# Resilience Among Breast Cancer Survivors of Different Sexual Orientations

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## Abstract

*Purpose:* Resilience could help protect the psychosocial wellbeing of sexual minority women (SMW) experiencing stressors from both breast cancer and sexual minority status; however, little research has assessed resilience among breast cancer survivors of different sexual orientations.

*Methods:* From 2011 to 2012, we surveyed a national sample of breast cancer survivors matched on sexual orientation, age, and cancer status.

*Results:* Among heterosexual ($n = 339$) and sexual minority ($n = 201$) breast cancer survivors ($n = 540$ overall), multivariable regression analyses revealed that more social support (coefficient: 0.87; 95% confidence interval [CI]: 0.56–1.19), fighting spirit combined with helplessness/hopelessness (coefficient: 0.30; 95% CI: 0.13–0.47), and fatalism (coefficient: 0.40; 95% CI: 0.14–0.65) were associated with greater resilience. Mental health counseling before breast cancer diagnosis and anxious preoccupation following cancer diagnosis were associated with reduced resilience (coefficient: −2.50; 95% CI: −3.83 to −1.18; and −0.46; 95% CI: −0.60 to −0.32). Although sexual orientation was not independently associated with resilience, among SMW, those who were unemployed had reduced resilience compared with those who were employed (coefficient: −3.52; 95% CI: −5.75 to −1.28), whereas there was no association between employment and resilience among heterosexual women.

*Conclusion:* These findings suggest that social support and other factors associated with resilience could be leveraged by interventions to improve the health and wellbeing of diverse cancer survivors.

**Keywords:** breast cancer, health disparities, resilience, sexual minority women

## Introduction

RESILIENCE IS GENERALLY defined as the ability to adapt positively to adversity, "bounce back" from challenging experiences, and work through difficult situations while remaining unharmed or even growing stronger.[1,2] Rather than the mere absence of psychological distress, resilience is conceptualized as a dynamic process of adaptation to stressors that results from a combination of personal attributes, learned abilities, environmental contexts, and social resources accumulated across the life course.[3] By caring for oneself, engaging in life, drawing on social support, and balancing responsibilities with recreation and rest, resilience enables individuals to overcome stress, anxiety, fear, depression, and other negative emotions.[4]

Sexual minority (SM) populations (i.e., including lesbian, gay, and bisexual individuals) have been recognized for developing high levels of resilience.[5] In line with the theory of minority stress, the resilience of SM populations may result from the multiple, overlapping forms of adversity, stigmatization, discrimination, internalized homonegativity, and chronic stress that they experience throughout their lives.[6] In contrast to research focusing exclusively on risks and deficits, the growing literature on resilience suggests that health outcome assessment and intervention development should include thorough investigation of strengths and assets.[7] However, most research on resilience among SM populations has focused on a limited range of health behaviors and outcomes, most notably HIV transmission among gay and bisexual men.[7] Although resilience has been identified as a correlate of psychological

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distress and mental health outcomes among transgender individuals,[8] little resilience research has focused on sexual minority women (SMW).[9]

Cancer diagnosis and treatment represent highly significant, stressful events that result in short- and long-term psychosocial needs. Breast cancer survivors report heightened anxiety and fear of cancer recurrence along with decreased quality of life and social wellbeing.[10] Breast cancer may promote some positive psychosocial reactions related to resilience.[11] However, few studies have focused on psychosocial adjustment or coping among breast cancer survivors of diverse sexual orientations,[12] even though SMW with breast cancer may experience greater stress during the cancer treatment and survivorship processes due to sexual orientation-related stigma, discrimination, and heteronormative healthcare policies and practices (e.g., excluding partners from treatment discussions).[13–15]

With recent improvements in breast cancer detection and treatment, survivors are living longer and represent an increasing proportion of cancer survivors.[16] The objectives of our study were thus to assess levels of resilience among breast cancer survivors of diverse sexual orientations and identify factors associated with resilience. In line with the theory of minority stress, we hypothesized that, following the additional stressor of breast cancer, SMW would exhibit greater resilience than heterosexual women (HSW). Based on the nascent, mostly separate literatures on resilience following cancer and resilience among SMW, we also hypothesized that resilience would be associated with other sociodemographics, clinical indicators (e.g., cancer severity),[5,8,9,11] and access to social support.[5,8,9,11] Given the positive psychosocial outcomes associated with resilience, understanding the correlates of resilience and whether it differs by sexual orientation could help inform interventions to promote the psychosocial adjustment and long-term health and wellbeing of diverse breast cancer survivors.[17]

## Methods

### Study design and sample

From October 2011 to June 2012, we recruited breast cancer survivors via the national ''Army of Women,'' an online recruitment resource designed to partner with researchers to accelerate breast cancer research. Women received an email about the study and, if interested, informed the Army of Women, which then forwarded their contact information to our study team for eligibility screening. Upon receiving contact information for interested women, we emailed invitations and consent forms or mailed these documents via postal service depending on women's preferences. We then called interested women by telephone to screen for eligibility and, if eligible, obtained verbal consent before conducting the survey. Our recruitment had two phases. First, we targeted SMW who were eligible based on the following criteria: older than 21 years of age and identified as lesbian or bisexual women or reported having a woman as a partner, in an effort to include women who may have felt uncomfortable embracing a lesbian or bisexual identity. After completing the recruitment of SMW, we then targeted HSW. We also asked each enrolled participant to refer other women breast cancer survivors to our study.

During eligibility screening, we classified breast cancer survivors according to their cancer status using a predeter-mined order of six cancer groups, acknowledging that participants could fall into more than one group: (1) metastatic cancer, (2) second cancers, (3) recurrent breast cancer, (4) diagnosed in the past 12 months, (5) current invasive treatment (defined as surgery, radiation, chemotherapy, or Herceptin), and (6) current noninvasive treatment (defined as antiestrogen therapy such as Tamoxifen). HSW were eligible if they matched an already recruited SMW in age (±5 years) and cancer status group. The Boston University Institutional Review Board approved all study procedures.

### Data collection and measures

Trained interviewers administered telephone surveys measuring domains that we hypothesized to be associated with resilience. Sociodemographics were age, race (White vs. other), Hispanic ethnicity, educational attainment, employment, health insurance status, income, partnership status, living with partner/spouse, spouse/partner is female, and legal marital status. Medical and clinical measures were cancer grouping, years since first breast cancer diagnosis, highest stage of cancer, type of breast cancer treatment, number of comorbidities, and body mass index (BMI).

Psychosocial and interpersonal factors were general social support (6-item short form Interpersonal Support Evaluation List [ISEL; range 6–24],[18,19] which measures belonging, tangible support, and appraisal with items such as, ''When I feel lonely, there are several people I can talk to,'' using 4-point Likert scale response options, ranging from ''definitely true'' to ''definitely false''), cancer support group attendance, mental health counseling before breast cancer diagnosis, and discrimination experiences, including harassment or being prevented from doing something based on age, race/ethnicity, gender, sexual orientation, appearance, income level, or cancer experience. We treated total discrimination experiences as continuous and categorical variables (none, 1, and ≥2 types of discrimination experiences).

We assessed cancer coping using five subscales of the 29-item Mental Adjustment to Cancer (Mini-MAC) scale: (1) ''fighting spirit'' (determination to fight cancer and optimism; measured by four items; range 4–16), (2) anxious preoccupation (constant feelings of anxiety, fear, and devastation; eight items; range 8–32), (3) helplessness/hopelessness (giving up, feeling pessimistic and engulfed by cancer; eight items; range 8–32), (4) fatalism (giving control to a ''higher power,'' living day by day; five items; range 5–20), and (5) cognitive avoidance (distracting oneself from thoughts of illness; four items; range 4–16).[20] After summing the 4-point Likert scale response items from ''definitely does not apply to me'' to ''definitely applies to me'' that make up each subscale, higher scores on fighting spirit and lower scores on the other four subscales indicate active and adaptive coping strategies. As recommended, we combined the subscales for fighting spirit and helplessness/hopelessness.[20]

Resilience, our dependent variable of interest, was measured using the 14-item Resilience Scale (RS-14), which assesses the following domains: (1) self-reliance (belief in one's own capabilities, recognizing personal strengths and limitations), (2) meaning/purposeful life (realization that life has meaning for which to live), (3) equanimity (recognition of one's own wisdom, optimism in one's ability to ''take things in stride''), (4) perseverance (emotional stamina, self-discipline,

determination despite difficulty or discouragement), and (5) existential aloneness (accepting and living with oneself and being able to ''go it alone'' if necessary).[4] The RS-14 uses a 7-point scale ranging from 1 (''strongly disagree'') to 7 (''strongly agree''). Summing all 14 items provides one total score of resilience, with higher scores indicating higher resilience (total possible scores range from 14 to 98).

### Statistical analysis

We matched HSW to SMW based on cancer groups (described above in Study design and sample) and age at screening ±5 years, which yielded 173 matched clusters of two to seven women. All data analyses were conducted using generalized estimating equations (GEE) with an exchangeable working correlation structure or Cochran–Mantel–Haenszel (CMH) analysis to account for matching. Characteristics of cancer survivors were described through mean and standard deviations for continuous variables and number and percentage for categorical variables. Differences in characteristics by sexual orientation were assessed through bivariable GEE linear regression for continuous variables, GEE logistic regression for dichotomous variables, and CMH analysis for categorical variables.

To identify factors associated with resilience, we followed a three-part model-building process. First, we conducted bivariable GEE linear regression analyses on resilience with each characteristic separately. Variables attaining statistical significance of $p < 0.10$ in the bivariable analyses were assessed for potential collinearity through Spearman's correlation matrix. One variable was selected from any pair of variables with $r > 0.40$. Next, stepwise regression considered the set of resulting variables using AIC for model building with the PROC GLMSELECT procedure in SAS. Finally, the selected model was run as a GEE model to account for the matching. All analyses were conducted using SAS/STAT Version 9.4 of the SAS System for Microsoft Windows (SAS Institute Inc., Cary, NC, 2002–2010).

## Results

### Characteristics of breast cancer survivors

Table 1 compares characteristics of heterosexual ($n = 339$) and SM breast cancer survivors ($n = 201$; $n = 540$ overall). Compared with HSW, average age was slightly lower among SMW (53.4 vs. 55.1 years). There were no differences between groups in race/ethnicity (91% overall identified as White), educational attainment (76% completed college or graduate school), or employment status (65% were employed); however, more HSW reported individual income in the lowest category (34% vs. 24%; $p = 0.0009$). More HSW than SMW were currently married or partnered (86% vs. 79%; $p = 0.03$) and lived with their spouse/partner (97% vs. 92% of those currently married/partnered; $p = 0.01$).

Regarding medical and clinical measures, average time since first breast cancer diagnosis was 4.9 years. Compared with HSW, SMW were more likely to report an in situ cancer as the highest stage of cancer and less likely to report a Stage IV cancer, and BMI was slightly higher among SMW than HSW (27.9 vs. 26.6; $p = 0.009$). Although there were no statistically significant differences by sexual orientation in the number of comorbidities, the types of cancer treatments differed

between groups ($p = 0.0002$ for breast cancer treatment, $p = 0.03$ for chemotherapy, and $p = 0.005$ for hormone treatment). In terms of psychosocial and interpersonal factors, more SMW reported seeking mental health counseling before cancer diagnosis (74% vs. 47%; $p < 0.0001$). SMW also reported more discrimination (46% vs. 17% reporting two or more types of discrimination experiences; $p < 0.0001$). There were no differences by sexual orientation in resilience or other psychosocial or interpersonal factors.

### Factors associated with resilience

Table 2 provides bivariable (unadjusted) associations of survivors' characteristics with resilience. Sociodemographic characteristics that were associated with more resilience were being employed and having higher income. In the medical and clinical measures domain, cancer stage and radiation treatment were associated with resilience, and higher numbers of comorbidities were associated with reduced resilience. In the psychosocial and interpersonal domain, social support was positively associated with resilience, whereas cancer support group utilization and past mental health counseling were associated with reduced resilience. Finally, aspects of mental adjustment to cancer were differentially associated with resilience, with fatalism and fighting spirit combined with helplessness/hopelessness being associated with increased resilience, and anxious preoccupation and cognitive avoidance being associated with reduced resilience.

### Factors independently associated with resilience

In our final multivariable model (Table 3), as hypothesized, social support was positively associated with resilience (adjusted coefficient: 0.87 per point increase in ISEL-SF score; 95% confidence interval [CI]: 0.56, 1.19; $p < 0.0001$). Two aspects of mental adjustment to cancer were positively associated with resilience: fighting spirit combined with helplessness/hopelessness (coefficient: 0.30 per point increase in Mini-MAC score; 95% CI: 0.13–0.47; $p = 0.002$) and fatalism (coefficient: 0.40 per point increase in Mini-MAC score; 95% CI: 0.14–0.65; $p = 0.003$). Mental health counseling before breast cancer diagnosis and anxious preoccupation following cancer diagnosis were associated with reduced resilience (coefficient: $-2.50$; 95% CI: $-3.83$ to $-1.18$; $p = 0.0004$; and $-0.46$ per point increase in Mini-MAC score; 95% CI: $-0.60$, $-0.32$; $p < 0.0001$). Sexual orientation was not independently associated with resilience; however, an interaction between sexual orientation and employment revealed that, among SMW, those who were unemployed had reduced resilience compared with those who were employed (coefficient: $-3.52$; 95% CI: $-5.75$ to $-1.28$; $p = 0.002$). There was no association between employment and resilience among HSW.

## Discussion

Limited cancer survivorship research has assessed resilience among breast cancer survivors of different sexual orientations. However, resilience is relevant for psychosocial wellbeing among SMW who often experience breast cancer risk[21–24] and SM stress during treatment and survivorship.[13–15] In our sample, resilience did not differ by sexual orientation; thus, we did not find evidence that resilience was additive

TABLE 1. CHARACTERISTICS OF BREAST CANCER SURVIVORS BY SEXUAL ORIENTATION ($n = 540$)

| Variable | Overall (n=540) | Heterosexual women (n=339) | Sexual minority women (n=201) | Matched p-value |
|---|---|---|---|---|
| Sociodemographics | | | | |
| Age (mean, SD)[a] | 54.4 (8.7) | 55.1 (8.8) | 53.4 (8.5) | — |
| White vs. other race[b] | 491 (90.9%) | 314 (92.6%) | 177 (88.1%) | 0.0749 |
| Hispanic/Latina ethnicity | 15 (2.8%) | 7 (2.1%) | 8 (4.0%) | 0.2106 |
| Highest educational attainment | | | | 0.5569 |
|   High school or technical training or below | 31 (5.8%) | 21 (6.2%) | 10 (5.0%) | |
|   Some college | 95 (17.6%) | 56 (16.6%) | 39 (19.4%) | |
|   Graduated college | 208 (38.6%) | 142 (42.0%) | 66 (32.8%) | |
|   Completed graduate school | 205 (38.0%) | 119 (35.2%) | 86 (42.8%) | |
|   Missing | 1 | 1 | 0 | |
| Currently employed for salary or wages (including self-employed) | 351 (65.0%) | 212 (62.5%) | 139 (69.2%) | 0.0853 |
| Currently has health insurance | 536 (99.3%) | 336 (99.1%) | 200 (99.5%) | 0.6179 |
| Individual income before taxes | | | | 0.0009 |
|   <$30K | 163 (30.2%) | 114 (33.6%) | 49 (24.4%) | |
|   $30K–<$70K | 185 (34.3%) | 106 (31.3%) | 79 (39.3%) | |
|   $70K or more | 162 (30.0%) | 93 (27.4%) | 69 (34.3%) | |
|   Unknown | 30 (5.6%) | 26 (7.7%) | 4 (2.0%) | |
| Currently has spouse or partner | 448 (83.0%) | 290 (85.5%) | 158 (78.6%) | 0.0278 |
| Currently lives with spouse/partner (among n=448) | 426 (95.1%) | 281 (96.9%) | 145 (91.8%) | 0.0107 |
| Spouse/partner is female (among n=448) | 143 (31.9%) | 0 (0.0%) | 143 (90.5%) | — |
| Current (legal) marital status | | | | <0.0001 |
|   Never married | 99 (18.5%) | 26 (7.7%) | 73 (37.4%) | |
|   Married | 348 (65.2%) | 262 (77.3%) | 86 (44.1%) | |
|   Separated, divorced, widowed | 87 (16.3%) | 51 (15.0%) | 36 (18.5%) | |
|   Missing | 6 | 0 | 6 | |
| Medical and clinical measures | | | | |
| Cancer grouping[a] | | | | — |
|   Metastatic cancer | 64 (11.9%) | 48 (14.2%) | 16 (8.0%) | |
|   Second cancer | 102 (18.9%) | 71 (20.9%) | 31 (15.4%) | |
|   Recurrent breast cancer | 58 (10.7%) | 39 (11.5%) | 19 (9.5%) | |
|   Diagnosis in the past year | 152 (28.2%) | 103 (30.4%) | 49 (24.4%) | |
|   Current invasive treatment | 5 (0.9%) | 3 (0.9%) | 2 (1.0%) | |
|   Current noninvasive treatment | 159 (29.4%) | 75 (22.1%) | 84 (41.8%) | |
| Years since first breast cancer diagnosis (mean, SD) | 4.9 (5.7) | 5.1 (6.1) | 4.6 (4.9) | 0.0961 |
| Highest stage of cancer (ever) | | | | 0.0054 |
|   In situ (or ductal carcinoma in situ) | 77 (14.3%) | 39 (11.6%) | 38 (18.9%) | |
|   Stage I | 187 (34.8%) | 119 (35.3%) | 68 (33.8%) | |
|   Stage II | 161 (29.9%) | 97 (28.8%) | 64 (31.8%) | |
|   Stage III | 48 (8.9%) | 33 (9.8%) | 15 (7.5%) | |
|   Stage IV | 65 (12.1%) | 49 (14.5%) | 16 (8.0%) | |
|   Missing | 2 | 2 | 0 | |
| Breast cancer treatment | | | | 0.0002 |
|   Lumpectomy | 197 (36.5%) | 122 (36.0%) | 75 (37.3%) | |
|   Mastectomy only | 134 (24.8%) | 66 (19.5%) | 68 (33.8%) | |
|   Mastectomy and reconstruction | 190 (35.2%) | 138 (40.7%) | 52 (25.9%) | |
|   Neither lumpectomy nor mastectomy | 19 (3.5%) | 13 (3.8%) | 6 (3.0%) | |
| Radiation treatment | | | | 0.0572 |
|   Never | 201 (37.2%) | 114 (33.6%) | 87 (43.3%) | |
|   Past | 316 (58.5%) | 210 (61.9%) | 106 (52.7%) | |
|   Current | 23 (4.3%) | 15 (4.4%) | 8 (4.0%) | |
| Chemotherapy treatment | | | | 0.0288 |
|   Never | 214 (39.6%) | 132 (38.9%) | 82 (40.8%) | |
|   Past | 270 (50.0%) | 174 (51.3%) | 96 (47.8%) | |
|   Current | 56 (10.4%) | 33 (9.7%) | 23 (11.4%) | |
| Hormone treatment | | | | 0.0049 |
|   Never | 153 (28.4%) | 93 (27.5%) | 60 (29.9%) | |
|   Past | 85 (15.8%) | 57 (16.9%) | 28 (13.9%) | |
|   Current | 301 (55.8%) | 188 (55.6%) | 113 (56.2%) | |
|   Missing | 1 | 1 | 0 | |

*(continued)*

TABLE 1. (CONTINUED)

| Variable | Overall (n = 540) | Heterosexual women (n = 339) | Sexual minority women (n = 201) | Matched p-value |
|---|---|---|---|---|
| Number of comorbidities | | | | 0.2655 |
| None | 66 (12.3%) | 44 (13.1%) | 22 (11.1%) | |
| One | 96 (17.9%) | 57 (16.9%) | 39 (19.6%) | |
| Two | 136 (25.4%) | 95 (28.2%) | 41 (20.6%) | |
| Three or more | 238 (44.4%) | 141 (41.8%) | 97 (48.7%) | |
| Missing | 4 | 2 | 2 | |
| BMI (mean, SD) | 27.1 (5.8) | 26.6 (5.4) | 27.9 (6.3) | 0.0090 |
| Psychosocial and interpersonal factors | | | | |
| Social support (mean ISEL-SF score, SD) | 22.2 (2.5) | 22.1 (2.6) | 22.3 (2.3) | 0.4569 |
| Current or past cancer support group attendance | 240 (44.4%) | 150 (44.2%) | 90 (44.8%) | 0.9011 |
| Ever sought mental health counseling (before breast cancer diagnosis) | 306 (56.7%) | 158 (46.6%) | 148 (73.6%) | <0.0001 |
| Discrimination (number of different types of discrimination experienced) | | | | <0.0001 |
| None | 271 (50.3%) | 204 (60.2%) | 67 (33.5%) | |
| One | 120 (22.3%) | 78 (23.0%) | 42 (21.0%) | |
| Two or more | 148 (27.5%) | 57 (16.8%) | 91 (45.5%) | |
| Missing | 1 | 0 | 1 | |
| Mental adjustment to cancer (Mini-MAC scale) | | | | |
| Anxious preoccupation (mean, SD) | 19.0 (4.5) | 19.3 (4.4) | 18.6 (4.5) | 0.0524 |
| Cognitive avoidance (mean, SD) | 9.6 (2.4) | 9.7 (2.3) | 9.3 (2.4) | 0.0537 |
| Fatalism (mean, SD) | 15.5 (2.6) | 15.6 (2.6) | 15.3 (2.5) | 0.1715 |
| Fighting spirit combined with helplessness/ hopelessness (mean, SD) | 30.0 (4.7) | 30.1 (4.7) | 29.9 (4.7) | 0.6106 |
| Resilience (mean score on RS-14 scale, SD) | 86.0 (9.2) | 86.0 (9.4) | 85.9 (8.8) | 0.9670 |

[a]Age and cancer grouping were matching criteria; no analysis conducted.
[b]Other race category is comprised of 12 women who identified as Black/African American, 2 as Asian, 9 as mixed race, 11 as other race, and 15 missing.

due to the dual stressors of SM status and breast cancer. The theory of minority stress posits that SM populations develop resilience from the multiple, overlapping forms of adversity faced throughout their lives.[6] In our sample, the added distress surrounding breast cancer may not confer additional resilience for SMW who had lower cancer stages than HSW. At the same time, breast cancer may provide an opportunity for HSW to develop resilience at levels of SMW. Longitudinal research assessing resilience before cancer diagnosis and throughout treatment could provide additional insights regarding these processes. For women in our sample, breast cancer may be a more recent traumatic event that "equalized" resilience across preexisting sexual orientation differences.

We did find, however, that unemployed SMW had lower resilience than employed SMW. This may suggest that resilience is reduced in the presence of multiple, simultaneous stressors external to the individual, such as social and structural determinants of health. As such, SMW struggling with unemployment lack the social resources needed to maintain resilience.[1,2] Alternatively, it is also possible that preexisting low resilience reflects reduced ability to balance multiple, competing responsibilities with recreation, rest, and self-care,[3,4] resulting in greater life disruption that prevents some SMW from returning to employment. Again, longitudinal research is needed into the processes of developing and maintaining resilience in light of the numerous, overlapping forms of adversity experienced by cancer survivors.

Several psychosocial and interpersonal factors were associated with resilience. Social support was positively associated with resilience. Research among SM populations has shown that social support from partners and peers is often more protective against SM stress and psychological distress than support from family members.[8,25,26] In the face of family rejection, young SMW may develop resilience and improved self-esteem by cultivating connections with SM organizations.[9] Interventions seeking to improve psychosocial outcomes among breast cancer survivors should explore methods of bolstering support from different sources.[25] Research is needed to determine how the strengths and assets already possessed by diverse individuals[7] could be leveraged to help improve coping with cancer.[11,27–29]

We also found that two aspects of mental adjustment to cancer were associated with greater resilience. First, fatalism was positively associated with resilience, which may relate directly to conceptualizations of resilience as the ability to "work through" and "bounce back" from adversity without blaming oneself.[1–4] Fatalism has some negative connotations in the health literature (e.g., avoiding responsibility for consequences of risk behaviors). However, fatalism in the context of coping with cancer may reflect the ability to relinquish control (e.g., to doctors or a "higher power") without feelings of personal responsibility or guilt.[20] Like resilience, fatalism could help reduce stress by increasing patients' focus on smaller, daily behaviors within their immediate control. Second, fighting spirit combined with helplessness/hopelessness was also associated positively with resilience. These constructs represent determination to fight cancer and feeling engulfed by cancer. While combining both optimistic and pessimistic attitudes,[20]

TABLE 2. UNADJUSTED ASSOCIATIONS BETWEEN BREAST CANCER SURVIVORS'
CHARACTERISTICS AND RESILIENCE ($n = 540$)

| Variable | Beta (95% CI) | Type III p-value |
|---|---|---|
| Sociodemographics | | |
| White (vs. other race) | −0.42 (−2.6083 to 1.77) | 0.7088 |
| Hispanic/Latina ethnicity | 0.38 (−2.62 to 3.37) | 0.8095 |
| Education: <HS/HS/Tech vs. completed college | 0.06 (−3.65 to 3.77) | 0.8981 |
| Education: Some college vs. completed college | −0.19 (−2.55 to 2.18) | |
| Education: Completed graduate school vs. completed college | 0.56 (−1.15 to 2.27) | |
| Not employed vs. employed | −2.76 (−4.51 to −1.02) | 0.0044 |
| No health insurance vs. has health insurance | −8.75 (−12.37 to −5.13) | 0.0640 |
| Income: <$30k vs. $70k or more | −4.65 (−6.78 to −2.52) | 0.0006 |
| Income: $30k–<$70k vs. $70k or more | −0.64 (−2.18 to 0.91) | |
| Income: Unknown vs. $70k or more | −3.58 (−7.50 to 0.34) | |
| Has a spouse or partner vs. not | 0.40 (−2.00 to 2.80) | 0.7457 |
| Lives with spouse or partner vs. not | 1.40 (−0.81 to 3.62) | 0.2179 |
| Spouse/partner: female vs. male | 0.1539 (−1.50 to 1.80) | 0.9362 |
| Spouse/partner: none vs. male | −0.35 (−2.78 to 2.08) | |
| Marital status: never married vs. married | −0.02 (−2.08 to 2.04) | 0.5336 |
| Marital status: separated/divorced/widowed vs. married | −1.40 (−3.94 to 1.14) | |
| Medical and clinical measures | | |
| BMI (continuous) | 0.06 (−0.20 to 0.02) | 0.1345 |
| Years since first breast cancer diagnosis | 0.02 (−0.10 to 0.14) | 0.7101 |
| Stage I vs. in situ | 4.15 (1.89 to 6.42) | 0.0097 |
| Stage II vs. in situ | 3.24 (0.63 to 5.86) | |
| Stage III vs. in situ | 2.55 (−1.35 to 6.44) | |
| Stage IV vs. in situ | 2.14 (−0.17 to 4.45) | |
| Treatment: mastectomy only vs. lumpectomy | −1.75 (−3.84 to 0.33) | 0.2381 |
| Treatment: mastectomy and reconstruction vs. lumpectomy | −1.44 (−3.04 to 0.16) | |
| Treatment: neither lumpectomy nor mastectomy vs. lumpectomy | 0.49 (−4.20 to 5.18) | |
| Radiation: current vs. never | 4.33 (1.44 to 7.21) | 0.0396 |
| Radiation: past vs. never | −0.23 (−1.89 to 1.44) | |
| Chemotherapy: current vs. never | −0.27 (−2.35 to 1.81) | 0.2026 |
| Chemotherapy: past vs. never | −1.43 (−3.01 to 0.15) | |
| Hormone treatment: current vs. never | −0.17 (−1.71 to 1.36) | 0.9729 |
| Hormone treatment: past vs. never | −0.02 (−2.18 to 2.14) | |
| Comorbidities: 1 vs. 0 | 1.24 (−1.18 to 3.65) | 0.0283 |
| Comorbidities: 2 vs. 0 | −0.14 (−2.25 to 1.97) | |
| Comorbidities: 3 or more vs. 0 | −1.93 (−3.93 to 0.07) | |
| Psychosocial and interpersonal factors | | |
| Social support (ISEL scale; continuous) | 1.43 (1.08 to 1.78) | <0.0001 |
| Attended cancer support group vs. not | −2.02 (−3.64 to −0.41) | 0.0162 |
| Sought mental health counseling before breast cancer diagnosis vs. not | −3.59 (−5.03 to −2.15) | <0.0001 |
| Discrimination experience types: 1 vs. 0 | 1.26 (−0.71 to 3.22) | 0.2006 |
| Discrimination experience types: 2 or more vs. 0 | −0.74 (−2.56 to 1.08) | |
| Anxious preoccupation (Mini-MAC scale; continuous) | −0.72 (−0.86 to −0.57) | <0.0001 |
| Cognitive avoidance (Mini-MAC scale; continuous) | −0.33 (−0.68 to 0.02) | 0.0713 |
| Fatalism (Mini-MAC scale; continuous) | 0.76 (0.45 to 1.08) | <0.0001 |
| Fighting spirit combined with helplessness/ hopelessness (Mini-MAC scale; continuous) | 0.75 (0.59 to 0.92) | <0.0001 |

these constructs may relate to the aspects of resilience pertaining to self-reliance (i.e., acknowledging one's capabilities and limitations) and perseverance (i.e., emotional stamina, self-discipline, and determination despite discouragement).[3,4]

Finally, mental health counseling before breast cancer diagnosis and current anxious preoccupation were associated with reduced resilience. These findings may reflect unmet mental health needs of breast cancer survivors and support research showing that low resilience reflects stress, anxiety, fear,[3,4] psychological distress, and poor mental health outcomes.[8] Current anxious preoccupation with cancer (i.e., feelings of anxiety, fear, and devastation)[20] represents a modifiable target for inter-

ventions with cancer survivors. In line with resilience theory,[1,2] mindfulness-based interventions may hold promise in building skills to address anxious preoccupation.[30] For example, the Stress Management and Resiliency Training (SMART) program, which targets resilience among breast cancer survivors through structured, group-based sessions, is feasible and efficacious in reducing perceived stress and anxiety.[17]

To further develop and increase uptake of these resilience training interventions, studies should explore the unique preferences and needs of diverse populations of cancer survivors. Of note, we did not identify any medical or clinical correlates of resilience, contrary to our hypotheses, suggesting

Table 3. Adjusted Associations Between Breast Cancer Survivors' Characteristics and Resilience ($n = 539$)

| Variable | Beta (95% CI) | p-value |
|---|---|---|
| Intercept | 62.21 (52.54–71.88) | |
| Interaction sexual orientation by employment[a] | | |
| SMW vs. HSW among not employed | −1.53 (−4.09 to 1.03) | 0.24 |
| SMW vs. HSW among currently employed | 0.81 (−0.86 to 2.49) | 0.34 |
| Not employed vs. currently employed among HSW | −1.17 (−3.03 to 0.68) | 0.22 |
| Not employed vs. currently employed among SMW | −3.52 (−5.75 to −1.28) | 0.002 |
| Social support (per point increase on the ISEL-SF Scale score) | 0.87 (0.56 to 1.19) | <0.0001 |
| Ever sought mental health counseling before breast cancer diagnosis (vs. did not) | −2.50 (−3.83 to −1.18) | 0.0004 |
| Anxious preoccupation (per point increase on the Mini-MAC subscale) | −0.46 (−0.60 to −0.32) | <0.0001 |
| Fighting spirit combined with helplessness/hopelessness (per point increase on the Mini-MAC subscale) | 0.30 (0.13 to 0.47) | 0.002 |
| Fatalism (per point increase on the Mini-MAC subscale) | 0.40 (0.14 to 0.65) | 0.003 |

Matched analysis ($R^2 = 0.31$); reduced sample size (from $n = 540$) due to missing data on one or more variables.
[a]Sexual orientation by employment interaction term: $p = 0.13$.

that interventions should help women at many disease stages "bounce back" from psychosocial stressors.

*Limitations*

Our findings should be interpreted in light of several limitations. First, our sample was highly educated and mostly White, limiting the generalizability of our findings because SMW of color or lower socioeconomic status may have different patterns of resilience and social support resources than HSW.[9] Second, our cross-sectional design prevents us from determining the temporality of measures. Positive reactions and psychological adjustment following cancer are believed to evolve over time in important ways.[11,31] Longitudinal research is needed to understand predictors and trajectories of resilience over time. Third, our matched study design provides a degree of control over heterogeneity within our sample, but some of our predictors (e.g., age) were mildly collinear with the cancer group. We expected those parameter estimates to show some attenuation due to the matching. Furthermore, SMW were closer to the time of first diagnosis; matching may have not completely accounted for this difference. Fourth, cancer is increasingly being viewed as a disease that also affects patients' informal caregivers, partners, families, and social support networks.[32]

Because SMW with breast cancer and their caregivers have similarly elevated levels of distress and fear of cancer recurrence,[33] understanding caregivers' resilience, which may be correlated with survivors' resilience,[34] is an area for future intervention research.[35] Finally, because resilience is an individual characteristic, it should be noted that studies of resilience should continue assessing the influence of social and structural determinants of health that affect SM populations disproportionately and may interact with resilience processes in specific and significant ways.[4] Despite these limitations, our study provides insight into factors associated with resilience among breast cancer survivors of diverse sexual orientations. Although resilience may not immediately equate to high levels of wellbeing or thriving,[36] it is protective against psychological distress, which relates directly to mental wellbeing. By potentially promoting adherence to clinical treatment plans and prevention recommendations, resilience may also relate indirectly to the physical health of breast cancer survivors.[37]

**Conclusions**

Most resilience research among SM populations has focused on HIV.[7] By examining resilience among long-term cancer survivors with diversity in sexual orientation, our study can help inform interventions to promote improved psychosocial functioning and other health outcomes. Similar to HIV and other chronic conditions, improvements in cancer detection and treatment are resulting in a rapidly growing population of cancer survivors, 22% of whom are women with breast cancer.[16] Thus, understanding resilience and other assets that could be leveraged by interventions may help to improve the wellbeing of this large and diverse population.

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