.25
Education	0,351	**0,02***
Family history for breast cancer	0.145	0.72
Oral contraceptive use	-0.576	**0.04***
Breast cancer history	-2,169	0.06
Cox Snell R Square	0.053	
Nagelkerke R Square	0.072	
X^2	346.727	
p	0.00*	

*p<0.05