

# Knowledge, Practices, and Attitudes of Women Towards Breast Cancer in Lebanon

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## Abstract

Breast cancer is a major public health concern that affects both developed and developing countries. Its annual incidence is rising globally, accounting for 12% of all new cancer cases and 25% of all cancers in women as of 2012. Breast cancer is responsible for the most frequent malignancy-causing deaths and cancer-related mortality and morbidity in women, an epidemiological profile mirrored in almost every country. However, in developing countries, where health literacy, access to care, and resources are all scarce, these numbers become particularly alarming. They contribute to major health disparities between the developed and developing worlds, especially in that most women in developing nations who develop breast cancer seek healthcare only when the cancer is at an advanced stage.

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## Introduction

Breast cancer is a major public health concern that affects both developed and developing countries.<sup>1</sup> Its annual incidence is rising globally, accounting for 12% of all new cancer cases and 25% of all cancers in women as of 2012. Annually, around 1.7 million women worldwide are diagnosed with breast cancer.<sup>2</sup> As such, breast cancer is responsible for the most frequent malignancy-causing deaths and cancer-related mortality and morbidity in women, an epidemiological profile mirrored in almost every country. However, in developing countries, where health literacy, access to care, and resources are all scarce, these numbers become particularly alarming. They contribute to major health disparities between the developed and developing world, especially in that most women in developing nations who develop breast cancer seek healthcare only when the cancer is at an advanced stage.

Breast cancer incidence is projected to rise in developing countries due to continued lack of awareness and resources for screening for women. Conversely, in developed countries, research and awareness campaigns have emphasized the necessity and importance of breast cancer screening. Successful efforts have also

taken religious and cultural considerations into account to ensure the effectiveness and appropriateness of the teaching language and methods used.<sup>3</sup>

One country epitomizing an environment in urgent need of promoting knowledge about breast cancer to women, and how to detect it early, is Lebanon. This nation has a rising incidence of breast cancer, a fact compounded by political turmoil, religious specificities, decreased access to healthcare, and lack of sustained public health awareness campaigns. In Lebanon, breast cancer accounts for 42% of all cancers in women, with a median age at diagnosis of 52.5 years.<sup>4</sup> Lebanese data show that 1 in 5 cancers nationally is breast cancer but, even more significantly, breast cancer occurring in women aged younger than 40 years represents approximately 22% of the cases, while such scenarios represent about 6% of cases in Western populations.<sup>5,6</sup> These findings further emphasize the disparity between developing and developed nations in this area, and the need for breast cancer screening efforts in Lebanon.

## Objectives

Using Champion's Health Belief Model Scale (CHBMS), the objectives of this study were to: 1) examine the knowledge of and attitudes about breast cancer in Lebanese women, and their practices of detection, and 2) identify potential barriers to breast cancer screening among Lebanese women.

## Background

### *Overview of Lebanon*

Lebanon, just 10,452 square kilometers in area, is in what's known as the Middle East, at the crossroads between the Mediterranean countries and the Arabian Peninsula. Because of its Mediterranean coastal location, the country has a rich history of religious and ethnic diversity, in addition to political turmoil and wars.

The total population of Lebanese people worldwide is estimated at 13 million to 18 million. Of these, the vast majority, 8.6 to 14 million, are in the Lebanese diaspora (ie, in countries around the world, outside of Lebanon), and about 4.3 million currently live in Lebanon itself.<sup>7,8</sup> Understanding what Lebanese women know about breast cancer, their attitude toward it, and how they act to protect themselves is important not only for the women residing in Lebanon today, but also for women of Lebanese origin living

internationally. More research about this population could help determine ways to promote and enhance early diagnosis and treatment of breast cancer, especially among young Lebanese women.

### Breast Cancer Knowledge and Screening in the Middle East and Lebanon

There is universal consensus that early detection of breast cancer offers the greatest chance of long-term survival among women.<sup>5,9,11</sup> Early detection of breast cancer can be achieved by proper awareness about performing breast self-examination (BSE), and by accessing clinical breast examination (CBE) by health providers, along with mammography.<sup>1</sup> Bener and colleagues,<sup>12</sup> in a study assessing barriers to breast cancer screening in Qatar (a country in the Arab Gulf region), reported that despite having a sufficient level of knowledge about breast cancer, Qatari women had low rates of breast cancer screening. Fears of and worries about mammography's potential results were frequently reported as among the barriers to screening. Similarly, Petro-Nustus and Mikhail,<sup>13</sup> in a study of 519 Jordanian women that examined factors associated with BSE, found that although the majority (67%) of participants had heard or read about BSE, only 7% had performed it on a regular monthly basis. Confidence, motivation, benefits, susceptibility, and personal history of breast cancer were variables that had a positive association with BSE practice.<sup>13</sup> Montazeri and colleagues,<sup>14</sup> in a descriptive study with 410 Muslim women in Iran, investigated whether religious beliefs matter in BSE. Study findings suggested that most Muslim women do not perceive BSE as being against their Islamic beliefs and that they believe clinical breast examination by a male physician does not interfere with their religious beliefs.<sup>14</sup>

The results of other studies<sup>15,21</sup> have also emphasized that women's knowledge of and beliefs about breast cancer and its management may contribute considerably to health-related help-seeking behaviors. BSE training and adherence are the first steps for women seeking health-promotion behavior, and these set the stage for CBE and mammography screening guidelines later in life. Screening is associated with perceptions of risk, benefits, and barriers through a reasoning process that embraces personal and social influences and attitudes.<sup>22</sup> Arevian and colleagues,<sup>23</sup> in a study assessing beliefs related to breast cancer knowledge and screening among 94 Lebanese Armenian women aged between 26 and 68 years, noted that 80.9% of the women surveyed had heard of BSE and 76.6% had heard of mammography. Nevertheless, 53.2% had never practiced BSE and 79.6% had never undergone mammography. The authors suggested that low practice levels of BSE and mammography utilization were related to a multitude of factors, including fatalism, fear, and lack of guidance from a physician or primary care provider, as well as sociocultural beliefs and the meaning of breast cancer screening.<sup>23</sup> Recently, Hassoun and colleagues,<sup>24</sup> in a study examining the barriers to mammography screening in Lebanon, reported the 3 most common deterrents as lack of knowledge about breast cancer, social reasons, and lack of access. These researchers, despite naming somewhat

different sets of barriers, agree and document that lack of knowledge and lack of practice are 2 major breast cancer screening barriers.

In 2002, Lebanese health experts and the Lebanese Ministry of Public Health began screening awareness campaigns about early detection to try to address the breast cancer taboo. Such campaigns are continuously being organized and conducted every year during October, November, and December, consisting of public awareness sessions about BSE, CBE, and mammography. The ministry also facilitated access to mammography for Lebanese women aged 40 years and older; it is offered free of charge in public hospitals and at discounted prices in some private hospitals and radiology centers. Despite these efforts, however, results of a survey of about 1200 women conducted between 2002 and 2005, to assess mammography utilization following breast cancer awareness campaigns showed disappointingly low rates of use—and those rates differed significantly between women in urban and rural locations. More than 50% of participants reported that they had heard about the campaign; however, just 12.7% of those who heard of the campaign were actually prompted to get mammograms in 2007.<sup>25</sup> More research is needed to understand why Lebanese women do not take advantages of available resources for breast cancer screening. Also, results of annual awareness campaigns for nurses and women across the country indicate that the majority of Lebanese women do not perform BSE or do not know how to do it. Although BSE alone does not decrease the risk of undetected breast cancer, the practice empowers women to take responsibility for their own health. Therefore, BSE is recommended for raising awareness among women at risk rather than as a screening method.<sup>2</sup>

To date and to our knowledge, no published studies exist that examine women's knowledge, practice, and beliefs related to breast cancer in Lebanon except for the Arevian et al<sup>23</sup> study, limited to 1 specific Lebanese Armenian group of women. Another study did focus on breast cancer from a different perspective—the lived experiences of Lebanese women with breast cancer. It highlighted their losses and feelings of guilt, fear, and uncertainty that they experienced during and after diagnosis.<sup>26</sup> The attitudes and knowledge base of Lebanese women must be taken into account when planning culturally appropriate health actions promoting breast cancer screening.

### Methods

#### Study Design

A national cross-sectional descriptive survey design was used to examine the knowledge of, practice of, and attitudes toward breast cancer screening. Institutional Review Board approval from a major academic institution in Lebanon was obtained. Data collection was conducted by 24 certified female field surveyors. Trained by the researcher to standardize the data collection process, the data collectors were intentionally female to meet the cultural needs of Lebanese women and to avoid embarrassment when discussing intimate breast cancer screening concepts. A proportional sampling technique was used across all the governorates (Mohafaza) and women coming from different religious, educational, and social backgrounds in

Lebanon. The surveyors used the Kish grid approach for determining participant eligibility. A participant was eligible if she lived in a house that had more than 1 woman and if she were aged 40 years or older. We excluded women who were diagnosed with breast cancer or had a positive family history of breast cancer. Data collection was conducted in Arabic using translated instruments.

We calculated the sample size based on a 95% confidence level and a maximum 2.83% error ratio. The population of Lebanon is about 4 million and 52% are women<sup>27</sup>; therefore, the sample size was calculated to be 1200 participants.

*Instruments*

We used the revised version of the CHBMS questionnaire.<sup>26</sup> The CHBMS is composed of 53 items evaluating 8 dimensions: a) susceptibility (5 items), b) seriousness (7 items), c) benefits of BSE (6 items), d) barriers to BSE (6 items), e) confidence (11 items), f) health motivation (7 items), g) benefits of mammography (6 items), and h) barriers to mammography (5 items). Items are rated on a 5-point Likert scale ranging from strong disagreement (1 point) to strong agreement (5 points). We used the CHBMS after securing written approval from the author. In addition to CHBMS, we added sections on sociodemographic characteristics and on breast cancer screening behaviors to the instrument.

*Translation and Pilot Testing*

We followed the recommended back-translation procedure for translating research instruments.<sup>28,29</sup> First, we translated the questionnaire from English to Arabic. Face validity and cultural validity of the translated questionnaire were examined by a group of experts (an oncology nurse, a breast cancer survivor, and an oncologist) with no recommendations for changes in translation. The Arabic version was back-translated to English by an independent translator with no prior knowledge of the original English version. The final version was pilot tested with 15 Lebanese women who met the eligibility criteria of the study. The purpose of the pilot was to assess for clarity, length, and comprehension of the translated survey. No further changes were recommended. Cronbach’s alphas for the 8 dimensions ranged between 0.7 (benefits of mammography) to 0.97 (susceptibility). The Arabic-translated survey was thus deemed valid and reliable to be used in this study.

*Analysis*

Descriptive statistics were used to summarize the respondents’ demographic characteristics, screening practices, and the CHBMS subscales. Simple and multiple logistic regression were used to determine the unadjusted and adjusted associations between the outcomes for BSE status (yes/no) and CBE status (yes/no) and independently selected predictors. Predictors included sociodemographic characteristics such as age, education, perceived socioeconomic status (SES), marital status, occupation, religion, governorate, and the CHBMS subscales. Crude and adjusted odds ratios and their

95% confidence intervals were reported. All tests were 2-tailed and P values <.05 were considered significant. Analyses were carried out using SPSS version 22 (IBM Corp; Armonk, NY).

**Results**

*Sociodemographic Characteristics*

A total of 1200 women participated in this study. Seventy-three percent were aged between 40 and 59 years with a mean age of 53.6 years (standard deviation, 11.2). More than half (67.3%) were married and 68.7% had an intermediate or secondary school education. Three-quarters (75.3%) were unemployed (not working outside the home) and 67.8% perceived their SES as middle income. More than half were Muslim (53.6%). Married women had a mean age at marriage of 21.5 years (SD, 5.7) and had on average 3 to 4 children (Table 1).

**TABLE 1. Background Characteristics of the Study Sample.**

	Count (n)	%
<b>AGE (YEARS)</b>		
40-49	504	42.0%
50-59	367	30.6%
60+	329	27.4%
<b>MARITAL STATUS</b>		
Single	149	12.4%
Married	808	67.3%
Widowed/divorced	243	20.3%
<b>EDUCATION LEVEL</b>		
Elementary	375	31.3%
Intermediate	347	28.9%
Secondary or above	478	39.8%
<b>EMPLOYMENT</b>		
Unemployed	903	75.3%
Employed	297	24.7%
<b>PERCEIVED SES</b>		
Low	266	22.2%
Middle	814	67.8%
High	120	10.0%
<b>RELIGION</b>		
Christian	456	38.0%
Muslim	643	53.6%
Druze	101	8.4%
<b>GOVERNORATE</b>		
Beirut	120	10.0%
Bekaa	240	20.0%
Mount Lebanon	360	30.0%
North	240	20.0%
South	120	10.0%
Nabatieh	120	10.0%
<b>AGE AT MARRIAGE (YEARS): MEAN, SD</b>	21.46	5.68
<b>NUMBER OF CHILDREN: MEAN, SD</b>	3.67	2.23

SD, standard deviation; SES indicates socioeconomic status.

*Breast Cancer Screening Practices*

The majority (83.5%) of the women had heard of BSE; among these women, 63.7% had conducted BSE; of the 83.5%, 71.1% said

they knew what CBE was, and 71.0% of those had conducted CBE. Overall, only 37.7% reported having had both CBE and BSE. The average responses of the Champion subscales are summarized in Table 2. Study participants were overall highly motivated, perceived high levels of benefit in performing both BSE and mammography, and had high levels of confidence in BSE. They perceived medium levels of susceptibility to breast cancer and seriousness of breast cancer. As for the barriers, participants perceived medium levels of barriers to performing mammography compared with low levels of barriers to performing BSE (Table 2).

**TABLE 2. BSE, CBE, Mammography Knowledge, Practice, and Beliefs of the Total Sample (N = 1200).**

Have you ever heard of breast self-examination? (count, %)	1002	83.5%
If yes, have you ever done breast self-examination?	638	63.7%
Do you know what a clinical breast examination is? (count, %)	853	71.1%
If yes, have you ever done clinical breast examination?	606	71.0%
Perceived susceptibility (mean, SD)	2.10	1.02
CHAMPION SUBSCALES (MEAN, SD)		
- Susceptibility to breast cancer	2.15	1.10
- Seriousness of breast cancer	2.82	1.11
- Health motivation	3.61	.86
- BSE barriers	1.88	.89
- BSE confidence	3.06	1.21
- BSE benefits	3.80	1.09
- Mammography benefits	3.86	1.06
- Mammography barriers	2.52	.98

BSE indicates breast self-examination; CBE, clinical breast examination, SD, standard deviation.

*BSE Practices*

Among women who knew and practiced BSE (n = 638), fewer than a quarter performed BSE every month (23.7%) and less than half performed BSE within the expected standard time, which is within 2 minutes (44.4%). Only 17.4% used the proper position of fingers to palpate the breast and 45.1% used 3 fingers while assessing their breasts. Only 34.3% used different types of pressure, whereas 76% followed a specific pattern, 39.0% used the proper hand to examine the breast, and 45.0 % always examined the entire area. Only 13.0% looked at the mirror when examining their breast and 17.8% of those always looked at the mirror with the 3 positions, whereas 27.4% always used small-circle motions and 51.3% examined both breasts (Table 3).

*Factors Associated With BSE*

To determine the factors associated with BSE practice, logistic regression analysis was conducted among women who knew what BSE is. In the unadjusted analysis, married women were more likely

**TABLE 3. Percent of Correct BSE Practices Among Women Who Perform BSE (N = 638).**

Practice	Correct	% Correct
1. During the past year, how many times have you examined your breasts?	Monthly	23.7
2. How long does it normally take to examine each breast?	1-2 minutes	44.4
3. When doing BSE, how do you feel your breasts?	Flat part of fingers	17.4
4. When doing BSE, how many fingers do you use?	3 fingers	45.1
5. When examining your breasts, how often do you use different types of pressure in each spot?	Always	34.3
6. When examining your breasts what type of pattern do you use?	Specific	76.0
7. What hand do you use to examine your breasts?	Proper	39.5
8. When examining your breasts, how often do you examine the entire area that extends from under the arm, across the bra line, and up the breast bone and across the collar bone	Entire area	45.0
9. When examining the breasts, how often do you look in the mirror?	Always	13.0
10. When looking in the mirror, how often do you view them from 3 positions—hands on your sides, hand on your hips, and hands on your head to assess your breasts?	Always	17.8
11. How often do you lie on your side when examining the outside area of your breasts?	Always	3.8
12. How often do you lie on your back to examine your breasts?	Depending on position of examination, the answers to this question are: never, sometimes, frequently, always	If always 7.4
13. When examining your breasts, how often do you move your fingers in small dime-shape circles?	Small circle	27.4
14. When examining your breasts how often do you examine both breasts?	Always	51.3

BSE indicates breast self-examination.

to practice BSE as compared with single women (odds ratio [OR], 1.79; 95% CI, 1.21-2.66). Women who perceived their SES as high were also more likely to perform BSE when compared with women perceiving their SES as low (OR, 3.45; 95% CI, 1.94-6.14). Across the 6 Lebanese Mohafaza, women living in the Bekaa, South, and Nabatieh Mohafaza regions were more likely to practice BSE than women living in the capital Beirut, which is also a Mohafaza (OR, 1.76; 95% CI, 1.10-2.84; OR, 3.17; 95% CI, 1.73-5.81; and OR, 2.11; 95% CI, 1.20-3.71, respectively). As for the Champion’s subscales, health motivation, women with more confidence about their skills in performing BSE, and women who believed in BSE benefits were more likely to practice BSE (OR, 1.46; 95% CI, 1.25-1.70; OR, 2.65; 95% CI, 2.29-3.06; and OR, 1.42; 95% CI, 1.26-1.59, respectively).

Women with high perception of the seriousness of breast cancer and those with high levels of BSE barriers were less likely to practice BSE (OR, 0.85; 95% CI, 0.75-0.95; and OR, 0.79; 95% CI, 0.69-0.92, respectively). Also, women with intermediate education were less likely to practice BSE compared with women with secondary education or above (OR, 0.62; 95% CI, 0.46-0.84). No significant differences were found related to age, employment, religion, and susceptibility.

In the adjusted analysis, women who were married; had secondary education and above compared with those with intermediate education; with high perceived SES; living in the Bekaa and the South Mohafaza compared with Beirut; and had high confidence in their own skills toward BSE practice remained more likely to practice BSE (Table 4).

**TABLE 4. Adjusted Logistic Regression Analysis of the Factors Associated With Performing BSE (N = 1002).**

	Adjusted OR	95% CI	P
<b>MARITAL STATUS</b>			
Single	Reference		
Married	1.70	(1.07-2.72)	.026
Widowed/divorced	1.37	(0.78-2.43)	.276
<b>EDUCATION</b>			
Secondary and above	Reference		
Elementary	1.34	(0.88-2.04)	.174
Intermediate	0.67	(0.46-0.96)	.031
<b>Perceived SES</b>			
Low	Reference		
Middle	1.14	(0.75-1.71)	.544
High	3.25	(1.63-6.52)	.001
<b>GOVERNORATE</b>			
Beirut	Reference		
Bekaa	1.83	(1.01-3.32)	.047
Mount Lebanon	1.07	(0.61-1.86)	.816
North	0.82	(0.45-1.48)	.508
South	3.56	(1.75-7.26)	<.001
Nabatieh	1.39	(0.70-2.76)	.342
<b>CHAMPION SUBSCALES</b>			
BSE confidence	3.02	(2.51-3.63)	<.001

BSE indicates breast self-examination, SES, socioeconomic status.

*Factors Associated with CBE*

To determine the factors associated with CBE practice, we carried out logistic regression analysis among women who knew what CBE was. In the unadjusted analysis, women aged between 50 and 59 years and women aged 60 years or more were more likely to perform CBE compared with women aged between 40 and 49 years (OR, 1.74; 95% CI, 1.23-2.47; OR, 2.10; 95% CI, 1.43-3.10, respectively). Married or divorced women were more likely to practice CBE compared with single women (OR, 1.73; 95% CI, 1.09-2.75; and OR, 2.09; 95% CI, 1.19-3.67, respectively). Women perceiving their SES as middle or high were more likely to perform CBE as compared with women perceiving their SES as low (OR, 1.55; 95% CI, 1.07-2.26; and OR, 1.85; 95% CI, 1.06-3.23, respectively). Employed women were more likely to perform a CBE (OR, 1.80; 95% CI, 1.25-2.58) when

compared with unemployed women. Muslim women (OR, 0.54; 95% CI, 0.39-0.74) and Druze women (OR, 0.48; 95% CI, 0.27-0.87) were less likely than Christian women to have a CBE. Across the 6 Lebanese Mohafaza, women living in the Bekaa, South, and Nabatieh were less likely to practice CBE than women living in the capital Beirut (OR, 0.25; 95% CI, 0.13-0.48; OR, 0.26; 95% CI, 0.13-0.54; and OR, 0.34; 95% CI, 0.17-0.70, respectively). Women with high perceived susceptibility were more likely to perform a CBE (OR, 1.29; 95% CI, 1.11-1.15). As for the Champion subscales, health motivation and women who had a high score on this subscale (OR, 1.33; 95% CI, 1.11-1.58) were more likely to practice CBE. No significant differences were found between women of different education levels and in those who had different perceptions of the seriousness of the condition.

In the adjusted analysis, women who were older; married or divorced; perceived their SES as middle or high; employed; had high perceived susceptibility; and were highly motivated remained more likely to have a CBE. Druze women and those living in Bekaa, South, and Nabatieh remained less likely to have CBE performed (Table 5).

**TABLE 5. Adjusted Logistic Regression Analysis of the Factors Associated With Performing CBE (N = 853).**

	Adjusted OR	95% CI	P
<b>AGE</b>			
40-49	Reference		
50-59	2.07	(1.41-3.04)	<.001
60+	3.06	(1.89-4.94)	<.001
<b>MARITAL STATUS</b>			
Single	Reference		
Married	2.57	(1.50-4.38)	.001
Divorced	2.26	(1.20-4.25)	.012
<b>PERCEIVED SES</b>			
Low	Reference		
Middle	1.53	(0.99-2.35)	.054
High	1.98	(1.05-3.72)	.034
<b>EMPLOYMENT</b>			
Unemployed	Reference		
Employed	1.89	(1.25-2.88)	.003
<b>RELIGION</b>			
Christian	Reference		
Muslim	0.99	(0.63-1.55)	.956
Druze	0.55	(0.28-1.07)	.08
<b>GOVERNORATE</b>			
Beirut	Reference		
Bekaa	0.25	(0.13-0.49)	<.001
Mount Lebanon	0.67	(0.33-1.34)	.255
North	0.73	(0.34-1.56)	.417
South	0.32	(0.14-0.69)	.004
Nabatieh	0.40	(0.19-0.87)	.02
<b>CHAMPION SUBSCALES</b>			
Health motivation	1.25	(1.02-1.53)	.03

CBE indicates clinical breast examination; SES, socioeconomic status

**Discussion**

As the incidence of breast cancer increases worldwide, understanding

women's knowledge of, attitude toward, and behaviors engaged in regarding breast cancer screening is essential, because screening is a first step toward early detection. Developed countries have recognized this for decades and have often created culturally specific awareness campaigns. However, a lack of similar research marks many developing countries, including Lebanon, to the detriment of women. With limited resources and access to healthcare, many developing countries may not have the luxury to plan several campaigns to make the required impact and reach women all over a given nation.

In Lebanon, the Ministry of Public Health and the National Breast Cancer Awareness Committee have tried to organize awareness sessions and campaigns to reach as many Lebanese women as possible, in different regions. However, studies have not been conducted to examine the post-campaign knowledge, attitudes, and practices of the women the campaigns sought to reach. Postcampaign studies are important to identify geographical areas that may have not been reached, messaging that needs to be modified, or remaining cultural barriers to this screening. Our study was timely to address these important issues to make breast cancer screening more widespread among Lebanese women, and our findings help us understand women's knowledge of, attitudes toward, and practices of BSE, CBE, and mammography.

Although strong evidence indicates that BSE does not reduce breast cancer mortality, it is still recommended that women know their breasts. Also, CBE is highly recommended for women in their 20s and 30s, every 3 years, and for women aged 40 and older on an annual basis.<sup>1</sup> Our study results showed that most of the surveyed women had heard of BSE but only a minority of women performed it monthly. Despite the acceptable rates of knowledge about BSE, its practice is unsatisfactory, given the intensive awareness strategy undertaken by the Lebanese Ministry of Health, which has been implemented on a yearly basis since 2002. The campaign uses a variety of media tools to enhance women's knowledge and practices regarding BSE, CBE, and mammography. Cancer-related anxiety and worry have been related with both the promotion and avoidance of breast cancer assessment.<sup>24,30-31</sup> This low percentage of practice of BSE among Lebanese women, which was also revealed by Arevian and colleagues<sup>23</sup> for Lebanese Armenian women, might be due to fear of breast cancer as mentioned in a study by Doumit and colleagues.<sup>26</sup> The low response could also be related to the type of message sent during the national campaigns. As emphasized by Champion and colleagues,<sup>32</sup> interactive tailored approaches are generally more effective than targeted messages, especially when addressing sensitive topics like breast cancer. As a comparison, results of a study done in Turkey<sup>17</sup> that involved 1344 women indicated that only 19.9% of the surveyed women practiced CBE, and almost half had heard or read about BSE. Furthermore, lower rates for BSE and CBE were reported in studies in Nigeria,<sup>33</sup> Qatar,<sup>12</sup> Jordan,<sup>13</sup> and Pakistan,<sup>34</sup> and among African American women as well.<sup>10</sup>

In our study, the characteristics of women who performed BSE and CBE compare well with the literature in terms of social status and

perceived susceptibility to the condition and level of education.<sup>35-36</sup> These results are comparable to those of a study done in India<sup>37</sup> that reported that a higher level of education correlated to a higher level of knowledge about breast cancer screening. Women with secondary and university levels of education are better exposed to information related to health awareness.<sup>37</sup>

When comparing between Mohafaza, we noticed that the women in the South were around 4 times as likely to perform BSE compared with those living in Beirut. After investigating this finding, we learned that many nongovernmental organizations (NGOs) are extensively educating women in this area. The south of Lebanon has been known as a deprived and low-income area with a dense population. Lately, many efforts are in place to improve the health status of the people living in such areas. These efforts might explain our results for BSE, which does not require a physician's visit. Additionally, these results highlight the fact that these campaigns might not be speaking to the people living in major cities such as Beirut and others; the efforts should ensure that basic messaging is reaching women throughout Lebanon, with increased efforts for the areas in greatest need. Most people living in the South work or have parents who work in Africa, which explains the high perceived level of SES; it is attributed to finances and not to education. Data from the literature reveal that women of low SES seek help from health providers when sick, and presume they are healthy unless they feel sick.<sup>36</sup> Similarly, Lebanese women with perceived low SES practice significantly less BSE and CBE. The higher their perceived SES, the more they practiced BSE and CBE. This means that efforts need to target low-SES areas. CBE, done by a physician, is more common among employed women living in Beirut with middle-to-high SES, than among women elsewhere with low SES.

Techniques of practicing BSE were assessed in this study, but only a minority of women who practice BSE actually used the proper techniques. It is worth noting that none of the reviewed studies reported any data about techniques of performing BSE, which makes comparison with other studies challenging. However, these results about the techniques will enlighten physicians and nurses who are working in community centers or clinics to focus more on the "actual doing" techniques and not just be satisfied with the positive self-reporting about BSE.

It is well documented that the presence of role models and favorable perceptions in popular culture play a vital role in encouraging women to participate in breast cancer screening.<sup>38</sup> Research suggests that social structures influence the way in which women experience breast cancer, including their decision making in response to treatment options as well as their strategies for coping with and making sense of breast cancer.<sup>39</sup> Despite some changes in Lebanese society related to acceptance of breast cancer, the topic is still considered taboo; it has a direct connection with the perception of poor self-image and with negative repercussions on daughters in a family affected by the disease.<sup>26</sup> The situation would likely change for the better if more breast cancer survivors spoke about their positive exper-

riences in media outlets, and if more efforts were made to reverse the stigma. Hassoun and colleagues<sup>24</sup> reported that important barriers to mammography in Lebanese women are related to fear of knowledge of having breast cancer and to the anxiety experienced while waiting for the results of the mammography.

Based on the health belief model, perceived barriers are adversely associated with screening behaviors. Our results indicated that concepts of health motivation and confidence in performing BSE were significant at the multivariate level, and benefits were significant at the univariate level. Susceptibility, seriousness, benefits, confidence, and health motivation were positively associated with the practice of BSE. Lebanese women who were motivated toward maintaining good health, had confidence in doing BSE, and perceived the benefits of doing BSE had a higher rate of performance than others. These results compare with the outcomes of a study<sup>17</sup> with Turkish women. Other studies had similar results on the concepts of motivation, confidence, and benefits.<sup>13,23</sup> Moreover, Hassoun and colleagues<sup>24</sup> reported that anxiety while waiting for the results of mammography was the main barrier that socially prevented Lebanese women from participating in mammography screening.

#### Limitations

The limitations of this study relate to the design itself. A cross-sectional study such as this one is carried out at a single point in time, or over a short period of time at most. It provides a snapshot of the outcomes and its related characteristics, at that specific point, and results could have been different had another time frame had been chosen. Another potential limitation could be related to the interviews, because the interviewees might exhibit some bias (even inadvertently) in reporting information about themselves that they perceived as quite intimate.

#### Conclusions

Lebanon is currently actively involved in promoting awareness of breast cancer and the necessity of screening at a national level; however, our findings indicate that there remains a need for additional campaigns. Moreover, improvements that take educational, cultural, and behavioral factors into account would be beneficial.

Our conclusions do not only potentially benefit Lebanon, but other developing countries with which it shares certain characteristics. It is essential for healthcare providers to be aware of the barriers affecting breast cancer screening—mainly the educational and knowledge barriers. Understanding these barriers is the first step toward planning an enhanced educational message. Cultural factors should also be considered in planning awareness campaigns. More studies should be planned to gain in-depth understanding of the social and economic barriers to women's participation in breast cancer screening.

Lebanon, a developing country with a diverse population and limited resources, shares some similarities with numerous other countries. The population in Lebanon is religiously diverse, ranging from very liberal to very conservative. Therefore, educational national-level

campaigns need to speak to different cultural preferences and practices of women. Other nations, too, have great sociodemographic variations and could benefit from the experiences of breast cancer awareness efforts in Lebanon.

This study presents the first national survey to study Lebanese women's knowledge of and attitudes toward breast cancer and screening, and of their practice of BSE, CBE, and mammography. By determining the perceived barriers to BSE, CBE, and mammography, we will be able to work with NGOs to plan a culturally appropriate strategic innovative approach to enhance women's compliance with screening measures.

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