Factors Predicting the Utilization of Breast Cancer Screening Services among Women Working in a Private University in Ogun State, Nigeria

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Authors' contributions

This work was carried out in collaboration between the two authors. Author OF designed the study, performed the statistical analysis and wrote the first draft of the manuscript. Author MN managed the analyses of the study. Both authors performed the literature review, read and approved the final manuscript.

Original Research Article

ABSTRACT

Aims: To examine the factors predicting the utilization of breast cancer screening services among women working in a private university in Ogun State.
Study Design: A cross-sectional descriptive study.
Place and Duration of Study: A private University in Ogun State, Nigeria. Data collected between June and September 2016.
Methodology: One Hundred and Eighty-seven (187) participants were randomly selected using multi-stage and proportional sampling techniques. Participant completed a questionnaire that assessed the predicting factors and screening practices. Data were analyzed using SPSS version 21 and presented as frequencies and percentages. Multiple regression analysis was used to test the hypotheses. Level of significance was set at a $P \leq 0.05$.
Results: Majority (54.5%) of the respondents had moderate knowledge of breast cancer as a deadly disease that needs to be prevented. Majority (65.8%) of the respondents also failed to practice breast self-examination. Partners acceptance of breast cancer screening services and

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knowledge of breast cancer screening were predictors (($F_{(1, 187)}$ = 9.060; *P* = 0.00; $F_{(2, 187)}$ = 10.989; *P* = .013) of breast cancer screening services utilization while knowledge of breast cancer symptoms and risks was not. Fear of cancer and death is not a predictor of the utilization of breast cancer screening with $F (1,187)$ =3.384; *P*=0.00.

Conclusion: Findings from this study showed that there is a need for continuous public awareness for breast cancer screening services. Through this, women would develop confidence in performing the procedure correctly.

1. INTRODUCTION

Cancer of the breast has the highest mortality rate among women with any forms of cancer in developing countries [1]. This is partly due to what has been established to predispose women to develop breast cancer. Such as family history of breast cancer, age at first pregnancy, number of pregnancies, breastfeeding history, diet, and physical activity. World Health Organization (WHO) reported that more than 60% of all cancers occur in middle-and low-income countries, including Africa [2]. Breast cancer has the highest record of cancer among women in Africa with an incidence rate of about 40/100,000 [3].

Recommended preventive screening services such as breast-self-examination (BSE), clinical breast examination (CBE) and mammography have been identified to reduce breast cancer morbidity and mortality [3,4]. Regular mammogram screening is utilized to detect breast cancer at early stage, and has shown to be effective in reducing breast cancer deaths [5]. However, women are not engaging in the screening practice thereby resulting in increased rate of morbidity and mortality from breast cancer. Some barriers to breast cancer prevention screening such as inadequate knowledge or awareness of screening services, culture, and levels of education of participants have been identified [6-8]. However, little is known about the factors that contribute to participation or non-participation in preventive screening services for breast cancer among women working in this faith-based private university in Ogun State.

Moreover, studies assessing barriers to breast cancer screening have reported that the rates of breast cancer screening utilization are low and the low utilization are associated with the level of education, socioeconomic status, access to health care, and race [8]. Various efforts to increase early detection of breast cancer especially among women with low socioeconomic status and limited access to healthcare should be addressed. Consequently, high screening rates will promote early detection of breast cancer. The utilization of preventive health services such as screening for breast cancer decreases morbidity and mortality effectively. However, several individual factors, as well as cultural factors, are negatively associated with the utilization of screening services [9]. There is a need to determine what factors might be predicting Nigerian women working in a private institution from engaging in early detection services that can reduce breast cancer death.

Specifically, the study addressed the following hypotheses:

1. Knowledge of breast cancer screening and breast cancer symptoms is not a predictor of utilization of breast cancer screening services
2. Partner's acceptance of breast cancer screening services is not a predictor of utilization of breast cancer screening services
3. Fear of cancer and death is not a predictor of utilization of breast cancer screening services

2. MATERIALS AND METHODS

This was a descriptive cross-sectional design where quantitative data was collected to assess the factors predicting the utilization of breast cancer screening services among non-academic female staff working at a private university in Ogun state. The study was carried out between June and September 2016.

The study was carried out in a private university in Ogun state. The university is one of the first private universities in Nigeria with a student

population of over 12,000. The study population consisted of consenting non-academic female staff working full time. Non-academic female working in the various non-academic division were considered eligible for the study. Academic female staff were excluded from the study because the study was conducted during summer whereby the majority of the academic staff were on annual leave. From the human resources record, the university has a total of 311 full time non-academic female staff working in 5 different divisions. A sample size of 175 respondents was determined using Yamane Taro formula [10]. The sample size was increased to 187 for attrition purposes. This represents about 60% of the total population. Proportionate allocation of study participants based on the number of staff in each division and simple random sampling was used to select the participants. The questionnaire used was developed by the researcher. It was developed to identify the predicting factors, screening practices, and knowledge of breast cancer and breast cancer screening. For the questions under knowledge variable, a score of 15 to 20 was considered high, 8-14 medium scores and between 0-7 were poor. The maximum score on the utilization of the screening services was 3 while the minimum was 0. A score of 1 was assigned to each of the screening methods (BSE, CBE, Mammogram) if utilized and 0 if not utilized. Partners acceptance of screening services was measured using five items developed for the current study on a 5 point likert scale of "Strongly agree,' "Agree", "Strongly disagree," and "Disagree". Pretesting the instrument was done to verify the data collection tool for reliability (Cronbach's alpha = 0.73) and face validity before data collection. Questionnaires were distributed to the respondents after purpose of the study was explained and verbal consent was given. Each questionnaire was verified for completeness and coded for analysis. Statistical analysis was performed using Statistical Package for Social Sciences (SPSS) version 21 was used to analyze data. In addition, data were descriptively analyzed and multiple regression statistics were employed to test the hypotheses with significance level set at $P<0.05$.

3. RESULTS

The descriptive characteristics of women who participated were as follows: 151 were with age range of 23-42 years. One Hundred and six (106) of the participants had tertiary education. More than half, 127 (67.9%) worked in the subsidiaries area such as the cafeteria, offices, and businesses. Table 1 shows the demographic data. One hundred and fifty-one (151) participants reported no family history of breast cancer.

Table 1. Descriptive presentation of women

Variable	Category	Frequency	%
Age	18-22	11	5.9
	23-27	41	21.9
	28-32	37	19.8
	33-37	40	21.4
	38-42	33	17.6
	43-47	17	9.1
	48-52	8	4.3
	53 & above	-	-
Level of Education	Primary	6	3.2
	Secondary	64	34.2
	Tertiary	106	56.7
	Others	11	5.9
Administrative Division	Presidency	15	8.0
	Financial administration	6	3.2
	Development and strategy	7	3.7
	Student development	32	17.2
	Subsidiaries	127	67.9
Family history of Breast cancer	Don't know	16	8.6
	No	151	80.7
	Yes	20	10.7

3.1 Utilization of Breast Cancer Screening Practices

Seventy-five (40.1%) of these women stated they perform breast self-examination, with only 28% performing breast self-examination monthly. All (100%) of these women never had a mammogram. Majority of the women (87%) reported not partake in clinical breast examination unless they have a problem with their breast. The overall score on the utilization of breast cancer screening practices was 0.89, indicating that utilization is low.

3.2 Knowledge of Breast Cancer and Screening Services

A total of 92% of respondents reported knowing what breast cancer is. 78.6% reported that breast cancer is fatal while 80.2% reported lumps in the breast as an early sign. More than 90% of the participants have heard about breast self-examination. Maximum attainable score on the knowledge variable is 20 and minimum is 1. Knowledge of breast cancer was categorized as high (15-20), moderate (8-14), and low (1-7). The responses of women knowledge of breast cancer and breast cancer screening are shown in Table 2(a), (b). More than half of the women 102(54.5%) had moderate knowledge of breast cancer.

3.3 Partner's Acceptance of Breast Cancer Screening Services as a Predictor of Utilization

Less than half (33.2%) of the participants strongly agreed and agreed that their spouse would recommend screening for breast cancer, 36% of their spouse would support doing clinical breast examination, and 42.2% spouse would feel embarrassed with a doctor or nurse examining their wives breast while present. Statistically, partner's acceptance of breast cancer screening services significantly predict the utilization of the breast cancer screening services among women ($F (1, 186) = 9.060$, $P=.000$ with an R^2 of 0.124. The utilization of breast cancer screening services among working women yielded a coefficient of multiple regression (R) of 0.352 and R^2 of 0.124. Therefore, 12.4% of the total variance in the utilization of breast cancer screening services is accounted for by partner's acceptance of breast cancer screening services. Analysis of variance of the multiple regression result of F-ratio value was significant at 0.05 level ($F_{(1, 187)} = 9.060$; $P = .000$) also indicated that partner's acceptance of breast cancer screening services is a predictor of the utilization among women working in a private university in Ogun state (Table 3).

3.4 Knowledge of Breast Cancer Symptoms and Breast Cancer Screening as a Predict

Breast cancer screening and breast cancer symptoms and risks knowledge when put together yielded a coefficient of multiple regression (R) of 0.299 and a multiple correlation square (R^2) of 0.089. This shows that 8.9% of the total variance in the utilization of breast cancer screening services is accounted for by the knowledge of breast cancer screening and breast cancer symptoms and risks. Table 4 also indicates that the analysis of variance of the multiple regression data produced an F-ratio value significant at 0.05 level ($F_{(2, 187)} = 10.989$; $P < 0.05$). Table 5 shows the relative contribution of each predictor variable to the variance in the utilization of breast cancer screening services. Knowledge of breast cancer screening has beta value of 0.261 and t-value of 3.876 significant at less than 0.05 alpha level, while knowledge of breast cancer symptoms and risks has 0.033 beta value and 0.410 t-value not significant at 0.05 alpha level. Therefore, knowledge of breast cancer screening is the only potent predicting factor to the utilization of breast cancer screening services.

Table 2(a). Information on the participants' knowledge of breast cancer and breast cancer screening

Variable		Frequency	Percentage (%)
Have you heard of breast cancer	Yes	172	92.0
	No	15	8.0
Do you think breast cancer is fatal?	Yes	147	78.6
	No	40	21.4

Variable		Frequency	Percentage (%)
Factors associated with increased risk	Old Age	52	27.8
	Family History	144	77.0
	Obesity	56	29.9
	Monthly breast examination	45	24.1
Early signs of breast cancer	Lumps in the breast	150	80.2
	Pain, soreness, burning in breast	123	65.8
	Nausea	12	6.4
	Shortness of breath	16	8.6
	Nipples' discharge	111	59.4
	Breast enlargement	50	26.7
	Changes in breast shape/nipples	94	50.3
	Changes in the color of breast	71	38.0
Have you heard about breast self-examination?	Yes	173	92.5
	No	10	5.3
How often should a woman perform breast self-examination?	Everyday	-	-
	Once a week	-	-
	Once a month	97	51.9
	Every 6 months	-	-
	Don't know	82	43.8
Breast examination should include feeling of the breast for lumps	Yes	134	71.7
	No	53	28.3
Have you heard of mammography?	Yes	156	83.4
	No	29	15.5
Mammography can detect lumps that cannot be felt when the hands are used	Yes	79	42.2
	No	108	57.8
Mammography is recommended for women at age 40years above	Yes	121	64.7
	No	66	35.3
Clinical breast examination involves the doctor/nurse using hands to check breast	Yes	40	21.4
	No	147	78.6
	Don't know		
With regular mammography, one does not need breast self-examination or clinical breast examination	Yes	113	60.4
	No	74	39.6
Regular breast examination will reduce the risk of developing breast cancer	Yes	48	25.7
	No	139	74.3

Table 2(b). Categories of participants' level of knowledge of breast cancer

Category	Criteria	Frequency	%	Remark
15-20	High	69	36.9	Number of participants with High level of knowledge of breast cancer
8– 14	Moderate	102	54.5	Number of participants with moderate level of knowledge of breast cancer
1-7	Low	16	8.6	Number of participants with low level of knowledge of breast cancer

Table 3. Summary of multiple regression analysis of partner's acceptance of breast cancer screening services as predictor of the utilization among working women

Source of variation	Sum of Squares	Df	Mean Square	F-Ratio	*P*
Regression	63.482	1	63.482	9.060	0.00
Residual	1303.302	186	7.007		
Total	1366.784	187			

Multiple R (Adjusted) = 0.352
Multiple R^2 (Adjusted) = 0.124
Stand error estimate = 4.589

Table 4. Summary of multiple regression analysis knowledge of breast cancer screening, breast cancer symptoms/risks and breast cancer screening services utilization

Source of variation	Sum of squares	Df	Mean square	F-ratio	*P*
Regression	203.576	2	101.788		
Residual	1917.231	185	9.263	10.989	0.013
Total		187			

Multiple R (Adjusted) = 0.299
Multiple R^2 (Adjusted) = 0.089
Stand error estimate = 3.186

Table 5. Test of significance of regression coefficients for knowledge of breast cancer and breast cancer screening as a predictor of utilization of breast cancer screening services

Model	Unstandardized coefficients		Standardized coefficients	T	Sig.
	B	Std. error	Beta		
1 (Constant)	21.432	0.887		17.687	0.000
KBCSR	0.041	0.087	0.033	0.410	0.067
KBC Screening	0.359	0.132	0.261	3.876	0.000

KBCSR = Knowledge of Breast cancer symptoms and risks
KBC Screening = Knowledge of breast cancer screening

Table 6. Summary of multiple regression analysis of fear of cancer and death

Source of variation	Sum of squares	Df	Mean square	F-Ratio	P
Regression	33.897	1	33.897		
Residual	1862.976	186	10.016	3.384	0.013
Total	1896.873	187			

Multiple R (Adjusted) = 0.175
Multiple R^2 (Adjusted) = 0.031
Stand error estimate = 3.654

3.5 Fear of Cancer and Death as a Predictor of Utilization of Breast Cancer Screening

The utilization of breast cancer screening services among women due to fear of death produced a coefficient of multiple regression of 0.175 and R^2 of 0.031 with F (1,187) =3.384; *P=0.013*. This implies that fear of cancer and death is not a predictor of the utilization of breast cancer screening among women working in that private university.

4. DISCUSSION

The outcome of the research revealed that the participants in this study had moderate knowledge of breast cancer screening and breast cancer symptoms and risks. This result could be attributed to the number of women in this study with tertiary education. This supports the results of Kotepui et al. [11] in a study conducted by the group among female personnel in a University which reported that knowledge of breast cancer screening was high. Lecturers and laboratory

scientist had a significantly higher mean knowledge of breast cancer screening than the temporary employees. The result was attributed to the level of education of respondents. In this study, the level of utilization of breast cancer preventive services was low. Even though BSE is a simple, quick, and cost-free procedure, the practice is very low among these women. This study, therefore, lends credence to the studies of Balogun & Owoaje [12] that among market women only 18.1% had ever checked their breast. Also, the study of Obaji et al. [13] showed that only 21.8% of participants in their study had ever practiced BSE. In similar studies among the semi-urban community and rural women, (34.9%) and 51.6% of the women practiced BSE [14, 15]. Moreover, study findings have shown that 40.0% of Thai women perform BSE and 46% of those women perform BSE monthly while 5.8% of participants had a mammogram in the past [16]. However, the finding sharply contradicts the findings among low income [17] and female undergraduate students whereby majority, 92.4% [17] and 84.3% Bassey et al. [18] reported performing breast self-examination. Likewise, pregnant women in Sule [19] and Obaji et al. [13] studies reported regularly performing a self-breast examination.

The present study revealed partner's acceptance of breast cancer screening services as a significant predictor of the utilization of the screening services among women working in this institution. It may be conjectured that the spouse may have great influence on their health behaviors. Existing literature has explained marital status as a socially enabling factor of timely receipt of mammography screening [16]. Similarly, the findings of Han et al. [9,12,13] reinforced that spousal and family support and encouragement to obtain mammogram led to increasing mammography utilization. In addition, women who were married reported receiving more support from their partner and were more likely to practice BSE than women who were not married [8]. Ghazali et al. [20] reported that married women inclined to have breast cancer screening practices. This may be explained by the economic and emotional support from their husbands and positive influence their partners have on their health behaviors. Additionally, unmarried and singles seem to be most at risk of breast cancer screening non-adherence. This may be explained by a lack of social ties which is benefitted within a context of a marriage. Increase in social support were associated with

increase in the odds that a woman intends to obtain a CBE [21]. Partners perceived benefits of utilizing preventative measures could promote and encourage utilization of cancer preventive services among women. Therefore, family involvement in health education and teaching must be encouraged. Strategies for family inclusion should be promoted in the utilization of cancer screening services. For instance, spouses should be encouraged to come for the screening exercises with their wives. Incentives in form of discount for such services should be offered to the family.

The knowledge of breast cancer screening is a major potent factor to the utilization of breast cancer screening services among these working women. This means that women who have good knowledge are likely to correctly practice BSE monthly and to detect a lump in the early stage of its development [22]. In Martinez- Donate et al. [23] study among Hispanic women 40 years of age and older, knowledge of mammogram was one factor that significantly associated with the likelihood of obtaining mammogram. The finding suggests that Latinas who are knowledgeable about recommended screening practices for breast cancer are more likely to adhere to breast cancer screening recommendations. Similarly, El Saghir et al. [24] reported that early diagnosis of breast cancer is known to be vital not just in the treatment of the disease but also in determining prognosis. The provision of resources that would promote understanding of breast cancer, its risk factors, and screening should be made available to women at every socioeconomic level.

In this study, fear of cancer and cancer death is not a predictor of the utilization of breast cancer screening services. This corroborates the finding of Charkazi et al. [25]. On the contrary, studies have found that fear of death was associated with low compliance with cancer preventive services [8,13]. Breast cancer fear and perceived susceptibility to developing breast cancer do predict screening intentions in Parker et al. [26] study. A cross sectional study by Labrie et al. [16] that investigated young women motivation to engage in early mammography screening in Switzerland also revealed that fear and ego involvement as main predictors of screening intentions. However, it was concluded that moderate fear can predict screening behaviors, but very high levels of fear can prevent women from engaging in screening practices.

5. CONCLUSION

Utilization of breast cancer screening services and practice of BSE is low even though the respondents had moderate knowledge level of breast cancer screening and breast cancer symptoms. Factors such as partner's acceptance and knowledge of breast cancer were predictors of the utilization of breast cancer screening services. To promote the practice of BSE and utilization of breast cancer screening services, institutions such as the healthcare, religious organizations should regularly involve in creating more awareness programs with discount. This would not only improve the knowledge levels of women but also induce positive changes in their utilization of the cancer screening services.

CONSENT

Each participant's consent was obtained.

ETHICAL APPROVAL

It is not applicable. There was no need for institutional ethical approval. However, verbal consent was obtained from the participants.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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