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Associations between Marital Status and Patient-Reported Physical and Mental Health among Breast Cancer Survivors in Georgia

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Abstract

Associations between Marital Status and Patient-Reported Physical and Mental Health among Breast Cancer Survivors in Georgia

By Elaine A. Böing

Purpose: The purpose of this study was to compare patient-reported physical and mental health by marital status among breast cancer survivors survey participants in the State of Georgia.

Methods: This was a secondary analysis of data drawn from a survivorship needs assessment survey that included a convenience sample of female breast cancer survivors who had undergone treatment and who were residents of Georgia. Data collection took place from September to December 2014. Married and not married patients were compared with respect to self-reported physical and mental health status (excellent/very good, good, fair/poor) using ordinal logistic regression models. The association with age, race, and education was also assessed. The results of all models were expressed as odds ratios (OR) and the corresponding 95% confidence intervals (CI).

Results: A total of 389 breast cancer survivors were included in this analysis, with 250 (64%) married and 139 (36%) not married. Most participants were white, between 50 and 64 years of age, and had some college-level education. Compared to married participants, a higher proportion of the not married reported being in fair/poor health status (6.8% vs. 16.8% for physical health; 6.9% vs. 19.7% for mental health). There was interaction between marital status and race. Marital status was associated with endpoints of interest in whites (physical health: OR 3.11; 95% CI 1.90, 5.10; mental health: OR 2.89; 95% CI 1.74, 4.80) but not in blacks.

Conclusions: The observed race-specific associations between marital status and self-reported health among breast cancer survivors may reflect differences in social and family support systems. Both marital status and race should be considered when planning targeted interventions.

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TABLE OF CONTENTS

INTRODUCTION

Breast cancer is one of the most frequently diagnosed types of cancer in the United States. More than 250,000 cases are expected in the country in 2017, with approximately 40,000 estimated deaths [1]. In the State of Georgia, breast cancer is the most common invasive malignancy among females, accounting for 31% of all new cancers in that population, or 7,820 new cases every year [2, 3]. Although an average of 1,125 Georgia females die from breast cancer annually, breast cancer mortality rates in the state have decreased at an average rate of 1.6% every year [3]. Prognosis of breast cancer largely depends on the stage of disease when diagnosed. In Georgia, the overall five-year survival rate is 86%, while local, regional, and distant stages have five-year survival rates of 96%, 81%, and 23%, respectively. From 2004 to 2010, the majority of Georgia females with breast cancer were diagnosed at an early stage [3]. Early detection coupled with improved treatment might contribute to increased survival, which in turn increases the importance of survivorship care.

According to the National Cancer Institute's Office of Cancer Survivorship, individuals are considered cancer survivors from the time of diagnosis through the balance of their lives. Because family members, friends, and caregivers are also impacted by the survivorship experience, they are included in the definition [4]. Survivorship comprises physical, psychosocial, and financial needs, as well as issues related to health care access, effects of follow-up treatment, recurrence, and quality of life [5-8]. A specific prevailing health-related concern among breast cancer survivors is lymphedema of the arm as well as other local effects of surgery such as numbness, tingling, and neuropathic pain. Younger women treated for breast cancer may develop issues related to infertility, premature

menopause, or osteoporosis. In addition, breast cancer survivors may have problems with cognitive impairment, persistent fatigue, hot flashes [9], body image, and sexual health [10].

Associations between health and marital status have been extensively reported in the literature. In most cases, not married men and women were found to have more adverse outcomes, such as significantly higher mortality, than their married counterparts [11, 12]. Similarly, in breast cancer research, studies have demonstrated that not married breast cancer survivors were at a higher risk of being diagnosed at a later stage [13], presenting with metastatic disease [14], being undertreated [14], and dying as a consequence of their cancer [13, 14]. Goodwin and colleagues, however, did not find a significant difference in the 5-year survival between married and not married breast cancer patients [15]. In terms of quality of life, a recent study conducted outside the U.S. demonstrated that survivors who had no partner had poorer health-related quality of life compared to those who had a partner [16]. Another study of breast cancer survivors reported that marital status was not associated with physical well-being, but not married survivors reported poorer mental well-being [17]. While it has been hypothesized that the beneficial effect of being married is due to increased social support, strain from familial and social relationships may also adversely affect health outcomes of breast cancer survivors [10, 18]. Ultimately, it is not clear how marital status impacts breast cancer survivors, especially in terms of outcomes other than survival. Furthermore, evidence from U.S. breast cancer survivor populations is sparse. Therefore, the purpose of this study was to examine whether patient-reported physical and mental health statuses differed according to marital status in a population of female breast cancer survivors in the State of Georgia.

METHODS

Data source and study population

The present study is a secondary data analysis of a survivorship needs assessment implemented by the Georgia Cancer Control Consortium Survivorship Working Group with the Emory University Rollins School of Public Health. The cross-sectional survey was aimed originally at understanding the physical, psychological, practical, and spiritual needs of adult cancer survivors in Georgia. The survivorship assessment tool was derived from published instruments and has been described previously [7].

Data collection occurred from September to December 2014 through self-administration of electronic and paper surveys by a convenience sample of cancer survivors. Inclusion criteria for this analysis were: 1) English-speaking female breast cancer survivors who had undergone treatment and 2) who were residents of Georgia. This study was approved by the Institutional Review Board of Emory University.

Variables

Self-rated physical health status and self-rated mental health status were the outcome variables of interest. Participants were asked: "How would you currently describe your overall physical health?", and "How would you currently describe your overall mental/emotional health?" Each of these quality of life metrics, originally rated on 5-point Likert scales consistent with the Behavioral Risk Factor Surveillance System questionnaire [19], was operationalized as: (1) fair or poor, (2) good, and (3) excellent or very good.

The main independent variable was marital status. Individuals who self-identified as married and those not married but living with a partner were categorized as "married" and

treated as the reference group. Single, separated, divorced, and widowed participants formed the comparison group ("not married").

The covariates included demographic characteristics such as age, race, and education level. Age was categorized as younger than 50, from 50 to 64, and 65 years or older. Categories for race were white, non-Hispanic; black, non-Hispanic; and other (including Asian, Indian, Hispanic, and multiracial). Education level was categorized as high school or less, some college, bachelor's degree, and graduate or professional degree. Additional demographic and clinical characteristics used to describe the population of interest were income, health insurance, geographic area, treatment received, time since last treatment, and presence of another type of cancer.

Statistical analysis

Descriptive statistics were generated for demographic and clinical characteristics grouped by marital status. Differences between married and not married participants were assessed using the Mann-Whitney test.

Unadjusted and adjusted associations were explored using ordinal logistic regression to take into account the inherent ordering of the levels of the outcome variable. Condition indices and variance decomposition proportions were used to examine issues with collinearity. Score tests were used to evaluate the proportional odds assumption [20]. Two no-interaction cumulative logit models were built to summarize the association between each outcome measure and marital status while adjusting for age, race, and education. Confounding was assessed through analyses of causal diagrams [21] and the all-possible subsets approach [22]. In addition, three separated models were built to examine interaction between marital status and age, race, and education, while still controlling for these same

demographic variables. The likelihood ratio test was used to evaluate which interaction terms were statistically significant.

Once final models were obtained, odds ratios (OR) and 95% confidence intervals (CI) were computed to examine the relationship between each independent variable and the outcomes of interest. An odds ratio greater than one indicated that those in the comparison group (not married) were more likely to report lower scores of physical and mental health than those in the reference group (married).

A sensitivity analysis was performed after excluding participants undergoing cancer treatment at the time the survey was administered. Reported p-values are two-sided and the threshold of 0.05 was used to establish statistical significance. All analyses were performed using SAS 9.4 (SAS Institute, Cary NC).

RESULTS

Originally, more than 960 cancer survivors started the needs assessment survey. The present analysis is based on 389 female breast cancer survivors with known marital status information. Two hundred and fifty (64%) survivors were married and 139 (36%) were not married (Table 1). The majority of survivors were between the ages of 50-64 years (52% and 47% respectively in the married and not married groups). However, there was a larger proportion of women under the age of 50 in the married group compared to the not married group (30% versus 23%). Conversely, 30% of not married women were 65 years or older, versus 19% in the married group. Overall, age ranged between 29 and 87 years. Most of the survivors were white in both groups (80% among married participants; 71% among not married), but there was a larger proportion of black women among the not married (25%) compared to the married (13%). Most survivors reported having some college or a bachelor's degree in both groups. A larger proportion of the married, however, reported having a graduate or professional degree (26%) compared to the not married (17%). Not married survivors were more likely to have a household income in the three categories less than $75,000 (p<0.001). There were no differences between groups in terms of health insurance (p=0.532) or geographical area (p=0.896). Married and not married breast cancer survivors were also similar in all types of treatment received, except for surgery (p=0.032). Time since last treatment (p=0.066) and presence of another type of cancer (p=0.484) were comparable in married and not married survivors.

Physical health status

Survivors reported statistically significant differences in physical health by marital status (p<0.001; Figure 1). Among the married, the numbers who reported being in excellent or very good physical health, good physical health, and fair or poor physical health were 166 (66.7%), 66 (26.5%), and 17 (6.8%), respectively. Among not married breast cancer survivors, the numbers reporting on the same physical health status were 63 (46.0%), 51 (37.2%), and 23 (16.8%).

In unadjusted analysis, not married survivors were significantly more likely to report worse physical health status than married survivors (OR 2.42; 95% CI 1.60, 3.65). After adjusting for age, race, and education, the association remained unaltered, with not married breast cancer survivors reporting significantly worse physical health (OR 2.41; 95% CI 1.56, 3.70; Table 2).

Interaction terms between marital status and age, and marital status and education in two separate models were not statistically significant (data not shown). Stratum-specific 95% confidence intervals overlapped in all analyses and did not provide evidence of clear patterns. In a third model involving interaction between marital status and race, however, the p-value for the interaction terms coincided with the threshold for statistical significance (p=0.050). The association between marital status and physical health was evident in whites (OR 3.11; 95% CI 1.90, 5.10; p<0.001) but not in blacks (OR 1.30; 95% CI 0.49, 3.40; p=0.599).

Mental health status

Breast cancer survivors also reported statistically significant differences in mental health by marital status (p<0.001; Figure 1). Among married women, the numbers reporting excellent or very good mental health, good mental health, and fair or poor mental health

were 174 (70.2%), 57 (23.0%), and 17 (6.9%), respectively. The numbers of not married

participants reporting the same mental health status were 74 (54.0%), 36 (26.3%), and 27

(19.7%).

Estimates from the unadjusted model suggest that not married survivors were

significantly more likely to report worse mental health status (OR 2.19; 95% CI 1.44, 3.33).

In the model adjusting for age, race, and education, the association remained the same (OR

2.19; 95% CI 1.40, 3.41; Table 2) indicating no evidence of confounding.

As with physical health, interaction terms between marital status and age, and marital

status and education in two separate models were not statistically significant (data not

shown), with overlapping stratum-specific 95% confidence intervals and absence of clear

patterns. However, the interaction between marital status and race in a third model was

statistically significant (p=0.018). The association between marital status and mental health

was again evident in whites (OR 2.89; 95% CI 1.74, 4.80; p<0.001) but not in blacks (OR

1.14; 95% CI 0.43, 3.04; p=0.786).

Sensitivity analysis

A total of 83 women were undergoing treatment at the time the survey was

administered. Among them, 50 (20%) were married and 33 (24%) were not married.

Excluding these participants from analysis resulted in similar unadjusted and adjusted odds

ratios. There were no significant interactions between marital status and any of the covariates

in both physical and mental health status models.

DISCUSSION

While previous studies investigated the association between marital status and survival in breast cancer [13-15], quality of survival has not been extensively examined. In this study, we analyzed the association between breast cancer survivors' marital status and self-reported health. We found that not married survivors were significantly more likely to report worse physical and mental health than married survivors. Our results align with a study that described poorer physical and mental quality of life among not married breast cancer survivors [16], but partially contrast with a study that found a significant relationship for mental well-being only [17].

The beneficial effect of marital status has been attributed to increased social support, which can substantially impact cancer detection and treatment [14, 23, 24]. Married individuals might receive more practical support for everyday tasks and, consequently, have more time to focus on treatment [25]. Marriage has also been found to correlate with healthy behaviors such as maintaining regular screening visits and seeking medical care with milder symptoms [24]. Moreover, a previous study conducted in a relatively similar population demonstrated that marital status was independently associated with the receipt of guideline-concordant adjuvant therapy. Guy *et al.* reported that not married breast cancer survivors in rural Georgia were more likely to be non-concordant for chemotherapy and radiation therapy guidelines, suggesting inadequate cancer care in that population [26].

Interaction between marital status and race in a similar population has been reported by Lipscomb and colleagues. In their study, black race was positively associated with completing chemotherapy. Furthermore, not married black breast cancer patients were more likely to complete care than the not married white, while there were no racial differences for

married patients [27]. In the present study, the estimated detrimental influence of being not married was evident in whites but not in blacks. Not married white breast cancer survivors were approximately three times more likely to report worse physical and mental health than married breast cancer survivors, while marital status did not impact health scores among blacks. Distinct characteristics of social networks of blacks and whites may help explain race differences. For example, church-based social support may be more important as a coping mechanism for blacks than for whites [28]. Blacks may also receive more support from and have more frequent contact with relatives in general. In addition, blacks, more than whites, are able to redefine their relationships with friends and create fictive kin who function when family relationships are insufficient [29].

Breast cancer is often diagnosed at an early stage and the overall five-year survival rate among Georgia patients is close to 90%. As the population of breast cancer survivors is expected to continue growing and quality of life after diagnosis is emphasized, the need for survivorship care is expected to increase. Health care providers often use survivorship care guidelines to make recommendations according to survivor characteristics, such as type of cancer, number of years post-treatment, sex, and age. The American Cancer Society/American Society of Clinical Oncology Breast Cancer Survivorship Care Guideline specifically states that clinicians should encourage the inclusion of caregivers (typically spouses, partners or family members) in usual follow-up care to optimize survivor wellness [30]. Further tailoring recommendations according to marital status and race might prove a successful strategy for improving patient-reported health, especially among the not married white. For example, they can be offered services such as one-on-one peer support or group therapy. Web-based interventions have also been successfully implemented to provide psychological care for breast cancer survivors [31].

This study is subject to a number of limitations, especially impacting generalizability, since the vast majority of participants were white, had health insurance, and lived in the metro-Atlanta area. In addition, the use of a convenience sample instead of a random sample makes the study susceptible to selection bias. Also, the sample size prevented a meaningful assessment of interactions, which would require a larger number of observations per stratum for proper comparisons across subpopulations. Finally, as with many cross-sectional studies, temporality between exposure and outcome could not be ascertained. Therefore, we cannot draw any causal inferences between marital status and physical and mental health. Temporality issues also prevented us from taking into consideration the effect of treatment, which could act as a confounder or a mediator of the relationship between marital status and patient-reported health.

CONCLUSION

The present analysis has reinforced the notion that marital status is significantly associated with physical and mental health. Moreover, marital status was important only among whites, with not married white survivors being more likely to report worse physical and mental health than married white survivors. The observed race-specific associations between marital status and self-reported health among breast cancer survivors may reflect differences in social and family support systems. Both marital status and race should be considered when planning targeted interventions. Further studies are warranted to understand specific survivor needs that, when met, could lead to decreased cancer morbidity in this population.

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Table 1. Sociodemographic and clinical characteristics of study participants by

marital status

Participant characteristics	Marital status		p-value[*]
	Married (n=250; 64%)	Not married (n=139; 36%)	
Sociodemographic			
Age (years), n (%)			0.019
<50	74 (29.7)	32 (23.2)	
50-64	129 (51.8)	65 (47.1)	
65+	46 (18.5)	41 (29.7)	
Race/ethnicity, n (%)			0.073
White	201 (80.4)	99 (71.2)	
Black	32 (12.8)	35 (25.2)	
Other	17 (6.8)	5 (3.6)	
Education, n (%)			0.017
High school or less	16 (6.4)	15 (10.8)	
Some college	85 (34.0)	55 (39.6)	
Bachelor's degree	83 (33.2)	45 (32.4)	
Graduate/professional degree	66 (26.4)	24 (17.3)	
Household income, n (%)			<0.001
Less than $20,000	2 (1.1)	18 (14.9)	
$20,000-$39,999	14 (7.8)	31 (25.6)	
$40,000-$74,999	41 (22.9)	43 (35.5)	
$75,000 or more	122 (68.2)	29 (24.0)	
Health insurance, n (% Yes)	241 (97.6)	132 (96.4)	0.532
Metro-Atlanta, n (% Yes)	194 (79.5)	108 (78.8)	0.896
Clinical characteristics			
Treatment received, n (%)			
Surgery	223 (89.2)	113 (81.3)	0.032
Radiation therapy	176 (70.4)	91 (65.5)	0.362
Chemotherapy	150 (60.0)	82 (59.0)	0.914
Hormone therapy	94 (37.6)	42 (30.2)	0.151
Other/None	17 (6.8)	7 (5.0)	0.521
Time since last treatment, n (%)			0.066
Less than 1 year	71 (30.1)	52 (38.2)	
1-5 years	100 (42.4)	57 (41.9)	
5-10 years	35 (14.8)	12 (8.8)	
More than 10 years	30 (12.7)	15 (11.0)	
Presence of another type of cancer, n (%)	23 (9.2)	16 (11.5)	0.484

[*]Mann-Whitney test. Frequency missing: age (2), income (89), metro-Atlanta (8), insurance (5), time since last treatment (17).

Table 2. Adjusted odds ratios and 95% confidence intervals for physical and mental health statuses among breast cancer survivors

Participant characteristics	Physical health status OR (95% CI)	Mental health status OR (95% CI)
Marital status		
Married	1.00 (ref.)	1.00 (ref.)
Not married	2.41 (1.56, 3.70)	2.19 (1.40, 3.41)
Age (years)		
<50	1.00 (ref.)	1.00 (ref.)
50-64	0.85 (0.53, 1.38)	0.66 (0.40, 1.07)
65+	0.82 (0.46, 1.48)	0.47 (0.26, 0.88)
Race/ethnicity		
White	1.00 (ref.)	1.00 (ref.)
Black	0.88 (0.51, 1.53)	0.98 (0.56, 1.71)
Other	1.03 (0.43, 2.50)	0.59 (0.22, 1.59)
Education		
High school or less	1.76 (0.78, 3.94)	1.32 (0.55, 3.14)
Some college	1.27 (0.74, 2.18)	1.70 (0.96, 3.02)
Bachelor's degree	0.71 (0.40, 1.26)	1.10 (0.61, 2.00)
Graduate or professional degree	1.00 (ref.)	1.00 (ref.)

Figure 1. Physical and mental health by marital status of breast cancer survivors