Differences in Perception of Breast Cancer Among Muslim and Christian Women in Ghana

abstract

Purpose The burden of breast cancer continues to increase in low- and middle-income countries (LMICs), where women present with more advanced disease and have worse outcomes compared with women from high-income countries. In the absence of breast cancer screening in LMICs, patients must rely on self-detection for early breast cancer detection, followed by a prompt clinical diagnostic work-up. Little is known about the influence of religious beliefs on women's perceptions and practices of breast health.

Methods A cross-sectional survey was administered to female members of Islamic and Christian organizations in Ghana. Participants were asked about their personal experience with breast concerns, knowledge of breast cancer, performance of breast self-examination, and experience with clinical breast exam.

Results The survey was administered to 432 Muslim and 339 Christian women. Fewer Muslim women knew someone with breast cancer (31% v 66%; P < .001) or had previously identified a concerning mass in their breast (16% v 65%; P < .001). Both groups believed that new breast masses should be evaluated at clinic (adjusted odds ratio [AOR], 1.08; 95% CI, 0.58 to 2.01), but Muslim women were less likely to know that breast cancer can be effectively treated (AOR, 0.34; 95% CI, 0.23 to 0.50). Muslim women were less likely to have performed breast self-examination (AOR, 0.51; 95% CI, 0.29 to 0.88) or to have undergone clinical breast exam (AOR, 0.48; 95% CI, 0.27 to 0.84).

Conclusion Muslim women were found to be less likely to participate in breast health activities compared with Christian women, which highlights the need to consider how religious customs within subpopulations might impact a woman's engagement in breast health activities. As breast awareness initiatives are scaled up in Ghana and other LMICs, it is essential to consider the unique perception and participation deficits of specific groups.

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INTRODUCTION

Breast cancer is the most common malignancy among women, with more than 2 million new cases per year worldwide.[1] Historically, the majority of breast cancer cases are reported in high-income countries (HICs); however, today most breast cancer cases and most breast cancer deaths occur in low- and middle-income countries (LMICs). This demographic shift toward increasing breast cancer statistics in LMICs is a result of an increase in life expectancy, urbanization, and the adoption of Western lifestyles.[2] Breast cancer in LMICs most commonly is not diagnosed until it is locally advanced or metastatic with predictably poor outcomes. For example, breast cancer in Ghana is the leading malignancy among women, with 70% of cases presenting in late stages.[3]

Early detection is a cornerstone for improving breast cancer outcomes, assuming effective treatment can be promptly provided once a cancer diagnosis is made.[4] In many LMICs, mammographic screening is poorly accessible and/or unaffordable, which forces these populations to rely on breast self-examination (BSE) and clinical breast examination (CBE) as the primary methods of breast cancer early detection.[5] Neither BSE, nor CBE have been independently shown to improve breast cancer mortality when used as screening tools.[6,7] Nonetheless, both methods can be used as markers of breast health engagement within existing health care systems and can correlate with earlier stage presentation.[8,9]

Delayed breast cancer presentation is common in LMICs, where women may have been aware of

changes in their breast for many months, or even years, before seeking medical help. Reasons for these delays are multifactorial and may be influenced by personal or cultural belief systems. Muslim women are frequently diagnosed with breast cancer in later stages and have a higher mortality rate than their non-Muslim counterparts.[10,11] Despite this observed difference, little has been reported on how Muslim women engage with and participate in breast health behaviors within their cultural context. In Somalia, the Middle East, and Asia, Muslim women have repeatedly reported that modesty, gender preferences, a lack of community discussion about breast cancer, fear of breast cancer that prevents breast feeding, and the reluctance of clinicians to provide education or recommend screening methods prevent them from receiving the standard of care.[10-14] To date, similar studies have not been performed in sub-Saharan Africa (SSA) to determine if similar patterns prevail among Muslim women.

The Health Belief Model has been commonly used to study women's engagement in breast cancer screening behavior. According to the Health Belief Model, a woman's engagement in breast cancer screening practices will be influenced by her perception of the threat that breast cancer poses and by the value she places on actions to reduce that threat.[15] A woman's religion is known to influence her perceptions[10,13]; however, the extent to which it impacts eventual participation in breast health activities remains unclear.

Ghana has a population of approximately 25 million people, 18% of which are Muslim.[16] By using surveys to assess the perceptions of breast health and participation in BSE and CBE, we aimed to characterize distinct differences in breast health engagement, perceptions, and participation of Ghanaian Muslim women compared with Christian women. We hypothesize that, compared with Ghanaian Christian women, Muslim women more commonly present with advanced stage disease because they are less likely to perform BSE; have more limited experience with clinical evaluation, including CBE; and may have more adverse misconceptions regarding the treatability and curability of breast cancer in Ghana.

METHODS

Setting

This study was a cross-sectional survey that was administered to female members of two religious organizations in Kumasi, Ghana. Local chapters of the Islamic Mission Secretariat and of the Christ Apostolic Church International organized breast health programs as part of larger religious meetings. Study authors were invited by each organization to provide breast health education sessions and to perform CBE as a component of these educational programs. Breast health program for both groups were identical in structure and content. Study participants were recruited from each educational program to participate in this study.

Survey Tool

The survey tool consisted of 17 questions: five questions outlined personal demographic characteristics; six documented prior experience with patients with breast cancer, personal experience with breast masses, and prior participation in breast health activities; and six queried perceptions around breast cancer knowledge (Appendix Table A1). To ensure content and construct validity, the survey tool was designed on the basis of published literature on women's perception of breast cancer.[17-22] With the exception of questions regarding demographic characteristics, responses to all other questions were recorded as "yes" or "no".

Sampling and Data Collection

All women who were surveyed voluntarily attended the breast health program organized by their respective religious organization. Sampling was inclusive; no woman who volunteered for breast screening was excluded. The survey was conducted in the local language. It was verbally administered to each participant before breast screening and breast cancer education to avoid perception contamination that might occur after receiving education on breast cancer. The survey tool was translated from English to spoken Twi and back-translated into English to ensure the validity of the verbal translation by each interviewer.

Data Analysis and Management

Data analysis was performed by using Stata (v14.2; STATA, College Station, TX; Computing Resource Center, Santa Monica, CA). Differences between various responses and religious affiliation were determined with χ^2 test. Bivariable and multivariable logistic regression analyses were performed to determine the effect of religious affiliation on the odds of breast health participation via BSE and CBE. The multivariable logistic model included each of the a priori–defined covariates that might affect a woman's decision to ever perform BSE or to present for CBE—that is, age, education status, marital status, having ever been

taught BSE, having known anyone with breast cancer, and having ever had a breast mass about which they were concerned.

Ethics

The study was approved by Kwame Nkrumah University of Science and Technology Committee for Human Research and Publication Ethics (reference number CHRPE/AP/296b/14). Oral informed consent was obtained from all participants after interviewers explained the study and answered all study-related questions to their satisfaction.

RESULTS

Study Population

Surveys were completed by 771 women: 432 Muslim and 339 Christian. Median age was similar between the two groups: Muslim women, age 39 years (range, 18 to 90 years) and Christian women, age 40 years (range, 18 to 80 years; P = .110). Muslim women had completed less education,

with 150 (35%) having not completed primary school compared with only 50 of Christian women (15%; $P <$ .001). In addition, more Muslim women were married (86% v 75%; $P <$ .001) and lived in rural areas (14% v 3%; $P <$ .001) compared with their Christian counterparts (Table 1). Christian women were more likely to have known someone who had breast cancer (66% v 31%; $P <$ .001) and more likely to have noted a breast mass about which they were concerned (65% v 16%; $P <$ .001).

Breast Health Perceptions

Women, on average, responded correctly to 3.57 ± 0.03 of the six questions, with Christian women, on average, answering correctly more than Muslim women (3.81 ± 0.04 v 3.39 ± 0.05; $P <$ .001). Apart from agreement that newly discovered breast masses should be evaluated in clinic (93% of Christian women v 89% of Muslim women; P = .056), responses from Muslim and

Table 1. Participant Demographic Information

Characteristic	Muslim	Christian	Total	P
Participants	432 (56)	339 (44)	771 (100)	
Age, median (range)	39 (18-90)	40 (18-80)	40 (18-90)	.110
Education completed				
None	150 (35)	50 (15)	200 (26)	< .001
Primary	156 (36)	142 (42)	298 (39)	
Secondary	95 (22)	91 (27)	186 (24)	
More than secondary	30 (7)	55 (16)	85 (11)	
Marital status				
Never married	60 (14)	85 (25)	145 (19)	< .001
Currently married	303 (70)	188 (56)	491 (64)	
Formerly married	67 (16)	64 (19)	131 (17)	
Place of stay				
Rural	61 (14)	11 (3)	72 (9)	< .001
Town	190 (44)	202 (60)	392 (51)	
City	181 (42)	124 (37)	305 (40)	
Has children				
No	67 (16)	48 (14)	115 (15)	.60
Yes	365 (84)	291 (86)	656 (85)	
Knows someone who has had breast cancer				
No	300 (69)	115 (34)	415 (54)	< .001
Yes	132 (31)	224 (66)	356 (46)	
Ever had a breast mass about which they were worried				
No	361 (83)	118 (35)	479 (62)	< .001
Yes	71 (16)	221 (65)	292 (38)	

NOTE. Data are given as No. (%) unless otherwise noted.

Christian groups differed significantly for most perception questions. A higher proportion of Muslim women answered correctly when asked if not all breast masses were cancer (68% *v* 32%; *P* < .001) and whether people who have breast cancer can survive it (44% *v* 25%; *P* < .001). A greater proportion of Christian women answered correctly when asked if breast cancer can be found on BSE (66% *v* 23%; *P* < .001), if breast cancer can be treated (72% *v* 34%; *P* < .001), and if breast cancer can be cured (94% *v* 82%; *P* < .001). After adjusting for a priori–defined covariates, differences in responses between the two groups were maintained apart from the question of whether breast cancer is survivable, which lost statistical significance (adjusted odds ratio [AOR], 1.48; 95% CI, 0.99 to 2.21; *P* = .054; Table 2).

Breast Health Participation

Four hundred nineteen women (54%) responded that they have been taught how to perform BSE, of which 356 (85%) answered that they have performed BSE at least once, 278 (66%) had performed BSE at least once per year, and 252 (60%) had performed BSE the recommended one time per month. Within the two groups of women, 275 of 339 Christian women had been taught BSE compared with only 144 of 432 Muslim women (81% *v* 33%; *P* < .001). Of these, a higher proportion of Christian woman had ever performed BSE (90% *v* 75%; *P* < .001); however, monthly BSE rates were not different between the two groups (Christian women, 73%; Muslim women, 66%; *P* = .167). After controlling for a priori–defined covariates, Muslim women were 49% less likely to have ever performed BSE compared with Christian women (AOR, 0.51; 95% CI, 0.29 to 0.88; Table 3); however, the odds of performing monthly BSE were not

significantly different from their Christian counterparts (AOR, 1.57; 95% CI, 0.82 to 3.01; *P* = .176)

Only 291 women (38%) had ever undergone CBE. Within groups, 217 Christian women (64%) had undergone CBE compared with only 74 Muslim women (17%; *P* < .001). Among Christian women who had ever had a breast mass about which they were concerned, 94% had presented for CBE compared with only 51% of Muslim women (*P* < .001). After controlling for a priori–defined covariates, Muslim women were less likely to have presented for CBE compared with their Christian counterparts (AOR, 0.48; 95% CI, 0.27 to 0.84; *P* < .001; Table 3).

DISCUSSION

This study aimed to determine differences in breast health practices and perceptions among Muslim women in Ghana compared with their Christian counterparts. By doing so, we hoped to inform efforts aimed at improving involvement in early breast cancer detection and screening initiatives in Ghana and elsewhere in SSA.

Early detection and prompt treatment offer the greatest chances of long-term breast cancer survival. In most LMICs—with limited availability of screening mammography—the focus has been on emphasizing BSE, a less expensive and more practical option, as part of a breast awareness strategy that might enhance other efforts to improve access to early diagnosis.[5,23] Addition of CBE adds a cost-effective and clinically useful aid in breast cancer early detection.[24] Whereas certain studies have questioned the utility of BSE, women who regularly performed BSE present with smaller cancers and are less likely to have axillary lymph node involvement.[25-27] Of note, the most commonly cited evidence against the use of BSE to

Table 2. Perceptions of Breast Cancer Among Ghanaian Muslim and Christian Women

Question	Correct Response (%)		*P*	AOR (95% CI)*	*P*
	Muslim	Christian			
Can breast cancer be found on breast self-examination?	22.5	65.8	< .001	0.38 (0.25 to 0.60)	< .001
Are all breast masses cancerous?	67.8	32.2	< .001	2.58 (1.73 to 3.84)	< .001
Should new breast masses be evaluated at the clinic?	88.9	92.9	.056	1.08 (0.58 to 2.01)	.808
Can breast cancer be treated?	33.8	71.7	< .001	0.34 (0.23 to 0.50)	< .001
Can breast cancer be cured?	81.7	94.4	< .001	0.35 (0.19 to 0.67)	.001
Is breast cancer survivable?	44.4	24.5	< .001	1.48 (0.99 to 2.21)	.054

Abbreviation: AOR, adjusted odds ratio.

*Covariates adjusted for age, education, marital status, having ever been taught breast self-examination, having known anyone with breast cancer, and having ever had a breast mass about which they were concerned.

Table 3. Factors Affecting a Woman's Participation in Breast Health Activities

Variable	Ever Performed BSE				Ever Attended CBE			
	OR	95% CI	AOR	95% CI	OR	95% CI	AOR	95% CI
Age	1.01	1.00 to 1.02	0.98	0.95 to 1.00	1.02	1.01 to 1.03	1.01	0.99 to 1.03
Religion								
Christian	Reference		Reference		Reference		Reference	
Muslim	0.15	0.11 to 0.20	0.51	0.29 to 0.88	0.12	0.08 to 1.16	0.48	0.27 to 0.84
Education								
None	Reference		Reference		Reference		Reference	
Any	2.16	1.55 to 3.01	0.85	0.48 to 1.51	1.50	1.06 to 2.11	0.88	0.49 to 1.58
Marital status								
Never married	Reference		Reference		Reference		Reference	
Currently married	1.22	0.84 to 1.77	2.35	1.19 to 4.62	1.54	1.03 to 2.29	2.24	1.08 to 4.65
Previously married	1.33	0.83 to 2.13	3.11	1.20 to 8.12	1.66	1.01 to 2.74	1.55	0.58 to 4.11
Knows someone who has breast cancer								
No	Reference		Reference		Reference		Reference	
Yes	5.82	4.26 to 7.95	2.74	1.65 to 4.56	10.60	7.48 to 15.00	3.18	1.97 to 5.15
Ever had a breast mass about which they were worried								
No	Reference		Reference		Reference		Reference	
Yes	6.51	4.67 to 9.06	1.42	0.81 to 2.49	44.53	29.03 to 68.31	21.21	12.91 to 34.84
Ever been taught BSE								
No	Reference		Reference		Reference		Reference	
Yes	62.94	39.54 to 100.19	45.58	26.79 to 77.54	9.70	6.71 to 14.02	3.35	1.96 to 5.73

Abbreviations: AOR, adjusted odds ratio; BSE, breast self-examination; CBE, clinical breast examination; OR, odds ratio.

improve breast cancer outcomes was in Shanghai, China, where women in the control group who had not been taught BSE were nonetheless found to be successful in finding their cancers at earlier stages, with 41.6% being diagnosed with cancers smaller than 2 cm.[7] The Shanghai experience contrasts with the large, late stage, grossly visible, or even frankly ulcerated clinical presentations that are commonly observed in SSA. Conclusive evidence against the use of BSE in SSA has yet to be established and, as such, remains among recommendations by leading global health groups, including WHO and the Breast Health Global Initiative.[4,5]

Like many LMICs, Ghana lacks a national breast cancer screening program. In this setting, monthly BSE and regular CBE may help to reduce the large proportion of late-stage presentations. Participation in BSE and CBE could be improved by increasing public awareness and understanding around breast cancer and the importance of early stage diagnosis. Both religious organizations in our study effectively mobilized a large number of their

membership to attend their respective breast health programs, which suggests that such programs may provide a suitable platform for delivering breast cancer education to large segments of the population; however, our results support the need to intensify these campaigns as part of a national plan to aid early breast cancer detection.

Our study demonstrated that 46% of women have ever performed BSE. This is comparable to the rate reported from LMICs, such as Nigeria of 35%, but is higher than the 17% to 32% reported by studies from HICs.[28-33] Lower rates of BSE in HICs is likely a result of the existence of national screening programs that prioritize mammography over BSE.[5,27] In our study, only 54% of women who were interviewed had been taught BSE, of which only 85% had ever performed BSE. A substantially lower number of Muslim women had been taught BSE, but even among these women, performance of BSE was nearly two-fold lower compared with their Christian counterparts. It is more common among Ghanaian churches to organize breast health initiatives for their members,[34,35] and

women who were exposed to such breast health awareness campaigns were more likely to state that they practice BSE.[36-39] This highlights the importance of breast health campaigns in increasing participation; however, the observed difference in the performance of BSE between the groups of women suggests that religion may influence a woman's participation in breast health activities outside of simple access to training.

Participation in CBE also varied by a woman's religion. Christian women were more than two times more likely to have undergone CBE compared with Muslim women ($P < .001$). This may be a result of differences in awareness of, and access to, CBE providers that the more frequent church-organized breast programs may provide. Furthermore, as the odds of undergoing CBE were also increased by three-fold if women had known someone with breast cancer, these meetings may also foster community such that women have a better chance of meeting patients with breast cancer and engaging in supportive discussion.

Perceptions of breast health were different between the two religious groups, with Christian women, on average, demonstrating a better understanding of breast health screening and treatment principles. This is likely a result of the aforementioned increased popularity of Christian breast health initiatives. Muslim women knew less of the potential for treatment and cure than Christian women who were surveyed, and less than one half of Muslim women thought that BSE could detect breast cancer. Such incorrect perceptions could negatively affect one's motivation to participate in screening initiatives, which possibly contributes to why, even of those taught, only one third of Muslim women had ever performed a BSE. Of interest, Muslim women did demonstrate an understanding that breast cancer could be survived, which was in opposition to their perceptions of the potential for treatment and cure. This may indicate confusion around the seriousness of breast cancer, perhaps reinforced by a lesser proportion of Muslim women who have known someone with breast cancer. Opening these informative conversations and exposing Muslim women to more breast health education may help to correct such misconceptions.

Before drawing conclusions from these data, some limitations must be addressed. First, the sample size was relatively small and involved women from two specific religious groups, which limits the generalizability even within the larger Muslim and Christian women populations; however, group members were aggressively mobilized by their respective leaders for the screening program and none declined survey participation. Follow-up studies with a larger sample size that involved women from more Muslim and Christian groups as well as women of other religious affiliations are needed to further validate our findings. Second, our methodology relied exclusively on self-reported data. Survey participants sometimes respond in a socially desirable manner when answering questions about health beliefs and screening behaviors, and there was no way to independently validate the accuracy of the information provided.[20] Despite these limitations, our results allow reasonable conclusions to be drawn about Ghanaian Muslim women's perceptions of breast cancer and their involvement in early breast cancer detection or screening initiatives compared with their Christian counterparts.

In conclusion, Muslim women were found to be less likely to participate in breast health activities compared with Christian women, which highlights how religious belief systems play an important role in determining a woman's breast health and the need to consider how religious and cultural customs within subpopulations might impact a woman's engagement with and participation in breast health activities. In a country with no national breast cancer screening program, there is great need to scale up breast awareness initiatives, evidenced-informed screening efforts, and aid earlier care-seeking for women with new breast symptoms. As these initiatives are designed, tailoring efforts to the unique perception and participation deficits of specific groups will be essential.

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AUTHORS' DISCLOSURES OF
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Table A1. Breast Health Survey Among Muslim and Christian Women in Ghana

Demographic	Answer
1. Age in years	___ ___ ___
2. What is the highest level of education you completed?	1: None
	2: Primary
	3: Secondary
	4: More than secondary
3. What is your marital status?	1: Never married
	2: Married
	3: Widowed
	4: Divorced
4. Do you live in a village, town, or city?	1: Rural
	2: Town
	3: City
5. Do you have children?	Yes (1)/No (0)
Prior experience with breast health	
6. Do you know anyone who has had breast cancer?	Yes (1)/No (0)
7. Have you ever had a breast mass about which you were worried?	Yes (1)/No (0)
8. Have you ever had a breast mass evaluated in a clinic or hospital?	Yes (1)/No (0)
9. Have you ever been taught how to do a breast self-examination?	Yes (1)/No (0)
10. Have you ever done a breast self-examination before?	Yes (1)/No (0)
11. Do you perform breast self-examinations once per month?	Yes (1)/No (0)
Perception questions	
12. Can breast cancer be found with breast self-examination?	Yes (1)/No (0)
13. Are all breast masses breast cancers?	Yes (1)/No (0)
14. Should all new breast masses be evaluated in a clinic or hospital?	Yes (1)/No (0)
15. Can someone be treated for breast cancer if he or she has it?	Yes (1)/No (0)
16. Can someone be cured of breast cancer if he or she has it?	Yes (1)/No (0)
17. Is breast cancer survivable?	Yes (1)/No (0)