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Long term psychological benefits of cognitive-behavioral stress management for women with breast cancer: 11-year follow-up of a randomized controlled trial

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Abstract

BACKGROUND—Breast cancer survivors experience long-term physical and psychological sequelae following primary treatment that negatively influence quality of life (QOL) and increase depressive symptoms. Group-based cognitive-behavioral stress management (CBSM) delivered post-surgery for early stage breast cancer was previously associated with better QOL over a 12-month follow-up, as well as with fewer depressive symptoms up to five years post-study enrollment. This 8–15 year (11-year median) follow-up of a previously conducted trial (#NCT01422551) evaluated whether women in this cohort receiving CBSM had fewer depressive symptoms and better QOL than controls at the 8–15 years follow-up.

METHODS—Women with stage 0-IIIb breast cancer were initially recruited 2–10 weeks post-surgery and randomized to a 10-week CBSM intervention or a 1-day psychoeducational control group. One hundred women (51 CBSM, 49 controls) were re-contacted 8–15 years post study enrollment to participate in a follow-up assessment. The Center for Epidemiologic Studies-Depression scale (CES-D) and the Functional Assessment of Cancer Therapy-Breast (FACT-B) were self-administered. Multiple regression was employed to evaluate group differences on the CES-D and FACT-B over and above effects of confounding variables.

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RESULTS—Participants assigned to CBSM reported significantly lower depressive symptoms (*d*=0.63, 95% CI [0.56,0.70]), and better QOL (*d*=0.58, 95% CI [0.52,0.65]), above the effects of the covariates.

CONCLUSIONS—Women who received CBSM post-surgery for early stage breast cancer reported lower depressive symptoms and better QOL than the control group up to 15 years later. Early implementation of cognitive-behavioral interventions may influence long-term psychosocial functioning in breast cancer survivors.

Keywords

Breast Neoplasms; Survivors; Follow-up Studies; Depression; Quality of Life; Cognitive Therapy; Relaxation Therapy; Psychological Stress

INTRODUCTION

Cancer survivors comprise approximately 4% of the United States population (13.7 million) as of 2012[1] with 40% having survived 10 or more years.[2] Approximately 22% of these are female breast cancer survivors, making this the most prevalent cancer survivor group.[2] Medical advances that have extended survival and lowered recurrence rates in breast cancer also bring persistent side effects and emotional sequelae into the post-treatment period. Fatigue, insomnia, depression, cognitive dysfunction, and menopausal symptoms are among commonly reported difficulties in breast cancer survivors,[3] compounded by fears and stress around the possibility of recurrence.[4]

Breast cancer survivors report difficulty in quality of life (QOL) domains of physical and emotional/psychological well-being.[5] Lower scores on physical QOL domains are attributed to ongoing pain, swelling, fatigue, and treatment-induced menopausal symptoms;[6] lower scores on emotional/psychological QOL domains are attributed to worries about recurrence.[6] Long-term (> 5-years) breast cancer survivors report higher prevalence of mild-moderate depressive symptoms than healthy controls,[5] with prevalence rates of at least 15% at 5-years post-diagnosis[7] compared with rates of 4.5%–9.3% for women in health community samples.[8]

Psychosocial interventions based in cognitive-behavioral theories are most commonly used to improve QOL in cancer populations.[9] Meta-analyses have found them efficacious in improving QOL and depressive symptoms in the short-term, but less is known about long-term effects.[10–12] Cognitive-behavioral stress management (CBSM) delivered post-surgically for women with early stage breast cancer has been shown to improve QOL[13] and reduce depressive symptoms up to 5-years post-treatment.[14,15] More research is needed to determine whether women who receive CBSM as they move through active treatment experience even longer term benefits. This study aimed to evaluate whether women who received 10 weeks of group-based CBSM 2–10 weeks post-surgery for early stage breast cancer report lower depressive symptoms and better QOL than women in the control group at an 8–15 year (11-year median) follow-up.

MATERIALS AND METHODS

Patients and Study Design

Participants came from a single center, single blind, randomized, parallel assignment efficacy trial approved by the Institutional Review Board of the University of Miami and conducted between 1998 and 2005. Women who were 2–10 weeks post-surgery for stage 0-IIIb breast cancer were recruited via physician referrals from private practices and Sylvester Cancer Center as well as advertising. Women were excluded if they had stage IV breast cancer, had begun adjuvant treatment, had been previously diagnosed with another serious cancer, had other major medical conditions, had been diagnosed with psychosis or panic disorder, endorsed suicidality, were not between the ages of 21–75 years old, or were not fluent in English.

Of the 502 potential participants screened, 106 did not meet inclusion criteria and 156 declined participation; 240 signed informed consents, were enrolled, and completed a baseline assessment including interviewer-administered and self-report psychosocial questionnaires. Women were then randomly assigned to either a 10-week group-based cognitive-behavioral stress management intervention (CBSM) or a 1-day group-based psychoeducational seminar control. Randomization was implemented on a 1:1 basis. Each cohort averaged approximately 14 participants. Blinded study coordinators conducted randomization and assessments. Each group was co-led by a Ph.D. level clinical psychologist and a graduate student in clinical psychology. Assessments were repeated at six months,12 months, and five years post study enrollment.

Details of the parent study (National Institutes of Health Clinical Trial #NCT01422551) are fully described in initial interim reports[13] and recent reports with the final sample.[16] The parent study found that breast cancer survivors in the CBSM condition reported lower depressive symptoms and better QOL than controls at the three follow-up time points.

We launched a new study in 2013 to assess depressive symptoms and QOL in a longer term follow-up of survivors from this cohort. Participants, now 8–15 years post-enrollment (median=11 years), were re-contacted to complete questionnaires assessing QOL, depressive symptoms, and medical status. This article reports findings from this 8–15 year follow-up. From the original sample of 240, 20 had requested no further contact; 30 were confirmed to be deceased at this follow-up; we were unable to locate a new address or phone number for two; one was contacted but declined to participate; 25 agreed to participate but did not return the packet after multiple requests, and 62 were unreachable/lost to follow-up (see CONSORT flow diagram for illustration of participation from the time of contact for the original trial through the present follow-up, Figure 1). One hundred participants (CBSM = 51; Control = 49) returned the questionnaires.

Intervention Condition—The initial study tested a manualized CBSM intervention[17] designed to improve coping and psychosocial adaptation and reduce stress and negative mood for women undergoing primary breast cancer treatment. This intervention comprises cognitive-behavioral therapy (e.g., cognitive reframing, effective coping skills training,

assertiveness training, anger management) and relaxation training (e.g., progressive muscle relaxation, guided visual imagery, diaphragmatic breathing).

Control Condition—The control group was a 1-day psycho-educational "self-help" classroom seminar that took place within the corresponding 10-week intervention period. Women were given general information about breast cancer care and health. A condensed version of select portions of the CBSM modules came in handouts, but women did not have opportunities to practice those techniques.

Measures

Depression—Depressive symptomatology within in the past week was assessed at this follow-up using the Center for Epidemiologic Studies-Depression Scale (CES-D).[18] The CES-D contains 20 items (e.g., "I felt hopeless about the future") with responses ranging from rarely or none of the time (0) to most or all of the time (4). After appropriate reverse-coding, responses are summed for a total score (possible range 0–60). Higher total scores indicate more symptomatology. Reliability was good in the present sample ($\alpha = 0.90$).

Quality of Life—The self-administered 44-item Functional Assessment of Cancer Therapy for Breast Cancer (FACT-B)[19] was used to assess participants' overall QOL, including specific breast cancer physical concerns (e.g., "I have a lack of energy") and emotional concerns (e.g., "I worry about dying"). Response possibilities ranged from not at all (0) to very much (4). After appropriate reverse-coding, items are summed for a total score (possible range 0–164) with higher scores indicating better QOL. Because much of the research on breast cancer focuses specifically on physical and emotional well-being subscales,[5,6] we also analyzed those separately. Alphas for the FACT-B, physical well-being, and emotional well-being scale in the present sample were 0.94, 0.84, and 0.79, respectively.

Medical and Demographic Characteristics—Self-reported demographic, socioeconomic, medical, and breast cancer treatment information was collected at baseline, 6 months, and 12 months. Information related to breast cancer diagnosis, recurrence, and treatment was collected again at the follow-up and verified with medical chart reviews.

Statistical Analyses

Multiple regression was conducted in the Statistical Package for the Social Sciences (v.19) to examine whether study condition was associated with QOL on the FACT-B Total, FACT physical well-being, and FACT emotional well-being, and with depressive symptoms on the CES-D at the 8–15 year follow-up, over and above the effects of confounding predictors.

Highly skewed or kurtotic variables were log-transformed to meet assumptions of normality. Three outliers on the FACT-B and one outlier on the CES-D were winsorized to fall within three standard deviations of the mean.[20] All analyses controlled for baselines of the comparable measure of well-being: Analyses of QOL controlled for initial QOL, assessed by the FACT-B; analyses of depressive symptoms controlled for initial scores on the Hamilton Depression Rating Scale (HDRS).[21] An *a priori* set of covariates was established, using the

criteria that they differed by study condition at baseline or have been shown to affect QOL and depressive symptoms.[22,23] Controlled were income,[5] race/ethnicity (each minority vs. White as a dummy code),[24] Body Mass Index (BMI),[25] antidepressant use,[26] endocrine therapy,[27] and disease recurrence status.[28] In two more cases, potential control variables were highly correlated (menopausal status with age, and stage with surgical procedure). To minimize the number of covariates,[22] only one of the two from each pair was retained (age and surgical procedure).

This set of covariates was entered in the initial step of the hierarchical model; treatment condition was entered in the second step. Standardized regression coefficients, at a two-tailed level of significance ($p < 0.05$), 95% confidence intervals, and corresponding effect sizes (0.20 = small; 0.50 = medium; 0.80 = large)[29] were used to assess the relationships between study conditions and outcomes.

RESULTS

Participant Characteristics

Table 1 displays demographic and medical characteristics by study condition. At this follow-up, the breast cancer survivors were an average of 62.47 (*SD*=8.99) years old. Most were non-Hispanic White (70%), followed by Hispanic (21%), Black (5%), and Asian (3%). Twelve had experienced a breast cancer recurrence. Study conditions were equivalent on most characteristics, except for age, menopausal status, and surgical procedure (lumpectomy vs. mastectomy).

Women who completed questionnaires at this time point (N = 100) were not different from women in the initial trial who did not (N = 140) with regard to condition assignment (i.e., CBSM vs. control; $\chi^2[1]=0.48$, $p=.49$). Participating women were older ($F[1,238]=5.91$, $p=.016$), had lower depressive symptoms at baseline ($F[1,229]=6.70$, $p=.010$), and better overall FACT-B QOL at baseline ($F[1,238]=10.33$, $p=.001$) than those not in the follow-up.

Outcome Variables

At this follow-up, breast cancer survivors who had been assigned to CBSM reported significantly better overall QOL on the FACT-B (*M*=142.84, *SE*=4.26) than those in the control group (*M*=130.25, *SE*=3.73). This difference was significant over and above effects of all other predictors in the model, *d*=0.58, 95% CI [0.52,0.65], a medium effect (see Table 2 for all FACT-B regression results). The model with all predictors explained 39% of variance in the FACT-B ($p=.015$). Those receiving CBSM reported better physical well-being (*M*=27.14, *SE*=0.90) than those in the control group (*M*=23.62, *SE*=0.79), *d*=0.77, 95% CI [0.70,0.84], a large effect. The model with all predictors explained 38% of the variance in physical well-being ($p=.018$). Those receiving CBSM also reported better emotional well-being (*M*=22.49, *SE*=0.67) than those in the control group (*M*=20.34, *SE*=0.59), *d*=0.63, 95% CI [0.56,0.70], a medium-large effect. The model with all predictors explained 36% of the variance in emotional well-being ($p=.033$).

Breast cancer survivors who had been assigned to CBSM also reported significantly lower depressive symptoms at follow-up (*M*=4.69, *SE*=1.74) than those assigned to the control

group (*M*=10.10, *SE*=1.57), *d*=0.63, 95% CI [0.56,0.70], a medium-large effect size (Table 3). The full model explained 37% of the variance in depressive symptoms (*p*=.040). The current sample size is sufficient to detect an effect of medium magnitude with 95% power.

DISCUSSION

This is the first study to examine long-term psychosocial effects of a randomized controlled trial of group-based CBSM at 8–15 years follow-up in breast cancer survivors. Women who received CBSM in the weeks following surgery reported better QOL and lower depressive symptoms than women in the control group 8–15 years later. Women in the CBSM intervention group also reported better physical and emotional well-being. These findings suggest that women given the opportunity to learn stress management (relaxation training and cognitive-behavioral techniques) during active treatment may benefit well into survivorship. Group differences on QOL and depressive symptoms were found over and above effects of confounding demographic, medical, and cancer treatment-related predictors. The confidence intervals and medium to large effect sizes suggest that the magnitude of the group differences in QOL and depressive symptoms are clinically significant.

Although studies have examined long-term psychosocial well-being among breast cancer survivors, very few have evaluated the long-term influence of a psychosocial intervention on these outcomes of well-being.[30] A study by Helgeson et al[31] found that women given an 8-week educational intervention for early stage breast cancer continued to show improved QOL up to 3-years post-intervention. A meta-analysis, using a median follow-up length of less than or greater than 8 months, concluded that cognitive-behavioral therapy was effective in the short term for QOL and depression among cancer survivors, while long-term effects were found only for QOL.[12] This highlights the need to treat long-term depressive symptoms, which are still prevalent at least 6–13 years post-treatment in breast cancer survivors.[32]

One previous study found a mean CES-D score of 10.5 among breast cancer survivors at one or more years post-treatment, compared to age and gender matched controls who reported a mean of 8.3.[33] Women in our control group reported a mean CES-D score of 10.10, resembling breast cancer survivors from that study, while the mean CES-D score in the CBSM group (*M*=4.69) was significantly lower than scores among healthy controls [*t*(276)=3.47, *p*=.001] and breast cancer survivors [*t*(242)=4.52, *p*<.0001].

Group-based cognitive-behavioral interventions in early stage breast cancer reduced depressive symptoms up to 1–2 years after treatment.[34] Previous research showed that women receiving CBSM post-surgery for early stage breast cancer reported lower depressive symptoms than a control group at the 1-year and 5-year follow-ups.[14,15] The present study extends these findings to 8–15 years post-treatment, suggesting that a psychosocial intervention may affect long-term depressive symptomatology.

With respect to FACT-B QOL, one natural history study among women more than 5 years post-treatment[35] reported a physical well-being mean (*M*=24.30) that is comparable to the

mean in our control group, while our CBSM group members reported significantly higher physical well-being [M=27.14; t(86), p=.013]. A similar, though less pronounced pattern was evident for FACT-B emotional well-being scores, whereby the CBSM group showed greater quality of life (M=22.49) than scores observed in the natural history sample [M=18.0, t(86)=5.31, p<.0001] though our controls revealed scores falling between these two values (M=20.34). In summary, women in the CBSM group had QOL scores higher than other breast cancer survivors in observational studies.[35] This suggests that CBSM can provide a buffer against deterioration in QOL throughout survivorship.

Specific therapeutic components of CBSM may be pathways for these long-term effects. Relaxation training increases confidence in relaxation skills,[13,36] which may encourage their use as a coping modality post-treatment, in turn lowering distress. Cognitive restructuring and adaptive coping aspects of CBSM address cancer-specific distress around fears of recurrence and disease progression. Women may also continue to use these coping skills after treatment cessation to manage fears of recurrence, in turn, ameliorating depressive symptoms and improving QOL.

Strengths and Limitations

The extended follow-up period in this study is notable given that most studies examining psychosocial functioning in breast cancer survivors employ much shorter follow-up times.[12] Rather than examine only disease-free breast cancer survivors, the present study reports QOL and depressive symptoms among both women who remained disease-free and women who experienced recurrence. Approximately one third of the current sample was of an ethnic minority (i.e., Black, Hispanic, Asian) thereby increasing the generalizability of the findings to women of various ethnic backgrounds. However, generalizability is limited by other factors, such as the academic setting in which the study took place, the geographical location, the early stage sample, and the observed differences between women who took part in the follow-up and those who did not. The fact that women who participated in the follow-up were older and reported less depressive symptoms and greater well-being at the time of diagnosis than women who did not participate should be considered when generalizing the findings to all breast cancer survivors. Self-report bias may play a role in the measures collected. Given the post-hoc nature of this follow-up study, sample size was lower than the original starting sample, with 42% of the originally randomized sample taking part. Future work should seek to understand the mechanisms by which CBSM produces these long-term effects.

Clinical Relevance

The study has clinical implications, given the high prevalence of long-term depressive symptoms and diminished physical and emotional QOL in breast cancer survivors.[5–7] Depression in breast cancer survivors is a major health concern given that is a significant source of emotional distress and impaired physical and social functioning. In breast cancer survivors, depression is highly associated with pain, fatigue, and insomnia.[32] Furthermore, depression is an established risk factor for noncompliance with medical treatment.[37,38] Noncompliance with follow-up visits and with long-term regimens such as hormonal therapy may explain poorer clinical outcomes for depressed breast cancer patients.[39] Cancer

care plans outline the importance of ongoing evaluation of psychosocial burden and symptom management throughout breast cancer survivorship.[35,40]

Conclusions

This 8–15 year follow-up of a randomized controlled trial in women with early stage breast cancer showed that participants who received a 10-week, group-based CBSM intervention report fewer depressive symptoms and better QOL than women in the control group. The current findings highlight the possibility of maintaining long-term psychosocial health by way of early psychosocial intervention.

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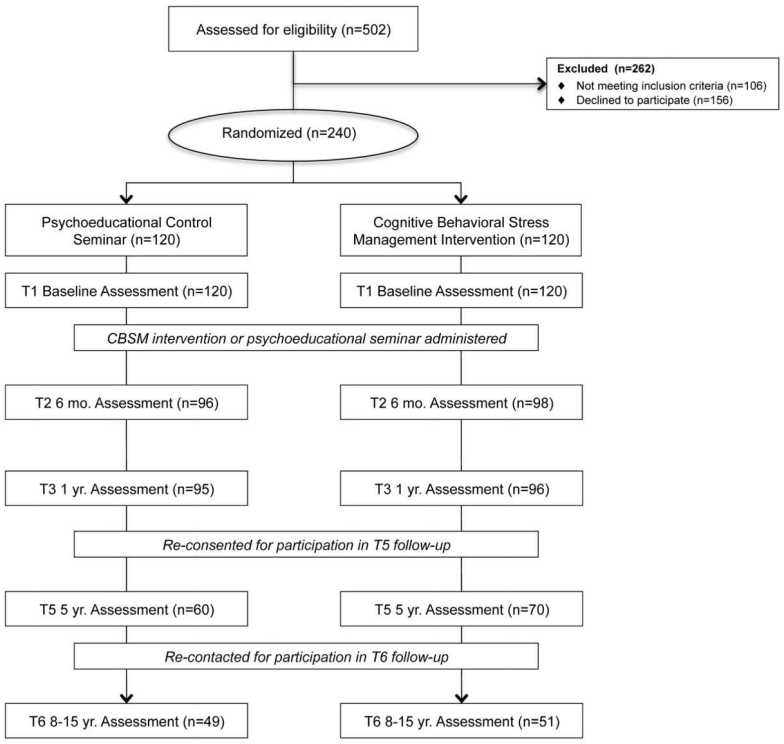

Figure 1.
CONSORT flow diagram extending from recruitment for the original trial through the present follow-up.

Table 1

Means, Standard Deviations, and Frequencies of All Study Covariates by Group

Variable	Control	Intervention	Statistic	*p*
Age at follow-up (years)	64.27 (8.48)	60.75 (9.21)	$F(1,98)=3.95$	.050*
Menopausal Status			$\chi^2(1)=4.29$	.038*
Premenopausal	15 (30.6%)	26 (51.0%)		
Postmenopausal	34 (69.4%)	25 (49.0%		
Ethnicity			$\chi^2(3)=1.69$	.64
White non-Hispanic	36 (73.5%)	34 (66.6%)		
Hispanic	8 (16.3%)	13 (25.5%)		
Black	2 (4.1%)	3 (5.9%)		
Asian	2 (4.1%)	1 (2.0%)		
Employment Status			$\chi^2(1)=0.13$	.72
Not Employed	11 (22.4%)	13 (25.5%)		
Employed	38 (77.6%)	38 (74.5%)		
Education (years)	15.67 (2.15)	15.92 (2.30)	$F(1,98)=0.31$	.58
Income (thousands of dollars)	82.11 (84.25)	74.80 (37.99)	$F(1,85)=0.24$	.63
Partnered Status			$\chi^2(1)=2.55$	.11
Not partnered	23 (46.9%)	16 (31.4%)		
Partnered	26 (53.1%)	35 (68.6%)		
Stage of disease			$\chi^2(3)=1.04$	.79
0	9 (18.4%)	8 (15.7%)		
I	19 (38.8%)	16 (31.4%)		
II	18 (36.7%)	21 (41.2%)		
III	3 (6.1%)	5 (9.8%)		
Positive Lymph Nodes	1.55 (3.69)	1.39 (2.94)	$F(1,98)=0.06$	.81
Size of Tumor	1.54 (0.90)	1.86 (1.17)	$F(1,58)=1.41$	.24
ER Status			$\chi^2(1)=2.83$	.09
Positive	38 (77.6%)	35 (68.6%)		
Negative	5 (10.2%)	12 (23.5%)		
PR Status			$\chi^2(1)=0.01$	.94
Positive	27 (55.1%)	28 (54.9%)		
Negative	14 (28.6%)	15 (29.4%)		
HER2/neu Status			$\chi^2(1)=2.09$	.15
Positive	3 (6.1%)	7 (13.7%)		
Negative	27 (55.1%)	22 (43.1%)		
Procedure Type			$\chi^2(1)=5.78$	.016*
Lumpectomy	31 (63.3%)	20 (39.2%)		
Mastectomy	18 (36.7%)	31 (60.8%)		
Time Since Surgery	41.98 (28.22)	36.12 (21.40)	$F(1,98)=1.38$	.24
Received chemotherapy			$\chi^2(1)=1.40$	.24

Variable	Control	Intervention	Statistic	*p*
Yes	26 (53.1%)	33 (64.7%)		
No	23 (46.9%)	18 (35.3%)		
Received radiation therapy			χ^2 (1)=1.90	.17
Yes	34 (69.4%)	28 (54.9%)		
No	15 (30.6%)	22 (43.1%)		
Received hormonal therapy			X^2 (1)=0.36	.55
Yes	39 (79.6%)	38 (74.5%)		
No	10 (20.4%)	13 (25.5%)		
Body Mass Index	25.97 (5.24)	25.53 (4.84)	*F*(1,66)=0.13	.72
Baseline HDRS	6.00 (4.31)	6.82 (4.92)	*F*(1,93)=0.74	.39
Baseline Low vs. High HDRS			X^2 (1)=1.74	.19
Low distress (< or = 7)	34 (69.4%)	30 (58.8%)		
High distress (>7)	12 (24.5%)	19 (37.3%)		

Notes: ER=Estrogen Receptor; PR=Progesterone Receptor; HER2/neu=Human Epidermal Growth Factor Receptor; HDRS=Hamilton Depression Rating Scale

* p<.05

Table 2

Effects on FACT-B Overall Quality of Life, Physical Well-Being subscale, and Emotional Well-Being subscale at 8–15 Year Follow-Up

Predictor	*Beta*	*SE*	*t*	*p*	Lower 95% CI	Upper 95% CI
FACT-B T1	0.61	0.18	4.33	<.001***	0.43	1.16
Age at follow-up	0.08	0.33	0.57	.57	−0.48	0.85
Income	0.18	3.91	1.47	.15	−2.14	13.61
Race						
Black	−0.04	13.72	−0.30	.77	−31.68	23.56
Hispanic	0.02	6.55	0.14	.89	−12.29	14.08
Asian	0.32	23.11	2.43	.019*	9.59	102.64
BMI	0.16	0.58	1.30	.21	−0.44	1.90
Antidepressant use	<0.01	7.67	0.01	1.00	−15.39	15.47
Endocrine therapy	0.02	7.29	0.15	.88	−13.54	15.79
Recurrence status	−0.06	8.48	−0.51	.62	−21.35	12.77
Surgical procedure	−0.09	5.90	−0.67	.51	−15.81	7.96
CBSM vs. Control	0.27	5.96	2.11	.040*	0.60	24.60
FACT-Breast Total; *R2*=0.39, *p*=.015*						
FACT-PWB T1	0.47	0.14	3.51	.001**	0.21	0.79
Age at follow-up	0.12	0.07	0.82	.42	−0.08	0.20
Income	0.20	0.83	1.63	.11	−0.32	3.01
Race						
Black	0.02	2.86	0.13	.90	−5.40	6.11
Hispanic	−0.01	1.38	−0.10	.92	−2.92	2.63
Asian	0.22	4.60	1.81	.076∞	−0.92	17.60
BMI	0.12	0.12	0.90	.37	−0.14	0.36
Antidepressant use	−0.13	1.57	−0.95	.35	−4.64	1.66
Endocrine therapy	−0.04	1.54	−0.34	.73	−3.62	2.57
Recurrence status	−0.05	1.79	−0.43	.67	−4.36	2.83
Surgical procedure	−0.12	1.26	−0.81	.42	−3.56	1.51
CBSM vs. Control	0.36	1.27	2.78	.008*	0.97	6.07

Predictor	*Beta*	*SE*	*t*	*p*	Lower 95% CI	Upper 95% CI
FACT-Physical Well-Being; *R2*=0.38, *p*=.018*						
FACT-EWB T1	0.50	0.12	3.51	.001**	0.18	0.67
Age at follow-up	0.09	0.05	0.64	.53	−0.07	0.14
Income	0.20	0.62	1.60	.12	−0.26	2.25
Race						
Black	0.03	2.12	0.24	.81	−3.75	4.78
Hispanic	0.01	1.04	0.06	.95	−2.02	2.15
Asian	0.35	3.74	2.61	.012*	2.23	17.26
BMI	0.15	0.09	1.13	.26	−0.08	0.29
Antidepressant use	−0.20	1.14	−1.48	.15	−3.97	0.60
Endocrine therapy	−0.02	1.16	−0.17	.87	−2.53	2.13
Recurrence status	−0.12	1.34	−0.89	.38	−3.90	1.51
Surgical procedure	−0.05	0.93	−0.36	.72	−2.22	1.54
CBSM vs. Control	0.30	0.94	2.28	.027*	0.25	4.04
FACT-Emotional Well-Being; *R2* =0.36, *p*=.033*						

Notes: SE=Standard Error; CI=Confidence Interval; FACT-B=Functional Assessment of Cancer Therapy-Breast; PWB=Physical Well-Being; EWB=Emotional Well-Being; BMI=Body Mass Index; CBSM=Cognitive Behavioral Stress Management

Coding: Race (dummy code: 1 in case of code existence, 0 otherwise); Antidepressant use (1= used antidepressants, 0 = did not); Endocrine therapy (1 = received endocrine therapy; 0 = did not); Recurrence status (1 = recurred 0 = no recurrence); Surgical procedure (1 = mastectomy, 0 = lumpectomy); CBSM vs. Control (1 = CBSM, 0 = Control).

∞ p<.10;

* p < .05;

** p<.01;

*** p<.001;

Table 3

Effects on CES-D Depressive Symptoms at 8–15 Year Follow-Up

Predictor	*Beta*	*SE*	*t*	*p*	Lower 95% CI	Upper 95% CI
HDRS T1	0.34	0.28	2.54	.015*	0.15	1.28
Age at follow-up	0.02	0.14	0.14	.89	−0.27	0.31
Income	−0.12	1.63	−0.91	.37	−4.77	1.82
Race						
Black	0.04	5.56	0.25	.80	−9.80	12.63
Hispanic	0.07	2.67	0.51	.61	−4.04	6.76
Asian	0.06	8.71	0.45	.66	−13.70	21.45
BMI	−0.13	0.24	−0.96	.35	−0.72	0.26
Antidepressant use	0.27	3.05	1.92	.062∞	−0.31	11.99
Endocrine therapy	−0.20	3.15	−1.55	.13	−11.25	1.47
Recurrence status	0.04	3.59	0.32	.75	−6.08	8.40
Surgical procedure	0.34	2.51	2.48	.017*	1.15	11.27
CBSM vs. Control	−0.30	2.46	−2.2	.033*	−10.37	−0.45
CES-D; *R2*=0.37, *p*=.040*						

Notes: SE=Standard Error; CI=Confidence Interval; CES-D=Center for Epidemiologic Studies; HDRS= Hamilton Depression Rating Scale; BMI=Body Mass Index; CBSM=Cognitive Behavioral Stress Management

Coding: Race (dummy code: 1 in case of code existence, 0 otherwise); Antidepressant use (1= used antidepressants, 0 = did not); Endocrine therapy (1 = received endocrine therapy; 0 = did not); Recurrence status (1 = recurred 0 = no recurrence); Surgical procedure (1 = mastectomy, 0 = lumpectomy); CBSM vs. Control (1 = CBSM, 0 = Control).

∞ p<.10;

* p < .05