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What Do We Learn from a Breast Cancer Awareness Campaign in a Developing Country? A Cross-sectional Study

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ABSTRACT

Background: Breast cancer (BC) screening and awareness programs are conducted annually for Iranian women by the collaboration of several governmental and non-governmental organizations (NGOs). We designed a study to assess the effect of the campaign on women's awareness, education, and the outcome of previously unnoticed breast lesions detected during the campaign screening program.

Methods: Through online social media announcements, women were invited to participate in this campaign run in five locations in the capital of Iran, Tehran. Participants filled out a questionnaire about personal data, previous breast problems, BC awareness, and screening attitudes. BC screening was only performed via breast examination by surgeons for all women. We called all participants who required further investigation after two years.

Results: In this campaign, 418 women with a mean age of 43.19±49.11 were examined. About 42% had some information about BC, mainly acquired from the media. Among women over 50, 30.2% had no previous screenings, and 15.9% had not been referred despite having symptoms. Among the women who needed further investigations, according to the campaign evaluation, 71.8% complied with the recommendation to follow-up their case, and two women were diagnosed with BC.

Conclusion: Women need more education in the field of BC awareness, and on the need for screening, especially after the age of 50. To achieve these goals, using mass media is highly recommended, and the experience of the successful campaigns run by charity organizations and academic centers might be a good guide for preparing a comprehensive protocol.

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INTRODUCTION

With a 5-year prevalence of about 7,80 million and 2,30 million new cases in 2020, breast cancer is the most common malignancy in women worldwide. Breast cancer is also the most common cancer (with 55,915 prevalent cases and 16,967 incident cases in 2020) and the leading cause of mortality due to cancer

(with 4,810 deaths in 2020) in Iranian women as well. [1] The incidence of breast cancer in Iran is rising due to the Western lifestyle, and we expect to have 23,000 new cases by 2040.[1-3] On the other hand, mortality from breast cancer in developing countries is much higher than in developed countries.[4] Iran faces a considerable economic burden from breast cancer, which is expected to increase significantly as the incidence rate rises.[5] Thus, breast cancer prevention, screening, and early detection should be prioritized by national cancer control programs.[5] Cancer prevention and control programs include awareness, regular periodic examinations, and screening and diagnostic procedures (mammography, sonography, MRI, and biopsy). Early detection is a key part of a cancer control program, and treating the disease in the early stages is less expensive and more successful. Moreover, the patient's survival rate and quality of life will be much higher if treated in the early stages. [6]

Governmental and non-governmental organizations (NGOs), as well as charities, are critical in supporting cancer control and prevention. They help raise knowledge and awareness about public health issues and cancer, and policymakers could benefit from the efforts of cancer charities concerning cancer early detection and screening programs and access to high-quality care. [7]

In a global effort to raise knowledge and awareness of breast cancer, October has been designated as Breast Cancer Awareness Month (BCAM) (pink month). This campaign is performed annually to inform and encourage women to undergo screening and early detection of breast cancer.

Jacobsen *et al.* evaluated the effectiveness of the BCAM program in detecting breast cancer. They assessed the number of definitive diagnoses of breast cancer in November (one month after BCAM) during the years before and after the start of the BCAM. [8] They found that the program led to an increase in breast cancer diagnoses in the US, probably due to the improvement in timely diagnoses and the increased public awareness leading to behavioral changes in women.

Since the BCAM has spread across the US and worldwide, voluntary organizations, government agencies, and private companies have sponsored related events. In recent years, Iranian cancer NGOs and charities such as Shams Charity have conducted many breast cancer primary prevention and control programs alongside the government. [9] These NGOs provide financial and non-financial support for cancer patients, hospital equipment and medical services, support cancer research projects, and run educational and awareness cancer prevention campaigns.

We designed a study to assess the effect of the BC campaign run in 2019 on women's awareness, education, and the outcome of previously unnoticed breast lesions detected during the campaign screening program.

METHODS

According to the annual schedule of Shams Charity, in October 2019, the breast cancer awareness month, we ran relevant programs supported by the Cancer Institute, Cancer Department of the Ministry of Health, Tehran Municipality, Noor Charity, and Roche Pars Company. We called for women to participate in our campaign titled "A valuable life, an invaluable lady" through online social media announcements and advertising banners in campaign locations. Five locations in different regions of the city were considered for the campaign, including the Iranian Multiple Sclerosis Society, the Iranian Hemophilia Society, Laleh Park, Park Shahr, and Bahman Cultural Center. These places have been selected according to past cooperations and willingness of these centers to conduct campaigns and to have the necessary facilities for breast examination by physicians as well as teaching places. The organized program included breast examination, breast cancer awareness workshops, and breast self-awareness (BSA) education. In awareness workshops, topics including breast cancer epidemiology, risk factors, symptoms, screening, and early detection methods were taught, and free breast cancer awareness brochures were given to the participants.

Women were asked to fill out a questionnaire if they wished by providing details including age, age at menarche, menopausal status, age at menopause, history of pregnancy, number of deliveries, duration of breastfeeding, history of breast and ovarian cancer in first- or second-degree relatives and their age at diagnosis. In addition, information was collected regarding BSA or seeing a doctor for clinical breast examination (CBE) or undergoing screening mammography and reasons for avoiding these examinations, knowledge about breast cancer and source of information, history of previous breast diseases and type of approach, and their feelings about breast cancer. Then, women were examined by breast surgeons, and the examination report and recommendations were documented. Mammography or/and ultrasound imaging were recommended in some women for breast cancer screening according to age and personal or family history of breast cancer. If women had suspicious symptoms such as mass or nodularity, discharge, skin thickening, and lymphadenopathy during a breast exam or if they had a positive family history of breast or ovarian cancer in first-degree relatives, physicians referred them for further evaluation and detailed follow-up. This

campaign was performed with the help of volunteers from different specialties, including breast surgeon fellowships, nurses, and midwives who had knowledge about breast cancer.

In the second phase, we contacted those participants who required further investigation through phone calls after an interval of two years. They were asked to send their imaging and biopsy reports if they had undergone any. Data analysis was conducted using SPSS v22.0 software (Inc., Chicago, IL). Descriptive data are presented as mean ± Standard deviation (SD) and number (%).

RESULTS

General characteristics of the participants

In this campaign, 418 women aged 15 to 74 years with a mean age of 43.19 ± 49.11 were visited. Participants' characteristics were manifested in Table 1. Three women under 20 presented to the campaign due to breast symptoms. About a quarter (25.6%) of the participants were menopausal. The number of women who participated in each campaign site was as follows: Iranian Multiple Sclerosis Society: 62 (14.8%), Iranian Hemophilia Society: 45 (10.8%), Laleh Park: 81 (19.4 %), Park Shahr: 138 (33%), and Bahman Cultural Center: 92 (22%).

Table 1. Total characteristics of the participants (n=418)

Continuous Variables		
	Mean ± SD	Range
Age (year)	43.19 ± 11.49	15-74
Age of Menarche (year)	13.42 ± 1.47	9-18
Parity (number)	2.06 ± 1.72	0-11
Breastfeeding duration (month)	34.76 ± 24.98	0-168
Age of menopause (year)	47.31± 5.87	23-60
Categorical Variables		
	Number	Percentage
Menopause		
Yes	107	25.6
No	311	74.4
History of pregnancy		
Yes	328	78.5
No	85	20.3
Missing data	5	1.2
Family history of BC/OC		
Yes	76	18.2
No	342	81.8

BC= Breast Cancer, OC= Ovarian Cancer, SD= standard deviation; Data are presented as mean ± standard deviation and number with percentages.

Breast self-awareness

Almost all participants were over 20 and thus eligible for the BSA program. However, 246 (58.9%) were familiar with the BSA and breast self-examination (BSE). Of those, 155 women (37%) had been educated on the significance of BSA, and 80 (19%) feared developing cancer. Five women were aware of BSA because of a personal positive history of cancer (breast, colon, endometrium, and skin) and for fear of recurrence. Lack of familiarity with BSA (29.7%) or forgetting the method of self-exam (15%) were the most common reasons for not paying attention to it.

Women's information and the source of information about breast cancer

One hundred seventy-six women (42.1%) expressed that they have little information about breast cancer. However, more than half of the participants (232 women; 55.5%) did not have any information, and 10 did not respond to this question. The most important information sources were TV and radio, followed by physicians and social media (Figure 1).

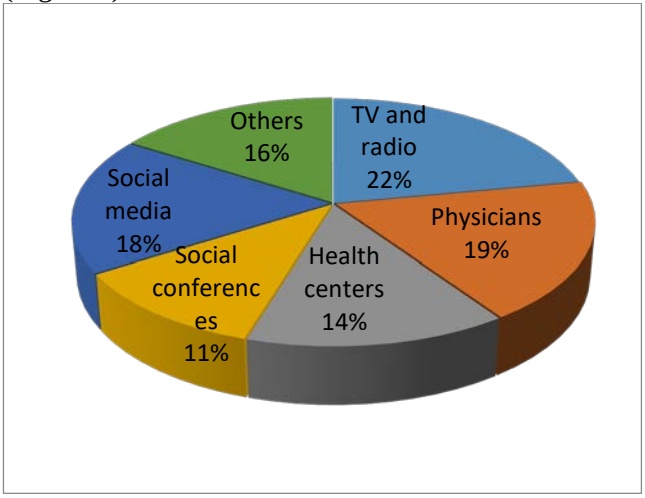

Figure 1. Sources of information about breast cancer in women participating in Shams campaign in 2019.

Women's feelings about breast cancer

Evaluation of the women's feelings about breast cancer showed that 54.3% (n=227) did not think about breast cancer but would follow health-promoting behaviors if educated. Results also showed that 15.6% of women always felt worried about developing breast cancer, and 23% preferred not to be aware of this disease due to fear.

Breast cancer screening in women over 50

One hundred twenty-six women (30.1%) were 50 years old or more, and eligible for BC screening. Eighty-eight women out of 126 ones (69.8%) had a previous history of breast evaluation with mammography or sonography. Participants were asked to report the following symptoms: new mass in the breast or axilla, erythema, edema and retraction of the skin or nipple, changes in the breast shape and size, thickening or darkness of the breast skin,

spontaneous nipple discharge, and breast pain. Among the participants, 160 (38.3%) had experienced one of these symptoms. Of these, 44 were over 50 years old, of whom 37 women (84.1%) had been referred for mammography or sonography. About 48% of the participants who were under 50 years old had not yet been referred for mammography despite having symptoms.

Examination results and the physicians' recommendations

In total, 316 women were referred for performing a breast ultrasound (n=106, 25.4%), mammography (n=80, 19.1%), or both (n=130, 31.1%) for screening purposes. According to the physicians' examination results, 113 cases (27%) needed further investigations. Further evaluations were requested due to suspicious mass (n=47, 41.6%), nodularity or thickening (n=38; 33.6%), lymphadenopathy (n=15, 13.3%), breast discharge (n=6, 5.3%), and other reasons (n=6, 5.3%) such as pain and asymmetry. Furthermore, a 58-year-old woman with a positive history of breast cancer in her father and no previous breast assessment was referred for screening.

Follow-up results

Of 113 women who required further evaluation, 9 (7.1%) women had not provided their telephone numbers in the questionnaires. Eighty-five out of 104 women answered our phone call (82% response rate). Sixty-one of these (71.8%) had presented to health centers for follow-up according to the campaign recommendation, while 24 had not followed the advice. Financial issues (4 cases), COVID-19 (7 cases), fear of cancer (2 cases), and lack of medical insurance (1 case) were reported as the main barriers. Resolved symptoms and lack of opportunity or sufficient information (10 cases) were other reasons for not doing the necessary follow-up.

Finally, 40 women out of 61 were reported as normal and did not require further investigations. Benign breast masses were detected in 19 women and two patients were diagnosed with breast cancer. The flowchart shows the participants throughout the study until the last follow-up (Figure 2).

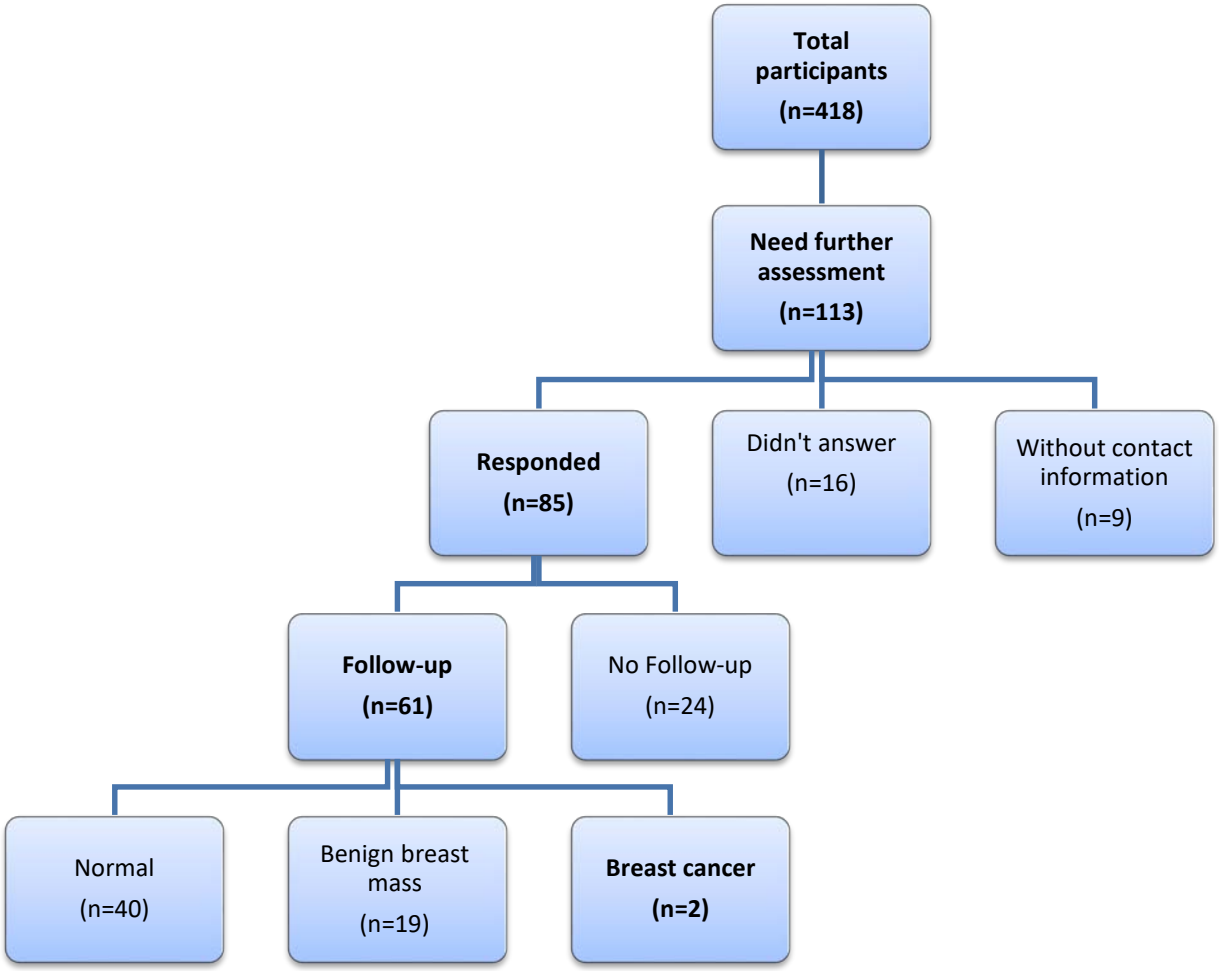

Figure 2. Campaign participants' flowchart

Details on the detected breast cancer cases

One of the two detected cases was a 46-year-old woman with invasive ductal carcinoma in the upper outer quadrant of the right breast (10 o'clock). Lumpectomy and axillary lymph node dissection (ALND) were performed on the patient. The histologic assessment had shown a breast tumor measuring 13*11 mm, and a positive lymph node. Six out of 16 axillary lymph nodes were involved. The tumor was triple-negative (ER, PR, HER2 negative), and the Ki-67 value was 60%. The second patient was introduced to us through another campaign participant, but she did not answer our phone call, so no detailed information is available about this case.

DISCUSSION

In this study, we reported the findings of a large breast cancer awareness and screening campaign run in October 2019 with the help of volunteers from different disciplines. Four hundred eighteen women participated and were clinically examined. In the subsequent follow-ups, breast cancer was diagnosed in two women who needed further investigation. Furthermore, the results of this report show several important points in the population of women participating in the campaign, which are discussed below.

About one-third of women over 50 had no breast cancer screening, and about one-fourth of women over 50 and about half of the women under 50 did not go to the doctor for further examination despite having high-risk symptoms. In the present report, almost 59% of women were familiar with BSE and BSA. Although researchers have concluded that BSE is not effective in detecting breast cancer or reducing mortality from breast cancer [(10)], physicians still believe there is a value in women being familiar with their breasts and that women should be encouraged to be aware of normal breast and recognize changes in their breast as soon as possible by self-examination once a month. However, women should be aware of the limitations of breast self-examination and know that this is not a substitute for clinical breast examination or mammography screening. Although mammography has remained the best modality for breast cancer screening and the International Agency for Research on Cancer (IARC) report showed screening women aged 50-69 years using mammography is associated with a 25% breast cancer mortality reduction [10], unfortunately, in developing countries such as Iran, population-based mammography screening is not available. The lack of resources and health system infrastructure in these countries, have prompted BSE and BSA as alternative approaches.

In our study population, over half of the participants did not even think about breast cancer but would follow the health care behaviors if educated. Furthermore, 42.1% of women who participated in this campaign mainly acquired information about breast cancer from the media. Several studies have summarized the evidence of social media engagement in breast cancer awareness and knowledge of breast cancer symptoms and prevention. [11, 12] Therefore, using media as a cost-effective tool should be considered to expand the dialogue between physicians and researchers with laypersons.

In our campaign, two breast cancer patients were detected from 418 participants. The detection rate corresponds to 478 cases per 100,000 women, representing a significantly higher age-standardized incidence rate (ASR) reported by GLOBOCAN (35.8 per 100,000 women). [1, 2] The discrepancy may be due to adopting the Western lifestyles and behaviors, including changes in diet and physical activity of women living in Tehran, one of the largest industrial cities with millions of women living in it. Another possible reason is the small sample size of this study, but the more important reason is that the participants in this campaign were those who paid attention to their breasts for a reason, such as having pain or family history, so it cannot be said that they are a real representative of the general population of the country. Besides, the estimates derived from the latest data available from IARC through collaborations with population-based cancer registries (PBCRs) and the World Health Organization (WHO) or based on information publicly accessible online might underestimate the accuracy of the data.

Participants' follow-up by the organizing team was delayed by two years, and many women who required further investigations did not attend health centers for follow-up due to barriers such as financial issues, fear of cancer, and lack of medical insurance. This result was similar to another breast cancer prevention campaign performed in the Northwest region of Iran.[13] Multicenter campaigns with multiple NGOs are required to detect and support more and faster breast cancer patients in the country and plan to remove these obstacles.

Limited research is available on the cost-effectiveness of breast cancer screening programs in Asian countries. Chootipongchaivat *et al.* evaluated the cost-effectiveness of breast cancer screening using mammography in Singapore. According to their results, Singapore's screening program is relatively cost-effective, and screening all women aged 40 or 45 is cost-efficient. [14]

In the Eastern province of Saudi Arabia, a non-governmental screening program was launched in October 2009, in which 2 mobile mammography

units covered 14 health centers. Women ≥ 40 years of age were recommended to perform annual screening mammography. In this program, 8061 women were screened up to 2014, with an uptake rate of 15%, a recall rate of 7.9%, 47 detected cancer cases, and a cancer detection rate of 5.83 per 1000. In all, 70.2% of the cancer cases detected had either no mass or the lesions were smaller than 2 cm. The screening parameters showed that a national breast cancer screening program is warranted for Saudi Arabia. [15]

The rising trend of breast cancer incidence in low-income countries, including Iran, has made the disease a health priority.[16] Limited financial resources to implement national mammography screening in Iran promote the use of alternative but less accurate screening modalities such as BSE and clinical breast examination. Launching a breast cancer screening program in Iran faces several challenges, including financial resources, health service capacity, and public awareness. [17]

The campaign has shown to be successful in identifying high-risk women. Thus, these non-governmental activities might be effective as long as no national screening program is accessible in the country.

As this report reaffirms, breast cancer awareness is essential. Several women did not know about breast cancer prevention and early detection. Lack of information, fear of imaging, and fear of developing malignancies were reported as the reasons for not engaging in examination programs. Charities and active members of the Iran Cancer National Network of NGOs (IRCNNC) are engaged in breast cancer awareness, early detection, and screening programs. However, no standard report on the effectiveness of their prevention, screening, and early detection programs has been documented up to now.

This study had some limitations. According to the background of the previous campaigns and due to the crowdedness of the centers and the lack of time for more detailed evaluations, a brief questionnaire was prepared for this campaign that included personal and reproductive characteristics, history of breast examination, and history of breast sonography and mammography. Meanwhile, some workshops were designed to teach about breast cancer and related topics. Therefore, a detailed evaluation of the level of awareness of women before and after a campaign was not done and the accuracy of their information has not been checked. Therefore, using a valid questionnaire for the evaluation of women's awareness by a pre-post-test in future campaigns is recommended. Second, since the main organizer of this campaign was the Cancer Institute and the collaborating centers were based in Tehran, our results are only limited to the women participating in the campaign in Tehran. Conducting such campaigns all over the country, with an accurate evaluation and a large sample size can properly indicate the level of awareness of Iranian women about breast cancer.

CONCLUSION

In conclusion, more education on breast awareness, breast cancer symptoms, and the need for screening, especially after the age of 50, is required in Iran. To achieve this, using mass media is a cost-effective method of communication. Furthermore, the experience of this campaign in collaboration with the Cancer Institute, the country's most reputable medical and research cancer center, might be a good guide for preparing a comprehensive and unified protocol for breast cancer awareness by all NGOs throughout the country.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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ETHICAL CONSIDERATIONS

This cross-sectional study was approved by the Deputy of the Research and Ethics Committee of Imam Khomeini Hospital affiliated with the Tehran University of Medical Sciences (IR.TUMS.IKHC.REC.1400.230).

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