

RESEARCH ARTICLE

Predictors of Knowledge Level and Awareness towards Breast Cancer among Turkish Females

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Abstract

Background: Breast cancer (BC) is the most-common malignancy of women worldwide. Though there are differences among developed and developing countries, BC remains the most common cancer type of women in Turkey. **Objective:** This study aimed to identify the level of knowledge, awareness, and their potential predictors towards BC in Ankara, Turkey. **Materials and Methods:** The present descriptive study was conducted on 376 females attending a breast health outpatient clinic. A self-administered questionnaire was designed to evaluate knowledge level about BC and predictors effecting its level. Data analysis was performed using the chi-square test. A value of $p < 0.05$ was considered statistically significant. **Results:** Mean age of the participants was 46.2 ± 9.93 (22-75). The majority (92.6 %) were married; 41.5% were educated less than nine years. Most of the women were housewives (82.7%) and, were living in an urban region (86.4%). Predictors of effecting responses to seven knowledge and awareness questions about BC varied from demographic features including older age groups, higher educational levels, being married, living in an urban area, being employee, smoking, having greater BMI to additional attributes associated breast health such as the increased number of births, applying for the purpose of control, positive family history of breast diseases, any diagnoses of breast diseases and performing BSE practice. **Conclusions:** It was determined that females in Turkey have better knowledge of BC than other developing countries even though it is not at the desired level. These findings revealed that females should be more informed about BC risk factors, prognosis and treatments by primary health-care providers to counteract the ascending burden of this disease.

Keywords: Breast cancer - female - knowledge - awareness - Turkey

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Introduction

Breast cancer (BC) is the most-common malignancy of woman's health worldwide. It is one of the principal causes of cancer-related mortalities among women coming after lung cancer. Based on the World Health Organization (WHO), the overall prevalence of BC is increasing rapidly (Jemal et al., 2011; World Health Organization (WHO), 2011). Noticeable geographical variation in incidence rates are described such as diagnosing highest in the developed countries and lowest in the developing countries in Asia, Middle East, and Africa whereas the gap is narrowing increasingly within last few years (International Agency for Research on Cancer (IARC), 2012). Western Europe, North America, Australia and New Zealand have the peak frequency, while Asia, Africa and South America have the lowest rates (Bray et al., 2013). The predicted incidence

of new diagnosed BC among women in the U.S. in 2014 were about 232,670 new cases of invasive BC, and nearly 40,000 women are going to die from BC (American Cancer Society, 2013).

The general incidence of the three most-frequent cancer types among women worldwide is breast, colon, and lung cancers respectively. Though the sequence demonstrates slight difference, BC remains as the most common diagnosed cancer type in Turkey while others just described as thyroid and colorectal cancers (Turkey Statistical Institute; International Agency for Research on Cancer (IARC), 2012). Based on existing data in Turkey, BC is the most-common malignancy with a rate of 24.1% within all cancer types diagnosed among women, and link with 18% of cancer-related mortalities (Golbasi et al., 2007; Avci, 2008). The likelihood to be diagnosed as a BC is 12.3% during her lifetime period (Altunkan et

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al., 2008). The specified number for BC development in Turkish women is predicted as approximately 10,000 new cases in each year (Yilmaz et al., 2013). Consistent to other countries, possibility of developing BC is also more likely with older ages in Turkey. It is stated that one out of every 66 women in 4th decade, and one out of every 40 women in 5th decade is under the BC risk in Turkey (Avci, 2008).

Including the BC, most cancer types and related mortalities are preventable with optimum management strategies. Early detection with appropriate screening policies and educational interventions plays an essential role in enhancing prognosis and decreasing mortality rates. It is emphasized that the better prognosis and lower survival of BC cases are found out in developed countries due to early diagnosis and treatment on time (Parkin et al., 2005). In most of the developing countries with low-income levels, majority of females apply to the breast outpatient clinic with advanced stage or metastatic BC. Breast Health Global Initiative (BHGI) aims a satisfactory BC awareness, knowledge levels, and high breast self-examination (BSE) rates in this regard to achieve the target of early detection of BC in developing countries (Anderson et al., 2006).

Knowledge about BC is important because it affects the likelihood that a woman will engage in appropriate primary and secondary prevention behaviors. According to the Health Belief Model (HBM), the likelihood of taking a recommended preventive health action is determined by the perceived benefits of the preventive action, the perceived barriers to the preventive action and the perceived threat of the disease.

Knowledge about the disease, according to the HBM, affects all three of the aforementioned direct causes of preventive behavior (Rosenstock I.M., 1966). These kinds of studies are the only possible way to learn the actual level of knowledge and attitudes of Turkish women towards BC. The sufficient and current information about BC increase the awareness and motivate the females to get involved in early screening programs consciously due to these field-studies. (2) The present study aimed to determine the awareness and the knowledge level of Turkish women about BC by asking questions in the survey.

Materials and Methods

Study design and sample

This cross-sectional study was conducted at Gulhane Military Medical Academy, breast outpatient clinic from January to May, 2011 in Ankara, Turkey. Three hundred seventy-six females aged >20 years either being treated as patients or applying for the purpose of control were included. Random sampling technique was used for the design purpose.

All women admitted to the breast health outpatient clinic were informed about research study and asked to participate if there aren't any contradiction. All participants agreed to enroll to the study filled out a self-administered questionnaire asking questions regarding their demographic features and awareness, knowledge and practice of BC. Responses to the knowledge questions were coded as "Yes/No." A total of 66 participants could

not participate in the study, 46 of those expressed their excuses related with time limitation, and 26 patients did not agree to get involved.

Questionnaire

Self-administered questionnaires delivered to participants were structured as two parts. First part was questioning about demographic characteristics and breast health-related histories of females including family histories of breast diseases, current diagnoses, number of births, and age of first pregnancy. Second part was comprised of seven specific knowledge questions about BC as follows: Question 1 (Q1): "Has a familial transmission?", Q2: "Is a curable disease?", Q3: "Is a mortal disease?", Q4: "Does easily spread out to other organs?", Q5: "Is breastfeeding protective?", Q6: "Cause to lose female characteristics?", Q7: "Is gender of physician important?"

Statistical analysis

While evaluating the data obtained from the study,

Table 1. Descriptive Statistics (N=376)

Variables	Frequency (n)	Percent (%)
Age categories		
20-39 years	90	23.9
40-49 years	160	42.6
50-59 years	84	22.3
≥60 years	42	11.2
Education levels		
0-8 years	156	41.5
9-11 years	142	37.8
≥12 years	78	20.7
Marital status		
Married	348	92.6
Others (single, widow)	28	7.4
Employment status		
Employed	65	17.3
Housewife	311	82.7
Location		
Urban	325	86.4
Rural	51	13.6
BMI (kg/m ²)		
18-24.9	173	46
25-29.9	126	33.5
≥30	77	20.5
Number of births		
1	85	22.6
2	226	60.1
≥3	65	17.3
Smoking status		
smoking +	88	23.4
smoking -	288	76.6
Alcohol drinking		
Alcohol +	4	1.1
Alcohol -	372	98.9
BSE		
BSE +	296	78.7
BSE -	80	21.3
Family history of breast disease		
Yes	99	26.3
No	277	73.7
Oral contraceptive usage	13	3.5

*BMI, Body mass index; BSE, Breast self-examination

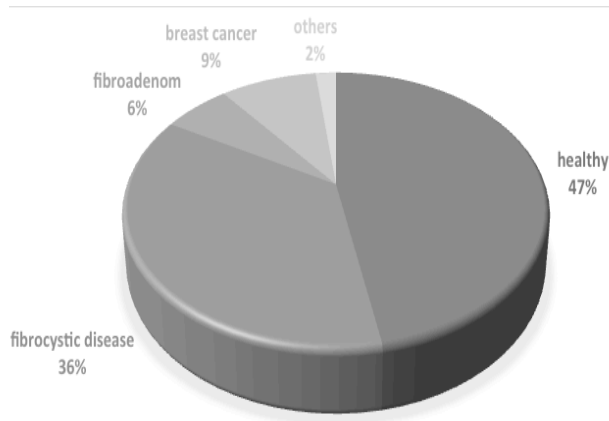


Figure 1. Distribution of the Breast Diseases among Patients Admitted to Breast Outpatient Clinic (N=376)

the package program SPSS 22.0 for Windows (Chicago-USA) was used. Descriptive statistical methods were given in numbers and percentages for categorical variables and as mean±standard deviation or median (minimum-maximum) for continuous variables. Answers to the survey knowledge questions were accepted as dependent variable while their demographic features and BC related information were accepted as independent variables. Data analysis was performed using the chi-square test. Results had 95% confidence interval with $p < 0.05$, indicating statistical significance. Multiple logistic regression analysis was applied to detect the impact of independent variables on the answers of knowledge questions.

Ethical Consideration

Ethics approval was obtained from the Local Institutional Ethics Committee of Gulhane Military Medical Academy, Ankara, Turkey. The researchers followed the principles of the Declaration of Helsinki and received oral consent of participants.

Results

Demographic characteristics and general BC related information of the study sample are included in Table 1. The mean age of the participants was 46.16 ± 9.93 (22-75). Majority (92.6%) were married; 41.5% educated less than nine years. Most of the women were housewives (82.7%) and was living in the urban region (86.4%). Among the participants, 26.3% had a family history of breast disease, and 7.7% had familial BC history. More than half of the females (60.1%) had two children, and only 3.5% were using oral contraception methods. Almost three-quarters (78.7%) stated they were practicing BSE methods. 23.4% were current smoker, whereas only 1.1% were drinking alcohol.

Distribution of the previous diagnoses related breast diseases among patients admitted to breast outpatient clinic is presented in Figure 1. 47% had no actual diagnose related breast health issues. Lump in the breast (31.4%) was the most-common appliance reason during admittance after the regular control (41.2%) (Figure 2).

Distribution of answer preferences to knowledge

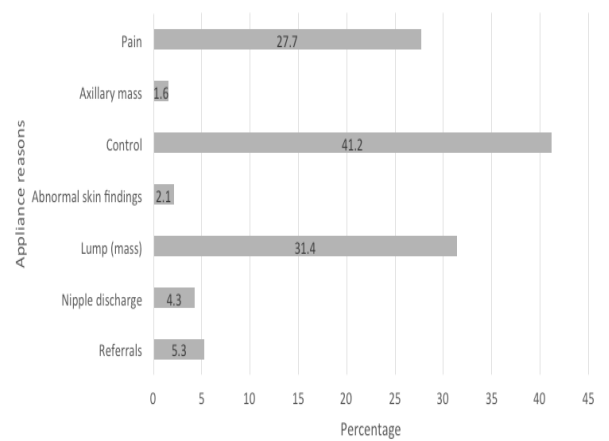


Figure 2. Distribution of Appliance Reasons for Patients Admitted to Breast Outpatient Clinic

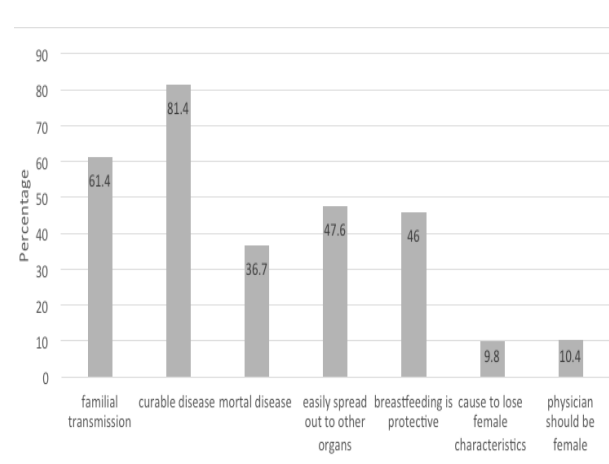


Figure 3. Distribution of Answer Preferences to Knowledge Questions about Breast Cancer and Gender of Physician in Patients Admitted to Breast Outpatient Clinic

questions about BC were detailed in Figure 3. Regarding the responses of knowledge questions, 81.4% of the females agreed that BC is curable, while 9.8% thought it might lead to losing the female characteristics of the women.

Detailed comparison of answers to the knowledge questions about BC is indicated in Table 2 by univariate analysis. Multiple logistic regression analysis revealed that the predictors effecting the answers of Q1 included "BC has a familial transmission" were more likely older age groups [≥ 60 years] vs (20-39 years), OR=2.976], higher education [≥ 12 years] vs (0-8 years), OR=3.151], practice BSE [(Yes) vs (No), OR=1.838], younger age periods of 1st pregnancy [(21-24 years) vs (≥ 25 years), OR=2.103]. Those participants living in urban regions [OR=2.243] and diagnosed with the breast disease [OR=1.981] were more likely thought BC is a curable disease (Question 2). Females with a low number of births explained that they were less likely concerned with the gender of a physician [(2 births) vs (≥ 3 births), OR=0.294] (Question 7). All significant predictors effecting the entire knowledge questions are presented in Table 3 particularly.

Table 2. Comparison of Answers to the Knowledge Questions about Breast Cancer (N=376)

Variables	Questions		X ²	p*
	Q1. Has a familial transmission			
	No	Yes		
Educational level			13.022	0.001
0-8 years	51.7%	35.1%		
9-11 years	35.2%	39.4%		
≥12 years	13.1%	25.5%		
Family history of breast disease	20.7%	29.9%	3.871	0.049
BSE	71.7%	83.1%	6.903	0.009
Age periods of 1st pregnancy			10.742	0.005
≤20 years	45.5%	32.0%		
21-24 years	26.9%	42.9%		
≥25 years	27.6%	25.1%		
	Q2. Is a curable disease			
Educational level			6.161	0.046
0-8 years	54.3%	38.6%		
9-11 years	27.1%	40.2%		
≥12 years	18.6%	21.2%		
Location (urban)	78.6%	88.2%	4.538	0.033
Diagnose of Breast disease	40.0%	55.9%	5.768	0.016
BSE	68.6%	81.0%	5.292	0.021
	Q3. Is a mortal disease			
Age groups			8.004	0.046
20-39 years	27.7%	17.4%		
40-49 years	42.9%	42.0%		
50-59 years	20.6%	25.4%		
≥60 years	8.8%	15.2%		
BMI classification (kg/m ²)			13.094	0.001
18-24.9	52.9%	34.1%		
25-29.9	30.3%	39.1%		
≥30	16.8%	26.8%		
Apply for the purpose of control	37.4%	47.8%	3.923	0.048
	Q4. Easily spread out to other organs			
Age groups			8.799	0.032
20-39 years	29.9%	17.3%		
40-49 years	40.1%	45.3%		
50-59 years	20.8%	24.0%		
≥60 years	9.1%	13.4%		
Family history of breast disease	20.8%	32.4%	6.495	0.011
Smoking	18.3%	29.1%	6.075	0.014
BSE	71.1%	87.2%	14.486	<0.001
	Q5. Breastfeeding is protective			
Marital status (married)	89.2%	96.5%	7.359	0.007
Apply for the purpose of control	34.5%	49.1%	8.274	0.004
	Q6. Cause to lose female characteristics			
Age groups			9.968	0.019
20-39 years	24.8%	16.2%		
40-49 years	44.0%	29.7%		
50-59 years	21.5%	29.7%		
≥60 years	9.7%	24.3%		
BMI classification (kg/m ²)			10.770	0.005
18-24.9	48.7%	21.6%		
25-29.9	32.4%	43.2%		
≥30	18.9%	35.1%		
Number of births			10.338	0.006
1	23.9%	10.8%		
2	60.8%	54.1%		
≥3	15.3%	35.1%		
	Q7. Gender of physician is important			
Number of births			8.460	0.015
1	22.6%	23.1%		
2	62.0%	43.6%		
≥3	15.4%	33.3%		
Diagnose of Breast disease	54.9%	35.9%	5.064	0.024

BMI, Body mass index; BSE, Breast self-examination; *Chi-square analysis

Table 3. Multivariate Regression Analysis of Answers to the Knowledge Questions about Breast Cancer (N=376)

	p	OR	95%CI	
			Lower	Upper
Q1. Has a familial transmission				
Age groups (≥ 60 years) vs (20-39 years)	0.024	2.976	1.153	7.677
Educational levels (≥ 12 years) vs (0-8 years)	0.008	3.151	1.355	7.326
BSE	0.031	1.838	1.057	3.195
Age periods of 1st pregnancy (21-24 years) vs (≥ 25 years)	0.019	2.103	1.132	3.906
Q2. Is a curable disease				
Location (Urban vs Rural)	0.033	2.243	1.068	4.709
Diagnose (Y vs N)	0.021	1.981	1.109	3.539
Q3. Is a mortal disease				
Age groups (≥ 60 years) vs (20-39 years)	0.046	2.643	1.015	6.883
Employment status (employed vs housewife)	0.044	2.209	1.022	4.772
BMI (25-29.9) vs (18-24.9)	0.030	1.811	1.059	3.098
BMI (≥ 30) vs (18-24.9)	0.024	2.065	1.101	3.872
BSE	0.031	1.933	1.062	3.518
Smoking (Y vs N)	0.006	2.143	1.246	3.687
Q4. Easily spread out to other organs				
Age groups				
(40-49 years) vs (20-39 years)	0.036	1.962	1.045	3.681
(50-59 years) vs (20-39 years)	0.015	2.553	1.196	5.448
(≥ 60 years) vs (20-39 years)	0.005	4.185	1.553	11.278
Marital status (Married vs others)	0.032	2.766	1.093	6.998
BSE	<0.001	3.413	1.857	6.274
Family history of breast disease (Y/N)	0.019	1.848	1.105	3.091
Diagnose (Y vs N)	0.015	1.804	1.120	2.907
Smoking (Y vs N)	0.002	2.463	1.403	4.322
Q5. Breastfeeding is protective				
Marital status (Married vs others)	0.003	4.489	1.662	12.126
Employment status (employed vs housewife)	0.039	2.176	1.039	4.555
Apply for the purpose of control	0.004	2.007	1.245	3.234
Q6. Cause to lose female characteristics				
BMI (≥ 30) vs (18-24.9)	0.024	3.335	1.169	9.515
Q7. Gender of physician is important				
Number of births (2 vs ≥ 3)	0.010	0.294	0.116	0.750

*BMI, Body mass index; BSE, Breast self-examination

Discussion

It was precisely known that causes for high BC mortality comprise insufficient information about the disease diagnosis and treatment as much as blamed in other types of cancer. It has been anticipated much more of the increasing prevalence of BC would be occurred in developing countries, including Turkey. Hence, these countries particularly must adjust the BC prevention and early diagnosis program regarding this worldwide health issue (Mafuvadze et al., 2013; Kurtuncu et al., 2014). In the present study, the predictors of effecting responses to seven knowledge and awareness questions about BC vary from demographic features including older age groups, higher educational levels, being married, living in an urban area, being employee, smoking, having greater BMI to additional attributes associated breast health such as the increased number of births, applying for the purpose of control, positive family history of breast diseases, any diagnoses of breast diseases and performing BSE practice.

In this study, almost third quarters of the women were older than 40 years that means the sample consist of reasonably enough cases with a high risk for BC. The main difference of the current study is the evaluation method of BC knowledge in detail instead of just an overview of BC knowledge explaining in previous studies

whether it is sufficient among females in Turkey. The results of this study differ from the findings reported previously. Different findings are likely to be due to important differences in sampling. Most health behavior surveys are distributed to random samples intended to be representative of the community overall. Our sample is drawn from patients who visited a breast health clinic. As such, our subjects were likely to be motivated by concerns about breast health. They might be expected to be more knowledgeable than other women. The concerns that motivated their visits to the breast health outpatient clinic would have increased receptivity to information about BC.

Most studies designed for the awareness and knowledge of BC among women found out the results regarding the age variances. Mandelblatt et al. reported in their study; the level of sufficient knowledge about BC was decreasing while age increased (Mandelblatt et al., 2005). However, in a study conducted in Turkey, Sen et al. stated this relationship inconsistently (Sen S, 2002). In the present study, older females were disposed to response to knowledge questions affirmatively than younger ones. This result would have naturally arisen from the experiences and interactions of elder women in their social lives while all cancer types were spread out worldwide and perceived that they were at high risk of BC development.

High educational level present close association with sufficient BC knowledge and awareness in most studies. Kosgeroglu et al. in Turkey indicated the linear relationship between education levels of women and the level of knowledge about BC (Kosgeroglu et al., 2011). Other studies conducted worldwide or in Turkey demonstrate consistency with this positive correlation (Nekhlyudov and Fletcher, 2001; Altuncan et al., 2008; Donnelly et al., 2013). Assuming the expected probable effect of the education may empower the awareness of females about BC prevention, diagnosis and treatment methods, we had thought to find out the similar results. Contrast to previous studies, we were unable to detect a significant relationship between knowledge questions and educational levels except Question-1 asking the BC has a familial transmission. This finding might have originated from almost four-fifths of educational levels were less than 12 years in our study sample.

It is thought that working females could have sufficient knowledge and high awareness level about BC since they are exposed more materials related with BC early diagnose and treatment. This anticipated opinion also stated by some studies (Golbası et al., 2007). In contrast, Kosgeroglu et al. could not have found out any significant relationship between employment status and BC knowledge level (Kosgeroglu et al., 2011). The result of the current study, even though it was represented in two knowledge questions (Q3, Q5), is compatible with the past studies demonstrating that the level of knowledge about BC in those working were higher. It could be accepted as a natural consequence of high rates of social interaction among working females and their increased sensitivity to woman's health issues.

Literature published to date supports the argument that smoking is well-known risk factor by participants of most studies. However, number of studies taking smoking into consideration as an independent variable were limited. In one of these studies, the level of knowledge about BC in those with smoking was higher when compared to ones not smoking (Kosgeroglu et al., 2011). Although nearly one-quarter of the current study sample was smoking, it was also detected that those who were regularly smoking seemed to have a higher level of knowledge about the questions related BC is a mortal disease (Q3), and it could quickly spread out to the whole body (Q4). An appropriate explanation for this result may be smoking women would have greater awareness of carcinogenic predictors for all cancer types.

It is an acceptable hypothesis that the women of whom were diagnosed any breast diseases could have been in more consciousness about BC than others were not. In this regard, Kosgeroglu et al. reported that females with previously diagnosed with benign or malign breast diseases had sufficient knowledge about BC comparing the cases had any breast diseases diagnoses (Kosgeroglu et al., 2011). It was found out that those with any diagnosed breast diseases at earlier visits had generally higher level of knowledge about the questions regarding BC was a curable disease (Q2) and easily spread out to other organs (Q4) comparing of those were not. It could be the result of the increased requirement of gaining medical knowledge

about BC since they are in a high-risk population.

Positive family history is thought as one of the substantial predictors effecting the knowledge level about BC. In one descriptive study performed in western of Turkey, women with no family/friends history of BC were in 5.2 times higher risk of having insufficient knowledge of BC than in women with family/friends BC history (Dundar et al., 2006). This association also was supported by other international studies (Lipkus et al., 2001). The present study partially agreed with the opinion of those with a positive family history had a higher level of knowledge about BC, since only the question related metastasis (Q4) had a significant relationship with the sufficient knowledge level. A history of breast diseases in families of women may be regarded as an enhancing risk factor to stimulate the perception of sensitivity about BC.

Location type where the females lived in is accepted another predictor for the awareness of BC. In a study performed in western of Turkey, it was expressed that the level knowledge of BC and early screening methods practice rates in urban were higher than rural areas (Discigil et al., 2007).

Regarding questioning about BC has a familial transmission (Q1), almost only sixty percent of women had sufficient knowledge about this established risk factor. This result was in agreement with the study reported by Radi in Saudi females (Radi, 2013). In other study, a characteristic familial transmission of BC was regarded as particular risk factor by most of the participants (Alam, 2006). Though it is not satisfactory, the affirmative response rate of this particular question was very consistent with the literature. Methods of teaching about BC knowledge in health-care facilities and public health policies should be overviewed again from the point of this aspect.

In the present study, it was reported that almost four-fifths of the females emphasized they believed BC was a curable disease and could be preventable. In the study comprised of young females, Kurtuncu et al. reported that majority of their participants were aware of current knowledge of BC was a treatable disease (Kurtuncu et al., 2014). In the another descriptive study consisted of undergraduate university students, more than sixty percent stated the BC was preventable disease (Chioma and Asuzu, 2007). Contrary to this finding, Dandash et al. found out in their study that more than half of women in the study sample had a negative attitude about the treatment of BC (Dandash and Al-Mohaimeed, 2007). These kinds of fatalistic beliefs towards BC could be considered as an essential barrier to gain current knowledge of BC prevention and early diagnose in developing countries (Powe and Finnie, 2003).

A significant barrier preventing women could not be able to achieve the proper level of BC knowledge is modesty thoughts and embarrassment of the females in developing countries particularly in the conservative regions. Hence, the lack of awareness and knowledge about BC in females could easily cause not to have examined by male physician for a clinical breast examination (Bener et al., 2009; Khalil, 2013), or force the females if only the symptoms were worsened explicitly to care about (Saadi

et al., 2012). Some of the Muslim countries adjusted their health-care system regarding this cultural or religious beliefs as setting up a gender-appropriate system in breast health clinics (Donnelly et al., 2013). It was detected that this barrier thought about physician gender for breast health does not seem like a great issue in the present study since most of participants (90%) indicated the gender of health-care provider had no importance. The difference of the study in this aspect than others may originate from urban social lifestyles and interactions of the females in our study.

Number of births, shortly named as “parity,” is established as another essential protective variable for BC development. Pregnancy is thought associated with decreased risk of BC among the general population after the age of 40 years, whereas stimulate the risk for very early onset BC (Narod, 2006; Fishman, 2010). In the present study, number of births did not impress the responses as expected except the question asking the importance of physician gender responsible for breast examination (Q7). Increasing in the parities may provide to lead experiences by women in gynecologic examinations, and also diminish the severity of embarrassment in clinical breast examination.

Although the truth that overweight may have a great potential increased risk for BC was known by most of the participants in studies (Begum et al., 2009; Gilani et al., 2010), the relationship between their responses of knowledge questions and BMI levels could not be analyzed. As an interesting finding, over-weight and obese females were likely to answer the question (Q3) asking whether BC was a mortal disease as “Yes.” This finding could have arisen from the high motivation of over-weight participants about the risk of obesity for health-related issues including BC development.

BC may be perceived as a loss of feminine characteristic by women in some of the developing countries. In qualitative studies, participants declared the negative effects of BC on females’ appearance, furthermore, few particularly stated it was equal to disappearance of femininity (Khazae-Pool et al., 2014). Almost ten percent of participants in the present study agreed with this perceived misbelief which could be regarded as negligible level. The significant predictor of this knowledge question (Q6) was being in an obesity state which may lead the pessimistic mood regarding their unpleasant appearance generally.

Limitations

The present study was written from the spreadsheet limited to some sections of the community and linked with only regarding few aspects of the BC. The information about knowledge of BC was gathered from self-administered questionnaire, so we cannot eliminate informative bias issues. The results could not be generalized to all Turkish women and representative of the entire population since the sample was enrolled from Ankara, in Turkey.

In conclusion, knowledge levels about BC were not at the desired standards in our sample though sufficient response rates were higher than other developing

countries. These findings demonstrate that females should be more informed about BC early diagnose, prognosis and treatments by primary health-care providers to get through the ascending burden of this disease. Providing available public health education to raise the awareness of BC would lead to contribute to the BC prevention and related mortalities.

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