

Relationship Between Sexual Orientation and Quality of Life in Female Breast Cancer Survivors

Jennifer M. Jabson, Ph.D.,¹ Rebecca J. Donatelle, Ph.D.,² and Deborah J. Bowen, Ph.D.¹

Abstract

Background: Some groups of breast cancer survivors bear a greater burden of diminished quality of life than others. Self-identified lesbians, or women who partner with other women in romantic and spousal relationships, are one group of women that has been hypothesized to experience and report poorer quality of life compared with heterosexual breast cancer survivors.

Methods: A convenience sample of 204 breast cancer survivors (143 heterosexual and 61 self-identified lesbians) participated in this cross-sectional, online study by completing electronic surveys regarding their quality of life.

Results: Multivariate linear regression indicated that quality of life was not related to sexual orientation ($\beta = 0.13$, $p = 0.30$). Quality of life scores were similar between heterosexual and self-identified lesbian breast cancer survivors.

Conclusion: Quality of life scores were similar between heterosexual and lesbian breast cancer survivors. Future survivorship research should include population-based sampling of lesbian breast cancer survivors for testing quality of life and reducing the healthy volunteer effect, and population-based methodologies should be made available to enhance researcher ability to study this rare population.

Introduction

TODAY BREAST CANCER SURVIVORS REPRESENT the largest group of cancer survivors in the United States, where nearly 90% of those diagnosed with breast cancer go on to survive their cancer and live beyond the 5-year, cancer-free mark.¹ In 2009, more than 2.5 million breast cancer survivors were reported in the United States.¹ As the population of breast cancer survivors grows, the focus for breast cancer survivorship research has shifted from a sole focus on issues related to women's mortality, to include issues associated with their morbidity and quality of life. The psychosocial domains of survivorship, including quality of life, are comprised of physical, spiritual, social, and psychological well-being. These outcomes are important if we are to extend our understanding of survivorship beyond mortality²⁻⁴ and enhance the quality of survivorship for women surviving breast cancer.

Differences in quality of life among subgroups of survivor women exist along a continuum, on which some women report very positive outcomes and others report poorer outcomes. For example, significant gaps in quality of life have been observed among women of varying socio-demographic

groups including older versus younger women,^{5,6} and women of color compared with white women.^{7,8} Self-identified lesbians (SILs), women who identify as having a sexual orientation other than heterosexual and/or partner with other women in romantic and spousal relationships, are one group that has been hypothesized to experience and report poorer quality of life compared with heterosexual breast cancer survivors.⁹ This group of cancer survivors has reported elevated levels of stress,¹⁰ compromised social support,¹¹ poorer clinical management of treatment side effects,¹² and strained experiences in health-care settings¹³ that may be related to pervasive heterosexism, stigma, and discrimination.¹⁴ These facets of breast cancer survivorship may impact quality of life outcomes during and after breast cancer, and compromises in these domains may manifest as significant gaps in quality of life among SILs compared with heterosexual breast cancer survivors. However, there are no focused, quantitative examinations published on SIL breast cancer survivors' quality of life compared with levels of quality of life reported by heterosexual women.

This study was designed to extend our understanding about the similarities and differences in quality of life experienced by SIL women. Based on unique factors that covary

¹Boston University School of Public Health, Department of Community Health Sciences, Boston, Massachusetts.

²Oregon State University, Department of Public Health, Corvallis, Oregon.

with sexual orientation, we hypothesized that quality of life would be lower among SIL breast cancer survivors.

Methods

A detailed description of this study's methods, including study measures, is described elsewhere.¹⁵ A convenience sample of 204 breast cancer survivors (61 SILs, 143 heterosexual women) participated in this cross-sectional online quality of life study (power=0.95, $\alpha=0.05$). Participants were recruited online from September 2008 through September 2009 through breast cancer survivor groups ($n=11$), websites (e.g., Komen regional groups; $n=6$), regional news outlets ($n=2$), social networking sites ($n=2$), and electronic discussion boards ($n=1$). Hard copy recruitment materials were placed in women-focused spaces including women's health centers and hospitals ($n=6$), book stores ($n=1$), cafes ($n=2$), and community message boards ($n=4$). SILs were recruited through the same sources as heterosexual breast cancer survivors in addition to SIL-specific sources such as an online lesbian health organization (i.e., Mautner Project; $n=1$), lesbian-specific discussion boards ($n=4$), and lesbian health-focused newsletters ($n=2$). For SILs, hard copy recruitment materials were also distributed at Pride festivals ($n=3$), community dances for women ($n=2$), and a lesbian health-care center and clinic ($n=1$). To be included in the study, participants had to have a history of breast cancer, be English speaking to the degree necessary to complete the online survey, and be willing to identify their sexual orientation.

Participants completed a 15- to 30-minute online survey (average 22.5 minutes) about their breast cancer and survivorship experiences. Surveys were entirely anonymous and incentives were not provided to participants.

Measures

Quality of life. Quality of life, measured by Ferrell and Hassey Dow's Quality of Life Cancer Survivors,¹⁷ was the dependent variable in this study. The measure was comprised of 41 items that were endorsed on an 11-point Likert scale ranging from "0, worst outcome" to "10, best outcome" on four domains of quality of life: physical well-being, psychological well-being, social well-being, and spiritual well-being. Negative items in the scale were reverse coded. A total quality of life score was calculated by averaging the scores for each of the items. Average scores for each of the four subdomains were also calculated. The measure's internal consistency/reliability was measured with Cronbach's alpha coefficient, and resulted in an overall score, $\alpha=0.93$, indicating that the overall quality of life measure reliably measured participant's quality of life. Cronbach's alpha was also used to assess the reliability of the measure's subscales for the full sample (alpha scores for the Ferrell and Hassey Dow tool are reported parenthetically) where physical well-being, $\alpha=0.82$ (0.77); psychological well-being, $\alpha=0.88$ (0.89); social concerns, $\alpha=0.84$ (0.81); and spiritual well-being, $\alpha=0.71$ (0.71).

Self-identified sexual orientation. Sexual orientation operated as the independent variable in these analyses. Measuring sexual orientation can involve questions about three domains of sexual orientation: sexual orientation identity (whether an individual self identifies as gay, straight, heterosexual, lesbian, etc.), sexual behavior (same-sex or oppo-

site-sex sexual behaviors), and romantic attraction (degree of attraction to the opposite and/or same-sex individuals).^{18,19} In this study sexual orientation was measured in terms of women's sexual orientation identity. This was assessed by asking women a single question about how they self-identified their sexual orientation. Participants reported their sexual orientation by selecting the best fitting option in response to the following question: "the best description that best describes your sexual orientation." Response options included (1) heterosexual (straight), (2) lesbian (gay, queer, woman loving, etc.), (3) bisexual, (4) not sure, and (5) other.

Analysis

We used *t*-tests and chi-square to describe continuous and dichotomous variables and to test for demographic differences between SIL and heterosexual breast cancer survivors. Wilcoxon-Mann-Whitney tests were calculated to describe ordinal variables and to test for differences between the two groups of women. Bivariate correlations were calculated to identify significant associations between sexual orientation and demographic characteristics. Linear regression was used for estimating the association between quality of life and breast cancer survivor's sexual orientation. Two linear regression models were calculated and reported with quality of life as the outcome variable. Model 1 was adjusted for income, and Model 2 was adjusted for education. After adjusting for income and education separately, associations between quality of life and sexual orientation were calculated.²⁰ This study was approved by Oregon State University's Institutional Review Board (protocol 4075). Analyses were conducted with Stata 11.0.

Results

Participant characteristics

Of the 204 participants, 61 women self-identified as lesbian and 143 self-identified as heterosexual. In addition, seven women identified as bisexual. Based on the important differences identified by a recent Institute of Medicine report on lesbian, gay, bisexual, and transgender (LGBT) health, bisexual women were excluded from these analyses.²¹

Table 1 summarizes participant's demographic characteristics. The variation in sample among demographic variables was due to missing data, noted in Table 1. Women in this sample ranged from 30 to 79 years of age. SIL breast cancer survivors were nearly 56 years of age on average compared with heterosexual breast cancer survivors who were 54 years of age on average, though this difference was not statistically significant. Most women were economically stable (69% have money left over at the end of the month sometimes or always), employed (65%), and insured (95%), and 48% of women had completed some college or a baccalaureate college degree. Half of the participants (51%) had survived cancer 5 years or longer. A large portion of the participants reported being in a married or partnered relationship (79%) and most women identified as being white (91%). Heterosexual women were more likely to report being in a partnered or married relationship as compared with SILs, and this was marginally significant ($p=0.05$). The only significant demographic difference identified between heterosexual and SIL women were years of completed education. SILs were more likely to have

TABLE 1. PARTICIPANT DEMOGRAPHIC CHARACTERISTICS

Characteristic ^a	Total sample (N=204)	Heterosexual women (n=143)	Self-identified lesbians (n=61)	p
Age in years, mean (range) (N=204)	54.50 (30–79)	54.10 (30–79)	55.70 (38–74)	0.30
Income, % (n) (N=135)				
Can't make ends meet	11.43 (16)	11.43 (16)	7.89 (3)	
I have just enough money, no more	14.29 (20)	14.29 (20)	15.80 (6)	
I have enough with a little left over	41.43 (58)	42.27 (41)	44.74 (17)	
I always have money left over	27.86 (39)	29.90 (29)	21.05 (8)	
Other	5.0 (7)	3.09 (3)	10.53 (4)	0.76
Employment, % (n) (N=198)				
Employed	65.66 (130)	64.75 (90)	67.80 (40)	
Unemployed	10.10 (20)	10.07 (14)	10.17 (6)	
Retired	14.65 (29)	17.27 (24)	8.47 (5)	
Disabled	5.56 (11)	5.76 (8)	5.08 (3)	
Other	4.00 (8)	2.16 (3)	8.47 (5)	0.86
Has health insurance, % (n) (N=133)				
Yes	95.49 (133)	96 (92)	94.59 (35)	
No	4.51 (6)	4.17 (4)	5.41 (2)	0.10
Education, % (n) (N=200)				
Secondary (9–12 years)	6.86 (14)	8.63 (12)	3.39 (2)	
Trade or technical	2.94 (6)	4.32 (6)	—	
Junior college or some college	23.53 (48)	24.26 (34)	18.6 (11)	
Bachelors degree	24.02 (49)	23.02 (32)	25.42(15)	
Graduate degree	33.33 (68)	33.09 (46)	35.59 (21)	
Professional training	7.35 (15)	5.04 (7)	—	0.01
Years as survivor, % (n) (N=176)				
<5	48.30 (85)	51.22 (63)	41.51 (22)	
≥5	51.70 (91)	48.78 (60)	58.49 (31)	0.24
Marital/partnered status, % (n) (N=191)				
Married/partnered	79.58 (152)	83.21 (114)	70.37 (38)	
Single/not married/not partnered	20.42 (39)	16.79 (23)	29.63 (16)	0.05
Ethnicity, frequency (n=128)				
White	117	86	34	
Black/African American	0	0	0	
Latina	5	4	1	
American Indian/Alaska Native	4	4	0	
Asian American/Pacific Islander	2	2	0	0.15

^aSample size varies according missing data; percentages may not equal 100% due to rounding.

completed college and graduate education as compared with heterosexual women ($p=0.01$). There were no other significant demographic differences between heterosexual and SIL participants.

Quality of life

Table 2 summarizes quality of life values reported by the sample. In this sample participants' quality of life scores ranged from 3.75 to 8.29 with a total possible score of 10, where 10 represented the best possible quality of life score.

The quality of life variable approximated a normal distribution with a skewness of 0.37 and kurtosis 3.0 and transformations were not conducted. Participants reported an average overall quality of life score of 5.59 (standard deviation [SD]=0.9), falling approximately midway on Ferrell's quality of life scale. Participants' scores were within 1 SD of the overall quality of life score (6.51, SD=1.31) reported by Ferrell, Hassey Dow, and colleagues.¹⁷ Of the four domains of quality of life measured, participants in this study reported the highest average score on psychological well-being (mean=6.4, SD=1.00) and the lowest score on physical

TABLE 2. PARTICIPANT QUALITY OF LIFE BY SEXUAL ORIENTATION

N =204	Overall Mean	SD	Hetero Mean	SD	SIL Mean	SD	t	p	Overall Alpha	Hetero. Alpha	SIL Alpha
Overall quality of life	5.59	0.90	5.59	0.93	5.59	0.82	0.01	0.99	0.93	0.93	0.92
Physical well-being	3.82	1.47	3.82	0.12	3.86	1.56	-0.20	0.84	0.82	0.83	0.81
Psychological well-being	6.40	1.00	6.41	0.09	6.30	0.94	0.65	0.52	0.88	0.89	0.87
Social concerns	4.50	1.70	4.49	0.15	4.50	1.65	-0.07	0.95	0.84	0.85	0.81
Spiritual well-being	5.70	1.80	5.79	0.16	5.43	1.48	1.45	0.16	0.71	0.75	0.59

well-being, with an average score of 3.82 (SD=1.47). Participants scored 4.5 on average (SD=1.7) for social concerns and 5.7 (SD=1.8) for spiritual well-being. There were no significant differences in overall quality of life according to breast cancer survivor's sexual orientation ($t = -0.4, p = 0.68$) or in the quality of life subscales according to sexual orientation.

Associations between quality of life and sexual orientation

Table 3 provides regression coefficients and summary statistics for two models (Model 1 and Model 2) describing the relationship between quality of life and sexual orientation. Sexual orientation was not associated with quality of life when the regression model was adjusted for income (Model 1), $\beta = -0.07, p = 0.46$, or education (Model 2), $\beta = 0.05, p = 0.51$. In this sample of breast cancer survivors, R^2 values produced by Model 1 (0.02) and Model 2 (0.07) do not indicate that a significant portion of the variance in quality of life is explained by sexual orientation when adjusted for income or education.

Discussion

Heterosexual and SIL women's quality of life scores all fell within 1 SD above or below Ferrell and Hassey Dow's report on quality of life among cancer survivors.¹⁶ The only exception was the social concerns subscale. Among the heterosexual breast cancer survivors, the social concerns subscale was 1.14 SD lower than the value reported by Ferrell and Hassey Dow. Among SILs the average value on the social concerns subscale was 1.25 SD below the value reported by Ferrell and Hassey Dow. Excluding social concerns, we interpret the similarities between our sample and the Ferrell and Hassey Dow study to mean that our participants were experiencing similar quality of life to those used for the scale's reliability and validity testing. The lower mean scores on the social concerns subscale suggests that, our convenience sample of breast cancer survivors may have fewer social concerns than

other breast cancer survivors. This could reflect sampling bias and other important limitations related to demographic characteristics discussed later in this section.

Among both groups of participants, the reliability scores for the quality of life measure were all above 0.80, except for the spiritual well-being scale. The reliability score for spiritual well-being among SIL was $\alpha = 0.58$ as compared with heterosexual women, $\alpha = 0.71$. Future research into the quality of life among SIL cancer survivors should include a reliability comparison of multiple quality of life measures. This would add to our understanding about the best possible measurement tools for assessing quality of life among SIL cancer survivors. We advocate for this as a first step in understanding the utility of the Ferrell and Hassey Dow tool among SIL cancer survivors. It is possible that a next step could include redeveloping the spirituality scale for use among SIL.

In this analysis we were surprisingly unable to identify a significant relationship between quality of life and sexual orientation among breast cancer survivors. These unexpected findings suggest that in this sample of breast cancer survivors, the differential experiences others have reported as associated with sexual orientation may not result in compromised quality of life as we had expected. We are encouraged by this positive finding, that heterosexual and SIL breast cancer survivors are reporting similar quality of life outcomes. In this sample it appears that SILs are coping moderately well with their breast cancer and that their quality of life is on par with that reported for heterosexual breast cancer survivors. From these analyses it appears that the potentially negative effects of sexual orientation-based minority stress and breast cancer stress experienced by SIL breast cancer survivors are not evident from their quality of life reports. However, we are also cautious in our interpretations. We are not so naïve as to think that the pervasive heterosexist and discriminatory social climate that many SILs face on a daily basis has evaporated. Consequently, our findings lead us to ask why SIL breast cancer survivors are reporting positive quality of life outcomes similar to those of heterosexual breast cancer survivors. It is possible that the similarity in quality of life represents an alternative response of SIL to minority stress. It is possible that the similar quality of life indices observed between heterosexual women and SILs may indicate SILs' resilience.

A qualitative study by Arena and colleagues¹² examined the unique psychosocial experiences of SIL breast cancer survivors and determined interesting and notable differences. In their study SILs experienced less cancer avoidance than heterosexual breast cancer survivors and more "fighting spirit." This suggested that SILs were coping well with their breast cancer diagnosis by engaging the health crisis instead of denying its presence. It is plausible SIL breast cancer survivors in these studies have developed a heightened resilience stemming from their exposure to chronic and pervasive minority stress and that this resilience facilitates coping with breast cancer.

Meyer²² suggested that when sexual minorities are faced with minority stress that they may develop resilience, or a propensity to respond to chronic stressors with a coping and resiliency that has a positive effect on health and quality of life outcomes. SILs' resilience may then result in similar quality of life reports as those reported by heterosexual breast cancer survivors. However, due to our study's limitations further investigation may be necessary in order to tease out the factors that have resulted in our null outcome.

TABLE 3. ASSOCIATIONS BETWEEN SEXUAL ORIENTATION AND QUALITY OF LIFE

	Quality of life ^a		
	<i>b</i>	β	<i>p</i>
Model 1			
Income	0.12	0.13	0.18
Sexual orientation	-0.14	-0.07	0.46
Summary statistics ^b			
R^2	0.02		
<i>p</i>	0.32		
Model 2			
Education	-0.18	-0.26	<0.001
Sexual orientation	0.10	0.05	0.51
Summary statistics ^b			
R^2	0.07		
<i>p</i>	0.005		

^a*b*, unstandardized regression coefficient (slope); β , standardized regression coefficient (beta); *p*, conditional probability based on *t*-test.

^b R^2 , goodness of fit measure, or the proportion of variance in the dependent variable explained by the regression equation; *p*, conditional probability coefficient based on *F*-test.

Despite our encouraging findings, the results from this study are constrained by sampling issues. This study involves a convenience sample and not a representative probability sample drawn from a distinct population of breast cancer survivors. These data do not represent the population of SIL and heterosexual breast cancer survivors as a whole. Rather, we have presented data on a sample of breast cancer survivors who self-identified as mostly white, insured, highly educated, married/partnered, and economically stable. Consequently it is highly plausible that the healthiest, most positive, and affluent breast cancer survivors have been sampled resulting in the healthy volunteer effect,²² where only the healthiest breast cancer survivors have participated in this online study. Additionally, our study suffers from missing data. It is possible that our survey was too long and resulted in incomplete responses. These limitations can be remedied by research methodologies that employ population-based techniques including, but not limited to, sampling from cancer registries to examine the role of sexual orientation in quality of life outcomes among breast cancer survivors.

Our findings do point to two distinct directions for future SIL cancer survivor research. First, population-based sampling of SIL breast cancer survivors is essential for testing quality of life and reducing the healthy volunteer effect. Second, population-based methodologies should be made available to enhance researcher ability to study this rare population. Solutions could include the use of representative cancer registries and the addition of sexual orientation questions to population-based health surveillance and cancer surveillance efforts nationally.

Despite the notable limitations of this study, we believe that it relates to and extends the existing literature pertaining to quality of life among breast cancer survivors. In the field of cancer survivorship research, quality of life has become a highly regarded measure of breast cancer survivors' survivorship characteristics. This indicator has aided in our understanding of breast cancer survivors' survivorship and adjustment.²³ Quality of life indicators have been used to determine differences and similarities among older versus younger women^{24,25} and women who have opted for surgery or not,^{26,27} are going through menopause,^{28,29} or are experiencing cognitive dysfunction.³⁰ However, most studies assume women's heterosexuality or do not consider the role of sexual orientation in breast cancer survivorship experiences. Our study provides a key step in understanding the role of sexual orientation in quality of life among breast cancer survivors.

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Disclosure Statement

The authors have no conflicts of interest to report.

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Address correspondence to:

Jennifer M. Jabson, M.P.H., Ph.D.

Boston University School of Public Health

Department of Community Health Sciences

801 Massachusetts Avenue, Room 441D, Fourth Floor

Boston, MA 02118

E-mail: jjabson@bu.edu

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