Asian Pacific Journal of Cancer Care
Vol 10 No 1 (2025), 33-41
Original Research

The Impact of Health Education on Compliance to Screening Practices in Breast Cancer

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Background: Screening for breast cancer in asymptomatic women can lower the disease's mortality rate and improve treatment outcomes. Increasing adherence to breast cancer screening programs is essential.

Objectives: To estimate the current level of females' awareness, attitudes, and screening about breast cancer and to evaluate the impact of health education on adherence to breast cancer screening practices.

Methods: Between September 2023 and May 2024, 62 women were enrolled in a quasi-experimental intervention study at Menoufia University Hospital through the family medicine outpatient clinic. Medical history and demographics were gathered prior to the intervention. All patients also had their awareness, attitudes, and compliance with breast cancer screening assessed. The women were then divided into two groups at random: An intervention group, which included 28 women undergoing an educational program, and a control group, included 34 women. A month following the start of the health education program, the outcome measures were evaluated.

Results: Statistically, no significant disparities between the intervention and control groups in average score of knowledge, attitude and any of the included practices or interest in a getting a screening mammogram, according to pre-intervention data. With regard to the control group, the post-intervention assessment revealed a significant rise in the intervention group's practice of self-examination and mammography, as well as a higher level of interest in screening mammography.

Conclusion: An effective strategy to identify and treat breast cancer early is to raise awareness of screening programs.

Introduction

The most prevalent malignancy among women worldwide is breast cancer [BC]. BC is the most prevalent form of cancer among Egyptian women [1]. The Egyptian BC population was significantly younger than their Western counterparts, with a mean diagnosis age of 50.4 years and 57% perimenopausal [2].

Notably, young female BC patients presented with significantly more advanced stages. Advanced

stages are more common in Egyptian patients. This leads to a lower rate of survival regardless of advancements in treatment. This emphasizes how crucial early detection is as a means of enhancing the prognosis [3].

For the purpose of early breast cancer recognition and screening, there are three standard methods. Mammography is the first and most widely used modality for breast screening and is the only one that may be used independently [4]. After the age of 45, the American Cancer Society advises moderate-risk women to undergo annual mammograms [5]. Because of the larger glandular breast density in younger populations, screening mammography has substantially lower sensitivity [6]. This implies that a mammography screening program could fail to identify up to half of the Egyptian individuals with BC diagnoses [3].

Women may be unaware of breast cancer or may have misconceptions about its nature or curability or have fatalistic attitudes toward diseases in general, so programs to enhance public awareness of BC and to teach that BC outcomes to improving participation in early detection programs regardless of the selected methods of early detection [7].

The purpose of this study was to determine the present state of knowledge, attitudes, and behaviours among females regarding breast cancer and screening programs. It also sought to determine the effect of health education on adherence to the screening process for breast cancer.

Materials and Methods

This quasi-experimental intervention study was conducted from September 2023 to May 2024 involved women in the child bearing period above 18 years old.

Study time and setting

The participants were recruited at their visits to family medicine outpatient clinics, Menoufia university hospitals, Menoufia Governorate, Egypt seeking for family planning counselling as these women visit the clinic on a regular basis to help with follow-up and to evaluate the effectiveness of the health education initiative.

Sample size calculation

Based on review of past literature, [8] they noticed that attendees of the Breast Care International class reported doing breast self-examinations considerably more frequently [OR = 12.29, 95% CI = 5.31–28.48]. Statistical Methods for Rates and Proportions, Fleiss, OpenEpi, Version 3 open source calculator SSCohort calculates the sample size using formulas 3.18 and 3.19 with continuity correction, the least sample size is 56. The power of study is 80% and confidence level is 95.

The sample size was collected through systematic random sample technique; the interval calculated every 4^{th} woman regarding [number of total registered female attendants in the last 6 months [224] over the calculated sample size, [56] till completion of calculated sample.

Women who were at least eighteen years old and willing to engage in the study made up the study unit after explanation of the study aims, procedures and expected outcomes. The study omitted women with mental health disorders, a history of breast cancer, or who had recently participated in a breast cancer or mammography health education program. Additionally, mothers who were breastfeed or pregnant were not included. The recruited women were 70 women, eight refused to participate in the study. Following enrolling, the participants were divided into two groups: the control group, which consisted of 34 women, and the intervention group, which attended an

educational program.

Methods

Study instruments

A questionnaire that was created based on previously published literature served as the data gathering method [The Kenya Breast Cancer Project BCAM Survey; Breast Cancer Awareness Questionnaire for Community Healthcare Workers [8, 9]. The predesigned questionnaire is composed of the following sections:

The first section

Demographic data were included age, residence, marital status, educational level, comorbidities, medication history, and menstrual history. Furthermore, questions were added to assess any personal experiences the participants may have with breast cancer.

The second section

A total of 24 questions 7 on early warning warning signs and symptoms of breast cancer, 11 on risk factors, 3 on methods of diagnosis and treatment, and 4 on breast cancer screening programs were asked during the survey to evaluate participant awareness of the disease.

There were three possibilities for each question: yes, no, and don’t know. “Yes” replies were coded as “1” during analysis; whereas “no” or “don’t know” responses were scored as “0.” The raw scores from each question were added together to determine the overall BC awareness score. Higher scores correspond with better awareness. Pre-test awareness was classified as satisfactory [mean≥14], unsatisfactory [mean < 14].

The third section

Questions aimed to assess attitude towards breast cancer screening [10]. The attitude assessed using 14 questions in six domains with five point Likert scale responses. A composite attitude score of 1–5 was created by averaging the responses to all attitude questions; a score of 5 denoted the most positive attitude toward screening. The Cronbach’s alpha for the attitudes measure was 0.65.

The forth section

[Compliance of breast cancer screening practices]: The practice assessed through questions about past practice of any available screening methods [BSE, CBE and mammogram] and awareness of frequency of these methods and reasons for not practicing BSE. In addition, a yes/no/undecided assessment of the plan to take part in the mammography screening program was conducted.

Following a pilot study in January 2024, the translated Arabic version was verified. Two oncology consultants and a family medicine expert interviewed the patients.

Data collection

It took roughly thirty minutes for the participants to finish the questionnaire on their own. Participant confidentiality, anonymity, and volunteering have all been verified. The data stored and saved by main researcher.

Intervention phase

The education programs hold for the intervention group composed of three sessions each last 15-20 minutes in the same day with pre-test and separated by small breaks. It was facilitated by consultant of family medicine and two oncologist consultants. During the interventional phase, materials such as lectures and discussions, brain storming, brochures with pictures illustrating the BSE process, and educational booklets were used that covering burden of BC, risk factors, early warning signs, importance of early detection and compliance to the screening programs.

Participants were encouraged to share and explain what they had learnt in each session to make sure the responders could understand what was taught. Additionally, this was picked at random from among those who agreed to do the assignment.

The control group's participants only got standard medical care during the study, and in light of ethical concerns, they were given access to the session materials after the study was over.

The post-test phase

The participants were contacted again for a post-test survey one month following the education session. Same pre-test questions were reposed to participants during the post-test phase in order to determine any changes in their understanding of breast cancer, their attitudes about it, and their screening behaviours.

Ethical Consideration

Menoufia Faculty of Medicine ethical committee formally examined and approved this research with the Institutional Review Board [IRB] [8/2023 ONCO 3]. Official permission was obtained for conduction of the study. The respondent read and understood the contents of an informed consent form in Arabic before signing it. For statistical analysis, SPSS Inc., Chicago, IL, USA's version 20 of the IBM SPSS statistical package was used. The responses to every awareness question from the prior to and following the program were evaluated using a paired t-test. Additionally, the prior to and after-program mean awareness scores were determined. Pre-test attitudes were divided into three categories: favourable [mean 3.5–5], negative/neutral [mean >3.5], and compare the differences between before and after the program attitudes.

A significant p-value was one that was less than 0.05.

Results

The women involved in the study had an average age of 31.47 years with standard deviation [SD] 9.53. The majority [87.1%] of them lived in rural areas; 96.8 % of them were married and, 41.9 % of the participants were house worker. The studied participants, 25.8% were highly educated and 85.5% with no chronic diseases. In the study, 88.7% of the women had no personal relatives who had survived breast cancer and had a negative family history of the disease. Menarche occurred at an average age of 11.34 years with SD: 1.2. (Table 1).

Parameters	Number 62	Percentage%

Age [years]		
Mean ± SD	31.47±9.53	
Min- Max.	18-49	
Residence		
Rural	54	87.1
Urban	8	12.9
Marital status		
Single	2	3.2
Married	60	96.8
Separated/divorced	0	0
Work		
Physical worker	12	19.4
House worker	26	41.9
Office worker	24	38.7
Level of education		
Primary education or less	27	43.5
Secondary education	19	30.6
University graduate or more	16	25.8
Chronic diseases		
No	53	85.5
Yes	9	14.5
Family history of breast cancer		
Negative	55	88.7
Positive	7	11.3
Personal relation of breast cancer survivors		
No	55	88.7
Yes	7	11.3
Age of menarche		
Mean ± SD	11.34±1.2	
Min- Max	14-Sep	
Regular menstrual period		
No	17	27.4
Yes	45	72.6

Table 1. Demographic and Medical Data Among the Studied Women.

Part of the assessment of knowledge regarding breast cancer included being aware of its warning presentations. Most of the study's female participants thought that breast lumps that were painless or painful but did not have a lump were signs of breast cancer. Skin changes on the breast are seen by nearly all of them [98.4%] as warning signs. In terms of risk factors, 86% of the women questioned thought that women over thirty had a higher risk of developing breast cancer, and that the disease predominantly impacts women [83.6%]. Additionally, 77.4% of the women studied believed that having a positive family history, never having children, and using hormonal contraception were risk factors for BC. Furthermore, almost everyone [96.8%] thought that smoking and early menarche were risk factors for breast cancer (Table 2).

Parameters	Number	Percentage %
Knowledge about early warning symptoms and signs of breast cancer		
Painful breast lump	25	40.3
Breast lump without pain	50	80.6
Pain in the breast without lump	53	85.5

Change in shape of the nipple	13	21
Nipple discharge	38	61.3
Lump in the armpit	32	51.6
Skin changes on the breast	61	98.4
Knowledge about risk factors of breast cancer		
The most likely women to get breast cancer in her next five years of life		
A 30 year old women	50	80.6
A 50 year old women	12	19.4
Sex		
Female	52	83.9
Male	10	16.1
Family history		
Negative	14	22.6
Positive	48	77.4
Obstetric history		
Never having children	48	77.4
Multiparty	14	22.6
Age of first pregnancy		
Early before 30 years old	17	27.4
After 30 years old	45	72.6
Breast feeding		
Never	20	32.3
Breast fed mothers	42	67.8
Menarche		
Starting menstruation early	61	98.4
Starting menstruation late	1	1.6
Menopause		
Early menopause before 40 years old	24	38.7
Late menopause after 55 years old	38	61.3
Family planning methods		
Hormonal contraception	48	77.4
Non hormonal contraception	14	22.6
Life style		
Eating canned or processed foods	49	79
Eating well balanced diet	13	21
Smoking		
Non smoker	2	3.2
Smoker	60	96.8

Table 2. Knowledge of Presentation and Potential Risk Factors for Breast Cancer Among the Studied Participants.

When it comes to breast cancer diagnosis methods, 46.8% of the women surveyed believed that a mammography is the most reliable means of detecting the disease, while 87.1% of the women thought that an early diagnosis would enhance the prognosis. In terms of treating BC, 37.1% and 32.3% of the women in the study thought that surgery and chemotherapy, respectively, were efficient methods of care. Over half of women surveyed [54.8%] knew about the various BC screening initiatives and 79.0% believed the best screening method is breast self-examination. The women in the research reported that the average age of the first BC screening was 41.0 years old, and the average age of those having the most latest screening was 67.77 years old (Table 3).

Parameters	Number	Percentage %

Early diagnosis of breast cancer improves outcome		
No	8	12.9
Yes	54	87.1
Effective ways to detect breast cancer		
Breast self-examination	7	11.3
Clinical breast examination	5	8.1
Mammogram [X-ray]	29	46.8
Breast ultrasound	15	24.2
Tissue sample [histology]	6	9.7
Effective treatment of breast cancer		
Herbs	0	0
Antibiotics	10	16.1
Surgery	23	37.1
Chemotherapy	20	32.3
Radiation treatment	9	14.5
Knowledge of breast cancer screening programs		
Awareness of any available Breast Screening Program		
No	28	45.2
Yes	34	54.8
Best breast cancer screening methods		
Breast Self-Examination	49	79
Clinical Breast Examination	6	9.7
Mammography	7	11.3
The age to be first screened at the Breast Screening Program		
Mean± SD [Min- Max.]	41.0±7.74	30-55
The age to be last screened at the Breast Screening Program	67.77±6.67	55-80

Table 3. Knowledge of Methods of Diagnosis and Treatment for Breast Cancer Among the Studied Participants.

The study revealed no statistically significant distinctions between the control and intervention groups about their previous inadequate understanding of breast cancer symptoms, risk factors, diagnosis, treatment procedures, and screening initiatives. However, following health education programs, the two groups differed significantly from one another, with the intervention group demonstrating a greater improvement in knowledge across all examined items than the control group. The mean awareness score increased significantly [p value: < 0.001] in the intervention group, from 13.0 to 21.0. (Table 4).

Parameter		Knowledge of BC		Paired t-test	p-value
		Pre	Post		
		Intervention	Intervention		
		Mean ±SD	Mean ±SD		
Warning symptoms of BC	·Intervention group	3.8±2.1	5.4±1.3	2.324	0.023
	·Control group	3.9±1.8	3.38±1.4		
	· p-value*	0.817	0.001		
Risk factors of BC	· Intervention group	7.6±1.0	9.6±1.02	3.348	0.001
	· Control group	7.6±1.1	7.02±0.94		
	· p-value*	0.667	0.001		
Screening,	· Intervention	3.1±0.93	5.9±0.95		

Diagnosis and treatment of BC	group				
	· Control group	3.05±0.83	3.38±0.89	4.969	0.001
	· p-value*	0.683	0.001		
Total knowledge	· Intervention group	13.0±3.0	21.0±2.29	7.298	0.001
	· Control group	13.3±2.2	13.7±2.31		
	· p-value*	0.705	0.001		

Table 4.Comparison of Studied Women's knowledge of Breast Cancer (BC) and Their Screening Practices Before and After a Health Education Program.

p- value*, t-test compared between intervention and control group; SD, standard deviation

When the attitudes regarding breast cancer screening were compared before and after a health education program, it was found that all of the pre-intervention phase's included items did not notably distinct between the control and intervention groups with negative attitude in all items. When comparing the intervention group to the control group, the mean attitude for each item in the post- intervention evaluation revealed a statistically important change. In the intervention group, the mean attitude raised significantly [p value <0.001], from 2.79 to 3.47 (Table 5).

Parameter		Attitudes towards BC screening		Paired t-test	p-value
		Pre	Post		
		Intervention	Intervention		
		Mean ±SD	Mean ±SD		
Mammography understanding	· Intervention group	3.24±0.93	3.77±0.54		
	· Control group	3.01±0.61	3.08±0.56	3.609	0.001
	· p-value*	0.259	0.001		
Early detection	· Intervention group	3.33±0.56	3.79±0.57		
	· Control group	3.25±0.62	3.25±0.62	4.285	<0.001
	· p-value*	0.582	0.001		
Fear/wanting to know about cancer	· Intervention group	3.32±0.76	3.88±0.41		
	· Control group	3.11±0.72	3.11±0.72	3.591	0.001
	· p-value*	0.275	0.001		
Risk/benefits of mammograms	· Intervention group	2.67±0.76	3.55±0.86	3.901	<0.001
	· Control group	2.46±0.72	2.46±0.72		
	· p-value*	0.591	0.001		
Comfort with getting a mammogram	· Intervention group	1.73±0.65	2.61±0.92		<0.001
	· Control group	1.81±0.68	1.94±0.56	4.244	
	· p-value*	0.591	0.001		
Communication at mammogram appointment	· Intervention group	2.42±0.65	3.20±1.19		<0.001
	· Control group	2.52±0.68	2.49±0.73	4.101	
	· p-value*	0.595	0.001		
Total attitude	· Intervention group	2.79±0.49	3.47±0.22		<0.001
	· Control group	2.69±0.41	2.72±0.37	5.9	

	· p-value*	0.442	0.001		

Table 5. Comparison of Studied women's Attitude Towards Breast Cancer (BC) Screening before and after a Health Education Program.

p-value,*t-test compared between intervention and control group; SD, standard deviation

Women's screening behaviours for breast cancer were compared before and after a health education program to three practices: mammography, clinical breast examination, and breast self-examination. The intention for routine screening was assessed by the interest in obtaining a mammography. Pre-intervention data showed no statistically significant variations in any of the included practices or interest in a mammogram between two enrolled groups. The post-intervention evaluation showed a significant increase in the intervention group's readiness to get screening mammography as well as a rise in the practices of self-examination and mammography, in contrast to the control group. From 10 women pre-intervention to 23 women post intervention, there was a notable rise in the practice and interest in screening programs. [p value: <0.001] (Table 6).

Parameter		Practice of BC screening		Chi square test	p-value
		Pre	Post		
		Intervention	Intervention		
		No [%]	No [%]		
Ever been practice breast self-examination	· Intervention group	15 [53.6]	23 [82.1]	5.239	0.022
	· Control group	14 [41.2]	16 [47.1]		
	· Chi square	0.948	8.099		
	[p-value]*	0.33	0.004		
Ever received clinical breast examination	· Intervention group	5 [17.9]	17 [60.7]	10.78	0.001
	· Control group	10 [29.4]	14 [41.2]		
	· Chi square	1.118	2.345		
	[p-value]*	0.29	0.126		
Ever had a mammogram	· Intervention group	2 [7.1]	11 [39.3]	8.114	0.004
	· Control group	4 [11.8]	5 [14.7]		
	· Chi square	0.375	4.845		
	[p-value]*	0.54	0.028		
Interested in getting a mammogram for routine screening	· Intervention group	10 [35.7]	23 [82.1]	12.469	0.001
	· Control group	11 [32.4]	11 [32.4]		
	· Chi square	0.077	15.37		
	[p-value]*	0.781	<0.001		

Table 6. Comparison of Women's Screening Practices for Breast Cancer (BC) before and after a Health Education Program.

[p- value*], chi square test compared between intervention and control group; SD, standard deviation

Discussion

Among women worldwide, early identification and appropriate therapy are the most effective ways to manage breast cancer, which is among the most prevalent types of cancer [11].

Women's understanding of the warning presentations of cancer can aid in early detection with a timely diagnosis, which makes cancer control efforts for curable cancers more practical and affordable [12].

Sixty-two women were divided into two groups for the study: the control group and the intervention group. The intervention group attended a health education program about breast cancer and the related screening program. Every woman participating was in her reproductive years. Awareness assessment was conducted on all the women under study.

In the current work, skin changes on the breast, breast lump without pain and breast pain without lump were the most known warning symptoms within the studied population.

This is agreed with Sathian et al study in Nepal that studied awareness of breast cancer among female residents and Pal et al, study. They found that Changes in the breast and a painless breast lump are the most common early indications of breast cancer that their participants are aware of. It was unclear what was meant by nipple changes and discharge [13, 14].

In concordance, Koo et al. reported that approximately 1 in 6 females with breast cancer did not have a breast lump when they first sought treatment; instead, they had a variety of symptoms [15].

Based to the study, the most well-known risk factors for breast cancer are females, smoking, early menarche, age beyond 30, and hormonal contraception.

Momenimovahed et al conducted a research for epidemiology and risk factors for breast cancer and determined that, after gender, aging is the most important known associated risk factor for breast cancer. Additionally, Younger age at menarche doubles the risk of breast cancer, and family history of the disease is one of the main risk factors [16].

Srivastava et al in their study observed positive responses when risk factors for breast cancer were evaluated, with increasing age being one such risk factor [61.5%], radiation [85%], obesity [60%] non-breastfeeding [64.5%], and nulliparity [54%] [17].

Most of the women in this study were aware that better outcomes can be achieved with early detection of breast cancer and that mammograms are the most effective means of detection; surgery and chemotherapy are the most successful forms of treatment.

A majority of the women in the research thought that breast self-examination was the most successful means to screen for cancer, and just half of them were aware of BC screening programs. Furthermore, the first screening age is little lower forty, and the screening should conclude by the average age of sixty-seven.

Unlike this study, Osei-Afriyie et al., observed that the majority of respondents knew that mammography can be used to test for breast cancer, and knew about BSE whereas 10.0% of them were unaware of any screening techniques [18].

According to Pal et al. review, 78.67% of the women were either aware of or had heard about early detection and screening techniques [14].

Concerning the awareness of breast cancer, attitudes and practicing BC screenings, based on

statistical analysis, there was not a significant distinction between the two groups in this study. The recruited women had a low level of awareness, particularly when it came to screening, diagnosis, and treatment options.

In regard to attitude, negative/ neutral attitude was observed with the lowest score in the item assessing comfort with getting a mammogram. Furthermore, a small proportion of the women had ever had a mammography or a clinical breast examination. Only one third were interested in getting a mammogram for routine screening. According to Pal et al., The study participants were considered to have extremely low levels of actual practice, despite their strong opinions and knowledge of breast cancer screening [14].

Based on Kumar et al., Miller et al., a number of obstacles may contribute to lower practice levels, including the absence of medical problems, difficult screening plans, ignorance of screening tests' advantages, negligence, discomfort to be examined by male doctors, pain anxiety, and the belief that one is not at risk of cancer [19, 20].

Following the health education program, comparing the intervention group to the control group, the former showed noticeably higher awareness and attitude levels. Furthermore, a considerable increase in interest in getting a mammogram was seen.

These results are agreed with Akhtari-Zavare et al., and Eskandari-Torbaghan et al., studies. They concluded the application of an educational programs improved participants' understanding of breast cancer preventative practices even with different age groups [21, 22].

In addition, the Srivastava et al believes that more regular awareness campaigns should be conducted to broaden participants' understanding and improve their confidence and expertise in educating women about breast cancer and early diagnosis [17].

Limitations of the study

This study's limitations included a limited sample size and a brief follow-up time. It is imperative to lengthen the follow-up period and collect more samples. An additional limitation related to the control group, which was not provided with any educational program until the study's completion. But once they finished their studies, they were given access to the session materials.

In conclusion, the most effective plan of action is to educate others about the significance and application of best breast cancer screening programs at regular intervals and to lead by example as women, and health care providers.

Acknowledgements

We appreciate the participants taking the time to provide us with such valuable information.

Conflicts of Interest

None have been revealed.

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