



Research Article

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Knowledge and Awareness of Sudanese Women toward Breast Cancer Detection

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Abstract

Background: The most frequent cancer in women is breast cancer (BC), which unfortunately has high mortality in Sudan whereas most of the patients are diagnosed at late stages of this disease sequence either due to a lack of awareness or unavailability of screening programs. **objective:** to assess the knowledge and awareness of breast cancer detection among Sudanese women 2022 - 2023. **Material and Methods:** a community representative descriptive cross-sectional study of women aged 17 to 70 years in different Sudanese provinces was included using a semi-structural interview questionnaire. **Results:** out of 200 participants, the mean age was 39.8 (± 12.13) years and the majority of them were aged between 41 and 50 years 54 (27%). 120 (60%) had no prior experience with breast cancer at all and 73 (36.5%) had never heard of breast self-examination for BC. The study resulted that the dominant of interviewed women 181 (90.5%) had a good awareness of breast cancer, and 161 (80.5%) believed that breast screening must require for the early detection of breast tumors. Breast changes, discharge, and lump pain were the most common prevalent reasons for breast screening in this study 95 (38.7%), 46 (18.7%), and 45 (18.3). It was clear that education level has a significant effect on the level of knowledge of breast cancer and its diagnostic screening tools among participants, with graduated women having adequate knowledge in comparison to those not graduated women 92 (50.5%) and 89 (49.2%) ($p\text{-value} = 0.004 < 0.05$). As well, the central resident participants had good knowledge about breast cancer 112 (70 %) in comparison with other residents. **Conclusion:** awareness and knowledge of BC detection increase with increasing educational levels and central urban living, there is an urgent need for intensive breast cancer awareness programs and the availability of screening centers authorities in Sudanese periphery areas.

Keywords: Breast Cancer Detecting, Knowledge, Awareness, Mammography, Ultrasound and Sudanese Women.

INTRODUCTION

Of all cancers in women, breast cancer (BC) has the highest incidence and mortality rates in the worldwide. According to estimates, the global burden of BC risen to 2.1 million new cases and 627 thousand deaths in 2018, representing for one in every four new instances of cancer and 15% of cancer deaths among women^[1, 12]. Given that the incidence of BC is increasing over the entire continent of Africa, reaching approximately 169 thousand in 2018, Globocan has predicted that by the year 2040, the number of incident cases could virtually double from present projections (IACR, 2018). Cancer estimates in Sudan are still mostly based on hospital case series due to lack of national population-based cancer registry. BC was identified as the most prevalent cancer among Sudanese women according to data from the Khartoum State Cancer Registry for the years 2009 to 2010. Incidence of BC accounted for 34% of cancer cases among female patients in 2017, according to data from the National Cancer Institute—University of Gezira (NCI-UG)^[3]. Studies on the clinic pathologic characteristics of BC in the Sudan have shown that, similar to other sub-Saharan African nations, Sudanese women are diagnosed younger ages, at an advanced stage, with a higher tumor grade, and with more extensive lymph node (LN) involvement than women in developed countries^[4, 5, 6, 14, 15]. Although breast cancer treatment has come a long way, the prognosis is still dismal in poorer nations like Sudan. It is necessary to alter the behavior of both women and medical professionals in order to fight breast cancers successfully. Reduced morbidity and mortality rates are mostly due to early detection of breast cancers^[17]. An essential public health principle is the screening for early identification and detection of diseases and health issues. BSE, clinical breast examination, and screening are the three screening techniques advised for BC. Early cancer detection increases the likelihood that it will be successfully treated because the cancer is not yet too advanced and has not spread.

Therefore, in many societies, proper awareness and attitude about breast screening are needed for the early diagnosis of breast abnormalities. This study was conducted among Sudanese women to assess their knowledge and awareness toward breast cancer detection.

MATERIAL AND METHODS

A descriptive cross-sectional study was conducted among women aged 17 to 70 years in different Sudanese provinces using semi-structural interviewed questionnaire developed based on diagnostic criteria and literature according to the possible awareness and knowledge about the breast cancer which used to collect the responses of included participants in the duration period from 15th November 2022 to 26th January 2023. Background variables: age, marital status and occupation, independent variables: state and educational level and dependent variables: participants' answers for questionnaire.

Statistical Analysis: All statistical analyses were calculated using software program (SPSS Statistics, version 26.0, Chicago, IL, USA). Qualitative variables were expressed as categorical groups and presented as frequency and percentage of the total. Cross tabulation test was used to show the effect of state and educational level of participants in the level of awareness and knowledge of breast cancer detection. A variable with a P value of less than or equal to 0.05 was considered significant.

Ethical considerations: Clear Informed written consent was taken from the participants. This study was approved by the Diagnostic Radiology Department, College of Medical Radiological Science, Sudan University of Science and Technology. All questionnaire responses were kept anonymously.

Results: Out of 200 participated females were aged between 41 and 50 years (54; 27%) followed by age groups from 31 to 40 years (52; 26% and 49; 24.5%). Their mean age was 39.80 ± 12.13 years. Most of them were married (148; 74 %) and (40; 20 %) were single. the majority of them were not graduated (105; 52.5%), as compared to graduated females (95; 47.5%). Furthermore, among all involved participants, a housewife was the most common occupation (103; 51%), whereas employed persons were (74; 37%) out of the total number. results demonstrated that 120 (60 %) of participants were from center states, 31 (15.5 %) were from the north states and 27 (13.5 %) were from the west states of Sudanese provinces. As in table 1

Table 1: characteristics of the study population (n = 200)

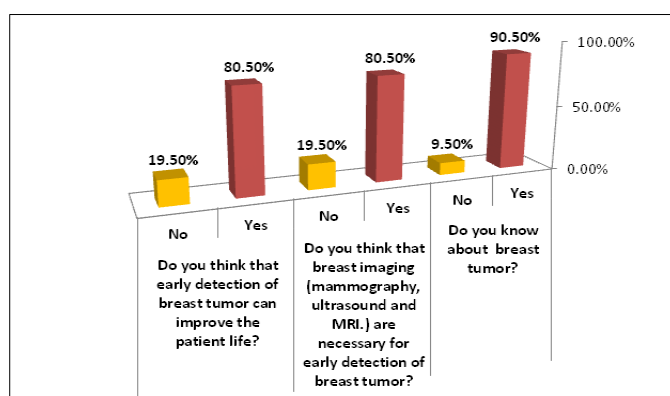
Variables	N	%
Age groups	Less than 19 years	6 3.0 %
	20 - 30 years	49 24.5 %
	31 - 40 years	52 26.0 %
	41 - 50 years	54 27.0 %
	More than 50 years	39 19.5 %
Marital Status	Marry	148 74.0 %
	Single	40 20.0 %
	Widow	8 4.0 %
	Divorced	4 2.0 %
Educational Level	Graduate	95 47.5 %
	Non-Graduate	105 52.5 %
	Employee	74 37.0 %
Occupation	House Keeper	103 51.5 %
	Student	23 11.5 %
	Center	120 60.0 %
	North	31 15.5 %
State	East	13 6.5 %
	West	27 13.5 %
	South	9 4.5 %

Table 2: Shows the experience of participants about breast cancer and how they are dealing when they effected by BC

Do you have any breast tumor?	N	%
Yes	63	31.5 %
No	137	68.5 %
In case of follow up have you had family history of breast cancer?	N	%
Yes	54	27 %
No	146	73 %
Have you experienced a breast imaging before?	N	%
No	120	60 %
Ultrasound	64	32 %
Mammography	40	20 %
MRI	9	4.5 %
Biopsy	59	29.5 %
Have you done a breast self-examination before?	N	%
Yes	61	30.5 %
You have not heard of it.	73	36.5 %
You don't know the way.	46	23 %
I'm afraid to do it.	20	10 %

Table 3: Shows the knowledge of participants about breast cancer and screening (n = 200)

Questions	Answers	N	%
Do you know about breast tumor?	Yes	181	90.5 %
	No	19	9.5 %
Do you think that breast imaging (mammography, ultrasound and MRI.) are necessary for early detection of breast tumor?	Yes	161	80.5 %
	No	39	19.5 %
Do you think that early detection of breast tumor can improve the patient life?	Yes	161	80.5 %
	No	39	19.5 %



Graph 1: Shows the knowledge of participants toward breast cancer and screening

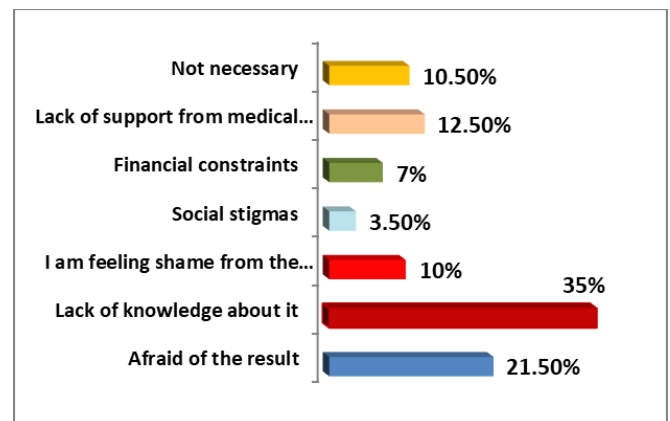
Table 4: Shows the knowledge of participants about Mammography

Why did you do /or you will do mammography or us?	N	%
Changes	95	38.77 %
Discharge	46	18.77 %
Fear from breast cancer	14	5.76 %
Follow up	17	6.93 %
Lump pain	45	18.36 %
Requested	28	11.42 %
Who Should perform mammography?	N	%
Both female and male	75	37.5 %
Female only	125	62.5 %
At what age Should mammography be performed?	N	%
Before 40 years	106	53 %
After 40 years	94	47 %

Table 5: Shows the awareness of participants about breast cancer and screening and the reasons making them don't have a breast Screening before

What was or should be the period between detecting changes and performing the first medical imaging?	N	%
No	19	9.5 %
Immediately	120	60 %
1 – 5 months	38	19 %
6 Months	6	3 %
1 Year	11	5.5 %
8 Month	6	3 %
How often should mammography and/or ultrasound be performed?	N	%

Annually	51	25.5 %
Every 6 months	104	52.0 %
Every 4 months	45	22.5 %
If you don't have breast Screening before, what is the reason?	N	%
Afraid of the result	43	21.5 %
Lack of knowledge about it	70	35 %
I am feeling shame from the tests	20	10 %
Social stigmas	7	3.5 %
Financial constraints	14	7 %
Lack of support from medical institutions	25	12.5 %
Not necessary	21	10.5 %



Graph 2: Shows the answers distribution according to the participant's answers when they were asked about the reasons making them don't have a breast Screening before

Table 6: Shows the effect of education level in the knowledge of breast tumor and its diagnostic imaging tools

Questions	Answers	Education Level		Asymptotic Significance (2-sided)
		Graduated	Non-graduated	
Do you know about breast tumor?	Yes	92(50.5%)	89(49.2%)	0.004
	No	3(15.8%)	16(84.2%)	
Have you done a breast self-examination before?	Yes	37(60.7%)	24(39.9%)	0.001
	You have not heard of it	21(28.8%)	52(71.2%)	
	You don't know the way.	26(56.5%)	20(43.5%)	
Do you think that breast imaging (mammography, ultrasound and MRI.) are necessary for early detection of breast tumor?	I'm afraid to do it.	11 (55%)	9(45%)	0.000
	Yes	88(54.7%)	73(45.3%)	
Do you think that early detection of breast tumor can improve the patient life?	No	7 (17.9%)	32(82.1%)	0.000
	Yes	88 (54.7%)	73 (45.3%)	
	No	7(17.9%)	32(82.1%)	
If you don't have breast Screening before, what is the reason?	Afraid of the result	27(62.8%)	16(37.2%)	0.019
	Lack of knowledge about it	22 (31.42%)	48 (68.58%)	
	I am feeling shame from the tests	9 (45%)	11 (55%)	
	Social stigmas	3 (42.85%)	4 (57.15%)	
	Financial constraints	7 (50%)	7 (50%)	
	Lack of support from medical institutions	23 (92%)	2 (8%)	

Not necessary	7 (33.33%)	14(66.67%)
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Table 7: Shows the effect of State in the knowledge of breast tumor and its diagnostic imaging tools

Questions	Answers	States					Asymptotic Significance (2-sided)
		Center	North	East	West	South	
Do you know about breast tumor	Yes	112 (70%)	28 (15.5%)	13 (7.2%)	20 (11%)	8 (4.4%)	0.027
	No	8 (42.1%)	3 (15.7%)	0 (0.0%)	7 (36.8%)	1 (5.3%)	
Have you done a breast self-examination before?	Yes	42 (70%)	8 (13.1%)	3 (5%)	7 (11.5%)	1 (1.6%)	0.383
	You have not heard of it	43 (59%)	11 (15.1%)	4 (5.5%)	10 (13.7%)	5 (6.8%)	
	You don't know the way.	24 (52.2%)	6 (13%)	6 (13%)	7 (15.2%)	3 (6.5%)	
Do you think that breast imaging (mammography, ultrasound and MRI) are necessary for early detection of breast tumor	I'm afraid to do it.	11 (55%)	6 (30%)	0 (0.0%)	3 (15%)	0 (0.0%)	0.039
	Yes	104 (64.6%)	24 (15%)	10 (6.2%)	18 (11.2%)	5 (3.1%)	
Do you think that early detection of breast tumor can improve the patient life?	No	16 (41%)	7 (18%)	3 (7.7%)	9 (23.1%)	4 (10.3%)	0.039
	Yes	104 (64.6%)	24 (15%)	10 (6.2%)	18 (11.2%)	5 (3.1%)	
	No	16 (41%)	7 (18%)	3 (7.7%)	9 (23.1%)	4 (10.3%)	

DISCUSSION

In generally, detection and early diagnosis are the two essential strategies for early cancer disease identification. The screening processes involves the use of different screening imaging tools chosen dependently according to the abnormal findings. These procedures even should available to asymptomatic individuals to help them in detecting and treatment of tumors before they in risk danger to their health, based on the Globocan 2020, 41.2 out of 100,000 Sudanese females age-standardized were infected by breast cancer comparing to cervix and ovarian cancer (8.7 and 6.7. respectively) [7]. For these reasons, this population-based study was intended to increase public awareness and improve knowledge of breast cancer diagnosis among Sudanese women.

The study revealed that 137 (68.5%) of the women participated in this research had no history of breast cancer, whereas 63 (31.5%) had and 146 (73%) had no a family history of breast cancer, compared to 54 (27%) who said that they did. When asked if they ever had a breast imaging, 120 (60%) stated that they had no prior experience with breast cancer at all, although ultrasound and mammography were their preferred investigation methods of breast screening (64; 32% and 40; 20%, respectively). Furthermore, the study found that (73; 36.5%) of participants had never heard of breast self-examination for breast cancer, 46 (23 %) were afraid to do this examination. Other responses of them for these questions shown in table 1. These basic findings are consistent with research [8] showing that (86.1%) of the interviewed women did not know how to perform breast self- examination. (56.3%) were being worried, anxious and afraid of being diagnosed with cancer. (18.4%) of the interviewed women stated that they practiced breast self-examination. As well with previous study in Ethiopia showed that self-reported breast cancer screening coverage is low. About two-thirds of women had no information about breast cancer screening methods [9].

The study resulted that the majority of our interviewed women (181; 90.5%) had a good awareness of breast cancer, 161 (80.5%) believed that breast imaging (mammography, ultrasound and MRI) must require for early detection of breast tumors and 161 (80.5%) believed that early detection of breast tumors could improve their lives. When asked why they did mammography or ultrasound, the most prevalent reasons were

breast changes, discharge and lump pain (95; 38.77%, 46; 18.77% and 45; 18.36%, respectively). Although only 75 (37.5%) of responses mentioned that both male and female should perform mammography scan, the majority of them 125 (62.5%) stated that only female should do this investigation type. Another finding was that 106 (53 %) of women have thought that age before 40 years is an only age for doing a mammography and 94 (47 %) of them stated that this procedure should be done after 40 years. As shown in table (3) and graph (1).

When the interviewed women were questioned about the period between detecting changes and performing the initial medical imaging, the majority of them (120; 60%) said it should be done immediately, while the rest (38; 19%) thought it should be done one to five months following a breast change. Furthermore, 104 (52%) of total participants agreed that mammography and/or ultrasound should be done every 6 months, whereas (51; 25.5%) of total respondents indicated an annual scan. As shown in table (5).

According to the study, the most prevalent reasons for not having a breast screening were a lack of awareness about breast screening, fear of the results and a lack of support from medical institutions (70; 35%, 43; 21.5% and 25; 12.5%. Respectively). Other factors are shown in table (5) and illustrated in graph 2. These findings as previous findings in KSA by Ahmed et al [11] who found that attitude and practices according to breast cancer screening showed that 73.39% of their respondents have not had mammography or U/S experiences. Despite their good knowledge level, they justified their lack of experience through the following reasons: 59.5% did not have lump or pain, 14.19% were afraid of the results and 11.49% were ashamed or afraid to perform it. A popular explanation of these findings has been illustrated by Altirifi, H.I., et al. 2022 [18] who showed that Sudanese women's unwillingness to undergo breast screening is due to the non-adequate quality improvement of health care authorities and the expansive of these procedure in our developing country and by Husain Elmalaika, et al. 2022 [7] who stated that Sudan has essentially no programmers for cancer prevention, screening, or early detection.

Using cross-tabulation statistical analysis and ($P = 0.05$) as a significant reference value yielding good results, it is clear that education level has a

significant effect in the level of knowledge of breast cancer and its diagnostic imaging tools among Sudanese women, with graduated women having adequate knowledge in comparison to whom not graduated women (92; 50.5% and 89; 49.2%) and (p value = 0.004 < 0.05). as well, there was a significant difference according to having a breast self-examination between graduated women and not graduated (p value = 0.001 < 0.05) whereas the study showed a good practice for breast screening in comparing to non-graduated individuals. Furthermore, graduated women stated that mammography, US and MRI are more important than non-graduated individuals for early detection of breast cancer (88; 54.7% and 73; 45.3%, respectively) and (88; 54.7%) of graduated participants thought that early detection of breast cancer can improve their life in comparison to (73; 45.3%) of non-graduated women (p value = 0.000 < 0.05). Fear of the outcome of breast screening was the most prevalent reason among graduated women (26; 62.8%), but among non-graduated women, lack of knowledge was the most common reason for not having a breast screening (48; 68.58%) and the (p value = 0.019 < 0.05). as illustrated in the table (6).

These findings in the same line with previous study conducted in Malaysia which stated that awareness of breast cancer and practice of screening procedures increases with higher education [10] and similar to results of Ahmed, R.M., et al. 2021 [11] who found that there was a significant correlation between good knowledge and the educational level of the participants ($p=0.003$).

Table (6) showed that states has a significant difference according to the knowledge of breast tumor and its diagnostic imaging tools, whereas the center resident participants had a good knowledge about breast cancer (112; 70 %) out of total participants in compare to the population in other states (p value = 0.027 < 0.05) but there was no difference between the participants in different state of Sudanese women according to having a breast self-examination (p value = 0.383 > 0.05) while there was a significant difference when they were asked the necessary for early detection of breast cancer which can improve their life (p value = 0.039 < 0.05). these differences in answers may due to the population density in the central region, as well as the high level of education and availability of health care compared to the periphery regions.

CONCLUSION

In conclusion, our results seem to improve obviously that awareness and knowledge of breast cancer detection among Sudanese women increase with increasing educational level and central urban living. As a result, there is an urgent need for an intensive breast cancer awareness program and the availability of screening centers authorities in periphery areas. Moreover, study conclude the followings: The participants demonstrated an adequate knowledge and awareness towards breast cancer detection in compare to poor self-practices. The most prevalent etiologies for not having a breast screening among Sudanese women are the lack of awareness about breast screening, fear of the results and a lack of support from medical institutions.

Recommendations

Breast self-examination, clinical breast examination, and mammography/US are the three recommended screening procedures for breast cancer screening. These approaches aid in the early detecting and diagnosis of breast cancer. Federal Ministry of Health of Sudan should improve breast cancer detecting programs as camping, conversances and events and support the role of the media in promoting healthy, positive behavior towards early detection of breast cancer, as well as encourage and train volunteer women to make them competent in promoting women's awareness and knowledge of breast cancer. Different medical authorities recommended to provide mammography and ultrasound machines in their compounds especially in periphery areas. Voluntary programs, workshops, activities, seminars, courses, camps and events should be done periodically about the important of the early detection of breast cancer and the proper behaviors and attitude toward breast screening. It will be important that future research investigators to make their future researches with larger sample size and external validation of time in different Sudanese provinces.

Conflict of Interest

None declared.

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None declared.

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