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Sexual functioning in breast cancer survivors experiencing body image disturbance

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Abstract

***Background*: Breast cancer treatments and the traumatic nature of the cancer experience frequently elicit considerable sexual difficulties. Breast cancer survivors (BCS) experiencing body image (BI) issues may represent a vulnerable group for developing sexual dysfunction posttreatment. The current study explores sexual functioning (SF) in this unique clinical group.**

***Methods*: A descriptive study assessed 127 BCS who were engaged in sexual activity. Standardized baseline measures included the following: BI Scale, BI after Breast Cancer Questionnaire, Female Sexual Function Index (FSFI), Kansas Marital Satisfaction Scale, and Functional Assessment of Cancer Therapy – Breast. Levels of SF were compared with BCS, heterogeneous cancer, and healthy female populations. Correlational analyses were conducted between SF, BI, relationship, and health-related quality of life variables. Guided by a conceptual framework, regression analyses were conducted to determine significant demographic, clinical, and psychosocial predictors of sexual desire, satisfaction, and overall SF.**

***Results*: Eighty-three per cent of BCS met the FSFI clinical cutoff score for a sexual dysfunction. Participants exhibited poorer SF when compared with other female cancer and healthy groups. No significant correlations were found between BI questionnaire total scores and SF. BI after Breast Cancer Questionnaire – Body Stigma subscale showed significant associations with FSFI Arousal, Orgasm, Satisfaction (average $r = -0.23$), and overall SF ($r = -0.25$). Vaginal dryness ($\beta = -0.50$), body stigma ($\beta = -0.24$), and relationship satisfaction ($\beta = 0.27$) were significant predictors of overall SF.**

***Conclusion*: Difficulties in SF appear to be highly prevalent in BCS experiencing BI disturbance posttreatment. Brief screening tools assessing SF should adopt a biopsychosocial model, which includes questions regarding vaginal dryness, relationship satisfaction, and body stigma issues.**

Background

Breast cancer survivors (BCS) face many challenges on their road to restoring sexual health following diagnosis. Treatments, their associated side-effects, and the traumatic nature of the cancer experience frequently elicit considerable disruptions in many areas of sexual functioning (SF) [1–3]. Reported rates of breast cancer-related sexual difficulties vary widely, ranging from 25% to 100% [1,3], depending on the breast cancer population surveyed (e.g., age group and treatment type), how and when sexual dysfunction was defined and evaluated (e.g., active versus posttreatment), and the specific sexual problem(s) of focus. Sexual difficulties can persist years after treatment, with detrimental effects on survivors' and loved ones' relationship health, psychological and emotional well-being, and quality of life [2–5]. Disturbances in SF are associated with poorer mental health [2,3], fears of fertility loss, rejection and abandonment by one's partner [6,7], feelings of sexual unattractiveness [6,8], and alterations in one's sense of sexual self [2,9,10]. Assessing sexual health is a vital component to BCS' comprehensive care. Identification of women at high risk of experiencing sexual dysfunction following treatment would facilitate implementation of targeted interventions to improve SF and thus overall well-being in the survivorship stage.

Sexual dysfunction and breast cancer

Sexuality is viewed as a core dimension of what it is to 'be human', broadly encompassing constructs such as gender, sexual identity and orientation, emotional attachment/love, sex/intimacy, and reproduction [7,11]. Under the umbrella term of sexuality, sexual function has traditionally and more mechanistically defined in terms of the human sexual response cycle: arousal, plateau, climax (orgasm), and resolution [12]; newer models of female SF incorporate psychological parameters [13].

Sexual dysfunction refers to conditions that interfere with the ability to engage in sexual activity or disrupt the full sexual response cycle [14,15]. Commonly observed symptoms of sexual dysfunction in breast cancer include decreased libido, dyspareunia, vaginal atrophy and dryness, loss of breast(s) sensitivity, and lowered sexual pleasure [2,10,14]. While the sexual dysfunction issues in breast cancer (e.g., desire and arousal difficulties, and sexual pain) mirror those commonly reported in a nonclinical, similarly aged female population [9,16], BCS tend to have a higher prevalence and greater persistence of these sexual problems as compared with their healthy peers [3,5,9,17]. Most BCS regain near pre-diagnosis levels of SF [9,18]; however, a subset of survivors continues to experience disruptions to their SF at severity levels warranting clinical intervention.

Assessing sexual dysfunction in breast cancer poses a difficult challenge to healthcare professionals. Changes in SF are typically due to the multifactorial impact of the illness on the body's integrity and on the survivor's psyche, thereby complicating determination of etiology. Medical treatments often directly affect sexual organs and hormone levels [19,20]. Adjuvant chemotherapy has demonstrated contributory effects to worsening SF across age groups [4,9,21,22]. Induction of menopause due to chemotherapy is characterized by lowered estrogen, decreased sexual desire and arousal, dyspareunia, loss of sexual sensations, and decreased frequency and intensity of orgasms [2,23]. Psychosocial factors have also been shown to powerfully influence SF, as demonstrated by the body of research performed by Ganz and colleagues in the area of sexual health in BCS [4,21,22]. Identified risk factors include younger age [24], marital/relationship status and quality [4,6,21], body image (BI) disturbance [4], poorer emotional and mental health [20], and pre-disease history of sexual dysfunction [5,9]. A further challenge is teasing apart cancer-related effects from the normal age-related changes in SF. Few healthcare professionals are adequately trained to comprehensively assess or treat cancer-related sexual dysfunction issues [14].

Body image and sexual functioning

As an integral component of sexuality [7,25], it is not surprising that disturbances in BI brought about by the cancer experience could have profound effects on SF. BI is viewed as a highly subjective mental representation, not only of one's physical appearance, body, and attractiveness but also of one's perception of overall health and functioning [9,26,27]. Breast cancer treatments and their side-effects, such as the removal of a breast(s), ovaries and/or uterus; alopecia; and scarring, affect those body parts and functions that have universal connotations with womanhood and female sexuality. This BI disturbance is often characterized by considerable bodily shame and dissatisfaction, feelings of physical unattractiveness, and decreased self-esteem and femininity [28,29]. Greater BI disturbance in BCS was associated with a tendency to engage in frequent self-surveillance of one's physical appearance and role functioning [28]. Harboring body shame, perpetuated by increased self-consciousness and self-scrutiny, and perceived changed 'female status', can detrimentally influence a survivor's inclination to emotionally connect [17] and intimately engage with her partner [6,10], thus impacting the quality of her sexual relationships and social well-being. Thus, BCS who continue to experience difficulty adjusting to their 'new body' may represent a particularly vulnerable group who are at risk of experiencing sexual dysfunction posttreatment.

Study objectives

The overall aim of the current study was to explore the SF of BCS who reported experiencing BI difficulties posttreatment and were sufficiently engaged in sexual activity. Frequency and severity of SF, BI-related physical symptoms, and relevant everyday problems were examined. Demographic and clinical variables were also compared with the study subgroup of BCS who were not engaged in sexual activity. To investigate this BCS group as a potentially vulnerable one to experiencing sexual dysfunction, a comparison of this group's SF levels with other female cancer and general populations from published studies was conducted. Lastly, relationships between domains of SF and BI were examined. It was hypothesized that greater BI disturbance would be associated with greater sexual dysfunction. No specific hypotheses were put forth regarding associations between SF and BI domains.

Specific sexual dysfunction predictors in this BCS group were also investigated. Ganz and colleagues proposed a conceptual framework outlining predictors of sexual health in women diagnosed with breast cancer [4,21,22]. Utilizing this theoretical model to guide analysis, it was hypothesized that BI would be a significant predictor of sexual desire, satisfaction, and overall SF after accounting for demographic, clinical, and psychosocial variables (Figure 1).

Methods

Participants

Women who were diagnosed with primary breast cancer and completed treatment with curative intent were recruited from cancer and survivorship clinics at Princess Margaret Cancer Centre and Odette Cancer Centre, Sunnybrook Health Sciences Centre, Toronto, Canada, for a randomized controlled trial of an intervention

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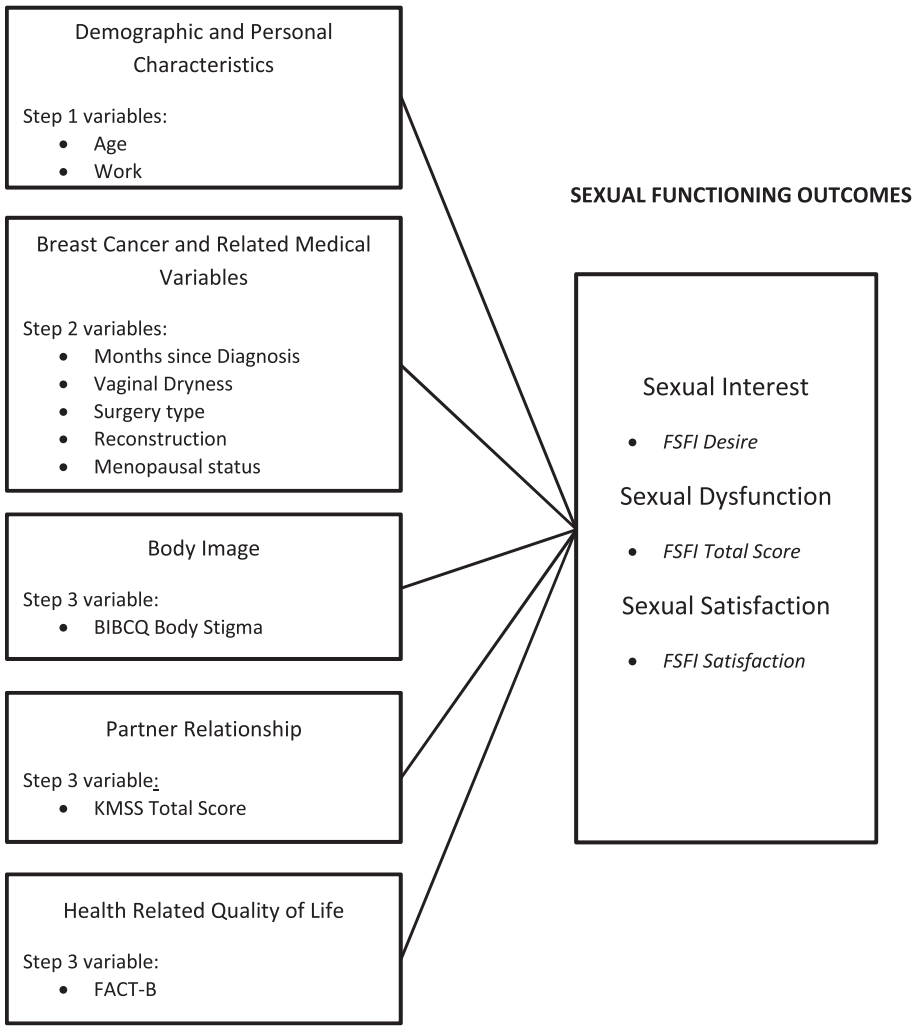

Note: BIBCQ = Body Image after Breast Cancer Questionnaire; FACT-B=Functional Adjustment to Cancer Therapy-Breast; FSFI=Female Sexual Functioning Index; KMSS = Kansas Marital Satisfaction Scale

Figure 1. Conceptual framework of predictors of sexual functioning in breast cancer survivors [21]. Corresponding study variables used in the regression analyses are in italics

focused on BI concerns. BCS who self-reported continuing BI difficulties and who were interested in treatment for these issues participated in a prospective, randomized controlled clinical trial investigating the effectiveness of a psychosocial group therapy intervention dealing with BI disturbance.

Eligibility criteria for the randomized controlled trial included the following: sufficient demonstration of BI disturbance in a pre-group screening clinic assessment; histologically confirmed diagnosis of primary invasive carcinoma of the breast (stages I, II, and III) with no history of or current evidence of metastatic disease; breast cancer treatment involving lumpectomy or mastectomy (including reconstruction and non-reconstruction); completion of adjuvant chemotherapy and radiotherapy; being over 18 years of age; and demonstration of sufficient English speaking and writing proficiency. Participants were deemed ineligible if they had a history of major psychiatric disorder, resided more than 1 h away from the treatment center, or were currently participating in a therapist-led psychosocial support group.

The current study sample represents a subset of BCS from the larger trial that were deemed sufficiently engaged in sexual activity. Baser, Li, and Carter [19] validated the use of the Female Sexual Functioning Index (FSFI) (see *Measures*) in a cancer survivor population. They stressed that the FSFI's validity as a measure of SF is seriously threatened when used in sexually inactive women (e.g., due to lack of a partner, who are in a bad relationship, or for non-cancer-related reasons) [19].

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The FSFI contains 15 items in which 'No sexual activity' or 'Did not attempt intercourse' are response options, and would be assigned the score of '0'. This scoring algorithm, however, potentially decreases FSFI scores, thereby inflating the level of sexual dysfunction. Following Baser and colleagues' suggestion [19], women who indicated ≥ 8 nonzero responses (out of 15 relevant questions) were deemed as being sufficiently engaged in sexually activity, and comprised the 'Engaged in sexual activity' group. Participants who did not meet this FSFI criterion comprised the 'Not engaged in sexual activity' group.

Procedure and measures

All study participants in the randomized controlled trial completed a series of questionnaires at baseline (prior to randomization in the intervention or control arms of the randomized control trial), and 8-week, 6-month, and 1-year post-baseline. Questionnaires were mailed to the participant's home to be completed and returned via mail. This study represents a secondary analysis of baseline data gathered for the randomized controlled trial.

Demographic and clinical characteristics included marital/relationship status, educational level, occupational status, and self-identified ethnicity. Participants provided information on general health habits, menopausal status, and sexual relationship status (i.e., having a sexual partner on a regular basis). Clinical characteristics included breast cancer stage, surgery type, and reconstruction.

Participants completed an 18-item self-report questionnaire assessing frequency of physical and cognitive symptoms commonly experienced after breast cancer treatment (e.g., hot flashes, nausea, difficulty concentrating, weight gain, and arm swelling). Relevant symptoms to the current study included vaginal dryness, pain with intercourse, and unhappiness with body appearance. If a symptom was experienced in the past 4 weeks, participants rated its severity on a Likert scale from 0 (Not at all) to 4 (Extremely).

Body image

The BI Scale (BIS) [30] is a 10-item self-report measure assessing BI in a heterogeneous cancer population. Examples of items are as follows: 'Have you been felt dissatisfied with your body?' and 'Have you felt less physically attractive as a result of your disease or treatment?' Higher scores reflect greater BI disturbance.

The BI after Breast Cancer Questionnaire (BIBCQ) [31] was included as a second measure of BI disturbance. The BIBCQ is a multidimensional assessment of the specific impact of breast cancer on BI. It is a self-report measure consisting of 45 common items, regardless of surgery type. Higher scores reflect greater BI disturbance.

The BIBCQ yields a total score and six subscales: (a) Vulnerability (feeling susceptible to illness and cancer), (b) Body Stigma (feeling the need to keep the one's body hidden), (c) Limitations (feeling competent and able to perform everyday tasks), (d) Body Concerns (satisfaction with one's physical appearance), (e) Transparency (self-consciousness related to the obviousness of cancer-related alterations to appearance), and (f) Arm Concerns (arm symptoms and appearance).

Sexual functioning

The FSFI [32] is a widely used 19-item self-report measure assessing key dimensions of female SF: (a) Desire, (b) subjective Arousal, (c) Lubrication, (d) Orgasm, (e) Satisfaction, and (f) Pain. The FSFI also yields a total score; lower scores are indicative of poorer SF. The FSFI demonstrated good internal consistency, consistent with previously reported internal consistency estimates (Cronbach's $\alpha > 0.80$ across SF domains) [19]. A total cutoff score of 26 or less is indicative of a sexual dysfunction as defined by DSM-IV criteria [33]. As described in the Section on Participants, participants who met Baser and colleagues' FSFI criterion for sufficient engagement in sexual activity comprised the current study sample.

Marital satisfaction

The Kansas Marital Satisfaction Scale (KMSS) [34] is a four-item self-report measure assessing perceived satisfaction of a marital or common-law relationship. Higher scores reflect greater relationship satisfaction.

Health-related quality of life

The Functional Assessment of Cancer Therapy – Breast (FACT–B, Version 4) [35] is a well-known multidimensional questionnaire designed to assess health-related quality of life (HRQoL) in women who have breast cancer. The FACT–B total score is composed of the FACT–General (27 items; FACT–G), plus 10 additional breast cancer-related items. The FACT–G has four subscales: (a) Physical Well-being, (b) Social/Family Well-being, (c) Emotional Well-being, and (d) Functional Well-being. Higher scores reflect higher reported levels of HRQoL.

Statistical analyses

Statistical analyses were conducted using SPSS Version 20 [36]. Descriptive analyses were conducted on all study variables. Nonparametric Kruskal–Wallis analysis of variance tests were conducted to compare BI disturbance and psychosocial and HRQoL variables between sexually engaged and not sexually engaged BCS groups. A second

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set of Kruskal–Wallis tests was performed to compare study variables for each categorical demographic and clinical variable in the sexually engaged group. Any variable showing significant group differences in the study's main variables was included in the regression analyses. Relationships between primary study variables were analyzed through correlational analyses.

Utilizing Ganz and colleagues' theoretical model to guide analysis [4,21,22], the predictive ability of the hypothesized demographic, clinical, and psychosocial variables on SF (FSFI Desire, Satisfaction, and Total score) was analyzed through a series of hierarchical regression analyses (Figure 1). Variables composing each block were entered into the analyses as follows (Figure 1): step 1 – demographic variables; step 2 – clinical variables (Months since Diagnosis, Vaginal Dryness, Surgery type (Mastectomy/Lumpectomy), Reconstruction (Yes/No), Menopausal status (Yes/No)); and step 3 – marital/relationship satisfaction, HRQoL, and BI (Total scores on BI questionnaires and any BIBCQ subscale that showed significant associations with SF outcomes).

Results

Sample characteristics

One-hundred ninety-eight BCS completed baseline questionnaires in the randomized control trial. SF was analyzed in 127 (64.1% of total sample) BCS who were categorized as being sufficiently engaged in sexual activity. Average participant age was 49.0 years (standard deviation (SD) = 7.9). Most participants were in married/common-in-law (73.2%) relationships, and had a sexual partner on a regular basis (76.2%). A majority of women had undergone mastectomy (66.1%) and have not had reconstructive surgery (84.3%) (Table 1).

Descriptive analyses of primary study variables

Means, standard deviations, and reliability statistics are presented in Table 2. The three FSFI dimensions that were rated the lowest in terms of level of functioning were Desire (M = 2.61, SD = 1.26), Satisfaction (M = 2.95, SD = 1.58), and Pain (M = 2.99, SD = 2.26). One-hundred and four women (82.5%) met the FSFI clinical cutoff score for a sexual dysfunction.

Results from the descriptive analysis showed that Months since Diagnosis was skewed; thus, this variable was log-transformed before inclusion into the regression analyses. Results from the Kruskal–Wallis analysis of variance tests showed a significant difference in employment status (Working versus Not working) in the FSFI domains of Arousal, Pain, and the Total score; a significant difference in node status (Negative versus Positive) in Pain; and a significant difference in age group (<50 vs >50 years) in Arousal and Lubrication (results not shown). Because there was a significant difference in employment status in the FSFI Total score, this demographic variable was included in step 1 of the relevant regression analyses.

Descriptive analyses of physical symptoms and daily problems

Prevalence of SF-related and BI-related physical symptoms and daily life activities were examined through frequency analyses. Seventy-six (59.8%) and 69 (55.2%) BCS reported experiencing vaginal dryness and pain with intercourse in the past 4 weeks, respectively. Forty-five (35.7%) respondents experienced arm swelling/lymphedema, and 112 respondents (88.2%) reported experiencing some unhappiness with their body's appearance. Forty-three participants (33.9%) reported feeling completely sexually unattractive, and 22 (17.3%) participants reported no interest in having sex (Figure 2). Sixty-one (64.9%) and 59 (64.1%) participants indicated wanting help with the latter two problem issues, respectively.

Comparison with 'Not engaged in sexual activity' group

Results from the Kruskal–Wallis analysis of variances tests showed a significant difference in BIBCQ – Body Stigma between the 'Sexually engaged' and 'Not sexually engaged' groups (chi-square = 6.649, p = 0.01); the latter group exhibited greater body stigma than the former group. There were no significant differences between these two groups in other BI, relationship, and HRQoL measures (see Table 2 for descriptive statistics for the 'Not sexually engaged' group).

Correlational analyses

Overall SF was not associated with BI disturbance; FSFI total score is not significantly correlated with BIS and BIBCQ total scores (r = −0.03 and −0.04, respectively). The only FSFI domain significantly associated with overall SF was BIBCQ – Body Stigma (r = −0.25, p = 0.005). BIS and BIBCQ total scores were not significantly correlated with any FSFI domain (results not shown). A closer examination revealed that BIBCQ – Body Stigma was the sole BI domain with significant associations with any FSFI domain, having negative correlations with Arousal, Orgasm, and Satisfaction (r = −0.18, −0.18, and −0.33 respectively; all $p < 0.05$).

The demographic variable Age was significantly associated with FSFI Arousal, Lubrication, and Total score (r = −0.23, −0.26, −0.20; all $p < 0.05$). Several domains of SF were positively associated with marital/relationship satisfaction. The KMSS showed significant correlations with Satisfaction and Pain (r = 0.38 and 0.30, respectively; all $p < 0.01$) as well as

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Table 1. Summary of participant demographic and clinical characteristics

	Engaged in sexual activity (*N* = 127)			Not engaged in sexual activity (*N* = 61)		
	Mean (*SD*)	Range	*N* (%)	Mean (*SD*)	Range	*N* (%)
		Demographic information				
Age (years)	49.02 (7.89)	29–64		51.51 (9.95)	26–75	
Ethnicity						
Caucasian			109 (85.8)			48 (78.7)
African–Canadian			7 (5.5)			3 (4.9)
Asian			3 (2.4)			3 (4.9)
Other			8 (6.3)			7 (11.5)
Marital status						
Single, never married			15 (11.8)			17 (27.9)
Married/common law			93 (73.2)			26 (42.6)
Separated, divorced, widowed			19 (15.0)			18 (29.5)
Having a sexual partner on a regular basis						
Yes			96 (76.2)[a]			19 (31.7)[e]
No			30 (23.8)[a]			41 (68.3)[e]
Highest educational level						
Part of/completed high school			12 (9.5)			6 (9.8)
Part of/competed university/college			89 (70.0)			39 (64.0)
Graduate school			26 (20.5)			16 (26.2)
Current occupational status						
Employed full-time			60 (48.0)[b]			33 (54.1)
Employed part-time			15 (12.0)[b]			5 (8.2)
Unemployed because of illness			26 (20.8)[b]			12 (19.7)
Unemployed/retired/homemaker/student			24 (19.2)[b]			11 (18.0)
		Clinical information				
Months since diagnosis	38.72 (41.88)[a]	3–240		53.34 (60.65)	6–264	
Breast cancer stage						
1			41 (33.3)[d]			23 (37.7)
2			52 (42.3)[d]			23 (37.7)
3/4			30 (24.4)[d]			15 (24.6)
Surgery type						
Lumpectomy			43 (33.9)			24 (39.3)
Mastectomy			84 (66.1)			37 (60.7)
Reconstruction						
No			107 (84.3)			47 (78.3)
Yes			20 (15.7)			13 (21.7)
Lumpectomy			1			2
Mastectomy			19			11
Menopausal status						
Not menopausal			20 (16.4)[c]			14 (23.7)[f]
Menopausal			104 (83.9)[c]			45 (76.3)[f]
		Problem statements				
Vaginal dryness						
Experienced in the past 4 weeks			76 (59.8)			33 (55.0)[e]
Not experienced in the past 4 weeks			51 (40.2)			27 (45.0)[e]
Pain with intercourse						
Experienced in the past 4 weeks			69 (55.2)[b]			7 (13.5)[g]
Not experienced in the past 4 weeks			56 (44.8)[b]			45 (86.5)[g]
Unhappy with the appearance of my body						
Experienced in the past 4 weeks			112 (88.2)			54 (90.0)[e]
Not experienced in the past 4 weeks			15 (11.8)			6 (10.0)[e]

SD, standard deviation.
[a]*N* = 126;
[b]*N* = 125;
[c]*N* = 124;
[d]*N* = 123;
[e]*N* = 60;
[f]*N* = 59;
[g]*N* = 52.

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Table 2. Descriptive analyses of study variables

	Engaged in sexual activity ($N = 127$)		Not engaged in sexual activity ($N = 61$)		Possible range	Cronbach's α
	Mean (*SD*)	Min, max	Mean (*SD*)	Min, max		
Body image measures						
Body Image Scale	17.44 (7.27)	1, 30	19.48 (8.08)	0, 30	1–30	0.91
Body Image after Breast Cancer Questionnaire						
Vulnerability	37.58 (7.40)	14, 55	35.60 (9.16)	15, 54	11–55	0.87
Body Stigma	36.14 (7.75)[a]*	14, 53	39.03 (8.75)*	16, 55	11–55	0.82
Limitations	24.85 (6.08)[a]	12, 38	24.80 (14, 39)	14, 39	8–40	0.85
Body Concerns	20.75 (3.55)	10, 27	21.25 (3.67)	12, 27	6–30	0.51
Transparency	13.90 (4.47)[a]	5, 25	14.68 (5.67)	5, 25	5–25	0.78
Arm Concerns	11.19 (2.88)	6, 20	10.54 (3.36)	4, 16	4—0	0.23
Total	143.52 (23.83)	45, 200	145.90 (26.91)	73, 196	45–225	0.90
Relationship measure						
Kansas Marital Satisfaction Scale	20.17 (6.28)[b]	4, 28	17.86 (6.89)[c]	4, 28	0–28	0.96
Sexual functioning						
Female Sexual Functioning Index (FSFI)						
Desire	2.60 (1.26)	1.2, 6			1.2–6	0.91
Arousal	3.11 (1.41)[a]	0.9, 6			0–6	0.93
Lubrication	3.45 (1.66)	0, 6			0–6	0.94
Orgasm	3.34 (1.70)	0, 6			0–6	0.92
Satisfaction	2.95 (1.58)	0.4, 6			0.4–6	0.81
Pain	2.99 (2.26)	0, 6			0–6	0.96
Total	18.52 (7.05)[a]	5, 34.5			2–36	0.93
FSFI Clinical Sexual Dysfunction Cutoff Score[a]						
FSFI ≤ 26.0	$N = 104$; % = 82.54					
FSFI > 26.0	$N = 22$; % = 17.46					
Quality of life						
Functional Assessment of Cancer Therapy – Breast (FACT–B)						
Physical Well-being						
Social Well-being	19.76 (6.10)[d]	2, 28	20.68 (5.18)	7, 28	0–28	0.86
Emotional Well-being	18.59 (5.09)[d]	4, 28	16.78 (6.23)	2, 28	0–28	0.77
Functional Well-being	15.95 (4.54)	0, 24	15.72 (4.87)	5, 24	0–24	0.83
FACT–B Additional	16.25 (5.94)	1, 28	15.82 (5.12)	5, 28	0–28	0.84
Items	21.02 (6.49)	4, 36	20.22 (7.24)	7, 37	0–40	0.69
FACT–General	70.55 (17.01)[d]	20, 105	69.19 (15.49)	29.33, 102	0–108	0.91
FACT–B Total	91.58 (21.21)[d]	29, 138	89.67 (21.09)	38.33, 137	0–148	0.91

SD, standard deviation.
[a]$N = 126$;
[b]$N = 98$;
[c]$N = 29$;
[d]$N = 59$.
*Significant mean group difference, $p = 0.01$.

with FSFI total score ($r = 0.22$; $p < 0.05$). In terms of its relationship with a HRQoL outcome, overall SF was not associated with overall adjustment post-BC treatment, as measured by the FACT–B total score ($r = 0.08$, $p = 0.36$). The FACT–B Social Well-being subscale was positively correlated with FSFI Satisfaction and Pain ($r = 0.33$ and 0.22, respectively; all $p < 0.05$), as well as with the FSFI total score ($r = 0.25$; $p < 0.01$). No other FACT–B subscale demonstrated significant correlation with any FSFI domain (results not shown).

Regression analysis

A series of hierarchical regression analyses were conducted in order to analyze the contributions of hypothesized study variables to sexual desire, satisfaction, and overall SF (Figure 1). It was of particular interest to determine the incremental predictive value of BI disturbance on SF outcomes after accounting for demographic, clinical, and psychosocial variables. Based on the results of the correlational analyses, BIBCQ – Body Stigma was used in the regression analyses.

The regression model for overall SF was significant: $F(3, 75) = 4.55$, $p < 0.01$, explaining 37.7% of the total variance. Steps 2 and 3 explained 23.9% and 8.9% of this total variance, respectively. In terms of individual predictors, vaginal dryness ($\beta = -0.50$, $p < 0.01$), KMSS total score ($\beta = 0.27$, $p = 0.01$), and BIBCQ – Body Stigma ($\beta = -0.24$, $p = 0.03$) significantly predicted overall SF in the regression model (Table 3).

The regression model for sexual Desire was significant: $F(9, 77) = 2.22$, $p = 0.03$, explaining 20.6% of the total variance. Step 2 explained 17.0% of this total variance. Vaginal dryness ($\beta = -0.44$, $p < 0.01$)

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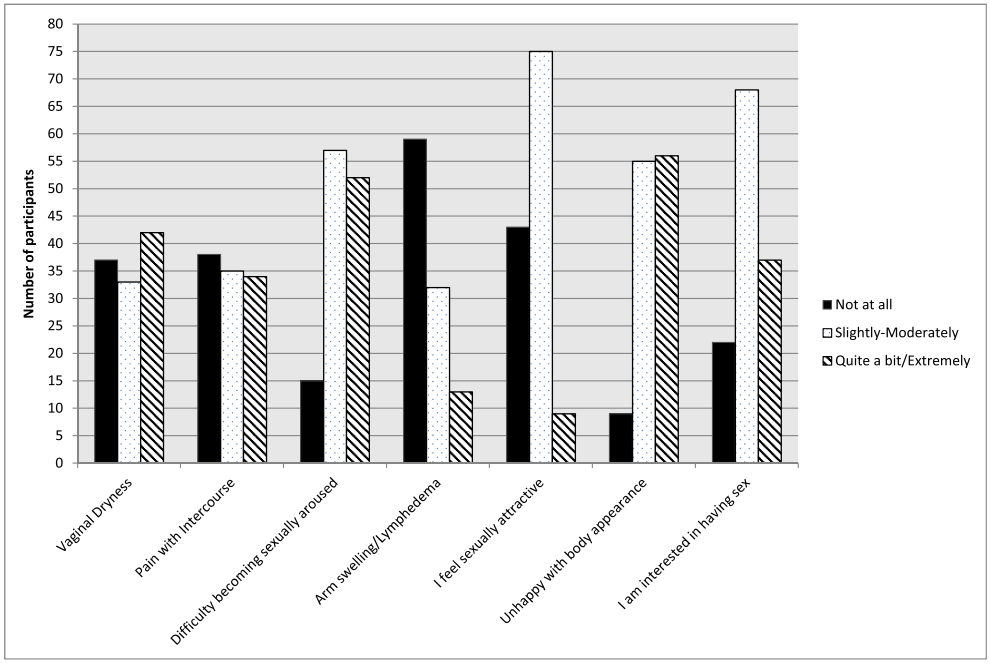

Figure 2. Prevalence and severity of physical symptoms and daily problems experienced by participants in the past 4 weeks

significantly predicted sexual Desire in the regression model (Table 3).

The regression model for sexual Satisfaction was significant: $F(9, 78) = 4.42$, $p < 0.01$, explaining 33.8% of the total variance. Steps 2 and 3 accounted for 7.1% and 23.5% of this total variance, respectively. Vaginal dryness ($\beta = -0.22$, $p = 0.03$), KMSS total score ($\beta = 0.45$, $p < 0.01$), and BIBCQ – Body Stigma ($\beta = -0.35$, $p = 0.002$) significantly predicted sexual Satisfaction in the regression model (Table 3).

Discussion

The overall goal of the present study was to examine the SF of a unique and select subset of BCS: women continuing to cope with BI difficulties posttreatment and who

Table 3. Significant predictors of breast cancer survivors' sexual desire, satisfaction, and overall sexual functioning

	Desire (*N* = 87)				Satisfaction (*N* = 88)				Overall sexual functioning (*N* = 86)			
	Final β	*t*	95% CI for β Lower	Upper	Final β	*t*	95% CI for β Lower	Upper	Final β	*t*	95% CI for β Lower	Upper
Demographic												
Age												
Work												
Clinical												
MthsDx												
VagDry	−0.44**	4.02	−0.43	−0.15	−0.22*	−2.26	−0.4	−0.03	−0.50**	−5.13	−2.96	−1.30
Surgery												
Reconst												
Menopaus												
Psychosocial												
KMSS					0.45**	4.27	0.06	0.16	0.27*	2.57	0.06	0.51
FACT–B												
BIBCQ – BodyStig					−0.35**	−3.15	−0.11	−0.03	−0.24*	−2.19	−0.40	−0.02

BIBCQ – BodyStig, Body Image after Breast Cancer Questionnaire Body Stigma subscale; FACT–B, Functional Adjustment to Cancer Therapy – Breast; Menopaus, Menopausal status (In menopause/Not in menopause); MthsDx, Months since Diagnosis; Reconst, Reconstruction (Yes/No); Surgery, Surgery (Mastectomy/Lumpectomy); VagDry, Vaginal Dryness. KMSS, Kansas Marital Satisfaction Scale.

*$p < 0.05$;

**$p < 0.01$.

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volunteered to participate in a randomized controlled trial to address their BI disturbance. Findings suggest that disruption in SF may be a common survivorship issue for this breast cancer group, with 83% of participants meeting the clinical FSFI cutoff score for sexual dysfunction. Sexual dimensions that were rated the most problematic were Desire, Satisfaction, and Pain. Only 17.3% of participants reported no interest in sex (for various reasons), suggesting that a large proportion do want to engage in some level of sexual activity and thus may experience considerable distress over being unable to do so. BCS report wanting information on sexual rehabilitation but rarely is the issue brought up in clinical appointments [37].

This BCS group also appears to experience greater sexual dysfunction than a heterogeneous group of female cancer survivors and a healthy female population (Table 4). When compared with a general BCS population, our study group appeared to have higher functioning in the dimensions of Arousal, Lubrication, Orgasm, and Pain, and overall SF. A closer examination of the comparison group in the study conducted by Raggio and colleagues [3] revealed that FSFI scores were calculated for a group consisting of married/partnered and single/unpartnered BCS. Sexual activity did not appear to be taken into account in these results, as recommended in the literature [19]. Indeed, not all of the women reported being sexually active in the Raggio *et al.*'s study [3]; thus, reported FSFI scores may have been artificially deflated. This is supported by these researchers' *post hoc* analyses, showing better FSFI scores ($M = 25.26$, $SD = 5.89$) in women who were sexually active [3], a level considerably lower than our subset of BCS ($M = 18.52$, $SD = 7.05$).

Study results failed to provide empirical support for the hypothesis that greater BI disturbance was associated with lower levels of overall SF. Our findings are in contrast to other studies showing a direct positive relationship between these two constructs in a general breast cancer population (e.g., [5,9]). While it is possible that BI disturbance is not directly associated with SF in this particular BCS subgroup, it is likely that a more complex, dynamic relationship exists, with bidirectional influences in operation [3]. The present study, however, is one of the first to demonstrate that a facet of BI, namely body stigma, may be an important predictor of SF, particularly sexual satisfaction and overall functioning. Of the six BI domains assessed by the BIBCQ, only Body Stigma had significant correlations with any SF dimension, specifically Arousal, Orgasm, Satisfaction, as well as overall SF. Moreover, when comparing the 'sexually engaged' and 'not sexually engaged' groups, the former group reported significantly less body stigma than the latter group.

Stigma-related sentiments are commonly expressed by BCS, for example, how their body 'failed them' or how they feel 'disfigured' or 'broken'. The BIBCQ – Body Stigma subscale is composed of items related to body shame and associated avoidant behaviors. Our findings are consistent with literature on this construct demonstrating that body shame, a factor linked to negative BI, can affect areas of SF, such as ability for orgasm or arousal difficulties [29]. The important mechanism appearing to mediate this relationship is women's self-consciousness during sexual activity [38], a behavior termed 'spectatoring' [39]. Women exhibiting body shame frequently inspect, monitor, and evaluate themselves during sexual activity, which tends to increase performance fears and interrupt the sexual response [39]. In a sense, engaging in this frequent self-surveillance represents a kind of cognitive distraction (e.g., intrusive thoughts and negative body perceptions) that lessens the level of intimate engagement with one's partner, resulting in decreased sexual satisfaction and disturbance of SF [29,40]. If a BCS is preoccupied with how her body appears to her partner, she is less likely to be fully present and engaged, cognitively and emotionally, during sexual activity.

The relationship between Body Stigma and SF can find its theoretical underpinning in the possible mediating constructs of shame and self-consciousness. Speculating on why the other BIBCQ subscales – Vulnerability, Limitations, Body Concerns, Transparency, and Arm Concerns – did not show any direct association with SF poses a

Table 4. Comparison of FSFI scores between female cancer and healthy groups

FSFI domain	BCS with BI issues (mean ± *SD*) (*N* = 127)	BCS (mean ± *SD*) (*N* = 83)[a]	Female cancer survivors (mean ± *SD*) (*N*)[b]	Healthy female population (mean ± *SD*) (*N* = 244)[c]
Desire	2.60 ± 1.26	2.72 ± 1.26	3.49 ± 1.28 (181)	4.28 ± 1.12
Arousal	3.11 ± 1.40 (126)	2.74 ± 2.01	4.06 ± 1.43 (181)	5.08 ± 1.11
Lubrication	3.45 ± 1.66	2.76 ± 2.20	4.26 ± 1.62 (180)	5.45 ± 1.14
Orgasm	3.34 ± 1.69	3.03 ± 2.41	4.31 ± 1.57 (180)	5.05 ± 1.30
Satisfaction	2.95 ± 1.58	3.12 ± 1.95	4.26 ± 1.47 (179)	5.04 ± 1.19
Pain	2.99 ± 2.26	2.74 ± 2.56	4.39 ± 1.79 (181)	5.51 ± 1.29
Total score	18.52 ± 7.05 (126)	16.89 ± 10.92	24.75 ± 6.75 (181)	30.75 ± 4.80

BI, body image; BCS, breast cancer survivors; FSFI, Female Sexual Functioning Index; *SD*, standard deviation.
[a]From Raggio *et al.* [3], p. 10.
[b]From Baser, Li, and Carter [19], p. 4612.
[c]From Wiegel, Meston, and Rosen [33], p. 5.

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greater challenge but may be explained by a closer examination of their items. The Vulnerability subscale items bear upon one's concerns of overall health, physical integrity, and fears of recurrence (e.g., 'I feel prone to cancer'). The Limitations subscale items have to do with functional limitations in one's ability to do daily tasks (e.g., 'I can participate in normal activities'). The Arm Concerns subscale focus on treatment-related arm morbidity (e.g., 'Swelling of my arm is a problem for me'). The thematic matter of these subscales does not relate to SF, or even more broadly, to sexuality; the links are distant and tenuous. The Body Concerns subscale items revolve around physical bodily satisfaction (e.g., 'I like my looks just the way they are'). The Transparency subscale items have to do with perceived obviousness of one's altered physical appearance, particularly one's breasts (e.g., 'I think my breasts appear uneven to others'). It can be hypothesized that being comfortable with one's physical appearance and feeling transparent can impact SF, albeit the connections may not be straightforward. They may contribute to one's overall BI, but each subscale, on its own, has a subject focus with indirect connections to SF. Conversely, the Body Stigma subscale has items that have relatively stronger, more direct links to SF (e.g., 'I avoid physical intimacy' and 'I feel sexually attractive when I am nude').

Investigation of clinical variables in predicting SF demonstrated that vaginal dryness significantly predicted lower sexual desire, satisfaction, and poorer overall SF, consistent with other studies (e.g., [4,9,21,22]). Thus, this symptom is an important one to screen for in a SF assessment in this population. In terms of psychosocial predictors, study results support the wealth of evidence that BCS who reported lower marital or relationship satisfaction experienced difficulties in sexual satisfaction and overall functioning (e.g., [5,6,9,17,21]). As with many life elements, cancer compounds and heightens any preexisting difficulties in the couple relationship. As women are adapting to their 'new body' after undergoing cancer treatment, fears of potential rejection, abandonment, and even disgust from their sexual partner are commonly experienced, which in turn may lead to decreased frequency and avoidance of sexual activity [17]. The woman's partner may also have uncertainty regarding what is medically permissible and may hold fears of potentially harming her [7]. Successful renegotiation of the sexual relationship and broadening of the couples' sexual repertoire require open communication, emotional closeness, and security associated with a mutually supportive relationship [6,21]. Couple approaches, therefore, might also benefit this group of women.

Future directions

Future research investigating SF in BCS should broaden its scope beyond the 'coital imperative' and examine other forms of sexual activity, such as mutual and self-touch masturbation, manual stimulation, oral sex, massage, and other forms of physical intimacy (kissing and hugging), which can contribute to sexual satisfaction and improved functioning. Further work is also critically needed in investigating the SF in BCS who are not engaged in sexual activity and the reasons for why this is the case. We did not ask the women in our study why they were not engaged.

A number of notable limitations in the present study deserve mention. Firstly, as a cross-sectional investigation of SF and BI, causal explanations cannot be made as to the direction of these relationships. In addition, it must be recognized that our study sample was not ethnically diverse (consisting primarily of Caucasian women) and was self-selected, that is, participants voluntarily took part in a randomized controlled trial for BI and sexuality concerns. The generalizability of study findings may be limited to this select group of survivors. Also, the FSFI response criteria determining sexual activity status (suggested by Baser, Li, and Carter [19]), were based on rational judgment and require validation. Despite being considered a necessary attempt to control for the potential score deflation inherent in the FSFI, our operationalization may not have truly captured women who are in fact actively engaged in sexual activity. Lastly, levels of precancer SF were not assessed, nor were sexual difficulties in the partner, which could explain some degree of the sexual dysfunction experienced by our study participants.

Conclusion

BCS who self-reported significant BI concerns posttreatment may represent a vulnerable subgroup to developing sexual dysfunction. Given the relatively high prevalence of sexual difficulties present in this clinical group, screening for this important issue is vital, to ameliorate the negative and often persistent impacts on the quality of life. Significant predictors of poorer SF were vaginal dryness, poorer marital/relationship satisfaction, and feelings of body stigma. Future studies should explore the development of SF screening measures that incorporate questions regarding these factors. Psychosocial interventions aimed at sexual rehabilitation could focus on helping survivors address body shame and the associated avoidant behaviors, thereby facilitating adjustment, integration, and acceptance of their 'new body'.

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Conflict of interest

The authors declare that they have no competing or conflicts of interest.

Ethics approval

Ethics approval was obtained from the University Health Network and Sunnybrook Health Sciences Centre review boards, and informed consent from each participant was obtained. The present study complies with current Canadian laws.

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