

Risk Perception on Breast Cancer and Acceptance of Screening with Mammogram by Female Nurses in Tertiary Health Facilities in Jos, Plateau State, Nigeria

Barnabas Mafala Mandong¹, Jagshak Barnabas Mandong², Innocent Emmanuel¹, Ayuba Ibrahim Zoakah³, Philip Ojile Akpa¹

Departments of ¹Anatomical Pathology and Forensic Medicine and ³Community Medicine, Jos University Teaching Hospital, Jos, Plateau State, Nigeria, ²Department of Internal Medicine, King Fahad Hospital Hofuf, Al Asha Region, Saudi Arabia

Abstract

Background: Breast cancer remains the major cause of cancer morbidity and mortality among women globally. The risk of breast cancer increases with advancing age. Screening programs have been demonstrated to significantly reduce breast cancer mortality. **Aim:** The main objective was to assess risk perception and acceptance of mammogram as a screening tool for the early detection of breast cancer among female nurses working in three tertiary health facilities in the city of Jos. The study also determined the factors that impede the acceptance of mammogram. **Materials and Methods:** Self-administered semi-structured questionnaires were administered at random to 450 female nurses across the three tertiary health facilities in the city of Jos. The questionnaires were structured into six sections, namely sociodemographic, knowledge of the risk of breast cancer, mammogram use and acceptance barriers to the use of mammogram, and possible obstacles to the utilization of mammogram. The resources were scored and graded accordingly. **Results:** A total of 450 nurses participated with the median age of the participants as 28 years (23–39), 66.7% were younger than 35 years of age, and 54.4% were single. The educational background showed that 53.6% had bachelor's degrees and the remaining had diplomas (46.4%). On risk perception, only 40.7% of the respondents had a good perception of risk factors for breast cancer, while 59.3% had a poor perception. Only 52 (11.6%) of the 450 participants have ever had a form of the mammogram. **Conclusion:** The study showed that less than half of the respondents had a good perception on the risk of breast cancer and also the rate mammogram acceptance was very low.

Keywords: Breast cancer, risk perception and mammogram uptake, screening

INTRODUCTION

Breast cancer is a major public health problem worldwide accounting for 25% of all cancers in women with a global burden of 1.7 million new cases of malignancy.^[1-4] It is the most frequent cancer in women ranking second in both sexes globally.^[5-7] It is the leading cause of cancer death among women in developing countries such as Nigeria.^[8,9] The risk perception of breast cancer and mammogram acceptance in Africa and Nigeria is reported to be very low.^[10-12] The mortality rate is the highest in developing or poor resource countries because of late presentation and lack of knowledge of the disease.^[10,11] Mortality from breast cancer is preventable if the disease can be detected early at the premalignant stage and treated.^[12,13] Mammogram (also called mastography) is the process of using a low-energy X-ray to examine the human breast for diagnosis

and screening. There are different methods of breast cancer screening, which include, breast self-examination, clinical breast examination, mammogram ultrasonography, positron emission mammogram, magnetic resonance imaging, and ductography. However, the mammogram is the most commonly cited method of screening.^[13,14] The advantage of mammogram over others is that it is cost-effective, it can detect lesions that self-breast or clinical breast examination may miss, it has low

Address for correspondence: Dr. Barnabas Mafala Mandong, Department of Anatomical Pathology and Forensic Medicine, Jos University Teaching Hospital, P.M.B. 2076, Jos, Plateau State, Nigeria. E-mail: mafala2004@yahoo.com

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radiation exposure, and the machine can be used as a mobile tool and so it can move from clinic to clinic.^[11,15]

Mammogram has the following benefits, namely detection of premalignant breast lesion as small as <2 cm which cannot be detected by manual palpation, it can distinguish benign from malignant even at a very early stage, however, a false-negative rate of at least 10% has been recorded, but the sensitivity and specificity increase with advancing age.^[10-12] The false-negative result occurs partly due to dense tissue obscuring the cancer on mammograms having a large overlap with the appearance of normal tissue.

There is poor risk perception of breast cancer and low acceptance of mammogram among women in Nigeria which translates to a reduced early detection of breast cancer and high mortality.^[1,2]

The low perceptive index of breast cancer and low uptake of mammogram among women in this environment predisposes women to an increased prevalence of breast cancer.^[10-12] All public health measures geared toward increasing the risk perception of breast cancer and increasing the acceptance of mammogram will significantly reduce the prevalence of breast cancer in this environment.

The aim of this multicentre work is to study the risk perception and acceptance of mammogram for breast cancer screening of female nurses at the Jos University Teaching Hospital (JUTH), Bingham University Teaching Hospital, and Plateau State Specialist Hospital. The specific objectives to effect include: to assess the risk perception; to determine the factors associated with the risk perception; to determine the acceptance of mammogram; and to determine the factors that may affect acceptance of mammogram among female nurses in the tertiary health facility.

MATERIALS AND METHODS

The study was a cross-sectional study. The sample population was selected from among female nurses working at tertiary health centres in Jos, Plateau State between the ages of 20–60 years, which are then grouped into those 35 years and below and those above 35 years. This grouping is based on the knowledge that breast cancer is uncommon in younger women aged 35 years and below.^[16]

Determination of sample size

The sample size was determined using the following formula

$$n = Z^2 P(1 - P) / d^2 = \frac{(1.96)^2 \times 0.078 \times 0.922}{(0.05)^2} = \frac{0.27627}{0.0025} = 110.5 \text{ samples.}$$

Where n is the sample size, Z is the statistic corresponding to the level of confidence, P is expected prevalence, and d is precision (corresponding to effective size).

A prevalence of 7.8% documented by Odusanya and Tayo in Lagos^[17] was adopted as the assumed prevalence, and a confidence interval (d) of 0.05 was adopted.

Data collection technique

A semi-structured self-administered questionnaire was used with open-ended questions. The questionnaire was pretested on selected student nurses at the Jos University Teaching Hospital before being handed to female nurses outside the tertiary health institution. This was to access the suitability of the questionnaire before being administered to the participants. The data were collected using questionnaire survey with close-ended responses in the form of Likert items and several open-ended questions.

Before answering the questionnaire, the participants were voluntarily given a consent form that was attached to the survey. After turning in the survey, educational material about breast health was made available to the participants. The participants were given a phone contact number to assist in obtaining any further information concerning breast screening programs and benefits. All surveys were anonymous, coded only with numbers, and the privacy of the participants was protected.

The questionnaires were structured into the following sections numbered 1–6 respectively: sociodemographic characteristics of the participants; history of contraceptive use, menarche, and postmenopausal period; knowledge of breast cancer symptoms and risk factors; mammogram use and knowledge of mammogram practice; barriers to the utilization of mammogram screening practice; and perceptions about breast cancer awareness and campaign in Nigeria.

In section 1, information about age, the number of children, marital status, family income, education, and family history of breast cancer will be included. Section 2, focused on the history of contraceptives, menarche, menopause, and parity. In Section 3, questions about mammogram use and knowledge were used. Section 4 focused on, breast cancer knowledge of signs and symptoms (pains, breast lumps, and nipple discharge). In Section 5, women were asked what they thought was the barrier to setting a mammogram screening. In Section 6, the perception about breast cancer risk campaign awareness in Nigeria.

The scoring and grading of responses followed:

For the assessment of perception of the risk of breast cancer, a total of nine stem questions were used for the perception of risk using a 5-point rating scale, with 5 points allocated to the most favourable response and 1 point to the least favourable response, giving a maximum attainable score of 45 points. Furthermore, a score of 36–45 corresponding to the two highest points of preferable response was adjudged as “Good perception of risk,” while scores of 35 and below corresponding to indecisive response to least favourable response adjudged as “Poor perception of risk.”

For the assessment of perception on nature of breast cancer, a total of five stem questions were used for the perception of risk using a 5-point rating scale, with 5 points allocated to the most favourable response and 1 point to the least favourable response, giving a maximum attainable score of

25 points. Furthermore, a score of 20–25 corresponding to the two highest points of preferable response was adjudged as “Good perception on nature,” while scores of 19 and below corresponding to indecisive response to least favourable response adjudged as “Poor perception on nature.”

For the assessment of perception of the severity of breast cancer, a total of five stem questions were used for the perception of risk using a 5-point rating scale, with 5 points allocated to the most favourable response and 1 point to the least favourable response, giving a maximum attainable score of 25 points. Furthermore, a score of 20–25 corresponding to the two highest points of preferable response was adjudged as “Good perception of severity,” while scores of 19 and below corresponding to indecisive response to least favourable response adjudged as “Poor perception of severity.”

For the assessment of perception of benefits of mammogram, a total of five stem questions were used for the perception of benefits of mammogram with 2 points allocated to a “Yes” response and 1 point to a “No” response, giving a maximum attainable score of 10 points. Furthermore, a score of 6–10 was adjudged as “Good perception of benefits,” while scores of 5 and below were adjudged as “Poor perception of benefits.”

Explanatory variables in this study were categorised as demographic characteristics of the respondents, medical history, perception of nature of the disease, perception of the severity of the disease, and perception of benefits of mammogram.

The outcome variables in the study included perception of risk of breast cancer categorised as good and poor perception as well as acceptance of mammogram classified as ever done and never done.

All the returned questionnaires were reviewed for completeness and thereafter serialised in preparation for data entry following completion of the data collection process. Data analysis was carried out using Statistical Package for the Social Sciences version 20. (Armonk, New York, USA: IBM Corp).

Ethical clearance was obtained from the Institutional Review Boards of all the Jos University Teaching Hospitals and was adopted by Bingham University Teaching Hospital and Plateau State Specialist Hospital.

The study was limited by the fact that the finding among female nurses might not necessarily be generally applicable to all females in Jos, because women outside the nursing profession were excluded. Furthermore, there are other methods of detecting breast cancer such as ultrasonography and other imaging techniques, clinical breast examination, and self-breast examination. These techniques were not used in this study.

RESULTS

A total of 450 nurses participated in this study with a median age of 28 years (23–39) and 300 (66.7%) being younger

than or equal to 35 years of age. Furthermore, 245 (54.4%) of the subjects were single and 172 (38.2%) were married. With regard to the level of education, 241 (53.6%) of the respondents had obtained a bachelor’s degree, while 206 (45.8%) had diplomas as their highest educational attainment [Table 1].

The medical history of patients showed that 38.7% had regular contact with a family doctor; 22.0% received regular advice on mammogram from a family doctor; 6.0% had an annual or biennial mammogram; 1.1% had a history of abnormal mammogram results, and 6.9% had a family history of breast cancer [Table 2].

Assessment of risk perception of breast cancer among the study participants revealed that 250 (55.6%) and 151 (33.6%) of the respondents strongly agreed and agreed to the female gender being perceived to be at a higher risk of breast cancer, respectively. Furthermore, older age (50 years and above) was perceived to be a risk factor for breast cancer as 38.7% and 37.1% of the respondents agreed and strongly agreed to this, respectively. The presence of a family history of breast cancer was perceived to be a risk factor for breast cancer as agreed and strongly agreed to by 170 (37.8%) and 167 (37.1%) of the respondents, respectively. Early menarche, obesity, and use of alcohol were strongly agreed to as perceived risk factors for breast cancer by 164 (36.4%), 117 (26.0%), and 129 (28.7%), respectively. Importantly, 183 (40.7%) of the respondents demonstrated an overall good level of risk perception for breast cancer [Table 3].

The relationship between characteristics of the respondents and the level of risk perception of breast cancer revealed a statistically significant relationship with age as the odds of good risk perception among those ≤ 35 years of age was

Table 1: Sociodemographic characteristics of the study participants

Variables	Frequency (n=450), n (%)
Age group (years)	
≤ 35	300 (66.7)
≥ 36	150 (33.3)
Median age (years) (IQR)	28.0 (23.0-39.0)
Marital status	
Single	245 (54.4)
Divorced	23 (5.1)
Married	172 (38.2)
Widowed	10 (2.2)
Highest level of education	
Diploma	206 (45.8)
Bachelor’s degree	241 (53.6)
Master’s degree	2 (0.4)
Doctorate degree	1 (0.2)
Health insurance availability	
Available	164 (36.4)
Not available	286 (63.6)

IQR: Interquartile range

Table 2: Medical history of the study participants

Variables	Frequency (n=450), n (%)
Regular contact with a family doctor	
Yes	174 (38.7)
No	276 (61.3)
Receipt of regular advice on mammogram from a family doctor	
Yes	99 (22.0)
No	351 (78.0)
Annual or biennial mammogram	
Yes	27 (6.0)
No	423 (94.0)
History of abnormal mammogram result	
Yes	5 (1.1)
No	445 (98.9)
Family history of breast cancer	
Yes	31 (6.9)
No	419 (93.1)

4.16 times the odds of those older ($\chi^2 = 39.828$; $P < 0.001$). Furthermore, the marital status of the respondents and level of risk perception for breast cancer showed a statistically significant relationship as 126 (51.4%) of the single respondents having good risk perception as compared to 6 (26.1%), 48 (27.9%), and 3 (30.0%) of the respondents who were divorced, married, and widowed, respectively. Bonferroni correction using pairwise comparison of single status as the reference revealed that the odds of good risk perception among the single respondents was 2.74 times that of the married ($P < 0.001$) which was responsible for the statistically significant relationship. All other characteristics assessed did not reveal any significant findings [Table 4].

Assessment of the self-reported uptake of mammogram by the respondents revealed that lifetime uptake was 11.6% while of those who had reported uptake of mammogram only 14 (26.9%) had done the mammogram within the last 12 months of the study [Table 5].

Assessment of the level of relationship between the characteristics of the respondents and lifetime uptake of mammogram showed that receipt of regular advice on mammogram from a family doctor had a statistically significant relationship with the uptake of mammogram as 19 (19.2%) of those who had received regular advice having done mammogram as compared to 33 (9.4%) of those who did not receive regular advice ($\chi^2 = 7.242$; $P = 0.007$). Furthermore, on the relationship between family history of breast cancer and acceptance of mammogram, acceptance was reported among 25% of those with a family history of breast cancer as against 10.5% of those without a family history of breast cancer ($\chi^2 = 5.242$; $P = 0.022$), [Table 6].

Receipt of regular advice from a family doctor was found to be a predictor of acceptance of mammogram among the respondents with its odds being two times that of those who

Table 3: Perception of the risk of breast cancer

Variables	Frequency (n=450), n (%)
Female gender	
Strongly disagree	24 (5.3)
Disagree	16 (3.6)
Undecided	9 (2.0)
Agree	151 (33.6)
Strongly agree	250 (55.6)
Age ≥ 50 years	
Strongly disagree	20 (4.4)
Disagree	57 (12.7)
Undecided	32 (7.1)
Agree	174 (38.7)
Strongly agree	167 (37.1)
Family history of breast cancer	
Strongly disagree	26 (5.8)
Disagree	17 (3.8)
Undecided	20 (4.4)
Agree	170 (37.8)
Strongly agree	217 (48.2)
Early menarche (age <11 years)	
Strongly disagree	34 (7.6)
Disagree	63 (14.0)
Undecided	79 (17.6)
Agree	110 (24.4)
Strongly agree	164 (36.4)
Obesity	
Strongly disagree	35 (7.8)
Disagree	83 (18.4)
Undecided	91 (20.2)
Agree	124 (27.6)
Strongly agree	117 (26.0)
Alcohol intake	
Strongly disagree	34 (7.6)
Disagree	53 (11.8)
Undecided	87 (19.3)
Agree	147 (32.7)
Strongly agree	129 (28.7)
Use of oral contraceptives	
Strongly disagree	33 (7.3)
Disagree	53 (11.8)
Undecided	75 (16.7)
Agree	153 (34.0)
Strongly agree	136 (30.2)
Perception of the risk of the disease	
Good perception	183 (40.7)
Poor perception	267 (59.3)

did not get regular advice having adjusted for family history of breast cancer (adjusted odds ratio: 2.010; 95% confidence interval = 1.061–3.810; $P = 0.032$), [Table 7].

DISCUSSION

Breast cancer still remains the most common cancer among Nigerian women with reported annual cases of over 400,000, as reported by Olugbenga-Bello *et al.*^[12]

Table 4: Relationship between sociodemographic characteristics, medical history of study participants, and level of risk perception of breast cancer

Variable	Frequency (%)			Df	χ^2	P
	Risk perception		Total (n=450)			
	Good (n=183)	Poor (n=267)				
Age group (years) [£]						
≤35	153 (51.0)	147 (58.8)	300 (100.0)	1	39.828	<0.001*
≥36	30 (20.0)	120 (80.0)	150 (100.0)			
Marital status ^{££}						
Single	126 (51.4)	119 (48.6)	245 (100.0)	3	26.325 ⁺	<0.001*
Divorced	6 (26.1)	17 (73.9)	23 (100.0)			
Married	48 (27.9)	124 (72.1)	172 (100.0)			
Widowed	3 (30.0)	7 (70.0)	10 (100.0)			
Highest level of education						
Diploma	74 (35.9)	132 (64.1)	206 (100.0)	3	7.971 ⁺	0.075
Bachelor's degree	107 (44.4)	134 (55.6)	241 (100.0)			
Master's degree	2 (100.0)	0 (0.0)	2 (100.0)			
Doctorate degree	0 (0.0)	1 (100.0)	1 (100.0)			
Health insurance availability						
Available	60 (36.3)	104 (63.4)	164 (100.0)	1	1.781	0.182
Not available	123 (43.0)	163 (57.0)	286 (100.0)			
Availability of a family doctor seen on a regular basis						
Available	66 (37.9)	108 (62.1)	174 (100.0)	1	0.880	0.348
Not available	117 (42.4)	159 (57.6)	276 (100.0)			
Advice from family doctor on a regular mammogram						
Yes	39 (39.4)	60 (60.6)	99 (100.0)	1	0.085	0.770
No	144 (41.0)	207 (59.0)	351 (100.0)			
Annual or biennial mammogram						
Yes	11 (40.7)	16 (59.3)	27 (100.0)	1	0.001	0.994
No	172 (40.7)	251 (59.3)	423 (100.0)			
History of abnormal mammogram result						
Yes	2 (40.0)	3 (60.0)	5 (100.0)	1	0.001 ⁺	0.976
No	181 (40.7)	264 (59.3)	445 (100.0)			
Personal history of breast cancer						
Yes	4 (36.4)	7 (63.6)	11 (100.0)	1	0.088 ⁺	0.767
No	179 (40.8)	260 (59.2)	439 (100.0)			
Family history of breast cancer						
Yes	17 (54.8)	14 (45.2)	31 (100.0)	1	2.771	0.096
No	166 (39.6)	253 (60.4)	419 (100.0)			

*Statistically significant, [£]OR=4.16, ^{££}Bonferroni correction taking single as the reference, ⁺Corrected Chi-square found married as being responsible for the significant finding (OR=0.37; P<0.001). OR: Odds ratio

In the assessment of risk factors, the overall risk perception was 40.7% and poor perception was 59.3%. This figure is surprising among nurses who practice in tertiary health centres where the training of both undergraduate nursing and professional courses are undertaken. Their level of low perception might be that majority of the respondent were young; below 34 years, when the risk of breast cancer is low. This finding is in contrast to a study done in Lagos and Benin City.^[11,13] A similar finding was reported in a Turkish study.^[14] It is however surprising that nurses in our tertiary health institutions have poor risk perception of breast cancer. This might be because nurses have poor knowledge about the pathology of breast cancer as presented in Table 4.

The study showed that only 11.6% of the participants had ever had mammogram. This low level of mammogram uptake is reported to be very low in University College Hospital (UCH) in Ibadan, Lagos, and midwestern Nigeria.^[10,11,13] In Lagos, it is reported to be only 5% among female health workers, while in UCH, it is similarly low, a situation that the authors reported as being very disappointing.^[10,11] This contrasted with studies by Osime *et al.* who found a prevalence of 35% mammogram acceptance and awareness among civil servants in Benin City, Nigeria.^[13]

In a study in Malatya, Turkey involving 1,782 women, 46.4% of them never knew mammogram can be used to detect early breast cancer and 72.7% had never received a mammogram.^[15]

Table 5: Acceptance of mammogram among the study participants

Variables	Frequency (%)
Acceptance of mammogram	
Ever done	52 (11.6)
Never done	398 (88.4)
Total	450 (100.0)
Date of the last mammogram done	
Within the last 12 months	12 (23.1)
12-24 months	2 (3.8)
25-36 months	8 (15.4)
>36 months	30 (57.7)
Total	52 (100.0)
Current acceptance of mammogram	
Within the last 12 months	14 (26.9)
>12 months	38 (73.1)
Total	52 (100.0)

Furthermore, only 8.2% of these women knew (correctly) that mammogram should be performed once every two years after the age of 40 (Turkish standard).^[15] Figures of 55.1% and 89.4% in two disparate studies in Turkey were reported as the proportion of women who never had any form of mammogram.^[18,19] In similar studies among midwives and nurses population who were expected to have positive health behaviour, it was reported that 87.3% and 58.3%, respectively had not utilized mammogram.^[20,21]

Mammogram utilization rate is reported to be 75% in Australia and 83% in Scotland.^[22] In the United States of America reported utilization of mammogram is 66.8% as at 2014.^[23]

What could be responsible for this low acceptance? Table 7 shows the respondent impediments to the screening program. Sixty-two percent (62.4%) of the participants had poor awareness of the benefits of a screening mammogram, while 51.4% listed the cost of mammogram as an impediment. Other factors that were linked to a refusal to do mammogram were exposure to radiation 48.7% and poor availability of mammogram among others. However, at the time of the study, JUTH had a mammography machine that was not functional, while the remaining tertiary health institutions never had one. In the city of Jos, only two private organizations have mammogram services being offered to the public at an exorbitant price. In this study, majority of the respondents were younger and unmarried and were likely not to see the importance of mammogram since they may think they are at low risk because of age. It has been shown that a younger age group is associated with a lower frequency of mammogram.^[15]

Even though the participants acknowledge the role of mammogram in the screening of breast cancer, their poor acceptance of mammogram might be linked to perceived low risk among the younger nurses. The disparity in the utilization in Nigeria (Africa), Middle Eastern countries, and

developed nations, is attributable to a lack of knowledge, poor financing, and health preventive programs in these poor resource countries.

Urban-rural dichotomy for acceptance mammography has been reported. This was demonstrated in a study conducted in Ohio City U.S.A. between rural and urban areas.^[24] A third of women who are eligible for screening in rural area did not have access to the mammogram.^[24] Rural women who are at low income and low educational level remain at an increased risk for not receiving screening mammogram.^[24] Low educational status was implicated as a denominator for this observed difference in the study despite a National Breast and Cervical Cancer early detection program gains. The program was aimed at increasing access to cancer screening for women with low income proving to be cost-effective by saving lives.^[25] Despite this effort, it was observed that there was a disparity in breast cancer access and affordability to mammogram among rural and urban women. Low utilization of mammogram was noticed among ethnic minorities with low income, with no health insurance, and low education. This report is said to relate to the stratification of social structure even in developed countries such as U.S.A.^[24]

The study concluded that common barriers to mammogram utilization in rural areas included the following: knowledge deficit, lack of primary health-care providers, lack of health insurance, fear, decreased accessibility, transportation issues, and financial constraints. Knowledge of these barriers the research reported will enable health providers in rural regions to better assist women to participate in screening behaviour.^[24]

Although this study was carried out in an urban setting in Nigeria, Jos, the characteristics of the developing country being mirrored in the rural setting described in the USA study above and may underlie the low update of mammography seen.

CONCLUSION

The risk perception of breast cancers among nurses in tertiary health facilities in Jos was found to be poor. The acceptance of mammogram was found to be very low also. It is therefore opined that health practitioners, such as nurses can act as a vehicle of health promotion at the service point, especially at antenatal and family planning clinics. A reduction of the cost of mammogram by the government and other sponsors or promoters of health education will also increase mammogram acceptance. It is also opined that the inclusion of health promotion in the school curricula at high school and school of nursing will improve acceptance and risk perception of breast cancer.

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Nil.

Conflicts of interest

There are no conflicts of interest.

Table 6: Relationship between sociodemographic characteristics, medical history, perceptions of the disease by study participants, and acceptance of mammogram

Variable	Frequency (%)			df	χ^2	P
	Acceptance of mammogram		Total (n=450)			
	Ever done (n=52)	Never done (n=398)				
Age group (years)						
0-35	34 (11.3)	266 (88.7)	300 (100.0)	1	0.043	0.835
≥36	18 (12.0)	132 (88.0)	150 (100.0)			
Marital status						
Single	30 (12.2)	215 (87.8)	245 (100.0)	3	5.268*	0.153
Divorced	6 (26.1)	17 (73.9)	23 (100.0)			
Married	15 (8.7)	157 (91.3)	172 (100.0)			
Widowed	1 (10.0)	9 (90.0)	10 (100.0)			
Highest level of education						
Diploma	20 (9.7)	186 (90.3)	206 (100.0)	3	2.130*	0.546
Bachelor's degree	32 (13.3)	209 (86.7)	241 (100.0)			
Master's degree	0 (0.0)	2 (100.0)	2 (100.0)			
Doctorate degree	0 (0.0)	1 (100.0)	1 (100.0)			
Health insurance availability						
Available	22 (13.4)	142 (86.6)	164 (100.0)	1	0.873	0.350
Not available	30 (10.5)	256 (89.5)	286 (100.0)			
Availability of a family doctor seen on a regular basis						
Available	26 (14.9)	148 (85.1)	174 (100.0)	1	3.184	0.074
Not available	26 (9.4)	250 (90.6)	276 (100.0)			
Receipt of advice from a family doctor on a regular mammogram						
Yes	19 (19.2)	80 (80.8)	99 (100.0)	1	7.242	0.007*
No	33 (9.4)	318 (90.6)	351 (100.0)			
Family history of breast cancer						
Yes	8 (25.8)	23 (74.2)	31 (100.0)	1	5.242*	0.022*
No	44 (10.5)	375 (89.5)	419 (100.0)			
Perception on nature of the disease						
Good perception	32 (11.5)	246 (88.5)	278 (100.0)	1	0.001	0.970
Poor perception	20 (11.6)	152 (88.4)	172 (100.0)			
Perception of the severity of the disease						
Good perception	49 (11.9)	363 (88.1)	412 (100.0)	1	0.599*	0.439
Poor perception	3 (7.9)	35 (92.1)	38 (100.0)			
Perception of the risk of the disease						
Good perception	19 (10.4)	164 (89.6)	183 (100.0)	1	0.415	0.519
Poor perception	33 (12.4)	234 (87.6)	267 (100.0)			
Perception of benefits of mammogram						
Good perception	49 (11.1)	391 (88.9)	440 (100.0)	1	2.526*	0.112
Poor perception	3 (30.0)	7 (70.0)	10 (100.0)			

*Statistically significant, *Corrected Chi-square

Table 7: Binary logistic regression of predictors of acceptance of mammogram poor among the study participants

Factors	OR	95% CI	P
Receipt of advice from a family doctor on a regular mammogram			
Yes	2.010	1.061-3.810	0.032*
No	1	-	-
Family history of breast cancer			
Yes	2.324	0.946-5.709	0.066
No	1	-	-

*Statistically significant. OR: Adjusted odds ratio, CI: Confidence interval

REFERENCES

- Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 2018;68:394-424.
- Global Burden of Disease Cancer Collaboration; Fitzmaurice C, Dicker D, Pain A, Hamavid H, Moradi-Lakeh M, *et al.* The global burden of cancer 2013. *JAMA Oncol* 2015;1:505-27.
- Jedy-Agba EE, Curado MP, Oga E, Samaila MO, Ezeome ER, Obiorah C, *et al.* The role of hospital-based cancer registries in low and middle income countries-the Nigerian case study. *Cancer Epidemiol* 2012;36:430-5.
- Ferlay J, Colombet M, Soerjomataram I, Mathers C, Parkin DM, Piñeros M, *et al.* Estimating the global cancer incidence and mortality in

- 2018: GLOBOCAN sources and methods. *Int J Cancer* 2019;144:1941-53. doi: 10.1002/ijc.31937.
5. Bray F, Colombet M, Mery L, Piñeros M, Znaor A, Zanetti R, *et al.* Cancer Incidence in Five Continents. Vol. XI. Lyon: International Agency on Cancer; 2017. Available from: <https://publications.iarc.fr/Book-And-Report-Series/Iarc-Scientific-Publications/Cancer-Incidence-In-Five-Continents%20Volume-XI-2021>. [Last accessed on 2022 Feb 22].
 6. Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D. Global cancer statistics. *CA Cancer J Clin* 2011;61:69-90.
 7. Kumar V, Abbas AK, Aster JC. Cancer epidemiology. In: Robbins and Cotran Pathologic Basis of Disease. 9th ed., Ch. 7. Philadelphia, PA: Elsevier/Saunders; 2015. p. 275-80.
 8. Mandong BM. Malignant diseases in Jos university teaching hospital Nigeria. *Niger Med Pract J* 1999;37:55-8.
 9. Mandong BM, Madaki AK, Manasseh AN. Malignant diseases in Jos: A follow up. *Ann Afr Med* 2003;2:49-53.
 10. Okobia MN, Bunker CH, Okonofua FE, Osime U. Knowledge, attitude and practice of Nigerian women towards breast cancer: A cross-sectional study. *World J Surg Oncol* 2006;4:11.
 11. Ibrahim NA, Odusanya OO. Knowledge of risk factors, beliefs and practices of female healthcare professionals towards breast cancer in a tertiary institution in Lagos, Nigeria. *BMC Cancer* 2009;9:76.
 12. Olugbenga-Bello A, Oladele EA, Bello TO, Ojo JO, Oguntola AS. Awareness and breast cancer risk factors: Perception and screening practices among females in a tertiary institution in Southwest Nigeria. *Niger Postgrad Med J* 2011;18:8-15.
 13. Akhigbe AO, Omuemu VO. Knowledge, attitudes and practice of breast cancer screening among female health workers in a Nigerian urban city. *BMC Cancer* 2009;9:203.
 14. Karayurt O, Ozmen D, Cetinkaya AC. Awareness of breast cancer risk factors and practice of breast self examination among high school students in Turkey. *BMC Public Health* 2008;8:359.
 15. Deniz S, Kurt B, Oğuzöncül AF, Nazlıcan E, Akbaba M, Nayir T. Knowledge, attitudes and behaviours of women regarding breast and cervical cancer in Malatya, Turkey. *PLoS One* 2017;12:e0188571.
 16. Aravind S, Muttath G, Bincy F, Murugesan M, Nayanar S, Balasubramanian S. Breast cancer in young women of age 35 years and below: Initial experience at a tertiary cancer centre in South India. *Oncol Radiother* 2021;15:1-6.
 17. Odusanya OO, Tayo OO. Breast cancer knowledge, attitudes and practice among nurses in Lagos, Nigeria. *Acta Oncol* 2001;40:844-8.
 18. Dündar PE, Ozmen D, Oztürk B, Haspolat G, Akyildiz F, Coban S, *et al.* The knowledge and attitudes of breast self-examination and mammography in a group of women in a rural area in western Turkey. *BMC Cancer* 2006;6:43.
 19. Açıköz A, Ergör G. Factors affecting breast cancer risk perception in women and comparison of risk levels to the Gail model. *J Breast Health* 2013;9:156-2. doi: 10.5152/tjbh.2013.23.
 20. Bakir N, Demir C. Determination of Nurses' Beliefs Regarding Breast Cancer, Breast Self-Examination and Mammography. *Journal of Celal Bayar University Health Sciences Institute*. 2020;7:266-71.
 21. Avcı İA. The health beliefs relating to mammography of midwives and nurses. *J Breast Health* 2007;3:4-8.
 22. Leung J, Macleod C, McLaughlin D, Woods LM, Henderson R, Watson A, *et al.* Screening mammography uptake within Australia and Scotland in rural and urban populations. *Prev Med Rep* 2015;2:559-62.
 23. Centres for Disease Control and Prevention. Health, United States 2014: With Special Feature on Adults Aged 55-64. Available from: <http://www.cdc.gov/nchs/data/atus/atus14.pdf#076>. [Last accessed on 2022 Feb 21].
 24. Colliver K. Factors Influencing Participation in Screening Mammography among Rural Women. Doctor of Nursing Practice Scholarly Projects. 2016. p. 20. Available from: https://digitalcommons.otterbein.edu/stu_doc/20. [Last accessed on 2022 Feb 21].
 25. American Cancer Society (ACS). Breast Cancer Facts and Figures 2013-2014. Atlanta: American Cancer Society, Inc.; 2013. Available from: <http://www.cancer.org/acs/groups/content/@research>. [Last accessed on 2021 Feb 20].