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Global Health and Cancer

Role of Family Obligation Stress on Ugandan Women's Participation in Preventive Breast Health

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Disclosures of potential conflicts of interest may be found at the end of this article.

Key Words. Family obligation stress • Breast cancer • Preventive care • Uganda • Early detection

Abstract

Background. The purpose of this study is to determine the role of family obligation stress on Ugandan women's participation in preventive breast health through the receipt of breast cancer education and health check-ups.

Materials and Methods. A validated survey was conducted on a community sample of Ugandan women, providing a multi-item scale to assess preventive breast-health-seeking behaviors and measure family obligation stress (FO; range 6–18). Univariate and multivariate linear regression was used to assess associations between sociodemographic factors and FO. Univariate and multivariate linear regression (used in conjunction with the robust sandwich estimator for standard errors) and probability differences (PDs) were used to evaluate associations between preventive breast-health-seeking behaviors, sociodemographic factors, and FO.

Results. A total of 401 Ugandan women ages 25–74 participated in the survey. Most had three or more children in the home (60%) and were employed full time (69%). Higher FO was associated with increasing number of children and/or adults in the household ($p < .05$), full-time employment ($p < .001$), and being single ($p = .003$). Women with higher FO were less likely to participate in breast cancer education (PD = −0.02 per 1-point increase, $p = .008$) and preventive health check-ups (PD = −0.02, $p = .018$), associations that persisted on multivariate analysis controlling for sociodemographic factors.

Conclusion. Ugandan women with high FO are less likely to participate in preventive breast cancer detection efforts including breast cancer education and preventive health check-ups. Special efforts should be made to reach women with elevated FO, because it may be a risk factor for late-stage presentation among women who develop breast cancer. ***The Oncologist*** 2019;24:624–631

Implications for Practice: High family obligation stress (FO) significantly reduces women's participation in preventive health check-ups and breast cancer education. These findings support research in U.S. Latinas showing high FO negatively affects women's health, suggesting that FO is an important factor in women's health-seeking behavior in other cultures. Addressing family obligation stress by including family members involved in decision-making is essential for improving breast cancer outcomes in low- and middle-income countries, such as Uganda.

Introduction

Breast cancer incidence in sub-Saharan Africa (SSA) is increasing, particularly in Uganda, where the rate has risen by 5.2% per year for the past 15 years [1]. Up to 89% of Ugandan women with breast cancer commonly first present for medical evaluation with stage III or IV disease, when more complex and resource-intensive treatments are more likely to be futile, in comparison with breast cancer of earlier stage in the same population [2–4]. Ugandan women commonly wait 2 years after first detecting a palpable breast mass before presenting for initial medical

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evaluation [5]. Although these data describe a dire situation, it is further complicated because these data were obtained from women who successfully overcame barriers to successfully seek health care at the national referral hospital. There are likely wide disparities in care-seeking behavior and service utilization in urban versus rural areas. A better understanding of the personal and cultural factors that contribute to delayed breast cancer presentation in a more representative sample is needed to inform interventions to improve breast cancer outcomes in Uganda and other SSA countries [6].

The World Health Organization (WHO) and the Breast Health Global Initiative (BHGI) have developed strategies and guidelines for addressing breast cancer disparities in low- and middle-income countries [7]. WHO and BHGI recommend breast health awareness education to help women understand the importance of seeking medical evaluation soon after noting a significant and persistent change such as a mass in one's breast, even if the lump is painless and not otherwise causing significant problems for the woman [7].

Certain social or cultural forces may inhibit or prevent women from participating in breast health activities. Sociocultural factors that contribute to delayed diagnosis in SSA have been linked to certain health communication preferences, cultural beliefs or misconceptions, and limited participation in early detection activities [6, 8–11]. Prevalent favors that may thwart early diagnosis efforts among SSA women include misconceptions and misinformation, cancer fatalism, limited breast health knowledge, low educational level, older age, and lack of participation in preventive health check-ups where breast health education is provided and clinical breast examination performed [6, 9, 10, 12]. Before a comprehensive early diagnosis strategy can be successfully implemented in any population, the sociocultural factors influencing breast health behavior need to be understood so that health participation can effectively be promoted [6].

Ugandan breast cancer survivors attribute their willingness and ability to participate in cancer treatment specifically to their family support that includes the encouragement to seek early medical attention after self-detecting a breast lump [12]. On the other hand, the cultural emphasis common among Ugandans, as well as women from other cultures, of caring for one's family above caring for oneself (family obligation stress [FO]) has been hypothesized to have a negative effect on one's own health-seeking behavior, and may limit the time and resources available for her to seek care for nonemergent medical issues (e.g., participate in breast health education and preventive health check-ups) [13, 14]. Thus, although family support may facilitate a patient's receiving prompt diagnosis and care [15], FO may also represent a competing risk factor contributing to late-stage presentation [16].

Previous research from other cultures showed high FO associated with older age, less education, lower income, married, and increasing household size [17]. In Uganda, FO has likely increased with events that have changed the traditional family structure. Economic factors such as social mobilization of healthy family members from rural to urban settings for jobs and more Ugandan women entering the workforce have resulted in further responsibilities and stress inside and outside the home [18]. Epidemics such as the human immunodeficiency virus (HIV)/AIDS epidemic have claimed the lives of many young adults, leaving children without caregivers to be taken in by members of the extended family, which has further increased the prevalence of single mothers and size of large households [18–20].

Understanding how FO is associated with participation in preventive health check-ups is important in order to design effective breast health education and detection programs to improve breast cancer outcomes—from earlier presentation through survivorship [6, 21]. In this manuscript, we first describe a psychometric scale for measuring FO in Ugandan women and then examine variations in family obligation stress across various sociodemographics. We also test for predictors of two preventive breast-health-seeking behaviors—received breast cancer education and participated in preventive health check-ups. We hypothesize that higher FO results in lower participation in preventive breast-health-seeking behaviors.

Materials and Methods

Participants and Settings

Approximately 80% of Ugandans live in a rural setting. Therefore, women were disproportionately sampled (approximately 3:1 ratio) for this study from rural parishes in Kakuuto and Kooki counties and Kampala (largest urban center and capital city). Convenience-based sampling methods were used to recruit women for this study, as previously described [10].

Procedures

The Attitudes on Breast Cancer Surveillance and Knowledge (ASK) survey development, testing, use, and data interpretation were carried out in close collaboration with a group of breast cancer survivors in the Ugandan Women's Cancer Support Organization (UWOCASO). The original intent of this survey was to better inform breast cancer education provided by UWOCASO in the underserved Ugandan population. The details of the ASK survey development and testing have been described previously [10]. Briefly, previously described focus group discussions and literature identified several constructs related to access to and knowledge of breast health services and beliefs about breast cancer [11, 12]. These constructs were supplemented by three additional focus group discussions of three to four women each (led by G.N. and analyzed as described previously [12]) and discussions with cultural and health care experts. From these constructs, survey items were selected from a validated instrument in other cultures and iteratively tested with UWOCASO women and cultural experts. The final survey, including the FO measure described below, was translated from English (primary language of Uganda) to Luganda (common local language) by a UWOCASO member fluent in both languages, and then discussed among the UWOCASO group to confirm accuracy of content.

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UWOCASO women surveyed eligible women between January and July 2014. Inclusion criteria included asymptomatic women age 25 years and older who spoke English or Luganda and had no personal history of breast cancer. Consenting women were interviewed in a semiprivate area and received a small financial reimbursement (~$10) for their time, as suggested by local collaborators. This retrospective analysis of anonymized surveys was exempt from Ugandan and U.S. institutional review boards.

Measures

Sociodemographic Measures

Sociodemographic information collected included age (25–39, 40–49, and 50–74 years), education (≤Primary, >Primary), geographic region (urban, rural), work status (full-time/student, other), relationship status (married/living with significant partner, other), self-pay for health care (Yes, No), number of persons under the age of 18 in the house (reclassified as a categorical variable), and number of persons 18 years or older in the house (reclassified as a categorical variable). Grouping of categorical variables was done to avoid small sample sizes in subgroups.

Family Obligation Stress Measure

This multi-item measure was adapted from the Caregiver Burden Scale [22]. During focus group discussions, FO was identified as a recurring determinant on health-seeking behavior and participation. The six items used in the Family Obligation Stress Scale are listed in Table 1 (English) and supplemental online Appendix 1 (Luganda). Responses for each item (Rarely, Sometimes, and Often) were recoded to numerical values (1, 2, or 3, respectively) and summed, resulting in a score range from 6 (minimal FO) to 18 (maximum FO).

Health-Seeking Behavior Outcomes

To assess the likelihood of a woman participating in preventive breast-health-seeking behaviors, they were asked two questions shown in supplemental online Appendix 1A (in Luganda and English). Responses to the question "Where do you usually go for your general health check-ups?" were combined as "yes" (if participant selected an answer indicating a location of a clinic/hospital/traditional healer) and "no" (if a participant selected that they did not participate in health check-ups). For the second question, "Has anyone ever talked to you about breast cancer before today?", we instructed participants to indicate "yes" if they received any breast cancer education, formal or informal. We intentionally did not use the term "education" in the question to avoid the association specifically with formal education (i.e., primary and secondary).

Analysis

Survey data were entered into DatStat Illume (Seattle, WA), as described previously [23]. Statistical analyses were performed using R (version 3.1.1; R Foundation for Statistical Computing, Vienna, Austria).

For the first aim, factor analysis was performed on the sample, as described previously [24]. Briefly, exploratory factor analysis of the measure items was performed with scree plots and parallel analysis to assess the number of potential underlying factors. The factor analysis was based on polychoric correlation coefficients as the measure items were ordinal with a small number of discrete categories

Table 1. Sociodemographic factors and breast-health-seeking behavior outcomes

Variable	Value[a]
Age, years	
25–39	188 (53.6)
40–49	94 (26.8)
50–74	69 (19.7)
Education	
≤Primary (P1–P7)	240 (68.4)
>Primary (>P7)	111 (31.6)
Geographic location	
Urban	83 (23.6)
Rural	268 (76.4)
Employed full-time/student	
Yes	243 (69.2)
No	108 (30.8)
Married/living with significant partner	
Yes	220 (62.7)
No	131 (37.3)
Self-pay for health care	
Yes	192 (54.7)
No	159 (45.3)
Persons <18 years of age in household	
0	17 (4.8)
1–2	127 (36.2)
3–4	122 (34.8)
5–6	54 (15.4)
7+	31 (8.8)
Persons ≥18 years of age in household	
1	80 (22.8)
2	147 (41.9)
3–4	83 (23.6)
5+	41 (11.7)
Household income[b]	
0–100,000 Shillings	57 (21.9)
100,001–500,000 Shillings	71 (27.3)
500,001–1,000,000 Shillings	68 (26.2)
>1,000,000 Shillings	64 (24.6)
Participated in preventive health check-ups	
Yes	242 (68.9)
No	109 (31.1)
Participated in any breast cancer education	
Yes	164 (46.7)
No	187 (53.3)
Family obligation stress measure[c]	12.1 ± 3.0

[a]Values are *n* (%) or mean ± standard deviation.
[b]Ninety-one respondents did not report a value for household income.
[c]Range is 6 (lowest stress) to 18 (highest stress).

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rather than continuous. Then, the correlation between the FO measure items was assessed using Cronbach's alpha.

Of the 401 respondents, 348 (86.7%) responded to all six items of the FO measure; the remaining were excluded from the factor analysis. Cronbach's alpha for these items was 0.76. Pairwise polychoric correlation coefficients between items were all statistically significant ($p < .05$) and ranged from 0.15 to 0.64 (mean: 0.43). The scree plot showed that the first principal component had 53% of the variance and that second component had 15% of the variance, consistent with a single factor model for the six items. Parallel analysis also selected a single factor model. All items had loadings >0.4 on the first factor (range: 0.50–0.85; supplemental online Appendix 2).

As part of the second aim, univariate and multivariate linear regression modeling was performed to evaluate associations between sociodemographic factors and FO. For this and related analyses, the family obligation stress scale was computed for individuals who completed at least 80% of items (≥5 of 6 items). For respondents who completed five items, the missing item was imputed using the mean of the other five items. Household income was excluded from the regression analyses because of the low response rate (n = 297; 74.1%). Similarly, univariate and multivariate linear regression modelling was used to evaluate associations of FO and sociodemographic factor with the health-seeking behavior outcomes, with associations summarized as probability differences (PDs). Standard errors were calculated using the robust sandwich estimator. This approach was used instead of logistic regression, as the PD is a more interpretable parameter than the odds ratio.

Results

Population Characteristics

Table 1 shows the sociodemographic distribution of the participants after excluding all those with missing values. Of the 401 originally surveyed, 393 (98.0%) had a calculable FO score, 380 (94.8%) responded to both health-seeking behavior outcome questions, and 351 (87.5%) responded to all sociodemographic variables and outcome questions included in the primary analysis. No significant sociodemographic differences were noted between the original sample and the analyzed set (data not shown).

Most women were <40 years of age (median age: 38 years), had ≤primary education (68.4%), employed full-time or a student (69.2%), married or living with their significant partner (62.7%), and self-paid for their medical care (54.7%). Most women (71.0%) reported 1–4 children (<18 years) living in the household (median: 3), although 8.8% reported 7+ children. Many women (41.9%) reported two persons >18 years living in their household (median: 2), but several reported 3–4 adults (23.6%) and 5+ adults (11.7%) living in their household. With regard to health-seeking behavior results, 31.1% reported not participating in preventive health check-ups and 53.3% reported never participating in any breast cancer education. The mean FO summary score was 12.1 ± 3.0 on a scale of 6 (lowest possible score) to 18 (highest possible score).

Associations Between Sociodemographic Factors and Family Obligation Stress

Table 2 demonstrates the association of sociodemographic factors to FO. From the univariate analysis, larger household size—including both a higher number of children (<18 years, p = .001) and a higher number of adults (18+, p = .022) living in the household—was significantly associated with greater FO. Middle age, living in an urban setting, and being employed full-time/student were also associated with a higher FO ($p < .05$).

Higher household size and being employed full-time or being a student remained significantly associated with higher FO after adjusting for all sociodemographic factors. After the multivariate adjustments, being married/living with a significant partner was significantly associated with lower FO (p = .047).

Predictors of Health-Seeking Behavior

Table 3 shows predictors of participating in preventive health check-ups. From the univariate analysis, higher FO was associated with lower participation in preventive health check-ups (PD = −0.02 per 1-point increase in FO, p = .008). FO remained significantly associated with participating in preventive health check-ups after adjusting for sociodemographic factors (PD = −0.02, p = .027). Among the sociodemographic factors, none were significantly associated with participating in preventive health check-ups after multivariate adjustment.

Table 3 also shows predictors of participating in breast cancer education. As with participating in preventive health check-ups, higher FO was negatively associated with participating in breast cancer education (PD = −0.02, p = .018) in the univariate analysis. After controlling for sociodemographic factors, this association remained statistically significant (PD = −0.02, p = .042). Among the sociodemographic factors, lower education (p = .002), living in a rural setting ($p < .001$), working full-time/student (p = .001), and self-pay for health care ($p < .001$) were each independently associated with a lower likelihood of participation in breast cancer education.

Discussion

The central importance of family in Ugandan society, similar to other cultures, led us to consider the potential role of FO as a barrier to early breast cancer diagnosis [6, 17]. We found that higher FO significantly reduced women's participation in preventive health check-ups and breast cancer education.

It has been well described by breast cancer survivors in Uganda that family support was invaluable throughout cancer treatment [12]. Likewise, encouragement by family to seek medical care after self-detecting a mass was essential for many women to present early for diagnostic evaluation [12]. Family support is also associated with adhering to treatment in those living with HIV/AIDS and preventing secondary transmission [25, 26]. Whereas this research

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Table 2. Predictors of family obligation stress

	Univariate model			Multivariate model		
Independent variable	**β[a]**	**(95% CI)**	***p* value**	**β[a]**	**(95% CI)**	***p* value**
Age, years						
25–39	(ref)		.033[b]	(ref)		.20
40–49	1.0	(0.2–1.7)		0.6	(−0.1 to 1.4)	
50–74	0.6	(−0.2 to 1.5)		0.6	(−0.3 to 1.4)	
Education						
≤Primary (P1–P7)	(ref)		.33	(ref)		.52
>Primary (>P7)	−0.3	(−1.0 to 0.3)		−0.2	(−0.9 to 0.4)	
Geographic location						
Urban	(ref)		**.039**[b]	(ref)		.15
Rural	−0.8	(−1.5 to 0.0)		−0.5	(−1.3 to 0.2)	
Employed full-time/student						
No	(ref)		**<.001**[b]	(ref)		**<.001**[b]
Yes	1.8	(1.1–2.4)		1.8	(1.1–2.4)	
Married/living with significant partner						
No	(ref)		.48	(ref)		**.047**[b]
Yes	−0.2	(−0.9 to 0.4)		−0.7	(−1.5 to 0.0)	
Self-pay for health care						
No	(ref)		.16	(ref)		.14
Yes	−0.5	(−1.1 to 0.2)		−0.5	(−1.1 to 0.2)	
Persons <18 years of age in household						
0	(ref)		**.001**[b]	(ref)		**.003**[b]
1–2	1.0	(−0.5 to 2.5)		1.2	(−0.3 to 2.6)	
3–4	1.7	(0.1–3.2)		1.6	(0.1–3.1)	
5–6	2.8	(1.1–4.4)		2.7	(1.1–4.3)	
7+	2.2	(0.5–4.0)		2.2	(0.5–3.9)	
Persons ≥18 years of age in household						
1	(ref)		**.022**[b]	(ref)		**.050**[b]
2	0.7	(−0.1 to 1.6)		0.9	(−0.0 to 1.7)	
3–4	0.9	(−0.1 to 1.8)		0.6	(−0.4 to 1.5)	
5+	1.8	(0.6–2.9)		1.6	(0.4–2.7)	

[a]Regression coefficient, corresponding to mean change in the family obligation stress measure compared with the reference group.
[b]Bolded values are statistically significant.
Abbreviation: ref, reference.

demonstrates the positive association between family support and health-seeking behaviors, our work demonstrates the potential negative association between family obligation and a women's health care-seeking behaviors—particularly as it relates to diseases not perceived as an acute problem, such as breast cancer. These results suggest that family support may act as a positive or negative influence on health-seeking behavior depending on the circumstances. Future interventions to downstage breast cancer in Uganda should involve family members important for medical decision-making and support of women at risk for breast cancer to seek medical care early after self-detecting a breast lump.

In this study, we looked at sociodemographic factors that predicted higher amounts of FO. The 6-item FO scale was originally developed and validated in U.S. Latinas—a population with a similar emphasis of placing family's needs above one's own [17]. We found that this measure performed similarly in Ugandan women as in U.S. Latinas: both had Cronbach's Alpha both in mid-0.70s, and both populations showed high FO that affected their participation in health care. Although U.S. Latinas are different from Ugandan women because they reside in a high-income country, they often originate from similar environments (e.g., low socioeconomic status, large households) and deal with similar stressors as Ugandan women [17, 27]. In this current research, we show that higher FO reduces women's participation in preventive breast health. These results emphasize how family obligation, although essential for survival in these settings (e.g., protection, income, housing), can be a barrier to women tending to nonurgent health concerns, such as preventive health check-ups and participating in breast cancer education. Our findings also suggest that FO may be prevalent in other cultures

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Table 3. Predictors of preventive breast-health-seeking behaviors

	Outcome: preventive health check-ups						Outcome: breast cancer education					
	Univariate model			Multivariate model			Univariate model			Multivariate model		
Independent variable	**PD[a]**	**(95% CI)**	***p* value**	**PD[a]**	**(95% CI)**	***p* value**	**PD[a]**	**(95% CI)**	***p* value**	**PD[a]**	**(95% CI)**	***p* value**
Family obligation stress[a]	−0.02	(−0.04 to −0.01)	**.008**[b]	−0.02	(−0.04 to 0.00)	**.027**[b]	−0.02	(−0.04 to 0.00)	**.018**[b]	−0.02	(−0.04 to 0.00)	**.042**[b]
Age, years												
25–39	(ref)		.051	(ref)		.21	(ref)		.34	(ref)		.27
40–49	−0.07	(−0.18 to 0.04)		−0.04	(−0.16 to 0.08)		−0.09	(−0.21 to 0.03)		−0.05	(−0.17 to 0.06)	
50–74	−0.16	(−0.29 to −0.03)		−0.12	(−0.26 to 0.01)		−0.02	(−0.15 to 0.12)		0.07	(−0.08 to 0.21)	
Education												
≤Primary (P1–P7)	(ref)		.053	(ref)		.13	(ref)		**.001**[b]	(ref)		**.002**[b]
>Primary (>P7)	0.10	(0.00–0.20)		0.08	(−0.02 to 0.18)		0.19	(0.08–0.30)		0.17	(0.06–0.27)	
Geographic location												
Urban	(ref)		.55	(ref)		.89	(ref)		**<.001**[b]	(ref)		**<.001**[b]
Rural	0.04	(−0.08 to 0.15)		0.01	(−0.11 to 0.13)		−0.22	(−0.34 to −0.11)		−0.22	(−0.34 to −0.11)	
Employed full-time/student												
No	(ref)		.37	(ref)		.54	(ref)		**<.001**[b]	(ref)		**.001**[b]
Yes	−0.05	(−0.15 to 0.06)		−0.03	(−0.14 to 0.07)		−0.22	(−0.33 to −0.11)		−0.18	(−0.29 to −0.07)	
Married/living with significant partner												
No	(ref)		.31	(ref)		.39	(ref)		.35	(ref)		.10
Yes	0.05	(−0.05 to 0.15)		0.05	(−0.06 to 0.16)		0.05	(−0.06 to 0.16)		0.1	(−0.02 to 0.22)	
Self-pay for health care												
No	(ref)		.21	(ref)		.23	(ref)		**<.001**[b]	(ref)		**<.001**[b]
Yes	−0.06	(−0.16 to 0.03)		−0.06	(−0.15 to 0.04)		−0.19	(−0.30 to −0.09)		−0.18	(−0.28 to −0.08)	
Persons <18 years of age in household												
0	(ref)		.66	(ref)		.38	(ref)		.41	(ref)		.13
1–2	−0.12	(−0.34 to 0.10)		−0.11	(−0.34 to 0.11)		−0.23	(−0.47 to 0.01)		−0.27	(−0.52 to −0.02)	
3–4	−0.07	(−0.29 to 0.15)		−0.05	(−0.28 to 0.18)		−0.17	(−0.42 to 0.07)		−0.21	(−0.46 to 0.04)	
5–6	−0.02	(−0.26 to 0.21)		0.02	(−0.23 to 0.27)		−0.15	(−0.41 to 0.12)		−0.12	(−0.40 to 0.15)	
7+	−0.06	(−0.31 to 0.20)		0.00	(−0.27 to 0.26)		−0.16	(−0.45 to 0.12)		−0.21	(−0.50 to 0.08)	
Persons ≥18 years of age in household												
1	(ref)		.49	(ref)		.42	(ref)		.50	(ref)		.79
2	−0.06	(−0.19 to 0.06)		−0.11	(−0.25 to 0.03)		0.10	(−0.03 to 0.24)		0.03	(−0.11 to 0.17)	
3–4	−0.03	(−0.16 to 0.11)		−0.06	(−0.21 to 0.09)		0.06	(−0.09 to 0.21)		−0.03	(−0.18 to 0.13)	
5+	−0.13	(−0.31 to 0.05)		−0.11	(−0.30 to 0.08)		0.09	(−0.10 to 0.27)		0.05	(−0.14 to 0.24)	

[a]The regression coefficient corresponds to the difference in probability of the outcome per 1-point increase in the family obligation stress measure or the difference in probability of the outcome between a sociodemographic group and the reference group (positive values indicate the group has a higher probability of the outcome than the reference group).
[b]Bolded values are statistically significant.
Abbreviations: CI, confidence interval; PD, probability difference; ref, reference.

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struggling with late-stage presentation and should be considered when implementing interventions to improve breast cancer outcomes in those populations. For example, future interventions might involve family leaders (e.g., family elders, husbands) with decision-making capacity to encourage their support for women seeking preventive breast health [12].

Using this FO measure, we found that larger household size (either more children or adults) and either employed full-time or as a student were significantly associated with higher FO. We also found that being married/living with a significant partner was significantly associated with lower FOS. We hypothesized that women with higher FO have less personal time and fewer financial resources to attend to their own health needs perceived as being nonurgent or life threatening, such as the presence of a painless breast mass, or to receive breast health education. These findings suggest that interventions should target employed, single women with large households in order to have the best results in improving breast cancer outcomes. These vulnerable populations may benefit from specific breast health information provided at the workplace or at colleges. The current method for delivering breast health information at health fairs or social gatherings during the work day may help explain why employed women and students delay presenting for a medical evaluation after self-detecting a breast lump [4, 5].

The high proportion of women diagnosed with late-stage breast cancer is a major contributor to poor outcomes in SSA [2–5]. Reducing late-stage diagnosis is complex and involves individual, societal, and health care infrastructure factors [6, 8, 10]. Earlier diagnosis of breast cancer is a prerequisite to improve breast cancer outcomes in SSA [2, 3]. Participating in preventive health check-ups and breast cancer education are essential steps in resource-stratified implementation of an early breast cancer diagnosis program in a country with limited resources like Uganda [7, 8, 10]. In this study, higher FO was the only predictor tested with a statistically significant association with decreased participation in preventive health check-ups and was also significantly associated with decreased participation in breast cancer education. The association between higher FO and decreased participation in preventive health check-ups suggests that FO may also be an important factor to address in other noncommunicable diseases, such as hypertension and diabetes, which also benefit from preventive health check-ups to prevent the sequelae of late diagnosis.

Programs designed to improve early diagnosis through participating in preventive health check-ups and breast health education need to focus on helping women with high FO [6, 28]. For example, providing breast cancer education through means other than medical clinics may be beneficial. Women with more children and working full-time have lower rates of receiving breast cancer education; thus, providing education materials in the workplace or through children in school may improve the distribution of information. School-based initiatives to distribute HIV/AIDS educational materials have proven an effective prevention strategy in decreasing the prevalence of HIV/AIDS and may prove helpful in noncommunicable disease as well [29, 30].

The limitations of this survey have been previously discussed [10]. Briefly, these limitations include differences in how participants interpreted breast cancer information and general health care. This was mitigated by involving Ugandan breast cancer survivors in the development and delivery of the survey and extensive presurvey discussions on how best to communicate these topics. The survey data are also limited by a convenience-based sampling of women in two large rural and urban geographic areas that may not reflect the attitudes and beliefs of women throughout Uganda. Similarly, responses from healthy women may not reflect the attitudes and beliefs of women once they self-detect a breast lump. Both of these factors may limit the generalizability of this study. Nevertheless, previous qualitative interviews of breast cancer survivors suggest that family plays an important role in health care decisions and is believed by some to be a major reason why some women lived and died from their breast cancer [12]. Also, this study provides additional insight into the heath-seeking behaviors of Ugandan women, as it relates to breast cancer, beyond what is currently available in the literature, which is mainly limited to women who presented to a tertiary medical center [1–3]. Many Ugandan women may also not feel comfortable disclosing that their family causes them stress. A sense of family pride and the belief that having close family relationships are desired in Uganda may result in underrepresentation of FO scores [18, 20]. Another limitation is the assumption that preventive health check-ups would involve a clinical breast examination and breast cancer education would improve breast cancer awareness and breast self-examination. Our study was not powered appropriately to measure these associations, as too few women participate in either of these activities. Likewise, the effect of FO on symptomatic women was also not addressed. Both of these activities would likely improve early diagnosis, and their exact relation to FO should be assessed with future research.

Conclusion

Higher FO among Ugandan women is associated with decreased health-seeking behaviors, such as preventive check-ups and breast cancer education. Efforts to implement early breast cancer diagnosis programs in Uganda should consider FO to help become successful and sustainable, perhaps by involving adult family members.

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Disclosures

The authors indicated no financial relationships.

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