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Utilization of Breast Cancer Screening Services Among Women Attending Centre Hospital University Kigali, Nyarugenge District, Rwanda

Korir Agnes Chebet[1]*, Dennis G Magu[1], Nwankwo Mercy[1], Monica Monchama[2] and Michael Habtu[2]

[1]School of Public Health, Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya
[2]Department of Public Health, College of Health Sciences, Mount Kenya University, Kigali, Rwanda

Abstract

Background: Breast cancer, the most frequent cancer among women, is also the leading cause of cancer-related deaths among women. In resource poor settings, it is often diagnosed late due to low rates of screening. To more successfully support breast cancer prevention, it is vital to know the reason women do not utilize breast cancer screening. Hence, this study assessed utilization of breast cancer screening services and associated factors among women attending Centre Hospital University Kigali (CHUK), Rwanda.

Methods: A cross-sectional study was conducted among 384 women who were selected consecutively as they came to the hospital. A pre-tested structured questionnaire was used to collect data. Both descriptive and inferential statistics were utilized during data analysis.

Results: The utilization of breast cancer screening was low at 35.2%. After running multivariable analysis the following factors were independently associated with utilization: respondents aged 30-39 years [AOR=3.62; 95%CI=1.80-7.29; p<0.001] and 40 years and above [AOR=4.37; 95%CI=1.68-11.33; p=0.003], single/widowed respondents [AOR=4.41; 95%CI=1.54-12.64; p=0.006], moderate level of breast cancer screening awareness [AOR=3.95; 95%CI=2.16 - 7.20; p>0.001], high level of screening awareness [AOR=17.23; 95%CI=7.62 - 38.99; p<0.001] and respondents who agreed that there was regular follow up by nurses at the health facilities [AOR=3.05; 95%CI=1.31 - 7.10; p=0.010].

Conclusion: Majority of women had not had screening for breast cancer of which a significant number were not even aware of breast cancer screening. The study found different factors associated with utilization of breast cancer screening including awareness. There is need to intensify efforts towards promoting awareness and screening of breast cancer.

Introduction

Breast cancer is growth that forms in the tissues of the breast, commonly in the ducts (tubing that carry milk to the nipple) and lobules (glands that produce milk) [1]. Breast cancer has the highest record of cancer among women in Africa with an incidence rate of about 40/100,000 [2]. Moreover, in developing countries, the incidence of breast cancer is rising sharply due to changes in reproductive factors, lifestyle, and increased life expectancy and other factors. More than half of incident cases occur in the developing world [3,4] where most women with breast cancer are diagnosed in late stages due mainly to lack of awareness on early detection and barriers to health services. Mortality from breast cancer is preventable if the disease can be diagnosed early [5]. There are different methods of breast cancer screening which include breast self- examination (BSE), clinical breast examination and mammography.

However, breast cancer is the most frequent cancer among women especially in Africa. Ogundiran [6] has established breast cancer to be the foremost source of cancer-related deaths in Nigeria. Outcomes from these lessons prove that breast cancer occurrence and mortality is growing rapidly in several sub-Saharan African countries and Rwanda is not excluded. Hence, breast cancer incident in Africa is described by appearance with advanced disease, absence of awareness and low practice of breast cancer screening [7].

In Rwanda a study done by Mody [8] on characteristics and presentation of cancer among patients showed, stomach cancer leads with 552, followed by breast cancer 508, cervical cancer 471, lymphomas 423, Skin cancers 349, liver 329, prostate cancer 240, lung cancer 120 and ovarian 103. Despite survival rates being low ranging from 10 to 40 percent, in settings where early detection and basic treatment are available and accessible, the five-year survival rate for early-localized breast cancer exceeds 80 percent, according to the World Health Organization. Little is known on utilization of the screening services and factors associated with breast cancer among women in Rwanda. Hence, this study aimed to assess factors influencing utilization of breast cancer screening among women in Kigali city, Rwanda.

Materials and Methods

Study setting and population

A cross-sectional study was conducted to assess factors influencing utilization of breast cancer screening among women at CHUK Hospital, Kigali, Rwanda, from August to September 2017. The University

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*Corresponding author: Korir Agnes Chebet, School of Public Health, Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya, Tel: +254 67 52711; E-mail: agfre2009@yahoo.com

teaching hospital of Kigali/CHUK is the largest hospital located in District of Nyarugenge at KN 4 Ave, Kigali City. It is also the biggest referral hospital of the country with a capacity of 519 beds.

Sample size and sampling procedure

All women attending gynecology outpatient clinics at The University teaching hospital of Kigali/CHUK and gave consent at time of study were included consecutively as they come to the hospital until the intended sample size was obtained.

The sample size was determined using the formula by Fisher's [$n=Z^2pqD/d^2$]; where; n=the desired sample size; Z=the standard normal deviate 1.96 at 95% confidence interval; P =assumed prevalence of utilization of breast cancer screening is 50% among women attending CHUK as there was no prior study in Rwanda; q=1-0.5=0.5; D=design effect=1; d =level of statistical significance set at 0.05. Therefore, after considering all the assumptions the sample size was 384 women.

Data collection tools and procedures

Data was collected using pretested structured interviewer-administered questionnaire. Trained enumerators administered the questionnaires. The questionnaire contained information on: socio-demographic characteristics, utilization of breast cancer screening and independent variables including awareness on screening and risk factors of breast cancer as well as institutional characteristics of breast cancer screening.

Diverse literatures were reviewed to build up the tool and to include all the important variables that address the objectives of the study. Validity was justified using content validity obtained through specialists in the field of study who went through question in relation to topic of study, its objectives and methodology applied and corrections were made where necessary. Reliability test of instruments was done through pretesting of related population at Centre hospital university of Kigali. Corrections were done to omit uncertainty. Cronbach's alpha test was 0.705 with number of items 40. All information was obtained from the respondents by them filling in the questionnaire with help of a trained research assistant.

Data management and analysis

Collected questionnaires were manually checked for completeness, coding was done and data entered into SPSS version 22.0. A back up of the data was done regularly using flash disks and compact disks to avoid any data loss. Data cleaning and validation was performed to achieve a clean set. The records were locked up in cabinet and were only accessed by the Principal investigator in keeping with the ethical considerations of the study.

Descriptive statistics were used in analysis to give proportions and frequencies. Pearson's Chi-square was used to determine the association between independent and dependent variables. Multiple regression analysis was performed in order to identify factors independently associated with breast cancer screening utilization among women attending Center Hospital University Kigali. Factors that associated with breast cancer screening at p<0.05 during bivariate analysis were subjected all together in a multiple regression analysis by specifying 'backward LR' method with removal at p<0.05.

The level of awareness on breast cancer screening and risk factors were determined by assigning scores of '1' and '0' to the correct and incorrect responses respectively. Aggregating the scores generated the overall score. The aggregate was converted into percentages and the

level of awareness was classified as follows: Low (>50%), Moderate (50-69%) and High (70% and above). Similarly, a 5-point Likert scale (strongly agree, agree, neutral or uncertain, disagree, and strongly disagree) was used to measure attitude on the factors that could influence decision for clinical breast examination and mammogram. Respondents responding with "strongly agree" for positive statement were given scores of 5 and those who responded with "strongly disagree" for negative statement were given scores of 1 or vice versa.

Ethical considerations

The researcher sought approval from the Health Sciences Department from the Jomo Kenyatta University Kigali campus. Ethical clearance was obtained from Health Research Ethics Committee at CHUK. The purpose of the research was explained to the respondents then written consent was sought from them before collecting data and respondent's voluntarism was maintained throughout the recruitment process. Information obtained from the respondents was handled with maximum confidentiality.

Results

Background Information of the Respondents

A total of 384 women attending Center Hospital University Kigali were consented to participate in the study. More than half of the respondents 217 (56.5%) were within the age group of 30-39 years followed by those aged 20-29 years 129 (33.6%). However, there were only 38 (9.9%) aged 40 years and above. Regarding level of education, about half 206 (53.6%) attained university education and almost a quarter attended 98 (25.5%) attended secondary school while the least percentage attended primary school 29 (9.9%). A large percentage 347 (90.4%) of the respondents was married. The income status was also examined and most of the respondents 353 (91.9%) belong to middle income status (Table 1).

Awareness on breast cancer and screening

As indicated in Table 2, the highest percentage 119 (31%) of the respondents defined cancer as untreatable disease followed by those who defined as an abnormal growth of cells which are malignant 108 (28.1%). However, 87 (22.7%) did not know what cancer is and 70 (18.2%) indicated it is a virus. Majority 298 (77.6%) of the respondents did not know the likely age to develop breast cancer. About two third of the respondents 263 (68.5%) believed that cancer cannot just happen without any underlying cause. The highest percentage 149 (38.8%) did not know whether heredity causes breast cancer while 117 (30.5%) indicated it is not caused by heredity and 118 (30.7%) claimed heredity causes breast cancer. Majority 230 (59.9%) reported that dad nutrition causes breast cancer. About one third 124 (32.3%) acknowledges that changes in breast size are a symptom of breast cancer, however the remaining indicated either it was not a symptom for cancer or did not know. Similarly, almost half of the respondents 191 (49.7%) did not know whether a lump or thickening of the breast is a symptom of breast cancer.

Most of the respondents (85.2%) had low level of awareness on the breast cancer risk factors/causes. However, the least percentage (9.6%) and (5.2%) had moderate and high level of awareness on the same.

Majority of the respondents 235 (61.2%) never heard of any breast cancer screening. Most 274 (71.4%) never heard of breast self-examination and about three quarter 292 (76.0%) never heard mammogram. Majority of the respondents 235 (61.2%) had low level

of breast cancer screening awareness followed by moderate level of awareness 96 (25.0%) (Table 2).

Institutional characteristics of breast cancer screening

Almost all of the respondents 375 (97.7%) indicated that they never had any educational sessions about breast health and screening by nurses/doctors at the Hospital within the last two years. Similarly, large percentage 377 (98.2%) never had guiding to perform breast self-examination. Most of the respondents and were never provided with brochures 347 (90.4%) and never given advise about the breast

Variables	N (384)	%
Age in years		
20-29	129	33.6
30-39	217	56.5
40 and above	38	9.9
Level of education		
Primary	29	7.6
Secondary	98	25.5
College	51	13.3
University	206	53.6
Marital status		
Married	347	90.4
Single/widowed	37	9.6
Income status		
Low income status	27	7
Middle income status	353	91.9
High income status	4	1

Table 1: Socio-demographic characteristics of respondents.

Variables	N (384)	%
What is cancer		
An abnormal growth of cells which are malignant	108	28.1
Untreatable disease	119	31
A virus	70	18.2
Don't know	87	22.7
Likely age to develop breast cancer in years		
20	7	1.8
30	9	2.3
40	35	9.1
50 and above	35	9.1
Don't know	298	77.6
Nothing causes breast cancer; it just happens		
Yes	36	9.4
No	263	68.5
Don't know	85	22.1
Heredity causes breast cancer		
Yes	118	30.7
No	117	30.5
Don't know	149	38.8
Bad nutrition causes breast cancer		
Yes	230	59.9
No	60	15.6
Don't know	94	24.5
Changes in breast size are a symptom of breast cancer		
Yes	124	32.3
No	92	24
Don't know	168	43.8
A lump or thickening of the breast is a symptom of breast cancer		
Yes	111	28.9
No	82	21.4
Don't know	191	49.7
Bad nutrition causes breast cancer		
Yes	55	14.3
No	243	63.3
Don't know	86	22.4

Level of awareness on the breast cancer risk factors		
Low (<50%)	327	85.2
Moderate (50-69%)	37	9.6
High (70% and above)	20	5.2
Ever heard of breast cancer screening		
Yes	149	38.8
No	235	61.2
Ever heard of ever heard of breast self-examination		
Yes	110	28.6
No	274	71.4
Ever heard of mammogram		
Yes	92	24
No	292	76
Level of awareness on the breast cancer screening		
Low (>50%)	235	61.2
Moderate (50-69%)	96	25
High (70% and above)	53	13.8

Table 2: Awareness on the breast cancer risk factors and screening.

cancer screening 355 (92.4%). Though majority 237 (61.7%) of the respondents were neutral on the regular follow up by healthcare providers using breast examination cards, considerable percentage 100 (26.0%) disagree that there was no regular follow up. Majority of the respondents 272 (70.8%) remain neutral on the cost of a mammogram/breast scan. About a quarter 97 (25.3%) indicated that there was long distance to screening facilities (Table 3).

Utilization of breast cancer screening

The dependent variable which was utilization of breast cancer screening was assessed using the following parameters: breast self-exam, ever done mammogram and examination by doctors/nurses. If respondents did one of the three parameters then they are classified as using/utilization breast cancer screening. The proportion of breast cancer screening in this study was found to be 136 (35.2%.) However, the remaining 248 (64.8%) had never done any kind of breast cancer screening as indicated in Table 4.

Factors associated with utilization of breast cancer screening

Respondents aged 30-39 years were about 3.6 times [AOR=3.62; 95%CI=1.80-7.29; p<0.001] while those 40 years and above were about 4 times [AOR=4.37; 95%CI=1.68-11.33; p=0.003] more likely to be screened for breast cancer than those aged 20-29 years. Single/widowed women were 4.4 fold more likely to practice breast cancer screening [AOR=4.41; 95%CI=1.54-12.64; p=0.006] compared to their married counterparts. Respondents with moderate level of breast cancer screening awareness were 4 times [AOR=3.95; 95%CI=2.16 - 7.20; p>0.001] and those with high level of screening awareness were 17 times [AOR=17.23; 95%CI=7.62 - 38.99; p<0.001] more likely to undergone breast cancer screening than those who had low level of screening awareness. Respondents who agreed that there was regular follow up of mothers by nurses at the health facilities using breast examination cards were 3 times more likely to have breast cancer screening [AOR=3.05; 95%CI=1.31- 7.10; p=0.010] than those who disagreed with the statement (Table 5).

Discussion

The study determined factors influencing utilization of breast cancer screening at CHUK Hospital, Kigali, Rwanda. It displayed that majority of respondents who participated were aged between 30-39 years, and most were married 115 (90.4%), highest education attained

by majority being university level 206 (53.6%) with highest number 353 (91.6%) belonging to middle income group.

The level of utilization of breast cancer screening in the study was at low (35.2%). This was in keeping with other study findings on breast cancer screening practices reported to be poor in developing countries [9-11]. However, this finding is lower than the findings reported by Obi 2015 [12] at 65.9%.

Variables that came out strongly to influence utilization of breast cancer screening independently in this study were: age of respondent's 30-39years (p>0.001), marital status particularly single/widowed (p=0.001), level of awareness both moderate (p=0.001) and high level of awareness (p=0.001) respectively. These findings backs a study done on the breast cancer prevention awareness and breast examination attitudes among Hong Kong women who work in a medical environment that showed breaches in utilization of breast cancer screening and that factors like level of awareness, and age influenced breast cancer screening.

A significantly higher breast cancer screening practice was evident at age category 30-39 years and those above 40 years. Similarly, the single/widowed proved to practice breast cancer screening more. This backs a study done by Tarver [13]. Studies carried out among Latin American women in the USA also demonstrated that age was a significant predictor of a screening mammogram [14,15]. However the same study showed that married women had higher screening uptake compared to single women, probably because of the increased awareness about their responsibility in being healthy enough and live longer to fend for their children to adulthood. This differs to this current study that shows that single/widowed had high breast cancer screening uptake. This could be probably due to their keenness in information provided on media or increased awareness of breast cancer and screening.

According to Lin 2008 [16], a knowledgeable public not only carries out breast self-examination, but also consults medical experts about any breast changes and the appropriate health actions to take in order to avoid the complicated effects of late breast cancer and also knows basics on what breast cancer is. This backs this current study that shows a significantly higher proportion of breast cancer screening among respondents who had moderate to high level of screening awareness compared to those who had low level of screening awareness 49 (20.9%). This study also supports a study by Moller 2008 [17] that a much-informed public tends to screen more for breast cancer. Low

Variables	N (384)	%
Frequency of educational sessions about breast health and screening by nurses/doctors at the Hospital within the last two years		
Once every 3 months	9	2.3
Never	375	97.7
Frequency of guiding to perform breast self-examination at the health service within this year nurses/doctors		
Once a year	7	1.8
Never	377	98.2
How often brochures were provided		
Rarely	37	9.6
Never	347	90.4
Regular follow up of mothers by nurses at the health facilities using breast examination cards		
Disagree	100	26
Neutral	237	61.7
Agree	47	12.2
High cost of a mammogram/breast scan		
Disagree	59	15.4
Neutral	272	70.8
Agree	53	13.8
Long distance to screening facilities		
Disagree	206	53.6
Neutral	81	21.1
Agree	97	25.3

Table 3: Institutional characteristics of breast cancer screening.

Variables	N (384)	%
Ever practiced breast self-exam		
Yes	61	15.9
No	323	84.1
Breast examined by doctor/nurse		
Yes	98	25.5
No	286	74.5
Ever been done mammogram		
Yes	34	8.9
No	350	91.1
Utilization of breast cancer screening		
Yes	135	35.2
No	249	64.8

Table 4: Utilization of breast cancer screening.

Variables	Yes, n (%)	No, n (%)	COR (95% CI)	AOR (95% CI)	p value*
Age in years					
20-29	27 (20.9)	102 (79.1)	Ref	Ref	--
30-39	91 (41.9)	126 (58.1)	2.73 (1.65-4.51)	3.62 (1.80-7.29)	<0.001
40 and above	17 (44.7)	21 (55.3)	3.06 (1.42-6.59)	4.37 (1.68-11.33)	0.003
Level of education					
Primary	14 (48.3)	15 (51.7)	2.44 (1.11-5.37)	0.94 (0.32-2.80)	0.911
Secondary	41 (41.8)	57 (58.2)	1.88 (1.14-3.11)	0.65 (0.31-1.37)	0.256
College	23 (45.1)	28 (54.9)	2.15 (1.14-4.03)	2.14 (0.78-5.93)	0.142
University	57 (27.7)	149 (72.3)	Ref	Ref	--
Marital status					
Married	115 (33.1)	232 (66.9)	Ref	Ref	--
Single/widowed	20 (54.1)	17 (45.9)	2.37 (1.20-4.70)	4.41 (1.54-12.64)	0.006
Income status					
Low income status	12 (44.4)	15 (55.6)	Ref	--	--
Middle income status	123 (34.8)	230 (65.2)	0.67 (0.30-1.47)	--	--
High income status	0 (0.0)	4 (100.0)	UD	--	--
Level of awareness on the breast cancer screening					
Low (>50%)	49 (20.9)	186 (79.1)	Ref	Ref	--
Moderate (50-69%)	47 (49.0)	49 (51.0)	3.64 (2.19-6.06)	3.95 (2.16-7.20)	<0.001
High (70% and above)	39 (73.6)	14 (26.4)	10.57 (5.32-21.02)	17.23 (7.62-38.99)	<0.001

Level of awareness on the risk factors					
Low (>50%)	102 (31.2)	225 (68.8)	Ref	Ref	--
Moderate (50-69%)	18 (48.6)	19 (51.4)	2.09 (1.05-4.15)	2.43 (0.82-7.21)	0.11
High (70% and above)	15 (75.0)	5 (25.0)	6.62 (2.34-18.70)	0.32 (0.06-1.63)	0.168
Frequency of educational sessions about breast health and screening by nurses/doctors at the Hospital within the last two years					
Once every 3 months	4 (44.4)	5 (55.6)	1.49 (0.39-5.64)	--	--
Never	131 (34.9)	244 (65.1)	Ref	--	--
Frequency of guiding to perform breast self-examination at the health service within this year nurses/doctors					
Once a year	4 (57.1)	3 (42.9)	2.50 (0.55-11.36)	--	--
Never	131 (34.7)	246 (65.3)	Ref	--	--
How often brochures were provided					
Rarely	21 (56.8)	16 (43.2)	2.68 (1.35-5.34)	1.57 (0.82-5.60)	0.171
Never	114 (32.9)	233 (67.1)	Ref	Ref	--
Regular follow up of mothers by nurses at the health facilities using breast examination cards					
Disagree	35 (35.0)	65 (65.0)	Ref	Ref	
Neutral	75 (31.6)	162 (68.4)	0.86 (0.53-1.41)	2.79 (0.96-5.37)	0.06
Agree	25 (53.2)	22 (46.8)	2.11 (1.04-4.27)	3.05 (1.31-7.10)	0.01
High cost of a mammogram/breast scan					
Disagree	25 (42.4)	34 (57.6)	Ref	--	--
Neutral	81 (29.8)	191 (70.2)	0.58 (0.32-1.03)	--	--
Agree	29 (54.7)	24 (45.3)	1.64 (0.78-3.47)	--	--
Long distance to screening facilities					
Disagree	75 (36.4)	131 (63.6)	Ref	--	--
Neutral	24 (29.6)	57 (70.4)	0.74 (0.42-1.28)	--	--
Agree	36 (37.1)	61 (62.9)	1.03 (0.63-1.70)	--	--

* Significant at p<0.05 bolded; COR =Crude Odds Ratio; AOR Adjusted Odds Ratio; CI =Confidence Interval

Table 5: Multivariable analysis of factors associated with breast cancer screening utilization.

level of awareness of breast cancer screening in Africa is the greatest impediment to breast cancer screening and many women are ignorant and unaware on factors/causes to the disease [18].

There was low level of screening among respondents who were less informed in this current study 49 (20.9%). This backed a study done by Ashing-Giwa [19] that reported that majority of respondents were not aware of breast cancer screening and proved the importance of women having an appropriate amount of breast cancer awareness as the more aware of their risk for breast cancer they are, the more likely they are to comply with breast cancer screening. A lack of breast cancer awareness and its associated risks has been the most common reason given by women for not practicing breast cancer screening [20]. Lin [16] further states that low awareness about causation and vulnerability of the respondents to breast cancer imply that the respondents are unaware of the implications of breast changes, the necessity of early breast screening and where to obtain the screening services and it supports the current study.

Respondents who agreed that there was regular follow up of mothers by nurses at the health facilities using breast examination cards were 3 times more likely to have breast cancer screening than those who disagreed with the statement. This clearly shows that if women become more aware on breast cancer is will help them utilize prevention measures early like breast cancer screening before it becomes fatal.

Some limitations encountered were reliance of self-reporting since information about utilization of breast cancer screening was obtained from respondents through an interview, answer and social interest bias are also possible limitations of this study.

Conclusion

Most respondents in this study were aged 30-39years and the singled/widowed were more likely to practice breast cancer screening compared to their married counterparts. Those with moderate to high level of awareness were more likely to practice breast cancer screening. Most participants had never heard of breast cancer screening and only few practiced it. Respondents who disagreed that presenting with advanced cancer could influence the clinical breast examination and mammogram/breast scan use were more likely to use breast cancer screening compared to those who agreed. Respondents who agreed that there was regular follow up of mothers by nurse at the health facilities using breast examination cards were more likely to have breast cancer screening than those who disagreed. This study clearly points out that: Age, marital status, level of awareness, Consequence of presenting with advanced cancer and regular follow up of women highly influenced breast cancer screening. Awareness should be improved coupled with more training to health care providers on importance of awareness and advertising through media. It is essential that another study be done on breast cancer prevention and attitudes.

Conflicts of Interests

The authors declare that they have no conflicts of interest.

Author's Contribution

Korir Agnes Chebet: conceptualized the idea for the study, contributed in the design and protocol preparation, involved in acquisition of data and drafted the first manuscript. Dennis G. Magu and Nwankwo Mercy: Assisted in design and protocol preparation, made a substantial contribution toward analysis and participated in critical review of the subsequent draft of the manuscript. Monica Mochama: Provided assistance with the design and participated in critical review of the subsequent draft of the manuscript. Michael Habtu: Contributed in design, performed analysis and interpretation of data and participated in critical review of the subsequent draft of the

manuscript. Each author has given final approval of the version to be published.

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