Journal of Global Scientific Research 8 (11) 2023/ 3332-3341

Contents lists available at www.gsjpublications.com

Journal of Global Scientific Research in Medical and Dental Sciences

journal homepage: www.gsjpublications.com/jgsr

Profile of Barriers to Breast Cancer Screening Among Libyan Women and its Predictors; A Study in Sirte

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ARTICLE INFO

Received: 27 Sep 2023,
Revised: 3 Oct 2023,
Accepted: 9 Oct 2023,
Online: 23 Nov 2023

Keywords:
Breast cancer - Screening - Barrier - Libya

ABSTRACT

Introduction: Breast screening can provides a chance for early detection of breast cancer. In Libya, breast cancer screening behaviors are scarce compared to women in Western countries. This study aimed to explore the barriers to breast cancer screening among Libyan women resident in Sirte. It also examined the contribution of selected socio-demographic characteristics and knowledge about breast cancer risk factors to perceiving more barriers to screening. **Methods**: A cross-sectional descriptive study of a 300 Libyan females was conducted among Libyan women residents in Sirte, from May 2020 to February 2021 using self-administered, constructed questionnaire for data collection, including inquiries about socio-demographics data and data relevant to breast cancer, its risk factors and the breast cancer-screening barrier. Data were analysed using SPSS software. **Results**: The most frequently reported barrier to screening was an economic barrier, followed by a healthcare access barrier. The high reporting barriers group represented more than half of the respondents (53.7%). Only three variables showed a statistically significant association with reporting a higher number of barriers to screening: age, income, and knowledge about breast cancer risk factors. These three variables were entered into a binary logistic regression model and showed that income is a predictor of more perceived barriers to screening. The model revealed that knowledge about breast cancer risk factors does not contribute to barriers to screening ($p > 0.05$). **Conclusion**: This study was identified economic, personal, and health care barriers. Addressing these barriers with emphasizing on providing medical insurance are highly recommended and providing educational interventions for improving breast cancer knowledge should be incorporated as core components of the screening program within the healthcare system.

1. Introduction

Breast cancer (BC) is the commonest cancer among women worldwide and is responsible for 15% of mortality due to cancer [1]. Accounts for 20% of total cancers among Libyan females [2 3 4 5 6 7], with the majority of cases being young females, with half diagnosed at an advanced stage at presentation [8]. The non-modifiable and other modifiable risk factors have induced breast cancer incidence [8 9 10]. The common practices for treatment of breast cancer are surgical removal of

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doi: 10.5281/jgsr.2023.10197146

the breast followed by chemotherapy and radiation therapy [11]. The diagnosis delay is a major problem in Libya and leads to advanced stages of cancer and potentially high mortality. This was suggested to be attributed to social, medical, and other patient-related factors [12]. However, breast screening can provide a chance for early detection of breast cancer and successful treatment [13], with substantial reductions in breast cancer mortality. Literature shows that a lack of screening programs is the main reason for the increased mortality rate from BC in developing countries [14]. Mammography is a proven screening tool for effectively reducing BC mortality [15] [16]. However, most women do not do regular screening, or even not at all, and studies have focused on breast self-examination and, in particular, its practice, knowledge, and benefits[12] [17]. In Libya, breast cancer screening behaviors are scarce compared to women in Western countries [18] [8].

Barriers to screening for breast cancer have been identified in different populations [18] [10] [12] [19] [20] [21] and categorized into: personal, economic, and health care service barriers [22] [23] [11] [24] [25] [26].

War has troubled Sirte twice, and a lack of a systematic program for breast screening and the presence of various factors could have an effect on screening rates, including; women's knowledge of risk factors, their socioeconomic status, having a family history of BC, and the availability of facilities for mammographic screening in the major governmental and private hospitals. Furthermore, there have been no clear studies conducted on the possible barriers to BC screening among Libyan females in Sirte, therefore, this study aimed to explore the barriers to breast cancer screening among Libyan women resident in Sirte. It also examined the contribution of selected socio-demographic characteristics and knowledge about breast cancer risk factors to perceiving more barriers to screening.

2. Methodology

Study design, settings, and respondents recruitment:

This is a cross-sectional descriptive study among Libyan women residents in Sirte, the coastal city, located at the middle of Libya. The study was conducted over a 10-month period, from May 2020 to February 2021. A 341 women were invited to the study using a convenient sampling method. Participation was voluntary. Eligible participants included women with Libyan heritage, who were equal to or older than 18 years of age, and who stated the absence of a previous or current history of breast cancer. We excluded respondents who had an uncontrolled medical illness, were undergoing treatment for cancer, or were in remission, as well as women who had performed any type of breast cancer screening or worked in the health care profession. An informed consent for participation was taken, kindly, every woman was instructed not to write her name on the questionnaire and had the right to ask for clarification and/or to withdraw from the study at any time, and she was invited to answer and fill out the questionnaire separately. Out of 341 recruited eligible women, 300 subjects responded, giving a response rate of (300/ 341 x100) %.

3. Study measures

A self-administered, constructed questionnaire was used for data collection. The questionnaire consists of three sections. The first part collects sociodemographic data, including age, occupation, marital status, education level, and income, and if there is a positive family history of breast cancer in first degree relative.

The second part was intended to assess the adequacy of knowledge about breast cancer risk factors, and included 14 items. Each item is attached to a two-response scale of “no” or “yes”. Each no response was coded as zero, while yes (correct) responses were coded as 1. The total knowledge about risk factors score was computed as the total sum of all the 14 items. Thus, the possible range of knowledge scores is 0 to 14. The mean was then used as a cut-off point, where respondents whose knowledge score equals the mean or higher were defined as having adequate knowledge about breast cancer risk factors, and those whose total score is less than the mean represent the inadequate knowledge group.

The third part was to collect data about the barriers to breast cancer screening. It includes 25 statements covering three domains of barriers; personal, health care, and economic. This section was developed based on previous studies that

explored barriers to breast cancer screening in developing countries [27] [28] [29] [30] [31] [32] [33] [34]. Each statement is attached to a three-response scale; yes, no, and do not know. Each yes response was coded as 1, while a response of don't know or no was coded as zero. The total barriers to breast cancer-screening score was computed as the sum total of all the 25 responses to the statements. Therefore, the possible range of the total barriers to screening score is 0 to 25. The total barriers score was then dichotomized into two groups using the mean as a cut-off point; whereby respondents whose score equals the mean or higher were defined as high barriers to screening group, and those whose total score is less than the mean represent the low barriers to screening group.

4. Data analysis

SPSS version 24 was used to conduct the data analysis. Missing data management, using case wise deletion and mean implementation, was performed as appropriate. Thus, data analysis was run on 300 valid cases. Descriptive statistics were run to present the sample's socio-demographic characteristics, pattern of knowledge about breast cancer risk factors, and profile of barriers to breast cancer screening. Frequency and percentage were used to describe categorical data, while mean and standard deviation were used to summarize normally distributed continuous data. Chi square was used to test for the bivariate association between the main outcome variable; breast cancer screening barrier status (high barriers and low barriers), and each independent variable; namely age, occupation, marital status, education level, income, family history of breast cancer in first degree relatives, and knowledge about breast cancer risk factors - knowledge status (inadequate and adequate). Thereafter, variables that showed a significant bivariate association with the breast cancer screening barrier status at a p value < 0.05 were considered in a logistic regression model using the enter method.

5. Results

The mean age of the respondents was 46.8 (SD = 12.2) years. The majority of women were married (79.7%), and more than half of them were not working (53.0%). Up to 32.0% of the respondents reported a positive family history of breast cancer in a first-degree relative (Table 1).

Table 1. Sociodemographic characteristics of the respondents (n = 300)

Characteristic		f	(%)
Age (yrs) [a]			
($\bar{x}$±SD) [b]		46.8	±12.2
Age groups			
	18-25	3	(1.0)
	26-35	111	(37.0)
	36-45	49	(16.3)
	46-55	83	(27.7)
	≥ 56	54	(18.0)
Occupation			
	Not working	159	(53.0)
	Working	141	(47.0)
Marital status			
	Married	239	(79.7)
	Single	26	(8.7)
	Divorced	11	(3.7)
	Widow	24	(8.0)

Education level			
	Illiterate	124	(41.3)
	Primary school	51	17.0)
	Secondary school	33	(11.0)
	High school or more	92	(30.7)
Income (LD/Month) [c]			
	Low (<500)	129	(43.0)
	Middle (500-1000)	98	(32.7)
	High (>1000)	73	(24.3)
Family history of breast cancer in first degree relatives*			
	Yes	96	(32.0)
	No	163	(54.3)

[a] yrs = years, [b] $\bar{x}$ = mean, SD = standard deviation, [c] LD=Libyan Dinars, * ~~Missing values on this variable =41~~

The total knowledge about breast cancer risk factors score among the respondents ranged between 2 and 12, with a mean score of 7.3 (SD =2). Women who showed inadequate knowledge represented 54.3% of the sample. Overall, the respondents showed better awareness about certain risk factors like lack of breast-feeding (84.0%) and exposure to radiation (79.3%). The results revealed that fewer women know that oral contraceptives (32.7%) and hormonal replacement therapy (35.3%) are among the risk factors (Table 2).

Table 2. Knowledge about breast cancer risk factors (n=300)

	Knowledge items	**Correct response**	
		f	**(%)**
1	Oral contraceptive use increases the risk of breast cancer.	98	(32.7)
2	The age of 35 or more increases the risk of breast cancer.	198	(66.0)
3	Early menarche increase the risk of breast cancer.	166	(55.3)
4	Late menopause increase the risk of breast cancer.	193	(64.3)
5	Lack of breast-feeding increases the risk of breast cancer.	252	(84.0)
6	First pregnancy at 30 and above increases risk of breast cancer.	172	(57.3)
7	Obesity increases the risk of breast cancer.	123	(41.0)
8	Unhealthy food increases the risk of breast cancer.	156	(52.0)
9	Lack of sports increases the risk of breast cancer.	117	(39.0)
0	Radiation exposure increases the risk of breast cancer.	238	(79.3)
1	Smoking increases the risk of breast cancer.	122	(40.7)
2	Hormonal replacement therapy increases the risk of breast cancer.	106	(35.3)
3	A family history of breast cancer is a risk factor.	117	(39.0)
4	A previous history of breast cancer is a risk factor.	144	(48.0)
	Total Knowledge score		
	($\bar{x}$±SD)	7.3	±2.0
	Observed range	(2-12)	
	Knowledge status		
	Inadequate Knowledge (Scores < 7.5)	163	(54.3)
	Adequate Knowledge (Scores ≥ 7.51)	137	(45.7)

Table 3 shows the reported profile of barriers to breast cancer screening. The total number of barriers reported by the respondents ranged from 5 to 20, with a mean number of barriers of 12.6 (SD = 2.7). The most frequently reported barrier to screening was an economic barrier, that is, the lack of medical insurance (71.3%). This was followed by a healthcare access barrier, where 71.0% of the respondents reported a lack of service or that the place that provides the service is too far away. A lack of female nurses or doctors was also commonly reported (63.0%). These were followed by two personal barriers; the embarrassment of uncovering breasts for examination (62.0%), and perceiving the need to go to the doctor only when having an illness (62.0%). The least frequently reported barrier was "treated rudely or unkindly" (19.3%). The high reporting barriers group represented more than half of the respondents (53.7%).

Table 3. Pattern of reported barriers to breast cancer screening (n = 300)

Barrier	f	(%)
Personal barrier		
Did not know I need one (a breast examination).	164	54.7
Would be embarrassed to uncover my breasts for examination.	186	62.0
Do not go to doctor unless i have symptoms.	186	62.0
Did not know where to go.	137	45.7
Fear that it causes discomfort or pain.	122	40.7
Did not know which specialist to go to.	115	38.3
Fear of the exposure to unnecessary radiation.	111	37.0
Fear of being diagnosed with cancer.	156	52.0
Cancer has no treatment, WHY TO GO THEN.	97	32.3
Mammograph screening is not important.	184	61.3
Screening might be refused by family.	142	47.3
Fear to end up with mastectomy.	171	57.0
Treated unkindly or with contempt by the personnel performing mammography.	58	19.3
Health care system related barrier		
Doctor hours not convenient.	92	30.7
Have to wait too long.	119	39.7
Lack of service or the place provide the service be so far.	213	71.0
The procedure of mammogram not explained adequately by doctor.	166	55.3
Unwilling to get mammogram until requested by doctor.	173	57.7
Lack female nurse or doctor.	189	63.0
No Privacy in health care settings.	158	52.7
Economic barrier		
Cost of the procedure.	166	55.3
No insurance coverage.	214	71.3
Costs of medical care services.	178	59.3
Transportation problems.	165	55.0
Lack of time.	138	46.0
Total barriers score		
Mean ($\bar{x}$±SD)	12.6	±2.7
Observed range of barriers	5-20	
Barriers to screening groups		

Low (<12.6)	139	46.3
High (≥12.6)	161	53.7

Table 4 displays the bivariate association between each independent variable and barriers to breast cancer screening status. Only three variables showed a statistically significant association with reporting a higher number of barriers to screening: age, income, and knowledge about breast cancer risk factors. A higher frequency of those who reported a high number of barriers to screening (67.3%) was found among women aged from 36 to 45 years (p = 0.044) than in other age groups. Income was also significantly associated with barriers to screening status (p > 0.001), with women who have high incomes having the highest frequency of those who perceive more barriers to screening (68.5%) compared to lower and middle income groups. Unexpectedly, a higher frequency of those who reported more barriers to screening (60.6%) was found among women who have adequate knowledge about breast cancer risk factors (p = 0.028).

Table 4. Association between both socio-demographic characteristics and breast cancer risk factors knowledge and barriers to screening status

Variable	Barriers to screening groups				χ^2	P-value
	Low		High			
	f	(%)	f	(%)		
Age groups						
18-25	2	(66.7)	1	(33.3)	9.269[a]	0.044*
26-35	52	(46.8)	59	(53.2)		
36-45	16	(32.7)	33	(67.3)		
46-55	36	(43.4)	47	(56.6)		
≥ 56	33	(61.1)	21	(38.9)		
Occupation						
Not working	77	(48.4%	82	(51.6)	0.597	0.440
Working	62	(44.0)	79	(56.0)		
Marital status						
Married	106	(44.4)	133	(55.6)	2.155	0.541
Single	15	(57.7)	11	(42.3)		
Divorced	6	(54.5)	5	(4.5)		
Widow	12	(50.0)	12	(50.0)		
Education level						
Illiterate	53	(42.7)	71	(57.3)	1.631	0.652
Primary school	27	(52.9)	24	(47.1)		
Secondary school	15	(45.5)	18	(54.5)		
High school or more	44	(47.8)	48	(52.2)		
Income (LD)						
Low (<500)	79	(61.2)	50	(38.8)	20.882	0.000**
Middle (500-1000)	37	(37.8)	61	(62.2)		
High (>1000)	23	(31.5)	50	(68.5)		
Family history of						

breast cancer						
Yes	46	(47.9)	50	52.1	0.033	0.856
No	80	(49.1)	83	50.9		
Knowledge about breast cancer risk factors						
Inadequate	85	(52.1)	78	47.9	4.852	0.028*
Adequate	54	(39.4)	83	60.6		

[a] Fisher's exact test statistic, * P < 0.05, ** P < 0.001

These three factors were entered into a binary logistic regression model to test for their contribution to the barriers to screening status (table 5). The model showed that income is a predictor of more perceived barriers to screening. According to the model, women who have middle income are almost two and a half times more likely to report a higher number of barriers to screening than women with low income (p = 0.001, OR = 2.490, 95 % CI = (1.429 - 4.340). Likewise, women who report high income are three times more likely to report more barriers to screening (p = 0.000, OR = 3.129, 95 % CI = 1.663-5.886). Concerning age, women in the age group from 36 to 45 years are almost three times more likely to report more barriers to screening than women older than 56 years. However, no significant differences were reported across the other compared age groups. The model revealed that knowledge about breast cancer risk factors does not contribute to barriers to screening (p > 0.05).

Table 5. Logistic regression model of the predictors of barriers to screening

Variables	Adj. OR	(95% CI)	P
Age groups (years)			
18-25 versus >56 yrs	0.450	(0.037-5.424)	0.529
26-35 versus >56 yrs	1.375	(0.682-2.769)	0.373
36-45 versus >56 yrs	2.738	(1.180-6.352)	0.019*
46-55 versus >56 yrs	1.708	(0.824-3.544)	0.150
Income			0.000*
Middle versus low	2.490	(1.429-4.340)	0.001*
High versus low	3.129	(1.663-5.886)	0.000*
Knowledge about risk factors			
Adequate versus inadequate	1.477	(0.910-2.399)	0.115
Constant	0.362		0.002

6. Discussion

The current study indicates that, almost half (54.3%) of the participants have knowledge deficits about breast cancer risk factors, consistent with other studies [35] [36] [37], and it is considered fairly acceptable compared with other reports [21] [38]. Previous researchers have identified inadequate knowledge about breast cancer as one of the barriers to screening [27] [30] [31].

Regarding breast cancer' risk factors, the current study showed that, most women stated that the most known risk factor was "lack of breast-feeding". These findings are consistent with other studies[35] [37] [39] [40], however, their beliefs about the risk from the usage of oral contraceptives and hormonal replacement therapy were consistent with a study in Sirte [37]and were in contrast with the other reports [35] [39] [40].

It is important to understand the nature of barriers to breast cancer screening, to achieve high rates of screening among women according to recommended guidelines and ultimately reduce female mortality as BC is diagnosed in late stages, especially in countries with limited resources[41]. Many personal, health care and economic barriers to the screening identified among a study group of Libyan females, which do not allow them to use a BC screening service, where both females' beliefs that, there is no need for medical check-ups unless one is ill and their embarrassment by breast examination, were the most common personal / cultural barriers revealed by the present participants, followed by a lack of awareness of mammogram's importance, in contrast to other Arab females, for example, an Egyptian women, who have better awareness of mammogram's examination [38]. As was predictable in the present study, a notable proportion of the females were afraid of discovering that they had breast cancer, in consistent with other studies [28] [38], and unsurprisingly, a significant proportion of participants have declared a fear of mastectomy, similarly to the report by Yousef A et al [27]. Most of the former personnel / cultural barriers (the first common three) had been reported as the most common personnel barriers to using the screening services [25] [42]. To overcome these barriers, we need to promote educational programs regarding early detection of breast cancer and its importance in prognosis, and how women can attain a healthy life. Unsurprisingly, 71% of females complain of the absence of medical service or the farness of the places that provide the service, followed by 63% of women who say that, the lack of a female nurse or doctor was the main health screening barrier in comparison with 38.1% and 42.6% subsequently of Egyptian females; this could be related to the consequences of war and conflicts, especially in rural areas. There was also a fairly considerable proportion of females who were unwilling to have a mammogram unless recommended by a doctor and also those with the opinion of inadequate explanation by a physician, consistent with other studies [38], where the former was the most prevalent health system barrier cited by women. A doctor's recommendation for screening mammogram is very important for our participants, this is also acknowledged as a motivation for women's compliance with breast screening in other studies [43] [44] [45]. Our recent study shows that, the most frequently reported barrier among all barriers to screening was an economic barrier. A lack of health insurance coverage is the most prevalent economic barrier among Libyan women specifically seeking mammography screening, followed by the high cost of medical services, which is generally considered to be a major health barrier [38] [27] [45] [46] [47] [48], so ensuring medical insurance and free breast cancer screening will resolve some of the problems facing screening.

The present study revealed three main factors affecting BC screening: women aged 36 to 45 years, participants with higher income, and those with adequate knowledge of the risks of BC seemed more likely to perceive different kinds of barriers to screening compared with their counterparts. In contrast to Egypt and others who reported a higher BC screening barrier and higher mortality rates among those with lower income and less education [29] [45] [49] [50] .

Interestingly, a binary logistic regression model that tested the contribution of the formerly mentioned factors to the barriers to screening status showed that, income is a predictor of perceiving more barriers to screening, particularly a higher income. Furthermore, women in the age group from 36 to 45 years are almost three times more likely to report more barriers, there were no reported significant differences across other compared age groups. Although there was an apparent relationship between age and barriers to screening status in the chi square test, it was strange that associations disappeared in the logistic regression model of the predictors of barriers to screening, it seemed to be related to other hidden factors that may not be described in the current study, and the model originally ran a bit of control and balance, because we entered more than one factor together.

Additionally, the model revealed that knowledge about breast cancer risk factors does not contribute to barriers to screening.

From the present study, barriers to women's screening for BC are more of economic and health system barriers that could be affected by conflicts and war. Although, no many published study was done on similar study groups, however, the author

recommend that, performing a comparative study between a current study group that never sought BC screening and with women who had previous screening, aiming to investigate and give a better idea about the barriers to screening among Libyan women.

7. Conclusions

There was a fairly low level of knowledge among the participants about breast cancer and its risk factors. The most frequently reported barrier was an economic one, hence, the present study emphasizes that an effective health-care education system and providing medical insurance are highly recommended. In addition to the presence of a female nurse and doctor, the availability of medical services related to early detection and diagnosis of BC, and doctors' recommendations for screening, these are issues that can be addressed within the healthcare system for improvement of medical services, aiming to eliminate some of the obstacles to screening mentioned here.

8. Funding

None

9. Acknowledgements

We acknowledge all the participants who took part in the study.

10. Competing interests

Authors declare that there are no competing interests with others.

11. References

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