

Knowledge, Attitude, and Practices of women regarding breast cancer screening and associated factors in Nyarugenge District, Rwanda

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Abstract

Purpose: This study aimed to assess knowledge, attitudes, practices towards breast cancer screening and associated factors among women in Nyarugenge District Rwanda.

Materials and Methods: We conducted a community-based cross-sectional study among women in Nyarugenge District, Kigali town Rwanda, from January 2022 to March 2022. A multistage and simple random sampling methods were used to select 423 females aged 20 to 49 years old from households, villages and cells of each sector in Nyarugenge District. The KAP (Knowledge, Attitude and Practices) levels were assessed by calculating the overall scores using SPSS score assessment tool. Bivariate and multivariate logistic regression analyses were used to determine the factors associated with Breast Cancer screening practices.

Results: Most of study participants (80%) were aged between 21-35 years and at least 47.9% of attained at tertiary level of education and about 90% of them were married. Less than a half, 154 (40.1%) have low level of knowledge and more than sixty percent, 263 (68.5%) had negative attitudes. More than sixty percent of study participants 235 (61.2%) had ever been screened for breast cancer in their lifetime. Females with positive attitude were 3.2 times more likely to have ever been screened for breast cancer compared to those with negative attitude [AOR=3.233; 95%CI=1.048-6.528; p=0.047]. Furthermore, females with high level of knowledge were 2 times more likely to have ever been screened for breast cancer compared to those with low knowledge [AOR=2.043; 95%CI=1.026-4.145; p=0.036]. Moreover, women with tertiary level of education were 2.4 times more likely to have ever been screened for breast cancer compared to those with secondary level of education [AOR=2.374; 95%CI=1.715-5.623; p=0.027]. Furthermore, females aged 31 years and above were 3.2 times more likely to have ever been screened for breast cancer compared to those aged 20 years and below [AOR=3.219; 95%CI=1.732-7.419; p=0.008].

Conclusion: The overall knowledge was slightly high while the attitudes towards breast cancer screening were low, while screening practice was considerably high. Age group, education, high knowledge and positive attitudes were predictors of good practices. Community education interventions targeting young women, utilizing peers or community health educators are expected to increase the level of knowledge, attitudes and practice thus reduce the burden of breast cancer among women in Rwanda.

Keywords: Attitudes, breast cancer, screening, knowledge, practice, Rwanda

Introduction

Breast cancer remains the most common cancer among women worldwide. Globally, an estimate of 2.3 million women were diagnosed with breast cancer in 2020, of which 685 000 of them died (Hyuna, 2021). Breast cancer incidence remains high in women compared to any other type of cancer with lost disability-adjusted life years (DALYs) of 17,708,600 reported in 2017 worldwide (Li, 2019).

Variability of breast cancer prevalence and mortality trends was reported worldwide with lower figures reported in high income countries as compared to low-income countries (DeSantis, 2015). This was demonstrated by the fact that Asian countries accounted for 39 percent of new cases and 44 percent of fatalities from BC, despite accounting for 59 percent of the global population while North America (the United States and Canada), which accounts for only 5% of the global population, accounted for 15% of new cases, 9% of deaths, and 17% of prevalent cases. The variability is also evident in African countries, which the other hand, account for 15% of the global population, yet they reported 8% of all new cases, 12% of breast cancer fatalities, and 7% of breast cancer prevalence. (DeSantis, 2015).

Western Africa, Northern Africa, and Melanesia were reported to have high mortality rates, while the lowest mortality rates were observed in Central America and Eastern Asia (DeSantis, 2015). Current data shows that many African and Asian countries (e.g., Uganda, South Korea, and India), are reporting rising mortality rates due to breast cancer (Alkabban, 2021).

Breast cancer prevalence is associated with age. This has been supported with incidence rates that have been shown to rise with age, with 1.5 cases per 100,000 seen in women aged 20-24 years and 421.3 occurrences per 100,000 seen in women aged 75-79 years; 95 percent of new cases occur in women aged 40 years or older (Alkabban, 2021). Women are on average 62 years old when they are diagnosed with breast cancer (Alkabban, 2021). Thus, the earlier it is screened and the better it is managed.

Early detection through surveillance measures is important in management of breast cancer. However, Johnson (2016) argued that developing countries were still lagging behind (Johnson, 2016) although detection of breast cancer in developed countries have improved tremendously to over 50% (Reisi *et al.*, 2013),

Recent study by Jedy, *et al.*, (2016) confirms that breast and cervical cancer were the two most commonly reported new cases of cancer in women in Sub-Saharan Africa. Conversely, there

are fewer preventive approaches to breast cancer such as screening compared to other cancer types such as cervical cancer, mainly due to lack of knowledge on the prognosis and treatment. Thus, improving screening of breast cancer in women is an urgent priority to reduce the increasing mortality burden which is projected to reach 112 000 deaths by 2040 (WHO, 2017).

In Africa, breast cancer prevalence ranged from 27.9/100,000 in Central Africa to 48.9/100,000 in Northern Africa, with a corresponding mortality of 15.8 percent –18.4 percent, respectively (Johnson,2016). According to the same report, most patients with breast cancer in present for the first time at advanced stages (III and IV) when the prognostic tests are performed pointing towards lack of awareness of the importance of screening at early stages. The introduction of new lifestyles has also been associated with increasing the incidence of breast cancer in Africa. Awareness of importance of early screening should be intensified especially in the most affected developing countries such as Uganda, where the incidence rate has increased by 37 per 100 000 women per year on average during the last 20 years (Wabinga *et al.*, 2014; WHO, 2017). Similar concerns were shared by Chepkwuri *et al.* (2020), confirmed that in Sub-Saharan Africa, breast cancer is on the rise, especially in Uganda where it has risen by 5.2% per year during the past 15 years. WOH (2017) attributed the rising figures to lack of awareness of breast cancer in the society, causing many women not to go for early diagnosis and treatment opportunities.

The Rwanda Cancer Center (RCC) chemotherapy infusion reported breast cancer incidence at 38.6%, among randomly selected women (Umutesi *et al.*, 2021). These patients required a medical consultation or chemotherapy infusion due to late stage diagnosis and were being carried up either from their homes or via district hospitals' (DH) referral in an ambulance. Despite the availability of screening techniques, 52 percent of patients with breast cancer in Rwanda had stage III while 24 percent had stage IV (Pace *et al.*, 2014). This is due to delays in cancer detection caused by both system and patient factors hence the need for a community-based study to identify women's breast cancer screening knowledge, attitudes, and practices. Chebet, *et al.* (2019) studied utilization of breast cancer screening and reported that utilization was low at 35.2%, and awareness was high at 73.6%. Although the study was informative, it had limitations in terms of sampling techniques; patients interviewed were those attending gynecology department; were inadequate; might have already had idea on risk of breast cancer and importance of screening; and they were not also randomly selected to participate, therefore the study lacked heterogeneity.

Kamińska *et al.* (2015) reported that there are some conditions known as risk factors that are attributed to breast cancer, even though no clear cause was classified to be the source of the disease. In Rwanda, little is known about KAP regarding BC screening among females. Few similar studies that have been conducted in Rwanda targeted mostly small groups of individuals and some were hospital-based and thus lack heterogeneity (Pace *et al.*, 2014; Chebet *et al.*, 2016). Thus, this community-based study had the potential benefits of diversity of respondents, determined knowledge, attitudes, practice of women towards breast cancer screening and associated factors in the community to aid decision makers to implement targeted interventions addressing revealed challenges faced in breast cancer prevention and control program in Rwanda.

Materials and Methods

We conducted a community-based cross-sectional study with 423 women selected randomly through a multistage-cluster sampling in Nyarugenge District, Kigali town Rwanda, from January 2022 to March 2022. The respondents were selected at household level, village level and at cell level in all 10 sectors. Quantitative data were collected using structured questionnaire administered to study participants.

Ethical Clearance

During data collection procedure, ethical clearance was obtained from Mount Kenya University Rwanda Institutional Review Committee. The clearance was presented to the Director of Health and Mayor of Nyarugenge District to get authorization of conducting the study. All local leaders were contacted before conducting data collection.

Data Analysis

The collected data were entered, cleaned in Excel version 3.1 and exported to SPSS version 20 for descriptive and logistic regression analysis of quantitative data. Descriptive data analysis was used to describe the knowledge, attitude and practices for breast cancer screening. Different frequency tables, graphs and descriptive summaries were used to describe the variables. In the context of breast cancer screening knowledge, there were 41 items divided into seven categories, Potential risk factors, signs and symptoms, methods of diagnosis, benefits of breast cancer screening, ideal time to get a mammogram, who should conduct a breast cancer screening, how breast cancer screening is done, what should be done if a breast anomaly is discovered during screening. Each correct response scored 1 and the wrong answer

was scored 0. The mean score was 20.5. Respondents with scores less than the mean (≤ 20) were taken as having low knowledge level (Final score= 0 in the model) and those scored 21 and above were scored as having high knowledge level (Final score=1 in the model). The overall score of attitudes on screening of breast cancer was assessed using a Likert scale. The scoring system used was: strongly disagree =1, disagree=2, indifferent=3, agree= 4, strongly agree=5. The responses were summed and a total score was obtained. Then calculation of the mean score was done (mean=30). Those who scored the mean score and above were considered as having a positive attitude, whereas those who scored below the mean score were considered as having negative attitudes towards breast cancer screening.

The status of breast cancer screening practice among respondents was determined by using a score of responses. Question was delivered to study participants in “Yes” or “No” responses. Each correct response was given a score of 1 and a wrong answer was given a score of 0. Respondents who had ever been screened for breast cancer were considered to have good practices while those who never been screened were classified as having poor practice.

Bivariate analysis was conducted to assess the association between socio-demographic characteristics, level of knowledge, attitudes and practice status towards breast cancer screening. All variables which showed statistically significant association with practice of breast cancer screening in bivariate logistic regression were entered to multivariate logistic regression to identify the independent contribution of each explanatory variable and p-value < 0.05 was used to decide statistically significant association between the independent and dependent variables. Multi-variate logistic regression analysis was applied to identify the variables independently associated with practices on screening of breast cancer. Six (6) variables were considered in the analysis including: Respondents characteristics such as age group, attitude level, knowledge level, education, marital status, and profession, level of practices on breast cancer screening. Upon fitting these factors using binary logistic regression and by specifying ‘backward conditional’ method with removal at $p < 0.05$, four (4) factors remained in both full model and reduced model analysis. Odds ratio at 95% CI was calculated to show the strength of the association between the outcome and the levels of practice towards cancer of breast.

Results

Socio-Demographic Characteristics of Respondents

Out of 423 females recruited from the 10 sectors, 384 participated in the study, translating to 90.7% response rate. Age group of the respondents ranged from 20 to 36 years, with a mean of 27.01 years and with a standard deviation (SD) of 6.218, whereas 138 (36%) were aged 31

years and above. About 371(96.6%) were married. Almost a half of respondents 184 (47.9%) had tertiary education. (Table 1).

Table 1: Socio-demographic characteristics of respondents

Variable	Frequency (%)
Age group in years	
<= 20	75 (19.5)
21-25	101 (26.3)
26-30	70 (18.2)
>= 31	138 (36)
Education level	
Primary	55 (14.3)
Secondary	145 (37.8)
Tertiary	184 (47.9)
Residence	
Urban	313 (81.5)
Rural	71 (18.5)
Marital Status	
Married	371 (96.6)
Single	13 (3.4)

Knowledge on breast cancer screening

The majority of the study participants 258 (67.2%) knew that smoking is the potential risk factor for developing breast cancer (BC). Likewise, the same majority 229 (59.6%) knew that aging is the major risk factor of BC. More than ninety percent 391 (91.4%) responded that family history of breast cancer is the major risk factor. More than a half 199 (51.8%) of study participants knew that alcohol consumption is the major risk of developing breast cancer. Likewise, more than a half 205 (53.4%) mentioned that having the first child at late age is the major risk to develop breast cancer. However, the majority of study respondents 256 (66.7%) denied that high fat diet is the major risk factor to develop breast cancer. All study respondents denied the fact that the larger breast constitutes the risk of developing breast cancer whereas 263 (68.5%) know that late menopause and obesity 195 (50.8%) constitute risk factors to develop breast cancer. However, the majority of respondents 262 (68.2%) denied the fact that stress is the main risk factor of developing breast cancer. A small percentage of respondents knew other potential risk factors for developing breast cancer include, among others early menarche and use of hormones stated by 39 (10.2%) of study participants, exposure to radiation mentioned 8.9% (34), and hormonal therapy, BRCA 1 and 2 mutations, benign breast masses stated by 33 (8.6%).

The majority of study participants knew the major signs and symptoms of breast cancer, 315 (90.0%) mentioned lump in the breast, discharge from the breast was stated by 282 (80.6%), pain and soreness in the breast were indicated by 278 (79.4%), Discoloration or dimpling of the breast was mentioned by 227 (64.9%), ulceration of the breast was stated by 260 (74.3%), weight loss was indicated by 255 (72.9%), changes in the shape of the breast was mentioned by 229 (65.4%) and swelling or enlargement of the breast were mentioned by 196 (56.0%). Other risk factors that were known to be linked to breast cancer signs and symptoms include among others cramps mentioned by 31 (8.1%), exposure to radiation known by 34 (8.9%), nights sweats and fever indicated by 32 (8.3%), skin changes on the breast “Peau d’orange” stated by 33 (8.6%).

The most of respondents were aware of methods used for diagnosis of breast cancer. Self-breast examination was stated by 235 (61.2%), Clinical-Breast Examination was mentioned by 310 (80.7%), Mammography was indicated by 264 (68.8%), and ultrasound was mentioned by 316 (82.3%). Furthermore, the majority 384 (100.0%) of study participants knew that early detection of breast cancer and detection of any abnormal change in the breast 294 (76.6%) are benefits of breast cancer screening. However, greater than a half 260 (67.7%) of respondents indicated that to be familiar with the breast texture does not constitute the benefit of breast cancer screening.

Less than a half 147 (38.3) of study participants knew that Doctors and nurses are the best to conduct breast cancer screening. While a small number 58 (15.1%) mentioned that individual examination is the best for breast cancer screening. The majority of study participants 350 (91.1%) stated that breast cancer screening is done by feeling the breast with the hand. However, a big number of females 282 (73.4%) knew that breast cancer examination is done by doing Ultrasound of the breast, while more than sixty percent of females 264 (68.8%) indicated that breast cancer screening is done by mammography. More than a half 202 (52.6%) of study participants indicated that the best ideal time to get a mammography for breast cancer screening is a week after a menstrual period.

More than a half 259 (67.4%) of the study participants stated that combination of seeing Doctors and playing are the best thing to do when breast cancer is diagnosed during screening test. (Table 2).

Table 1: Distribution of knowledge on breast cancer examination and screening

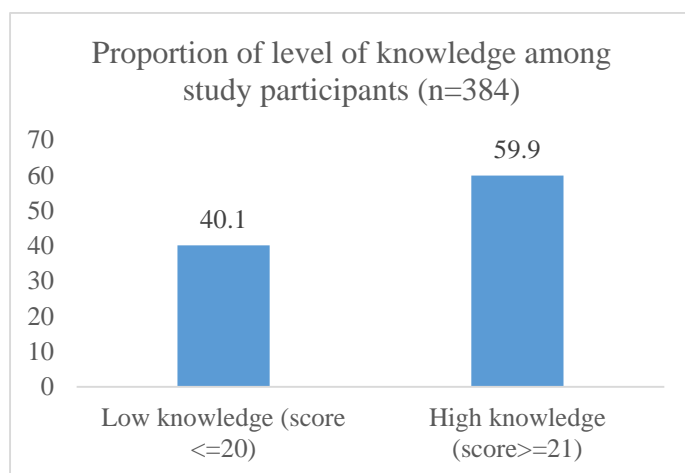
Variables	Yes n (%)	No n (%)
Know Potential risk factors for developing breast cancer		
Smoking	258 (67.2)	126 (32.8)
Increasing age	229 (59.6)	155 (40.4)
Family history	391 (91.4)	33 (8.6)
Alcohol consumption	199 (51.8)	185 (48.2)
High-fat diet	128 (33.3)	256 (66.7)
First child at late age	205 (53.4)	179 (46.6)
Late menopause	263 (68.5)	121 (31.5)
Stress	122 (31.8)	262 (68.2)
Obesity	195 (50.8)	189 (49.2)
Larger breast	0 (0.0)	384 (100.0)
Know signs and symptoms of breast cancer		
Lump in the breast	315 (90.0)	35 (10.0)
Discharge from the breast	282 (80.6)	68 (19.4)
Pain or soreness in the breast	278 (79.4)	72 (20.6)
Change in the size of the breast	157 (44.9)	193 (55.1)
Discoloration/dimpling of the breast	227 (64.9)	123 (35.1)
Ulceration of the breast	260 (74.3)	90 (25.7)
Weight loss	255 (72.9)	95 (27.1)
Changes in the shape of the breast	229 (65.4)	121 (34.6)
Swelling or enlargement of the breast	196 (56.0)	154 (44.0)
Know methods of diagnosis of breast cancer		
Self-Breast Examination	235 (61.2)	149 (38.8)
Clinical-Breast Examination	310 (80.7)	74 (19.3)
Mammography	264 (68.8)	120 (31.2)
Ultrasound	316 (82.3)	68 (17.7)
Know the benefits of breast cancer screening		
To be familiar with the breast texture	124 (32.3)	260 (67.7)
Early detection of breast cancer	384 (100.0)	0 (0.0)
Detection of any abnormal change in the breast	294 (76.6)	90 (23.4)
A good breast exercise	95 (24.7)	289 (75.3)
Do not know	30 (7.8)	354 (92.2)
Know who should conduct a breast cancer screening test		
Doctor	147 (38.3)	237 (61.7)
Nurses	147 (38.3)	237 (61.7)
Individual	58 (15.1)	326 (84.9)
All of them	295 (76.8)	89 (23.2)
Know how breast cancer screening is done		
By inspecting the breast in the mirror	166 (43.2)	218 (56.8)
By feeling the breast with the hand	350 (91.1)	34 (8.9)
By feeling the armpit with the hand	166 (43.2)	218 (56.8)

By doing Ultrasound of the breast	282 (73.4)	102 (26.6)
Mammography	264 (68.8)	120 (31.2)
Know what to do when breast abnormality is diagnosed during screening		
Leave it to God and pray	86 (22.4)	298 (77.6)
Do some lab tests	211 (54.9)	173 (45.1)
See a doctor	211 (54.9)	173 (45.1)
Combinations of the above three	259 (67.4)	125 (32.6)

Level of knowledge about breast cancer screening

Out of 384 respondents, 154 (40.1%) with score 20 and below were classified as having low level of knowledge, whereas 230 (59.9 %) with 21 score and above were classified as having high level of knowledge. (Figure 1).

Figure 1: Knowledge level of study participants



Attitudes for breast cancer screening

Among participants, 256 (66.7%) females agreed that breast cancer can affect any woman whereas 128 (33.3%) females strongly agree with the same statement. lower than a half 124 (32.3%) of women agreed that breast cancer is preventable. Furthermore, 187 (48.7%) of participants agreed that they cannot find any abnormalities in their breast if they inspect it themselves. More than eighty percent 329 (85.7%) of females added that there is no reason to examine their breasts. However, more than forty percent 161 (41.9%) agreed they would have gotten a mammogram by now if they had known about its benefits. Of participants 155 (40.4%) disagreed that women prefer female doctor for breast cancer screening.

The majority of respondents 268 (69.8%) disagreed that periodic breast cancer screening by a physician is not required if there is no concern in the breasts. Furthermore, the big majority of

respondents 287 (74.8%) disagreed that early detection methods have no effect on treatment whereas 220 (57.3%) of women were neutral to the statement that breast cancer risk is reduced by maintaining good personal hygiene. However, the majority of respondents 357 (93.0%) agreed that by doing early diagnosis of breast cancer the person may have prolonged life time. (Table 3).

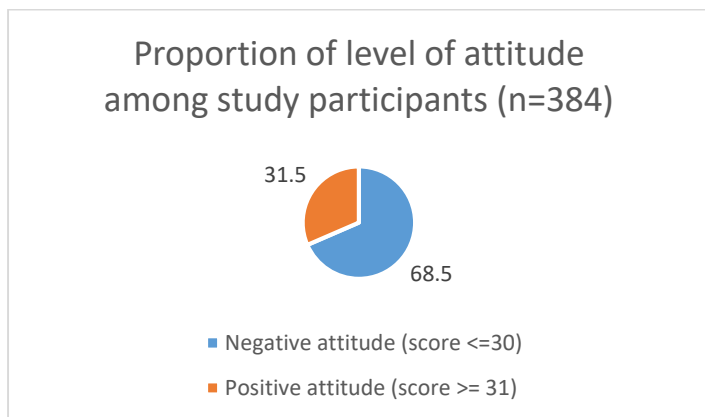
Table 2: Attitudes for breast cancer screening among respondents

Variables	Strongly agree,	Agree,	Neutral,	Disagree,	Strongly disagree,
	n(%)	n(%)	n(%)	n(%)	n(%)
Breast cancer can affect any woman	128 (33.3)	256 (66.7)	0 (0.0)	0 (0.0)	0(0.0)
Breast cancer can be prevented	61 (15.9)	63 (16.4)	191(49.7)	69 (18.0)	0 (0.0)
I cannot find any abnormalities in my breast if I inspect it myself	0 (0.0)	187 (48.7)	31 (8.1)	127 (33.1)	39 (10.2)
There is no reason to examine my breasts	0 (0.0)	0 (0.0)	55 (14.3)	97 (25.3)	232 (60.4)
I would have gotten a mammogram by now if I had known about the benefits	62 (16.1)	99 (25.8)	85 (22.1)	66 (17.2)	72 (18.8)
Women prefer female doctor for breast cancer screening	35 (9.1)	34 (8.9)	163 (42.4)	152 (39.6)	3(0.8)
Periodic breast cancer screening by a physician is not required if there is no concern in the breasts	0 (0.0)	58 (15.1)	58 (15.1)	199 (51.8)	69 (18.0)
Early detection methods have no effect on treatment	0(0.0)	63 (16.4)	34 (8.9)	92 (24.0)	195 (50.8)
Breast cancer risk is reduced by maintaining good personal hygiene	33 (8.6)	35 (9.1)	220 (57.3)	65 (16.9)	31 (8.1)
By early diagnosis of breast cancer, the person will have prolonged life.	58 (15.1)	299 (77.9)	27 (7.0)	0 (0.0)	0 (0.0)

Overall level of attitudes for breast cancer screening

More than a half of study participants had negative attitude 263 (68.5%) while about 121 (31.5%) of them had positive attitude towards breast cancer screening. (Figure 2).

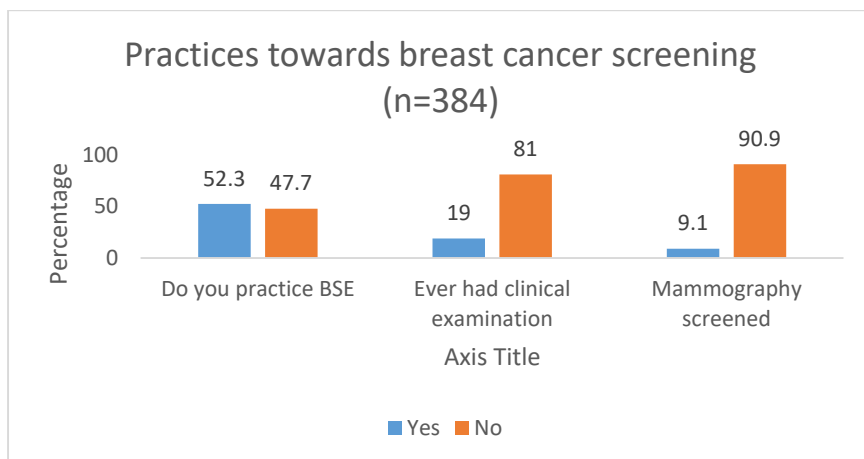
Figure 4. 2 Level of attitudes for breast cancer screening



Practices towards breast cancer screening

More than a half of the respondents 201(52.3%) have practiced BSE (breast Self-Examination) as a good practice of breast cancer status evaluation. The majority of study participants 311 (81.0%) have never had a doctor's breast examination (clinical breast examination) as a good practice of breast cancer status. More than ninety percent of the respondents 349 (90.9%) had never experienced breast cancer screening as a good practice of breast cancer status. (Figure 3)

Figure 4. 3: Practices towards breast cancer screening

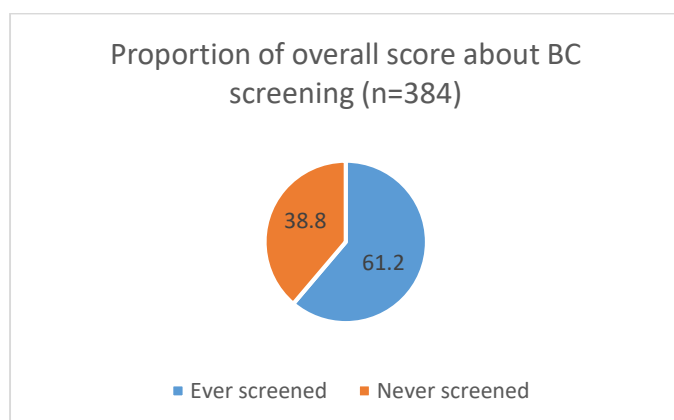


Overall practice towards breast cancer screening

Breast cancer screening practice consists of Breast cancer self-Examination, clinical examination, and screening using mammography. The overall practice on screening of breast cancer combined those three elements. More than a half of study participants had ever screened

for breast cancer 235 (61.2%) while the remaining 149 (38.8%) had never screened for breast cancer. (figure 4).

Figure 4: Overall score on breast cancer screening



Factors associated with breast cancer screening practice

Bivariate analysis demonstrated that there was statistically significant association between five predictors (Education, marital status, age group, knowledge level, and attitude level) for ever been screened for breast cancer with a significant p. value equal or less than 0.05.

Indeed, never been screened for breast cancer was much more observed among females with primary education 55 (100.0%) and ever been screened for breast cancer was much more observed among females with secondary education 140 (96.6%) with observed differences that are statistically significant (p. value = 0.045). Furthermore, never been screened was much more observed among all married in the study 149 (40.2%) and ever been screened for breast cancer was much more observed among all single 13 (100.0%) with observed differences that are statistically significant (p. value = 0.003). Furthermore, never been screened was much more observed among females aged ≤ 20 years 63 (84.0%) and ever been screened for breast cancer was much more observed among females aged 31 years and above 113 (81.9%) with observed differences that are statistically significant (p. value = 0.001). In addition, never been screen was much more observed among all females with low level of knowledge in the study 95 (41.3%) and ever been screened for breast cancer was much more observed among females with high level of knowledge 100 (64.9%) with observed differences that are statistically significant (p. value = 0.019). Furthermore, never been screen was much more observed among all females with negative attitude in the study 56 (46.3%) and ever been screened for breast cancer was much more observed among females with positive attitude 65 (53.7%) with observed differences that are statistically significant (p. value = 0.041). (Table 4).

Table 4: Bivariate analysis of factors associated with breast cancer screening practice

Variables	Never screened		Ever screened		Chi square value	p value
	N	%	N	%		
Residence					1.441	0.230
Rural	32	45.1	39	54.9		
Urban	117	37.4	196	62.6		
Education					4.026	0.045
Primary Education	55	100	0.0	0.0		
Secondary Education	5	3.4	140	96.6		
Tertiary Education	89	48.4	95	51.6		
Marital Status					8.531	0.003
Single	0.0	0.0	13	100		
Married	149	40.2	222	59.8		
Age group in years					95.128	0.001
<= 20	63	84.0	12	16.0		
21-25	29	28.7	72	71.3		
26-30	32	45.7	38	54.3		
>= 31	25	18.1	113	81.9		
Level of knowledge					4.512	0.019
High	54	35.1	100	64.9		
Low	95	41.3	135	58.7		
Attitude level					4.161	0.041
Positive	93	35.4	170	64.6		
Negative	56	46.3	65	53.7		

Multivariate analysis for significant variables with ever screening for breast cancer

In multiple logistic regression analysis indicated that females with positive attitude were 3.2 times more likely to have ever been screened for breast cancer compared to those with negative attitude [AOR=3.233; 95%CI=1.048-6.528; p=0.047]. Furthermore, females with high level of knowledge were 2 times more likely to have ever been screened for breast cancer compared to those with low knowledge [AOR=2.043; 95%CI=1.026-4.145; p=0.036]. Moreover, women with tertiary level of education were 2.4 times more likely to have ever been screened for breast cancer compared to those with secondary level of education [AOR=2.374; 95%CI=1.715-5.623; p=0.027]. Furthermore, females aged 31 years and above were 3.2 times more likely to have ever been screened for breast cancer compared to those aged 20 years and below [AOR=3.219; 95%CI=1.732-7.419; p=0.008]. (Table 5).

Table 3: Multivariate analysis for factors associated with ever been screened for breast cancer

Variables	AOR	95% CI		p value
		Lower	Upper	
Full Model = Reduced Model				
Attitude level				
Positive	3.233	1.048	6.528	0.047
Negative	Ref			
Knowledge level				
High	2.043	1.026	4.145	0.036
Low	Ref			
Education status				
Tertiary	2.374	1.715	5.623	0.027
Secondary	Ref			
Age group in years				
>=31	3.219	1.732	7.419	0.008
26-30	1.712	0.886	2.362	0.354
21-25	0.125	0.702	2.019	0.593
<=20	Ref			



Discussion

This study demonstrated that less than a half, 40.1% of women studied had low level of knowledge, and more than a half, 59.9 % of them had high level of knowledge. The results from this study are somewhat similar to the results from other studies conducted in rural coastal Kenya by Sayed *et al.* (2019) found that more than 80% of respondents had heard of breast cancer screening. However, results from this study are slightly different from the study conducted in South Africa by Ramathuba *et al.* (2015) found that women in the Makwarani Community had a poor level of understanding about breast cancer. Furthermore, limited knowledge was observed in Tanzania, Morogoro District by Ng'ida *et al.* (2019) found that 73.8% of participants had never heard of breast self-examination as a breast cancer detection strategy. The observed differences may be associated with the differences in the implementation of breast cancer control program between countries. Moreover, findings from this study are contradictory to the study carried out in Nyarugenge by Bahumura *et al.* (2018) found that only 24.7 % of participants surveyed were aware of five or more warning flags for breast cancer. These differences may be attributed to differences in study periods and sampling methods of study participants.

The results from this study showed that the majority of respondents were aware of breast cancer screening methods; 61.2% heard self-breast examination, Clinical-Breast Examination was heard by 80.7%, mammography was known by 68.8%, and ultrasound was known by 82.3% as methods of diagnosis of breast cancer. The results from this study are similar to those found by Mary *et al.* (2011) aimed at investigating beliefs related to breast cancer knowledge and screening among 94 Lebanese Armenian women aged 26 to 68 years revealed that 80.9 percent of women polled had heard of Breast Self-Examination and 76.6 percent had heard about mammography. In this study results, the majority of the study participants were aware of risk factors of breast cancer. For example; 67.2% knew that smoking status is the potential risk factor for developing breast cancer, 59.6% knew that increased age is the major risk factor, 91.4% knew that the family history of breast cancer is the major risk factor, 51.8% of study participants knew that alcohol consumption is the major risk of developing breast cancer and 53.4% mentioned that first child at late age is the major risk to develop breast cancer. These results are similar to the study among Jordan women by Al-Mousa *et al.* (2020) approximated that more than a half, 53.7% of participants had a good to excellent knowledge of risk factors, while 44% had a good to excellent understanding of breast cancer signs and symptoms. The results from this study are also, slightly similar to results from study conducted in Kayonza

District, Rwanda, indicated that 55.5 percent of women had a moderate understanding of breast cancer risk factors.

Findings from this study demonstrated that more than a half 68.5% of study participants had negative attitudes towards breast cancer screening. These results are slightly similar with other studies in many developing countries in which attitudes for breast cancer screening were reported to be Negative compared to developed countries (Montazeri *et al.*, 2018). The differences may be attributed to the differences of women behaviors and awareness of breast cancer in developed countries compared to their counterpart. This study revealed that the big majority of respondents 74.8% disagreed to the statement that early detection methods have no effect on treatment. These study findings are similar to the results with another study carried out in other African contexts. Indeed, these results are similar to those found in another study by Ramathuba *et al.* (2015) showed that early detection determines the likelihood of a cure for breast cancer according to 46.7 percent of women. Furthermore, the results from this study found out that the majority of respondents 93.0% agreed to the statement that by early diagnosis of breast cancer, the person will have prolonged life. These interesting results are opposed to those found in other studies conducted all over the world that demonstrated conflicting results on attitudes towards breast cancer. For example, a research in Saudi Arabia by Khadiga (2017) found that women's incorrect views about breast cancer prevention are to blame for their poor perceptions of the curability of early-stage disease and the efficacy of screening measures. Furthermore, with the same trends in contradictions, according to a survey conducted in rural coastal Kenya by Sayed *et al.* (2019) demonstrated that more than 85% of both men and women considered breast cancer to be a very serious condition. According to the same poll by Sayed *et al.* (2019) over 90% of respondents would seek medical help if they discovered a breast lump. According to a study conducted in a rural South African community, over half of the women disagreed, with 23.3 percent strongly disagreeing, that breast cancer therapy worsens the illness, while only 22.0 percent agreed. The treatment worsens the illness, according to 4.7 percent of those polled.

The overall Practices of breast cancer screening found out in this study was more than sixty percent. This study revealed that more than 61.2% of study participants had ever screened for breast cancer in their lifetime, while 38.8% of women had never been screened for breast cancer. This results are in contrast with other studies conducted elsewhere in Africa that demonstrated poor practice of breast cancer screening. For example, a study in South African community by Ramathuba *et al.* (2015) revealed that 94.7% of the women had never performed

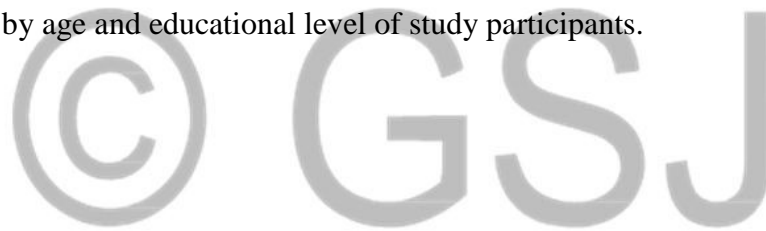
breast cancer diagnostic checks and only 6.3% had practiced one of the methods during their lifetime. Any other study in Morogoro District in Tanzania by Ng'ida *et al.* (2019) revealed that 73.8% of participants have never practiced breast cancer self-examination as a method for breast cancer screening. These differences might be attributed to the differences in the implementation of breast cancer prevention programs between the countries.

The results from this study showed that more than half of respondents 52.3% have practiced BSE (breast Self-Examination) as a good practice of breast cancer status assessment, these results are a little bit high than those found out in another study in Thailand by National Statistical Office of Thailand (2017) found that 40 percent of Thai women engage in BSE on a monthly basis, and 46% of those women engage in breast self-examination on a weekly basis. These differences may be linked to the differences in study period. Furthermore, the results from this study are very opposing to the results from a study conducted in Kayonza District, Rwanda by Igiraneza *et al.* (2021) found that 72% of respondents had never practiced BSE and 81.3% had not used clinical breast examination or breast ultrasound scan. Those differences may be associated with the differences in study population behaviors. Furthermore, this study presented good results when considering the results of the study conducted to examine awareness and practice of breast cancer self-examination among young girls in Nyarugenge District by Ndikubwimana *et al.* (2016) found that fewer than 24% practiced breast palpation and less than 10% were aware of the recommended frequency and techniques of breast self-examination. The findings from this study were also inconsistent with those reported by Bahumura *et al.* (2016) in a study conducted in Nyarugenge District found that the majority 56.3% respondent had never or rarely conducted breast cancer self-examination. These fluctuations of results might be due to differences in study periods and study population.

The results from this study showed that the majority of study participants 81.0% have never had a doctor's breast examination (clinical breast examination) as a good practice of breast cancer status. These results are similar to those from the study of El Bcheraoui *et al.* (2015) reported that 89 percent of women aged 50 and up had never had a clinical breast examination (CBE) in the previous year. The results from this study demonstrated that more than ninety percent of the respondents 90.9% had never experienced breast cancer screening with mammography while only 9.1% had ever experienced mammography screening in their lifetime. These results are similar to others study that demonstrated a very low mammography screening participation rates of less than 10% noted in Jordan by Othman *et al.* (2015). Moreover, the low rate of mammography breast cancer screening among Thai women was

reported by National Statistical Office of Thailand, (2017). Furthermore, in Kingdom of Saudi Arabia, breast cancer screening with mammography, has been found to be very low where 92 percent of women aged 50 and up had never had a mammogram in the previous year as reported by El Bcheraoui *et al.* (2015). The observed lower utilization of mammography and breast clinical examination may be attributed to the shortage of breast cancer examination infrastructures, insufficient trained personnel and lack of decentralized health care services near the population.

The findings from this study demonstrated that females with positive attitude, females with high level of knowledge, women with tertiary level of education and females aged 31 years and above were more likely to have ever been screened for breast cancer in their life time compared to their counterparts. The results from this study are much similar with the results from studies conducted elsewhere in the world. For example; the study conducted at US-Mexico border by Banegas *et al.* (2021) demonstrated that Age and education, were all found to be strongly linked with breast cancer screening utilization. The study conducted by Nehad *et al.* (2021) among female community pharmacists in Jordan revealed that screening methods were influenced by age and educational level of study participants.



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