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Research Article

The Effectiveness of Breast Cancer Health Education Campaign and Breast Self-Examination Training among Female Detainees, Khartoum City- Sudan

Ahmed Osman Ahmed Mohamed[1*], Muneer Makki Musa Nori[2], Randa Ahmed Abdalrheem Altamih[3]

[1]6th year medical student, Faculty of Medicine, University of Khartoum, Khartoum city, Khartoum state, Sudan
[2]6th year medical student, Faculty of Medicine, University of Khartoum, Khartoum city, Khartoum state, Sudan
[3]5th year medical student, Faculty of Medicine, University of Khartoum, Khartoum city, Khartoum state, Sudan

[*]Corresponding Author: Ahmed Osman Ahmed Mohamed, 6th year medical student, Faculty of Medicine, University of Khartoum, Khartoum city, Khartoum state, Sudan

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Abbreviations

BSE: breast self-examination; SCOPH: Standing Committee of Public Health; IFMSA: International Federation of Medical Students' Associations; RICK: Radiation and isotopes center in Khartoum; SPSS: Statistical Package for Social Sciences

Abstract

Introduction: Breast cancer has high mortality rate because most cases present at late stages. However, certain acts like breast self-examination may reduce the incidence of the disease. Therefore this study aimed to assess the effectiveness of breast cancer health education campaign and breast self-examination training among female detainees, Khartoum city- Sudan.

Method and Materials: One group pretest and posttest quasi-experiment conducted among 820 detainees at Dar- Altaebat prison, Khartoum state. 297 respondents were involved in the pre-interventional

and post-interventional phases. A self-administered structured questionnaire was used for data collection.

Results: 297 responses were finally analyzed, the mean age was found to be 31, SD ± 11.2. The mean knowledge score about breast cancer increased significantly (p.value = 0.00) from 11.2 (SD ± 8.22) to 26.1 (SD ± 14.19). Regarding knowledge about BSE, the overall mean of knowledge score was significantly higher in the post-interventional phase (p.value =0.000), changed from 1.54(SD ± 2.18) to 2.33(SD ± 1.56). Also, the percentage of those with a good attitude towards breast cancer and breast self-examination was higher in the post-interventional phase.

Conclusion: Our respondents demonstrated poor knowledge regarding breast cancer and BSE at the pre-interventional phase, poor practice and limited positive attitude toward BSE, but the intervention we made enhanced the participants' knowledge and attitude towards breast cancer and self-examination, but with no significant enhancement in BSE practice.

Keywords: Breast; Cancer; Self-examination; Knowledge; Attitude; Practice; Health education intervention

1. Introduction

Breast cancer is defined as an abnormal growth of breast tissues. These changes range from inflammatory changes, benign fibroblasts to fibrocystic changes and malignant diseases. Causes are not well-defined till now; however, many risk factors play important roles, such as socio-economic status, age, early menstruation, late menopause, previous family history of breast or ovarian cancers, hormonal replacement therapy, and lifestyle habits, including smoking, alcohol consumption, and obesity [1, 2].

Many studies reflected that although the effects of breast cancer are adverse worldwide, yet the mortality and morbidity rates are higher in middle and low-income countries, especially the African context where it is estimated that 70-90% of breast cancer cases present with late-stages, which causes a decrease in survival chances among diagnosed patients. Here in Sudan, the Khartoum isotope radiation center reported that 22.9% of cancer registered cases are breast cancers, making it the most predominant female cancer in Sudan [1, 3].

Worldwide, the prevalence of Breast cancer increases continuously, wherein every 3 minutes, a woman is diagnosed with breast cancer making it the commonest cancer among women globally, adding to this the increase in financial burden on health systems. Early detection techniques, including clinical breast examination, mammograms, and breast self-examination (BSE), are essential to diagnose the disease in the early stages through secondary prevention, which leads to lower fatality rates, increased survival rates, and by default, a better prognosis of patients [4, 5].

Studies showed that regular breast self-examination practice allows women to be familiar with normal breast structure and enable them to detect and find any sudden changes and abnormalities. Here comes the importance of practicing breast self-examination, which is a cheap, non-invasive, simple procedure that does not consume time, while other techniques need hospital visits [2, 4]. Moreover, suspected females

who do mammography annually must also do regular breast self-examination because 17% of breast cancers appear in the time between two continued mammograms [1].

Here comes the importance of raising awareness which is considered as one of the main elements of secondary prevention for many diseases, especially breast cancer, so this study was conducted to assess: The effectiveness of breast cancer health education campaign and breast self-examination training among female detainees, Khartoum city- Sudan.

2. Materials and Methods

2.1 Study setting

The study was conducted at Dar- Altaebat prison, a female imprisonment facility located in Khartoum state and considered one of Sudan's largest female detention facilities. The study was performed as a part of the breast cancer prevention campaign, a project organized by the standing committee of public health (SCOPH) -University of Khartoum faculty of medicine students' association. This students' volunteering organization is a part of the International Federation of Medical Students' Associations (IFMSA) which unites medical students worldwide to lead initiatives that positively impact their communities [6].

2.2 Study design

One group pretest and posttest Quasi experiment.

2.3 Sample Technique

About 297 participants were randomly selected from the total population of the facility, which is 820 persons. The sample was calculated using a formula of the known total population and a confidence level of 95% by randomly picking 397 numbers out of 820 numbers list of the total population.

2.4 Data collection

Data was collected using a self-administered structured questionnaire which was adopted from a previous study [7]. The questionnaire comprises 23 items, divided into four sections; socio-demographic section, knowledge, attitude, and practice sections for breast cancer and breast self-examination. Copies were handed in person to participants.

Codes were used instead of names to ensure confidentiality. A consultant oncologist performed the scoring for knowledge, attitude, and practice for breast cancer and self-examination items. Data were collected during July- September 2018.

Data collectors were enforced with the skills and knowledge needed to execute data collection optimally by attending sessions and workshops performed by qualified trainers and professional speakers in collaboration with the Sudan Federal Ministry of health, Salah Wanasi organization for cancer research Khartoum center for breast health.

After assessing our respondents in the pre-interventional phase, we used uniquely designed multiple methods in health education and BSE training. The intervention included breast cancer gallery, symposium, sketches, competitions and gifts, small working discussion groups, PowerPoint presentations, flyers and cards, videos, and breast self-examination small training groups. The campaign's team facilitated these activities composed of eighty well-trained medical students and twelve doctors from the oncology department. All prisoners

in the jail attended the campaign for three days to cover the total number of inmates. Then we made the post -interventional assessment to the same group.

2.5 Data management and analysis

Statistical package for social sciences 26.0 (SPSS) software was used for data processing. Categorical variables were presented as frequencies and percentages, and continuous variables as means and standard deviations. Additionally, the Wilcoxon signed-rank test was used to differentiate between continuous variables and correlation coefficient to determine the relationship between continuous variables. P.value of less than 0.05 was considered statistically significant.

3. Results

3.1 Demographic characteristics of the participants

Demographic characteristics of the 297 participants showed that their age ranged between 18 and 80 years old with mean (31, SD ± 11.2) years, and (45.8%) of them were in the age group 25-39 years. Regarding the participants' education status, (39.1%) of them were illiterate, and (37.0%) received primary education. The marital status of our participants reflected that the majority of them (60.9%) were married. More than half of them were housewives (54.2%). (Table 1).

Demographics	N	%
Marital status		
Single	55	18.5 %
Married	181	60.9 %
Divorced	37	12.5%
Widow	24	8.1 %
Educational level		
Illiterate	116	39.1%
Khalwa	7	2.4%
Primary	110	37.0%
Secondary	27	9.1%
University	30	10.1%
Post-graduate	7	2.4%
Occupation		
House wife	161	54.2 %
Employer	62	20.9 %
Others	33	11.1 %
Does not work	41	13.8 %
Age		
18-24	99	33.3%
25-39	136	45.8%
40-80	62	20.9%

Table 1: Demographic characteristics of the participants (n= 297).

	N	Mean	Std. Deviation	Minimum	Maximum	Percentiles		
						25th	50th (Median)	75th
Pre BC knowledge score	297	11.2189	8.22093	.00	30.00	4.0000	9.0000	18.0000
Pre BSE knowledge score	297	1.5455	2.18536	.00	7.00	.0000	.0000	3.0000
Pre BSE practice score	297	2.5051	.97302	2.00	9.00	2.0000	2.0000	3.0000
Pre BSE attitude score	297	2.18	2.463	0	5	.00	.00	5.00
Post BC knowledge score	297	26.1044	14.19028	2.00	52.00	15.0000	26.0000	38.0000
Post BSE knowledge score	297	2.3300	1.56790	.00	4.00	1.0000	3.0000	4.0000
Post BSE practice score	297	1.8350	1.97528	.00	7.00	.0000	1.0000	3.0000
Post BSE attitude score	297	4.19	1.791	0	5	5.00	5.00	5.00

Table 2: Wilcoxon signed rank test: the difference in the participants' knowledge, attitude and practice about the breast cancer and BSE between pretest and posttest phases. (n=297).

The participants' total mean knowledge score about breast cancer increased significantly after the intervention (p= 0.00) from 11.2 (SD± 8.22) to 26.1 (SD± 14.19) (Table 2).

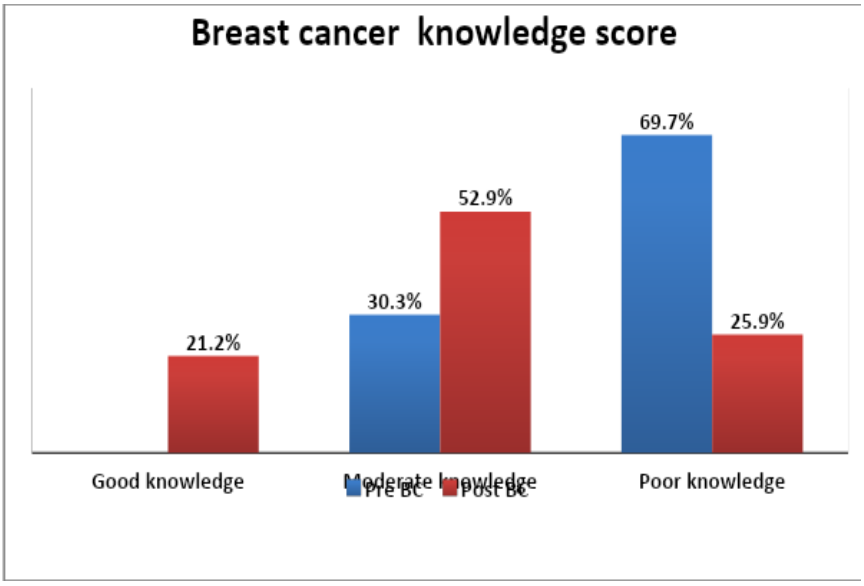

Figure 1: Breast cancer knowledge score categories at pre-interventional and post-interventional phases (n=297).

Questions and Answers	Pre		Post	
	n	%	n	%
Breast cancer is the most common cancer in women				
Yes	184	62.0 %	231	77.8%
No	0	0.0%	24	8.1%
I don't know	113	38.0%	42	14.1 %
Breast cancer is a curable disease				
Yes	183	61.6%	237	79.8 %
No	0	0.0%	20	6.7 %
I don't know	114	38.4 %	40	13.5 %
Early diagnosis improves outcome of the patient				
Yes	231	77.8 %	266	89.6%
No	0	0.0 %	10	3.4 %
I don't know	66	22.2%	21	7.1 %
Normally the two breasts are asymmetrical after puberty				
Yes	192	64.6 %	210	70.7 %
No	0	0.0%	71	23.9 %
I don't know	105	35.4 %	16	5.4 %
Breast cancer usually present as a painless breast lump				
Yes	179	60.3%	230	77.4 %
No	0	0.0%	18	6.1 %
I don't know	118	39.7%	49	16.5 %
Breast feeding decrease the incidence of breast cancer				
Yes	139	46.8 %	184	62.0 %
No	0	0.0%	51	17.2 %
I don't know	158	53.2%	62	20.9 %
What are the symptoms of breast cancer (more than one answer can be chosen)				
Swollen axillary lymph nodes	114	26.8%	194	31.6 %
Change of breast color, redness	118	27.8%	105	17.1 %
Nipple discharge	123	28.9%	186	30.3 %
Weight loss	70	16.5%	291	21.0%
I don't know	0	0.0%	52	17.5 %
Which of the following is a risk factor for breast cancer(more than one answer can be chosen)				
Smocking	156	25.5%	132	22.25%
Alcohol	101	16.5%	164	17.1%
Aging	81	13.2%	125	13.0%
Delayed menopause	57	9.3%	90	9.4%
Family history	75	12.3%	125	13.0%
Obesity	62	10.1%	112	11.7%
Taking contraceptive pills for a long time	80	13.1%	130	13.6%
I don't know	0	0.0%	0	0.0%
Which of the following is a method of diagnosis of breast cancer(more than one answer can be chosen)				
microscopic examination of breast tissue	75	35.7%	148	25.3%
Ultrasound	84	40.0%	264	45.1%
Mammography	51	24.3%	174	29.7%
I don't know	109	36.7%	68	22.9%
microscopic examination of breast tissue	75	35.7%	148	25.3%

Table 3: knowledge of the participants about breast cancer at pre-interventional and post-interventional phases (n= 297).

Before the intervention, (60.9%) of the participants agreed that breast cancer is the most common cancer among females, while (61.2%) of them considered breast cancer as a curable disease, but after the intervention, our participants stated the same about these two facts with higher percentages as (77.8%) and (79.8%) respectively. Moreover, nipple discharge was the most commonly chosen symptom of breast cancer by 123 (28.9%) of the participants before the intervention, but after it, the axillary lymph nodes enlargement was the most commonly chosen symptom of the disease by 194 (31.6%) of the detainees. (Table 3).

The majority (69.7%) of the participants had poor knowledge score about breast cancer before the intervention, and none of them had a good knowledge score, but after the intervention, 21.2% of the participants had a good knowledge score, and half of them found to have moderate knowledge score about breast cancer (Figure 1).

3.2 knowledge about the breast self-examination (BSE)

And the intervention improved the overall mean knowledge score from 1.54 (SD ± 2.18) to 2.33 (SD ± 1.56) (Table 2). More than half of the participants (55.6%) never heard about BSE before the intervention, and (71.4%) of them showed poor knowledge score about BSE. However, after the intervention (25.3%) and (46.5%) of the participants never heard about BSE and revealed poor overall knowledge score about BSE, respectively (Figure 2). Health education campaigns were chosen as a primary source of information about BSE by (37.9%) of women at the pretest phase; however, the percentage of participants who stated the same at the posttest was doubled (61.8%). Similar improvement was noticed when the women were asked about the appropriate age to perform BSE, so before the intervention (26.9%) of them said BSE should be performed after 18 years old while 53.9% of them stated the same after the intervention. (Table 4).

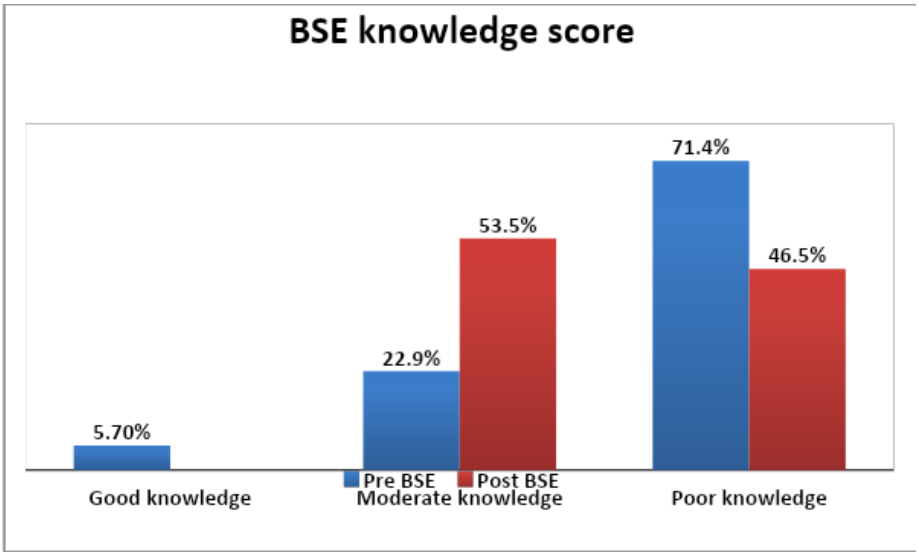

Figure 2: BSE knowledge score categories at pre-interventional and post-interventional phases (n=297).

Questions and Answers	Pre		Post	
	n	%	N	%
Have ever heard about self-breast examinatio				
Yes	132	44.4%	222	74.7%
No	165	55.6%	75	25.3%
What was the primary source of information about self-breast examination?				
TV	32	16.2%	32	10.4%
Radio	19	9.6%	21	6.8%
Education campaign	75	37.9%	188	61.8%
Internet	19	9.6%	20	6.5%
Magazines/Newspaper	12	6.1%	14	4.5%
Friends	22	11.1%	20	6.5%
Family	19	9.6%	13	4.2%
Others	10	3.0%	6	2.0%
In which age should the BSE should took place?				
less than 18 years old	53	17.8%	39	13.1%
more than 18 years old	80	26.9%	160	53.9%
I don't know	1	0.3%	25	8.4%
NA	163	54.9%	73	24.6%
How often should BSE should be undertaken by women				
Daily	0	0.0%	14	4.7%
Weekly	0	0.0%	25	8.4%
Monthly	77	25.9%	159	53.5%
Yearly	2	7%	9	3.0%
I don't know	59	19.9%	18	6.1%
Not at all	159	53.3%	72	24.2%
When can breast self-examination be done in case of regular menstruation				
At any time during the month	106	35.7%	27	9.1
5 days after the end of the menstruation	1	0.3%	155	52.2
I don't know	33	11.1%	52	17.5
NA	157	52.8%	63	21.2
Procedure of breast self-examination:(may be more than one answer)				
Using fingers	50	29.6%	102	28.5%
Examination of axilla	47	27.8%	95	26.5%
Standing before a mirror	39	23.1%	87	24.3%
Resting head on a pillow during the examination	33	19.5%	74	20.7%
I don't know	275	92.6%	2	0.7%

Table 4: knowledge of the participants about breast self-examination(BSE) at pre-interventional and post-interventional phases (n= 297).

3.3 Attitude to the breast self-examination (BSE)

Table 5 shows the participants' attitude to the BSE. During the pre-interventional phase, more than half of the prisoners thought that BSE neither important (57.2%) nor applicable (55.2%). The opposite was found during the post-interventional phase when the majority of our stated that BSE is important (81.8%) and applicable (88.2%) (Table 4). These enhancements within the participants' attitude regarding BSE were statistically significant (p=0.000)

(Table 2). Furthermore, participants with a good positive attitude were increased by 39%, while the mean of overall positive attitude score increased from 2.18 (SD ± 2.46) to 4.19 (SD ±1.79) by the intervention. (Figure 3).

Questions and Answers	Pre		Post	
	N	%	N	%
What do you think about the BSE ?				
Important	127	42.8%	243	81.8%
Painful procedure	3	1.0%	9	3%
Impressing procedure	2	0.7%	1	0.3%
Waste of time	1	0.3%	9	3%
not applicable	164	55.2%	35	11.8%

Table 5: Attitude of the participants to the BSE at pre-interventional and post-interventional phases (n= 297).

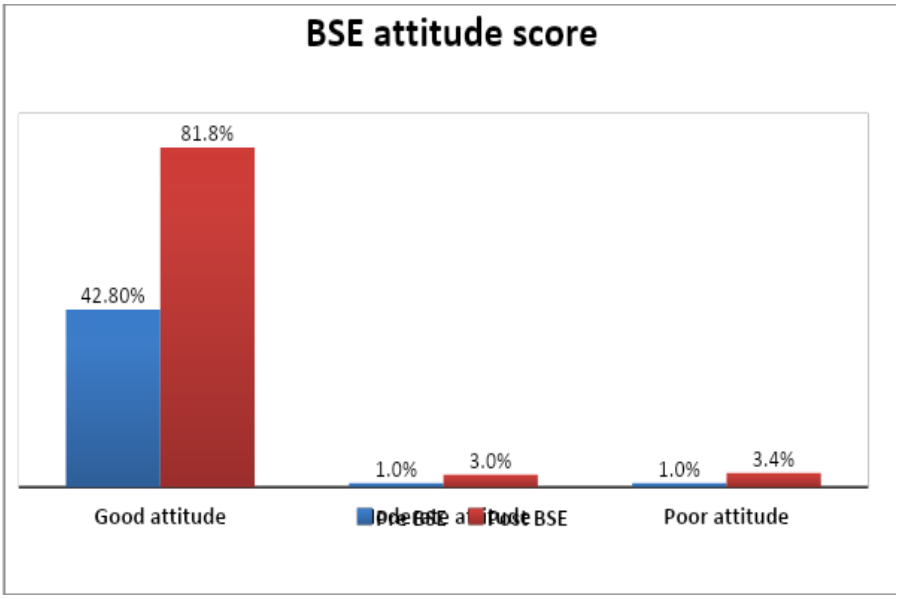

Figure 3: BSE attitude score categories at pre-interventional and post-interventional phases (n=297).

3.4 Practice of the breast self-examination (BSE)

Only 19.9% of the detainees did BSE before the intervention, while after it, 39.7% of the participants confirmed they performed BSE previously in their lives (Table 6). However, almost all the participants in this study showed poor BSE practice before (99.3%) and after (100%) the intervention (Figure 4). The overall practice score was found to be 2.5 (SD ± 0.97) at the pre-interventional phase and 1.83 (SD ±1.97) at the post-interventional phase (Table 2).

Questions and Answers	**Pre**		**Post**	
	n	**%**	**n**	**%**
Did you do the BSE before?				
Yes	59	19.9%	118	39.7%
No	238	80.1%	158	53.2%
N/A	0	0.0%	21	7.1%
Where did you perform the BSE ?				
at home	37	12.5%	65	21.9%
During health education campaign about breast cancer	0	0.0%	23	7.7%
In the hospital	21	7.1%	4	1.3%
Others	0	0.0%	19	6.4%
N/A "did not BSE before"	237	79.8	186	62.6%
What are the causes of refusing the BSE ?				
the fear from the results	77	17.9%	9	7%
I don't trust my abilities to perform the BSE in the right way	0	0.0%	13	10.1%
I don't know how to do the BSE	49	11.4%	81	62.8%
I think it is useless	76	17.7%	6	4.7%
I know I cannot get cancer	76	17.7%	9	7.0%
I am not afraid of having breast cancer	76	17.7%	6	4.7%
I fear being diagnosed with breast cancer	76	17.7%	5	3.9%
What are your reasons to do the BSE ?				
I do the BSE regularly	29	27.9%	75	36.2%
To follow up some abnormal changes in my breasts	19	18.3%	42	20.3%
It was the doctor advice	18	17.3%	37	17.9%
Breast cancer found in my family	5	4.8%	5	2.4%
I had diagnosed with other type of cancer	2	1.9%	4	1.9%
I am afraid to have breast cancer in the future	31	29.8%	44	21.3%

Table 6: Practice of the participants of the BSE at pre-interventional and post-interventional phases (n= 297).

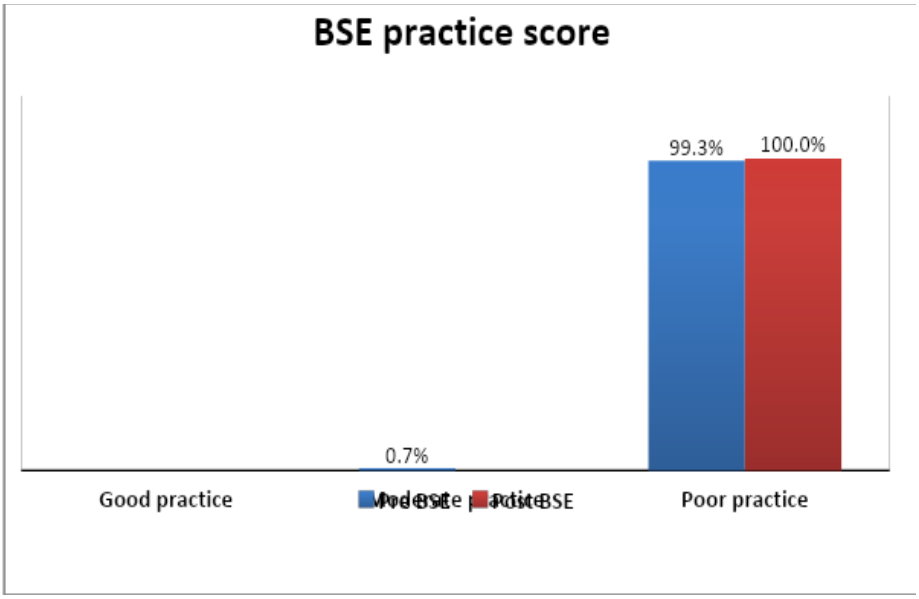

Figure 4: BSE practice score categories at pre-interventional and post-interventional phases (n=297).

4. Discussion

Breast cancer is the most prevalent cancer among women worldwide; it also causes 19% of deaths among all women who suffer from cancer [8]. However, early detection of breast cancer plays a major role in decreasing the disease's mortality rate, but missing such measures in developing countries like Sudan leads to late presentations and poor patient outcomes [9].

Early detection plays an important role in improving the disease prognosis; moreover, the adequate knowledge, attitude, and practice of BSE and the general knowledge about breast cancer can advance the disease's secondary prevention [8]. It was found that health education campaigns represent one of the most effective tools to improve women's knowledge, attitude, and practice regarding breast cancer and BSE [1, 10]. This study was designed as a one-group pre-test and post-test quasi-experimental study to prove the impact of the breast cancer prevention campaign and BSE training among prisoners at Dar- Altaaebat, a females' detention facility in Khartoum state. A similar facility-based quasi-experimental study was carried out in the Faculty of Physical Education at Zagarig University in Egypt among female students [11]. Another study was used to determine the influence of a breast cancer workshop on nursing students in Saudi Arabia [2]. Furthermore, the same concept was used in the study conducted in India among women of 42 villages in Karnataka rural area [12].

The overall level of knowledge regarding the breast cancer of our participants showed a significant dramatic change (p=0.00). 69.7% of them scored poor level in the pre-interventional phase of the study compared to 25.9% of them in the post-interventional phase. Furthermore, none of them showed a good level of knowledge about the disease at the pre-test phase compared to 21.1% of the participants at the post-test phase. A similar positive impact was

approved in the study that took place in Egypt among female college students when the good level of knowledge regarding breast cancer increased from 77.2% to 95.6% of the participants (Egypt-2015) [11]. The more positive impact was achieved in Brazil among 240 women when a health education session about breast cancer increased the overall good knowledge score about the disease from 9.5% to 89.6% of the participants (Brazil-2017) [9].

The hypothesis stated that a formal educational session about breast cancer would improve the female students' awareness about breast cancer was successfully approved in Madinah Munwarraha and Jazanas rural area in KSA, the good knowledge score increased from 34.2% to 99.7% of the students. In comparison, both the fair and poor knowledge dropped from 65.5% to 0.03% and from 0.03% to 0%, respectively (KSA-2014) [10].

Our participants' knowledge regarding the breast cancer symptoms was increased, in the pre-interventional phase, 60.3% of them identified the presence of a palpable painless breast lump as a red flag of the disease while 77.4% of them stated the same in the post interventional phase, also, similar improvement regarding the palpable axillary lymph nodes from 26.8% to 31.6% of the participants.

In congruence with this, a research was conducted by Shadia A. Yousuf in Jeddah- Saudi Arabia stated the same, when 27% of the participants recognized the palpable breast lump as a symptom of breast cancer in the pre-interventional phase while 42% of them did in the post-interventional phase, also an improvement from 30% to 61% of the participants regarding the identification of the palpable axillary lymph nodes as a disease symptom before and after the intervention respectively (Saudi Arabia - 2010) [2].

Smoking and alcohol consumption were the most chosen risk factors for breast cancer by participants in this study. A similar result was noticed in a previous study in KSA with dramatic improvement in women's knowledge about the disease risk factors by the intervention; hence 29% and 23.3% of the participants agreed that alcohol and smoking considered as risk factors of the disease, after a health education session about breast cancer these percentages increased to 44% and 73.7% respectively (KSA-2014) [10].

Regarding the detainees' knowledge about BSE in this study, more than half of the participants (55.6%) never heard about BSE at the pre-test phase, and (71.4%) of them showed poor knowledge score about BSE, but at the post-test phase (25.3%) and (46.5%) of the participants never heard about BSE and revealed poor overall knowledge score about BSE respectively. Similar significant positive improved results were noticed in previous studies ($p< 0.05$); in Egypt, the satisfactory level of knowledge regarding BSE was increased from 0.6% to 93.9% of the female students after a health education workshop (Egypt-2015) [11].

An analogous accomplishment was achieved by Fatemeh Haghighi when the level of good knowledge regarding the BSE increased from 27% to 67.4% of the participants after an education campaign regarding the BSE among female college students (Iran-2015) [8]. Likewise, in a study conducted in a rural area of India using a structured education program to raise awareness regarding breast cancer and BSE skills, the good knowledge score of BSE increased from 40.5%

to 80.9% among women after the program (India-2016) [12]. Additionally, a training course among women in Yazd-Iran succeed to increase the overall good knowledge score from 18% to 53% of the participants.

The participant's attitude regarding BSE was significantly increased (p=0.00); hence 81.8% of the participants scored good attitude in the post-test phase compared with 42.8% who scored the same in the pre-test phase. Likewise, significant improvement was noticed (p=0.001) in Zagazig University among female students regarding BSE attitude. 96.1% showed a good attitude toward BSE after educational sessions about breast cancer and BSE compared to 80.6% before these sessions [11]. Similar results were found in Saudi Arabia, where a study was conducted among 100 students in King Khalid University; an intervention program increased the participants' attitude from 41% to 55% in a significant way (p=0.05) [10]. In Iran, Fatemeh Haghighi stated a similar significant enhancement regarding the good BSE attitude among female employees (p=0.00) by 22.6% [8].

The practice of BSE among our participants showed no apparent improvement by the intervention. Hence almost all the participants showed poor practice in both pre-test ad post-test phases. This finding was explained by the fact that participants' practice either minimally improved or not changed by a single health education intervention among the population, unlike the participants' knowledge, which may easily show noticeable enhancement. A similar conclusion was noticed in a study conducted in Saudi Arabia and showed 12% improvement in BSE practice after the health education intervention compared to 65% improvement in the participants' knowledge about BSE .(Saudi Arabia -2014) [10].

5. Limitations

The limitation of this study is that it took place in only one facility, which makes it difficult to generalize its results over the larger population of inmates in Sudan.

6. Conclusion

The study findings concluded that participants showed poor knowledge regarding breast cancer and BSE at the pre-interventional phase, as well as poor practice and limited positive attitude toward BSE. The health education intervention regarding breast cancer and BSE found to be effective in improving both knowledge and attitude aspects of the participants, but with no significant enhancement in BSE practice.

Recommendations

This study gives an insight into the importance of conducting breast cancer health education campaigns in the most feasible and cost-effective way. These interventions should be organized regularly to build up better positive practice toward BSE; hence it is very difficult to be changed by a single intervention. The study also recommends providing maximum community participation in raising awareness about breast cancer.

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Ethical Considerations

The ethical approval was obtained from the institutional review committee at the radiation and isotopes center in Khartoum (RICK). Also, written consent was taken from the prison's administration, and verbal consent was obtained from each participant before conducting data collection.

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Declaration of Interest

Not declared.

Conflict of Interest

The authors declare no conflict of interest.

Authors' Contributions

AOAM: study design, data acquisition, data interpretation, and manuscript writing. MMMN: study design, data acquisition, data interpretation, and manuscript writing. RAAA: study design, data acquisition, data interpretation, and manuscript writing.

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