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# Knowledge and Behaviors Related to Breast Cancer Screening in Bozkır Konya: A Cross-Sectional Questionnaire Study

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**ABSTRACT**

**Objective:** Breast cancer is the most common cancer in women, and early diagnosis and treatment can be lifesaving. Screening methods for the early detection of breast cancer is purposed. This study aimed to measure breast cancer screening for women in Bozkir, Konya and to determine their attitudes and behaviors related to screening.

**Methods:** Eighty-six women of >35 years of age who were admitted to the general surgery outpatient clinic for nonbreast problems in the community hospital of Konya province, Bozkır district between June and July 2008 were enrolled in this study. Demographic data, education, occupation, marital status, and place of residence were to be filled in the questionnaire. In addition, knowledge regarding breast self-examination, clinical breast examination, and mammography as well as breast cancer screening information was present in the questionnaire.

**Results:** The mean age of the patients was 49.2±11.6 (range, 35–79 years). Totally, 67.5% of patients had elementary school education, 30.2% had high school education, and 2.3% did not have any school education. The ratio of cases who perform routine breast self-examination was 20.9% (n=18). This number was lower in patients who had age >55 years, had no education, and were settled in the village (p=0.018, 0.001 and 0.001, respectively). Seven patients (8.1%) were found to have regular clinical breast examinations, and 16.9% of patients of age >40 had at least one mammography.

**Conclusion:** It was found that awareness of breast cancer screening was low in women in rural settings. Health care providers have great tasks such as to boost this awareness.

**Keywords:** Breast cancer, screening, rural settings

## Introduction

Breast cancer is one of the most common cancers among women. One in eight women can develop breast cancer over the course of her lifetime (1). According to the data from the Turkish Ministry of Health, General Directorate of Health Research, Health Statistics Yearbook 2013, the incidence of breast cancer among women was 40.6 per 100,000 in 2009, and it was the most common cancer type with a rate of 23.4% in women (2).

In the guideline of the American Cancer Society for early detection of breast cancer, monthly breast self-examination (BSE) beginning at the age of 20 years, clinical breast examination (CBE) every 3 years between the age of 20 and 40 years, and CBE and mammography (MMG) beginning at the age of 40 years are recommended for women (1).

In Turkey, the national standards for breast cancer screening have been established by the Turkish Ministry of Health, Public Health Agency of Turkey, Department of Cancer Control. In accordance with these standards, women are recommended to perform monthly BSE from the age of 20 years, CBE every 2 years over the age of 20 years, and CBE and MMG every 2 years from the age of 40 years (3, 4). However, worldwide, some problems can reduce the level of compliance to the screening program. Some of these problems are as follows: lack of awareness, transportation problems, insufficient human resources (radiologist, pathologist, x-ray technician, and female technician), high cost of devices and business-related problems, application of quality criteria, lack of common standardized software, establishment of diagnosis centers after screening, and difficulty in obtaining patients' pathological results for the final diagnosis and staging (4).

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Because of the determination of women who are under high risk for breast cancer and early diagnosis in case of the development of cancer, successful outcomes can be obtained with proper treatments. Moreover, these women are recommended to undergo some protective treatments. Therefore, various models have been established for the prediction of breast cancer risk. The Gail model is a frequently used model for the determination of breast cancer risk. This model was established using 284.780 MMG data performed for screening in 1989 (5, 6).

In this study, it was aimed to measure knowledge levels of women on breast cancer and screening techniques, to determine their attitudes and behaviors related to screening, and to perform risk assessment using the Gail model.

## Methods

This cross-sectional study was conducted in the district of Bozkır in Konya. The population of the study consisted of 7863 women aged 35 years and above (data on the population of women aged 35 years and over, living in Bozkır in Konya, 7). For predicting the difference of 10% with 90% accuracy, the sampling group was decided to be 86.

The study was planned to be performed in the Outpatient Clinic of General Surgery in Konya Bozkır State Hospital between the months of June and July 2008. Necessary permission was received from the related institutions before the study. After obtaining written informed consent from female patients aged 35 years and over, who applied with a complaint other than breast disease, they were consecutively included in the study.

The data of this cross-sectional study were collected through a questionnaire form designed by the researcher. This form included questions on BSE, CBE, MMG, and breast cancer screening as well as demographic features, educational status, occupation, marital status, and place of residence (village, district center).

Moreover, questions on breast cancer risk assessment (modified Gail model) were asked (Table 1) (5). After the data were recorded, they were transferred to the breast cancer risk assessment tool using the modified Gail model (model 2) developed on the Internet by the National Cancer Institute (8). Using this tool, the 5-year estimated risk of developing breast cancer was calculated and recorded. The patients whose 5-year risk of developing breast cancer was 1.66% and greater were defined to be at high risk (6). Others with a risk below 1.66% were defined to be at low risk.

**Statistical analysis**

For evaluating findings obtained in the study, IBM SPSS 22 (IBM Statistical Package for the Social Sciences Statistics, New York, USA) software was used for statistical analyses. As descriptive statistics, mean and standard deviation were used for continuous variables and number and percentage were used for categorical data. While evaluating normally distributed data, t-test was employed for comparing parametric data. In the comparison of qualitative data, Fisher's exact test was used. The results were evaluated with 95% confidence interval at a significance level of $p<0.05$.

## Results

In total, 86 cases were included in the study. The mean age of the patients was 49.2±11.6 years, and the age range was between 35 and 79 years. When the educational status was evaluated, it was found that 30.2% of the patients were illiterate, 67.5% were elementary school graduates, and 2.3% were high school graduate. With regard to their occupations, 2.3% worked and 97.7% were housewives. Of the patients, 81.4% were married and 18.6% were single. In total, 19.8% of the patients lived in city centers, 20.9% lived in towns, and 59.3% lived in villages.

The rate of patients who performed routine BSE was 20.9% (n=18). No difference was observed between the patients who performed and did not perform BSE in terms of the age, occupational status, and marital status ($p>0.05$, Table 1). However, with regard to the educational status and place of residence, there was a significant difference between the patients below and above 55 years of age (p values=0.018, 0.001, and 0.001, Table 2). This difference resulted from the fact that, in particular, participants who were older than 55 years, illiterate, and lived in towns or villages did not perform BSE.

It was observed that 7 patients (8.1%) underwent routine CBE. No difference was found between the patients who underwent and did not undergo CBE in terms of the age, educational status, occupational status, marital status, and place of residence ($p>0.05$ for all, Table 2).

The cases older than 40 years (n=65) were evaluated in terms of performing mammography. It was observed that 11 patients underwent MMG at least once (16.9%). Most of the patients at advanced ages did not undergo mammography (55 years and above) ($p=0.005$). No significant difference was found between the cases undergoing and not undergoing MMG in terms of the educational status, occupation, marital status, and place of residence ($p>0.05$ for all, Table 3).

The number of patients who were aware of screening for breast cancer was 19 (22.1%). There was no difference between the patients knowing and not knowing about breast cancer screening with regard to the age, educational status, occupation, marital status, and place of residence ($p>0.05$, Table 3).

After the calculation of risk, the 5-year risk of developing breast cancer was found to be low in 68 cases (79.1%) and high in 18 cases (20.9%). When the cases with a low and high 5-year risk of developing breast cancer were evaluated as 2 groups, no difference was detected between the groups in terms of BSE, CBE, MMG, awareness of breast cancer

screening, occupation, marital status, and place of residence (p>0.05, Tables 2–4). The ages of the participants and age groups (below and above 55 years) were separately evaluated, and cases with high risk were mostly found at advanced ages (p=0,001 for both). The rate of risk was higher in illiterate cases than in elementary school and high school graduates (p=0.018).

## Discussion

In this study, women living in a district at a distance of 150 km from the city (for 1.5 h by a personal vehicle) center and in rural areas were evaluated with regard to their attitudes, behaviors, and knowledge on breast cancer screening and with regard to BSE, CBE, and MMG application. In our study, the rate of women performing BSE was found to be 20.9%, the rate of women undergoing CBE was 8.1%, and the rate of women undergoing MMG was 16.9%.

No contribution of BSE, which is recommended among breast cancer screening methods, to the survival in breast cancer was detected. However, it is suggested that awareness on breast cancer can be increased with this application, and then, better results can be obtained in terms of compliance to the methods of CBE and MMG (9-11).

In the international literature, the frequency of BSE ranges from 43% to 58% (12, 13). In the study of Şirin et al. (14), which was conducted in Ankara, it was found that 22% of women never performed BSE, although they had knowledge about it. In the same study, it was revealed that 24.6% of women performed BSE when they remembered and that the rate of women performing it every month was 4.6%. In our study, the rate of women performing BSE was found to be 20.9%. The frequency of performing BSE was reported to vary between 4% and 39% in the studies conducted in our country (14-16). However, in our study, the quality of BSE

**Table 1.** Modified Gail model

| |
|---|
| Age |
| Age of first menstruation |
| Age of first live birth |
| Number of previous breast biopsy (number of atypical hyperplasia) |
| Number of breast cancer cases among first degree relatives (mother, sister, daughter) |
| Race |

**Table 2.** Evaluation of breast self-examination and clinical breast examination

| | BSE | | | CBE | | |
|---|---|---|---|---|---|---|
| | **Yes (n=18)** | **No (n=68)** | **p[α]** | **Yes (n=7)** | **No (n=79)** | **p[α]** |
| Age (m±SD) | 46.2±8.9 | 50±12.1 | 0.216 | 41.9±7.1 | 49.8±11.7 | 0.0812 |
| | n (%) | n (%) | p[β] | n (%) | n (%) | p[β] |
| Age range | | | | | | |
| 35-54 years | 17 (27.9) | 44 (72.1) | 0.018* | 7 (11.5) | 54 (88.5) | 0.101 |
| 55 years and above | 1 (4) | 24 (96) | | 0 (0) | 25 (100) | |
| Educational status | | | | | | |
| Illiterate | 0 (0) | 26 (100) | 0.001* | 0 (0) | 26 (100) | 0.096 |
| Elementary +High school | 18 (30) | 42 (70) | | 7 (11.7) | 53 (88.3) | |
| Occupation | | | | | | |
| Housewife | 16 (20) | 64 (80) | 0.601 | 7 (8.8) | 73 (91.3) | 1.000 |
| Working | 2 (33.3) | 4 (66.7) | | 0 (0) | 6 (100) | |
| Marital status | | | | | | |
| Married | 17 (24.3) | 53 (75.7) | 0.174 | 7 (10) | 63 (90) | 0.339 |
| Single | 1 (6.2) | 15 (93.8) | | 0 (0) | 16 (100) | |
| Place of residence | | | | | | |
| Town+Village | 8 (11.6) | 61 (88.4) | 0.001* | 5 (7.2) | 64 (92.8) | 0.621 |
| City center | 10 (58.8) | 7 (41.2) | | 2 (11.8) | 15 (88.2) | |
| 5-year risk of developing breast cancer | | | | | | |
| Low risk | 16 (23.5) | 52 (76.5) | 0.340 | 7 (10.3) | 61 (89.7) | 0.337 |
| High risk | 2 (11.1) | 16 (88.9) | | 0 (0) | 18 (100) | |

BSE: Breast self-examination; CBE: clinical breast examination; m: mean; SD: standard deviation; α t-test; β Fisher's exact test; *p<0.05

**Table 3.** Evaluation of knowledge on mammography and breast cancer screening

| | MMG[μ] | | | Knowledge on breast cancer screening | | |
|---|---|---|---|---|---|---|
| | **Yes (n=11)** | **No (n=54)** | **p[α]** | **Yes (n=19)** | **No (n=67)** | **p[α]** |
| Age (m±SD) | 45.8±5.1 | 54.9±10.3 | 0.006* | 49.3±8.7 | 49.2±12.3 | 0.974 |
| | n (%) | n (%) | p[β] | n (%) | n (%) | p[β] |
| Range of age | | | | | | |
| 35–54 years | 11 (27.5) | 29 (72.5) | 0.005* | 15 (24.6) | 46 (75.4) | 0.568 |
| 55 years and above | 0 (0) | 25 (100) | | 4 (16) | 21 (84) | |
| Educational status | | | | | | |
| Illiterate | 2 (7.7) | 24 (92.3) | 0.492 | 2 (7.7) | 24 (92.3) | 0.078 |
| Elementary+High school | 9 (15) | 51 (85) | | 17 (28.3) | 43 (71.7) | |
| Occupation | | | | | | |
| Housewife | 11 (13.8) | 69 (86.3) | 1.000 | 17 (21.2) | 63 (78.8) | 0.610 |
| Working | 0 (0) | 4 (100) | | 2 (33.3) | 4 (66.7) | |
| Marital status | | | | | | |
| Married | 8 (11.4) | 62 (88.6) | 0.422 | 16 (22.9) | 54 (77.1) | 1.000 |
| Single | 3 (18.8) | 13 (81.3) | | 3 (18.7) | 13 (81.3) | |
| Place of residence | | | | | | |
| Town+Village | 10 (14.5) | 59 (85.5) | 0.685 | 13 (18.8) | 56 (81.2) | 0.191 |
| Center of district | 1 (5.9) | 16 (94.1) | | 6 (35.3) | 11 (64.7) | |
| 5-year risk of developing breast cancer | | | | | | |
| Low risk | 10 (14.7) | 58 (85.3) | 0.445 | 14 (20.6) | 54 (79.4) | 0.532 |
| High risk | 1 (5.6) | 17 (94.4) | | 5 (27.8) | 13 (72.2) | |

[μ]Evaluated for patients at the age of 40 years and above; MMG: mammography; [α]t-test; [β]Fisher's exact test; m: mean; SD: standard deviation; *p<0.05

performed by the patients was not questioned and the accuracy of their knowledge was not examined. Therefore, further studies are needed for investigating the reliability of this knowledge on this subject in rural areas.

The relationship between BSE and the educational level has been demonstrated in various studies. In the study of Kılıç et al. (17), it was reported that the rate of performing BSE increased in parallel with increased educational levels. In our study, it was observed that BSE was mostly not performed by patients at an advanced age (above 55 years), with a lower educational level (illiterate), and living in towns or villages. Therefore, we suggest that education on breast cancer screening will be useful for advanced-aged and illiterate women living in rural areas.

As a breast cancer screening method, CBE is a method with high specificity (11). In various studies, the rate of CBE among women was reported to range from 30% to 80% (18, 19). In many studies, the administration of CBE was investigated and different results related to the age, marital status, educational level, and cultural features were revealed (16, 20). In a study conducted in a rural area in our country, the rate of CBE was reported to be 3.3%. In the same study, it was emphasized that awareness on breast cancer should be increased and healthcare providers have a great responsibility about this issue (21). In our study, the rate of CBE was found to be 8.1%. Health care givers working in rural areas should increase awareness on this subject.

Some studies compared urban regions and rural areas and revealed that women who were aged between 35 and 49 years, had high education levels, and lived in urban regions used breast cancer screening methods more frequently (22, 23). In a study performed in our country, it was specified that the rate of performing MMG was higher in women living in urban areas than in those living in rural areas (15). Dişcigil et al. (11) reported the rate of MMG as 40% in their study. In our study, the rate of women who underwent MMG was found to be 16.9%, which is lower than the rate in the literature. The most important factor associated with this result can be the lack of health opportunities in rural areas and transportation problems to city centers. In breast cancer screening, CBE and MMG are simultaneously performed at the age of 40 years and above. However, our hospital in a rural area does not have MMG. In addition, it can be thought that both methods may be abandoned by individuals having transportation problems. Furthermore, new studies are needed for investigating limita-

**Table 4.** Findings after the evaluation of 5-year risk of developing breast cancer through modified Gail model

| | 5-year risk of developing breast cancer | | |
|---|---|---|---|
| | Low risk Below 1.66% (n=68) | High risk 1.66% and above (n=18) | p[α] |
| Age (m±SD) | 44.9±8.3 | 65.1±7.9 | 0.001* |
| | n (%) | n (%) | p[β] |
| Age range | | | |
| 35–54 years | 60 (98.4) | 1 (5.6) | |
| 55 years and above | 8 (32) | 17 (94.4) | 0.001* |
| Educational status | | | |
| Illiterate | 16 (61.5) | 10 (38.5) | |
| Elementary+High school | 52 (86.7) | 8 (13.3) | 0.018* |
| Occupation | | | |
| Housewife | 62 (77.5) | 18 (22.5) | |
| Working | 6 (100) | 0 (0) | 0.336 |
| Marital status | | | |
| Married | 57 (81.4) | 13 (18.6) | |
| Single | 11 (68.8) | 5 (31.3) | 0.310 |
| Place of residence | | | |
| Town+Village | 56 (81.2) | 13 (18.8) | |
| Center ofdistrict | 12 (70.6) | 5 (29.4) | 0.336 |

m: mean; SD: standard deviation; [α]t-test; [β]Fisher's exact test; *p<0.05

tions such as low cultural and economic level, beliefs, and attitudes.

In our study, the 5-year risk of developing breast cancer was calculated using the Gail method for the patients, and a high risk was found in 20.9% of patients. No difference was found between patients with low and high risks in terms of BSE, CBE, and MMG. Primarily television and then health staff were specified as the sources of knowledge on breast cancer (11). However, as a result of risk assessment, it was found that the awareness of breast cancer screening was not higher in women under high risk. Therefore, sources such as television and healthcare givers should be improved for increasing awareness on breast cancer screening in rural areas. Moreover, it is planned that the risk of developing breast cancer in future should be determined in women using the Gail model, women should be informed on this subject, and necessary management should be applied.

The limitations of this study include that because the patients were selected among those who applied owing to nonbreast diseases, it partially reflected the area and the accuracy of BSE was not evaluated by using a comprehensive structured scale. Another restrictive factor was the limitations for using the Gail model in rural areas. Further extensive studies on the breast health of women in rural areas should be performed by covering all women regionally or across the country.

## Conclusion

It was observed that the awareness of breast cancer was lower among women in rural areas. Healthcare providers working in rural areas should provide education on breast cancer screening, particularly to advanced-aged women whose education levels are low and who live in towns and villages as well as for prepare necessary brochures and posters.

**Ethics Committee Approval:** No approval was retrieved due to type of study (questionnaire).

**Informed Consent:** Written informed consent was obtained from patients who participated in this study.

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** Author declared no conflict of interest available.

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