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Article · January 2016

DOI: 10.12691/ajphr-4-3-3

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# Does Breast Cancer Risk Awareness Motivate Personal Prevention Practices: Findings from a Community-based Assessment?

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**Abstract** Breast cancer, is the leading cause of cancer specific mortality. But nearly 80% of the mortality is preventable by early diagnosis. We assessed knowledge and practice of breast cancer prevention by women in a rural community setting. Data was collected on demographics, family history, knowledge and practice of breast cancer by interviewer administered questionnaire. Knowledge (including knowledge of risk) and practice were measured using a response-based score to a set of 9 and 10 questions respectively. Prevalence odds ratio was calculated to estimate association between independent and outcome variables. Knowledge of breast cancer risk was low (14.2%). Family history and socioeconomic status were significantly associated with knowledge; respondents with more than eight years of school were more likely to have higher knowledge (OR=2.859; CI=1.578-5.178). Practice of prevention was equally low (17.2%). Practice was significantly associated with knowledge; respondents with higher knowledge of prevention were more likely to practice prevention (OR=6.8; CI=3.308-14.104). We propose that community-based risk communication and awareness creating programs may motivate breast cancer prevention practices. Women of lower socio-economic status should especially be targeted with such interventions. There is need to develop these into a sustainable community-based health education program.

**Keywords:** breast cancer knowledge practice community prevention

**Cite This Article:** Ouma J, Olang' S, Asweto CO, Obago IT, and Kaseje D, "Does Breast Cancer Risk Awareness Motivate Personal Prevention Practices: Findings from a Community-based Assessment?" *American Journal of Public Health Research*, vol. 4, no. 3 (2016): 93-97. doi: 10.12691/ajphr-4-3-3.

## 1. Introduction

Annual global cancer specific mortality is estimated at least 7 million, more than HIV&AIDS, malaria and Tuberculosis combined. [1] Further, morbidity has doubled in the last 30 years with more than 25 million people estimated to be living with cancer. [2] Moreover, nearly 55% of incident cancer cases and 70% of cancer deaths occur in developing countries. [1] The increase is a concern to public health practice as at least one third of the new cases and mortality are avoidable by primary prevention strategies and early diagnosis [3,4].

Breast cancer is the leading cancer among women and the leading cause of death among women aged 35 years and above [1]. It is common in 45 – 50 year old women, with about 5% chance in women under 30 years [5]. The risk of breast cancer is higher among white women but mortality is highest among black women, especially in developing countries due to inadequate practice aid and access to early diagnosis and treatment [1,6].

Breast cancer has a low incidence in Sub-Saharan Africa compared with other continents. Paradoxically, the

ratio of mortality to incidence in the region is the highest in the world [1]. The evident pattern of breast cancer here shows low incidence, high mortality, presentation at advanced stage and limited access to health care [8]. However, some areas recently reported a steep increase in incidence possibly related to increased screening and awareness [7]. Psychosocial barriers to cancer prevention and treatment still exist including taboos and stigma. But data on breast cancer is poor and scanty. Breast cancer evaluation and treatment is plagued with inadequate resource and screening facility throughout Sub-Saharan Africa.

Breast cancer is the most prevalent cancer in Kenya [13]. Although reliable prevalence and incidence data is lacking, it is estimated at 23 % of all cancers seen in hospitals [14].

Promotion of self-care, an attitude fostered early in life, could have benefits for breast cancer prevention. Breast self-care may encourage behaviors such as performing breast self-examination (BSE) and seeking regular professional breast examinations [10] and empower women to take control and responsibility over their health [11,12]. This should aid early detection and treatment of cases. Evidence show better survival of breast cancer with early diagnosis and treatment [13,15].

In this study we assessed knowledge and practice of breast cancer prevention by women in a rural community setting as a baseline for promoting BSE.

## 2. Methodology

We assessed the knowledge and practice of women in East Kisumu location, Kisumu County in between December 15<sup>th</sup> and 18<sup>th</sup> 2013. The study site was divided into 4 village clusters namely; Kogony, Dago, Mkendwa and Kanyakwar sub-locations. The estimated number of households in the location was based on 2009 national census results. Minimum sample size for the study was estimated and proportionately allocated to the clusters. A random sample was then drawn within the clusters get a representative sample. All eligible women found in a selected household were interviewed using a structured interviewer administered questionnaire. Data collected on demographics and history of breast cancer included; age, education, marital status, number of children born, age at first pregnancy, main source of income, family income, knowledge of someone with breast cancer, family history of breast cancer, and individual history of breast cancer. Further, we assessed the general knowledge of breast cancer; knowledge of breast cancer prevention; practice of breast cancer prevention.

To assess the general knowledge on breast cancer using a response-based score to a set of 9 questions which included; 1) Heard of breast cancer, 2) Knows at least 2 symptoms of breast cancer 3) knows at least 5 risk factors for breast cancer 4) Access to at least one source of information 5) Knows breast cancer is common 6) knows women above 40 years are most at risk of cancer 7) Heard of breast cancer month 8) Identify October as breast cancer month 9) participation in breast cancer month.

To assess knowledge of prevention of breast cancer, we used a response-based score to a set of nine questions; 1) knows at least 3 methods of primary<sup>1</sup> prevention, 2) knows breast cancer can be cured when detected early, 3) knows BSE, 4) knows CBE, 5) knows mammogram, 6) knows how to do BSE, 7) knows the best time to perform BSE is immediately after periods, 8) knows that women >40 years and above should get a mammogram every 1 to 2 years, 9) knows that women should do BSE monthly.

Assessment of prevention practices included practice of primary prevention such as physical exercise, practice of screening and willingness to be screened in the future. A set of ten questions was used, i.e.; 1) practicing at least one primary prevention strategy, 2) ever done BSE, 3) ever received CBE, 4) ever received a mammogram, 5) willing to recommend screening to a friend/family, 6) willing to get breast cancer screening in future, 7) ever smoked, 8) smoked in the last 3 months, 9) ever taken alcohol, 10) taken alcohol in the last 3 months. The association between knowledge and practice was estimated by prevalence odds ratios.

Knowledge was measured as a binary variable categorized as either high (score $\geq$ 50%) or low (score<50%). Knowledge was computed using a response-based score. Those who gave a correct response scored

one (1) and those who didn't scored zero (0). Total scores per respondents were calculated and converted to a percentage score. Descriptive statistics (mean, median, mode and frequencies) described knowledge of respondents on breast cancer and knowledge of prevention. The average knowledge score for the all participants was calculated. Those with score below the mean were assigned 'Low Knowledge' score and those attaining the mean score and above assigned the 'High Knowledge' score. Prevalence odds ratios were used to estimate association between knowledge and background factors.

Practice was measured as a binary variable categorized as either high (score $\geq$ 50%) or low (score<50%). Practice was based on a set of 10 questions, those with the correct practice scored one (1) and those without scored zero (0). Practice of individual respondents was obtained by calculating total scores out of ten and converted to a percentage score. The scores were then assigned to appropriate categories, high (score $\geq$ 50%) or low (score<50%). The association between knowledge and practice was estimated by prevalence odds ratios from logistic regression. Knowledge attributes were run independently in univariate analysis to determine those that were significantly associated with practice. Bivariate analysis was then done to adjust for significant socio-demographic characteristics and significant knowledge attributes.

Numerical demographic variables (age, age at first birth and education) were measured in complete years. Total household income for the last six months was first measured as a numerical variable and then assigned to appropriate categories. Marital status, number of children, main source of income, family and individual history of breast cancer were measured as categorical variables and assigned to appropriate categories. Descriptive statistics were used for characteristics of respondents, knowledge and practice. Means, median, mode and range were calculated for continuous variables while proportions were calculated for categorical variables.

To assess the association between knowledge and practice of prevention, subjects were categorized into cases (those with high practice) and controls (those with low practice). The association was estimated by prevalence odds ratios.

In order to detect a minimum difference of 30% with power of 80% and a 95% confidence, a minimum sample size of 184 was required.

## 3. Results

Table 1 shows the demographic characteristics of the participants. The average age of respondents was 33 years with a median and mode of 30 and 21 years respectively. The youngest was 20 years; eldest 70 years. Fifty-six percent (56%) were between age 20 and 30 years old whereas those in the highest risk group ( $\geq$ 40 years) were 28%.

Average years of school completed were 9.26 with median of 9 and mode of 8 years respectively. The highest number of completed years of school was 18. Approximately 63% were married and 21% single. Sixty-five percent had 5 children or more and 56.9% had their first child before 20 years of age. Mean age at first birth

<sup>1</sup> Prevention methods associated with lifestyle such as physical exercise, diet, parity etc

was 19.3 years with a median and mode of 18 years. Small to medium sized businesses and farming were the main source of income for 78% of households, 9% had main income from professional service provision while 12%

had no identifiable source of income. Forty-three percent of households had total monthly income of less than KSh.10000 (USD 120) in the six months preceding the survey.

**Table 1. Demographic characteristics of participants**

Characteristic		Frequency (n=325)	Percentage (%)
Age	<40 years	234	72
	>40 years	91	28
Marital status	Single	69	21.2
	Married	205	63.1
	Widowed/separated/divorced	51	15.7
No. of Children	None	56	17.2
	5 and below	211	64.9
Age at first birth	>5 children	58	17.8
	30 years and below	271	83.4
	>30	54	16.6
Completed years of school	0 – 8 years	129	39.7
	9 - 12 years	103	31.7
	>12 years	70	21.5
Main source of income	None	37	12.5
	Business/casual/farming	232	78.1
	Professional	28	9.4
Household income	10,000 and below	122	43.0
	10,000 – 50,000	112	39.4
	>50,000	50	17.6
	Not applicable/missing**	41	
History of breast cancer	Knows someone with b/c***	109	33.5
	Family member with b/c	58	17.8
	Individual history of b/c	4	1.2

\*Source of income was not applicable to 28 respondents still in school

\*\*8 respondents not sure of income and 37 had no source of income

\*\*\*Breast cancer.

Table 2 shows a summary of knowledge of breast cancer and its association with some demographic characteristics. The family history, education and income were significantly associated with knowledge. Respondents with a family history of breast cancer were two times more likely to have high knowledge compared to those with no family history of breast cancer

OR= 2.280 (1.212 - 4.292). Respondents with more than eight years of school were nearly three times likely to have higher knowledge of prevention OR=2.520 (1.273 - 4.992) compared to respondents with lower levels of education. The respondents with higher income were 80% more likely to know of breast cancer than those of lower income OR=1.820 (1.010 - 3.278).

**Table 2. Knowledge of breast cancer**

Characteristics	General knowledge*	Knowledge of prevention**
High	66 (20.3%)	46 (14.2%)
Low	259(79.7%)	279 (85.8%)
Variable	General knowledge of breast cancer OR (95% CI)	Knowledge of breast cancer prevention OR (95% CI)
Family history of breast cancer	2.280 (1.212 - 4.292)	0.964(0.424 - 2.193)
Income	1.820 (1.010 - 3.278)	0.871(0.449 - 1.690)
Education	2.859 (1.578 - 5.178)	2.520 (1.273 - 4.992)

Table 3 summarizes the practices. Nearly 62% of the women were practicing at least one breast cancer prevention strategy. The respondents reporting ever done BSE was 12.6%, CBE 8.9% and mammogram 1.8%. When asked if they would recommend breast cancer screening to their friends and family, more than 94%

affirmed and were also willing to get breast cancer screening in future.

Table 4 shows practice adjusted for family history, knowledge and socioeconomic variables. In all cases, knowledge remained a significant predictor of practice of prevention save for knowledge of how to do BSE.

**Table 3. Breast Cancer Prevention**

	(%)
Practicing at least one primary prevention strategy	61.5
Ever done breast cancer screening	
BSE	12.6
CBE	8.9
Mammogram	1.8
Would you recommend screening to a friend/family	94.8
Willing to get breast cancer screening in future	97.2
Ever smoked	5.8
Smoked in the last 3 months*	3.1
Ever taken alcohol	12.6
Taken alcohol in the last 3 months**	8.9

\*Of the 5.8% who ever smoked, 47.6% had smoked in the last three months

\*\*Of the 12.6% who had ever taken alcohol, 69% had taken alcohol in the last three months prior to the survey

**Table 4. Practice adjusted for knowledge, family history and socioeconomic variables**

	Adjusted OR	Unadjusted OR*	% change in OR**
Knowledge of screening and family history	2.917	3.633	24
Knowledge of screening and education	2.848	4.242	48.9
Knowledge of screening and income	2.954	4.125	39.6
Knowledge of risk factors and family history	3.828	3.850	0.57
Knowledge of risk factors and education	3.648	4.096	12
Knowledge of risk factors and income	6.127	7.637	24
Knowledge of symptoms and family history	3.227	4.306	33
Knowledge of symptoms and education	3.019	3.518	16
Knowledge of symptoms and income	3.662	5.596	52.8
Knowledge on how to do BSE and family history	3.368	3.908	16
Knowledge on how to do BSE and education	3.349	5.013	49.7
Knowledge on how to do BSE and income	3.196	3.360	5

\*\*% change of 10% is considered significant.

## 4. Discussion

Both knowledge and practice of breast cancer prevention were low in this population and even more so among women of lower socioeconomic status. Although majority of women had heard about breast cancer and know someone with this condition, in-depth knowledge of breast cancer symptoms, risk factors and prevention was poor. Nearly two in three women had heard about screening methods but knew little details like screening method schedules or BSE procedures.

Less than 20% of respondents had done any form of breast cancer screening. Whereas WHO recommends that women aged 40 years and above should get a mammogram annually, uptake of mammography was low<sup>14</sup>. CBE and BSE are equally low despite the recommendation for women aged 20-30 years to have CBE every three years and BSE monthly. The willingness to get screened and promote screening among family and friends was however high, creating a window of opportunity to scale up the intervention.

We found association between knowledge and practice of breast cancer prevention. Women with higher knowledge of breast cancer prevention were nearly six times more likely to practice prevention compared to women with lower knowledge (AOR=6.830; CI=3.308; 14.104). This is consistent with some studies from Thai and Europe. [7,8,9]

Our findings suggest that good knowledge of breast cancer screening, risk factors and symptoms play a key role in influencing uptake of breast cancer prevention

services. Although demographic characteristics such as family history and social status may influence knowledge on breast cancer, the study shows that in-depth knowledge of breast cancer supersedes these when it comes to practice. For instance, women with a family history of breast cancer were likely to have higher knowledge of breast cancer than those without a family history. Similarly, respondents with higher social status (education and income) were likely to have higher knowledge of breast cancer. But they equally need good knowledge of symptoms, risk factors and screening methods in order to practice prevention. Besides, knowledge on how to perform BSE may be important for women of lower socioeconomic status. The assumption here may be that women of higher socioeconomic may opt to have CBE and mammography as opposed to BSE due to their ability to pay for health services. Women with higher levels of income were also more likely to practice prevention even without knowledge on how to conduct BSE.

The low levels of knowledge observed in this study compare to those of studies done in Nigeria, Malaysia and Bahrain [16,17,19]. These studies also reported association between education, family history and knowledge of breast cancer. Electronic media is the most common source of information on breast cancer. Access to breast cancer information through health workers and community health workers is relatively low (28.5% and 13.2% respectively). There are concerns over capacity of health workers to provide information on breast cancer. There is increasing integration of reproductive organ related cancers and Maternal and Child Health services. However, the role of public health in cancer prevention should be continue, with community extension and



concerted health education programs. Awareness of major breast cancer community-based events such as breast cancer month is equally low among women. This presents a missed opportunity for large scale education on breast health and screening.

The study focused on knowledge and practice of primary prevention which includes change in lifestyle. Practice of primary prevention was fair with at least three in every five women interviewed practicing at least one form of primary prevention. Exposure to risks such as alcohol consumption (12.6%), smoking (5.8%) and delayed first pregnancy (16.6%) were observed. Evidence indicates that early child bearing reduces relative risk by 4.3% for every year of breast feeding while alcohol consumption has 7% increase for each drink consume. [1,4,18] Every kilogram gained in postmenopausal women has a relative risk of 1% while 2 to 3 hours per week of physical exercise have a 20% to 40% impact on incidence of breast cancer. [1,4,18] Attention to physical exercise and weight control in this study was however only observed among 20% and 3% of respondents respectively. WHO rates primary prevention as the most valuable method to improve public health and the most cost-effective and enduring intervention for reducing the cancer burden [1].

We recommend that women of lower social status should especially be targeted with breast cancer risk awareness campaigns and prevention programs. This calls for integration of breast health education, expanding the reach of health talks beyond the health facilities to the communities, development of suitable and targeted communication materials as well as improving publicity of breast cancer campaign events to reach a wider target community audience.

## Competing Interest

All the authors declare no competing interest.

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