

Contextual Life Stress and Coping Strategies as Predictors of Adjustment to Breast Cancer Survivorship

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ABSTRACT

Background/Purpose: The study presented here examined the influence of contextual life stress and coping strategies on change in adjustment over the year following completion of treatment for breast cancer. We also investigated whether contextual stressful life events moderate the relationship between coping strategies and adjustment, such that cancer-specific emotional approach coping processes would predict better psychosocial outcomes only in the context of lower life stress and would have less impact on adaptation in the context of heightened life stress. **Methods:** In a sample of women ($n = 558$) who had recently completed treatment for nonmetastatic breast cancer and were part of a psychoeducational intervention trial to facilitate the transition to survivorship, life stress in the year prior to study entry, cancer-specific coping strategies, and general and cancer-specific adjustment were assessed at baseline, and adjustment outcomes (i.e., vitality, depressive symptoms, cancer-specific distress, personal growth) also were assessed at 6-month ($n = 417$) and 12-month ($n = 397$) follow-up. **Results/Conclusions:** Although cross-sectional relationships between life stress and adjustment were demonstrated, findings suggest that contextual life stress does not appear to have a direct influence on change in adjustment in the first year after breast cancer treatment. Instead, life stress interacted with can-

cer-specific coping to predict adjustment, such that cancer-specific emotional approach coping was adaptive only under conditions of low contextual life stress.

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INTRODUCTION

In the United States, the chance of a woman being diagnosed with invasive breast cancer during her lifetime is about 1 in 8 (1). Given the substantial variability demonstrated in adjustment to the disease (2,3), characterizing the personal and contextual factors that facilitate or impede psychosocial adaptation is an important goal for breast cancer research. Although findings are not completely uniform, research suggests that coping through cognitive, emotional, or behavioral disengagement is detrimental to long-term adjustment, whereas coping through active acceptance, seeking social support, emotional expression, or other approach-oriented coping strategies predicts diminished distress over time (4–7), a finding that is consistent with the literature on other cancers (8,9). Functionalist theories of emotion would suggest that strategies aimed at expressing and exploring the emotions associated with breast cancer may be particularly useful, as processing and communicating one's affective states may call attention to primary concerns, facilitate goal-directed action relevant to these concerns, and engender social support (10). Indeed, in longitudinal research in breast cancer patients completing medical treatments (11) and individuals experiencing other stressors (12–15), coping through emotional approach predicted psychological adjustment over and above the influence of other coping strategies. A first goal of this study was to examine emotional approach coping (EAC) strategies and other coping processes as predictors of adjustment over

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time in women who had recently completed medical treatment for breast cancer.

In examining predictors of adaptation, it is also important to consider the context in which the cancer experience occurs for each woman (16), which may differ dramatically among individuals. Cancer does not occur in a vacuum, and over the course of a woman's diagnosis and treatments, such life events as death of loved ones, financial difficulties, and divorce continue to unfold. In the general population, these stressful life events are associated with depression and distress (17), and individuals with depleted physical and psychosocial resources (such as those undergoing cancer treatments) may be particularly vulnerable to the psychological sequelae of such events. Indeed, the stress and coping literature generally posits a cumulatively negative effect of stress (18). For example, a study of trauma survivors demonstrated that the occurrence of other stressful life events within 9 months following the trauma placed survivors at greater risk for posttraumatic symptomatology (19). Similarly, the psycho-oncology literature suggests that the occurrence of stressful life events, whether prior to diagnosis or years after treatment completion, may increase posttreatment distress and trauma symptomatology (16,20–23). Our second goal was to explore the effects of contextual stressful life events on adjustment over time. We considered both general (i.e., vitality and depressive symptoms) and cancer-specific (i.e., distress and personal growth) measures of adjustment. The purpose of this distinction was to explore whether coping with other life stressors in the year surrounding breast cancer treatment had a negative impact on both women's general energy and depressive symptoms as well as on cancer-specific distress or growth.

The final goal of this article was to examine whether the context in which cancer occurs might influence the predictive value of coping processes on distress. EAC is not adaptive for all women under all conditions, as expressing and processing one's emotions may be more useful for individuals who have both the resources to pursue goals and a receptive social context (11). Given that contextual life upheaval during breast cancer may challenge both one's intrapersonal and interpersonal resources, we expected that life stressors might moderate the relationship between cancer-specific coping strategies and adjustment, such that EAC processes specifically directed toward managing one's experience with cancer would predict better psychosocial outcomes only in the context of lower life stress and would have less impact on adaptation in the context of heightened stress.

We tested these hypotheses in a sample of women who recently had completed treatment for breast cancer and were part of a psychoeducational trial. The "reentry" phase, during which women resume their normal life patterns, includes unique adaptive challenges that can be unanticipated and distressing (24,25). For example, women may experience lingering physical side effects of treatment, loss of social support from health care providers and other patients as well as from their social circle, who may not recognize the need for continued emotional support, and a fear of recurrence once they no longer have active treatment as a vehicle for control. In the psychoeducational trial (26), we found that, relative to a standard print material control, expo-

sure to a preparatory videotape resulted in increased vitality at 6-month follow-up, particularly for women who felt unprepared for the reentry phase, and that brief psychoeducational counseling produced lower cancer-specific distress, but only for those who felt more prepared for reentry. At 12 months, intervention effects were in the same direction but not statistically significant. In this article, these effects were controlled statistically in regression analyses.

METHOD

Participants

Women treated for nonmetastatic breast cancer ($n = 558$) participated in this study as part of the Moving Beyond Cancer (MBC) trial, a randomized and controlled intervention to promote realistic expectations and approach-oriented coping for women in the reentry transition (26). Inclusion criteria were the return of baseline questionnaire within 8 weeks after medical treatment completion (i.e., surgery, radiotherapy, chemotherapy), invasive epithelial cancer histology, any tumor size, any nodal status, and surgery as initial therapy. Patients were excluded from this study if they had a prior history of breast cancer; had metastatic disease at diagnosis; had inflammatory breast cancer; planned to use high-dose chemotherapy with bone marrow or stem cell rescue; had complications related to surgery; had severe physical, cognitive, or psychiatric illnesses (in the opinion of the referring physician); were unable to read and write in English; or were participating in another quality-of-life intervention trial.

Participants who completed baseline and 6-month ($n = 417$) or 12-month ($n = 397$) assessments were included in analyses for this article. For those who completed baseline and 6-month assessments, mean age was 58.1 years (range = 26–86 years), 87% were White, 87% had completed at least some college, and 69% were married. Two thirds of the women had a lumpectomy, and one third had a mastectomy. Mean time between surgery and study entry was 5.6 months. In addition, 48% had received chemotherapy, 69% had radiation, and 58% were taking tamoxifen. Primary trial results and a full sample description are reported elsewhere (26–28).

Procedure

Participants were referred from the practices of surgical and medical oncologists in three geographic sites: Los Angeles; Washington, DC; and Kansas City/Lawrence, Kansas. Potentially eligible women were sent a letter of invitation to participate between 2 and 5 weeks after surgery, followed by a telephone call from research staff to describe the study, conduct a screening interview, and obtain verbal consent for periodic contact during treatment. Within 4 weeks after completion of medical treatment, women provided written informed consent and completed baseline questionnaires. Thus, time since completion of treatment was fairly uniform across participants. Upon mailed return of these materials, women were randomized to one of three study conditions: standard print information only (National Cancer Institute booklet, "Facing Forward"); standard information plus a videotape developed for the MBC trial that

modeled realistic expectations and effective coping during the transition period; or standard information, the MBC videotape, plus a two-session counseling intervention and educational workbook designed for the study (26). Participants completed mailed follow-up survey questionnaires at 6 months and 12 months postrandomization.

Measures

Prior to randomization and at follow-up assessments, women completed a packet of psychosocial measures. Measures relevant to this article are described here.

Contextual life stress. At baseline, women were asked, "Other than your diagnosis and treatment for breast cancer, please list up to three of the most stressful events you have experienced in the past 12 months. By 'stressful,' we mean a situation that is difficult or troubling to you either because it upsets you or because it takes considerable effort to manage." This definition was adapted from Dunkel-Schetter, Folkman, and Lazarus (29). Each event was coded by two independent coders into 1 of 87 event categories (e.g., death of a family member, relative moving in) reported by Miller and Rahe (30) in their revised scaling of the Social Readjustment Rating Scale (31,32) or into an "other" category. We excluded all cancer-related events ($n = 56$ events; e.g., "fatigue while taking taxol") and all psychological symptoms ($n = 5$; e.g., "anxiety," "stressed"). The two coders agreed on 96% of the codes. Disagreements (3.8% of codes) were resolved by a third coder. Each event was assigned a Life Change Unit (LCU) score, a rating of life change necessitated by the event, as specified in Miller and Rahe (30) in their reference sample of 239 women (e.g., LCU for "child leaving home" = 48, LCU for "laid off from work" = 73, LCU for "death of spouse" = 122). For any event in the "other" category, we assigned the mean LCU value for women (i.e., a value of 51) in Miller and Rahe (30). LCUs were summed across the three events to create a total LCU score reflecting the amount of life disruption experienced in the year prior to study entry. This brief measure of contextual life stress was chosen to minimize participant burden.

General adjustment outcomes. The SF-36 Vitality subscale from the Medical Outcomes Study Short Form (SF-36) was used as a primary outcome. This 4-item scale is a reliable ($\alpha = .89$ in this study) and valid measure of energy and fatigue that has been related to physical and mental health (33). The Center for Epidemiologic Studies–Depression Scale (CES-D), a psychometrically sound 20-item scale assessing frequency of depressive symptoms over the past week, was a secondary outcome (34). The 4-point rating scale yields total scores ranging from 0 to 60 ($\alpha = .70$ in this study).

Cancer-specific adjustment outcomes. The Revised Impact of Event Scale (IES-R) also served as a primary outcome (35,36). This 22-item instrument ($\alpha = .89$ in this study) asks participants to rate how distressing cancer-specific intrusive thoughts, avoidance, and hyperarousal had been for them over

the past week on a response scale ranging from 0 (*not at all*) to 4 (*extremely*). Because responses in this sample were skewed toward lower scores, and they conformed to a more normal distribution when a logarithmic transformation was applied, analyses were conducted with $\log(\text{IES-R} + 1)$.

The secondary cancer-specific outcome variable in the MBC trial was the Post-Traumatic Growth Inventory (PTGI), which assesses positive life changes often reported following stressful experiences (e.g., enhanced relationships, greater life appreciation). Developed by Tedeschi and Calhoun (37), the PTGI is a 21-item measure yielding five factor-analytically derived subscales and a total score ($\alpha = .96$ in this study). In completing the items, women reported the extent of change experienced as a result of their cancer on a scale from 0 (*I did NOT experience this change as a result of my experience with cancer*) to 5 (*I experienced this change to a VERY GREAT degree as a result of my experience with cancer*).

Cancer-specific coping. At baseline, participants completed items from the COPE, an inventory of coping strategies (38), in reference to their experience with breast cancer. They rated items on a response scale of 1 (*I don't do this at all*) to 4 (*I do this a lot*). Embedded in the COPE were two 4-item scales—Emotional Processing (e.g., "I take time to figure out what I'm really feeling"; $\alpha = .90$) and Emotional Expression (e.g., "I feel free to express my emotions"; $\alpha = .80$)—that assess the tendency to explore and express one's emotions around a stressful experience and have demonstrated sound internal consistency and predictive validity in a breast cancer sample (11) and other samples (12–15).

We also examined other COPE subscales that had predicted adjustment in previous research with breast cancer patients (39): Positive Reframing (e.g., "I learn something from the experience"; $\alpha = .78$), Religious Coping (e.g., "I put my trust in God or my spiritual beliefs"; $\alpha = .96$), Acceptance (e.g., "I accept the reality of the fact that it happened"; $\alpha = .74$), Seeking Social Support (composite of Seeking Social Support for Instrumental Reasons and Seeking Social Support for Emotional Reasons subscales, e.g., "I get emotional support from others"; $\alpha = .89$), Denial (e.g., "I say to myself 'this isn't real'"; $\alpha = .74$), and Problem-Focused Coping (composite of Active Coping and Planning subscales, e.g., "I make a plan of action"; $\alpha = .91$). Internal consistency estimates for two other scales, Behavioral Disengagement and Mental Disengagement, were too low ($\alpha < .50$) to support reliable analysis.

Intercorrelations among the subscales were generally low to moderate ($r = -.23$ to $.64$), except those between Emotional Processing, Emotional Expression, and Seeking Social Support ($r = .68$ to $.76$). As these subscales are also conceptually related (i.e., all three assess processes of intentionally expressing and exploring one's cancer-related emotions), we averaged these three scales to create an EAC summary score.¹

¹We also conducted analyses with the separate Emotional Expression, Emotional Processing, and Seeking Social Support subscales. These analyses yielded a very similar pattern of significant interactions of life stress with the separate coping subscales on the dependent variables.

Perceived preparedness for reentry. Perceived preparedness for reentry was assessed at baseline with two author-constructed items: "Overall, I feel very well-prepared for what to expect during my recovery" and "Overall, I feel the medical team has done a great deal to prepare me for what to expect during my recovery from breast cancer treatment." Responses were rated on a 0 to 4 scale (i.e., *not at all, a little, a fair amount, much, very much*). The items were highly correlated ($r = .84$) and were averaged to create a total score.

RESULTS

Descriptive statistics and repeated-measures analyses of variance (ANOVAs) were conducted to assess change across time on the dependent variables. Zero-order correlations were computed to assess relations of baseline life stress and coping processes with dependent variables at baseline, 6 months, and 12 months. Primary analyses were hierarchical multiple regressions conducted to evaluate the predictive utilities of life stress, coping processes, and their interaction on the four outcomes at baseline, 6-month follow-up, and 12-month follow-up. We were primarily interested in the ability of life stress and coping processes at baseline to predict adjustment prospectively. We also examined cross-sectional analyses in order to provide a fuller picture of the relationships across the measurement period and to allow comparison with other samples.

Descriptive Statistics, Repeated-Measures Analyses, and Correlations

There was substantial variability in the amount of life change reported by the women, with total LCU scores ranging from 0 to 286 ($M = 68.68$, $SD = 67.23$). Among the 441 women who completed the baseline and the 6-month or 12-month or both follow-up assessments, participants reported a mean of 1.34 stressful experiences ($SD = 1.14$), with 32% reporting that they had not experienced any additional stressful events, 24% describing one event, 22% describing two events, and 22% describing three events. Of the overarching event categories specified by Miller and Rahe (30), most events fell into the category of home and family (e.g., death or illness of a family member; 46% of events). An additional 13% were health-related stressors (e.g., major dental work), 7% were financial stressors, 15% were personal and social stressors (e.g., beginning school), and 18% were work-related events (e.g., more work responsibilities). Within the more specific event codes, the most commonly reported stressors included death of family members or close friends (11%), health change of family member (17%), other major illness or injury (9%), and relationship problems (5%).

As in previous breast cancer samples (39), Acceptance ($M = 3.51$, $SD = .55$) was more prevalent than the other coping strategies, and reports of Denial ($M = 1.30$, $SD = .48$) were lower than use of other coping processes. Regarding the dependent variables, the mean SF-36 Vitality score was lower only at baseline ($M = 51.89$, $SD = 22.47$) than the national general population norm for women ages 55 to 64 (population $M = 58.08$) (33). The mean CES-D score at all time points ($M = 8.75$ – 10.06 , $SD = 7.85$ – 8.57) was below 16, the cutoff suggestive of clinical de-

pression, and was comparable to the mean score observed in other cancer patient samples (40). On the IES-R, women on average reported that thought intrusion, avoidance, and hyperarousal regarding their breast cancer were "a little bit" to "moderately" distressing during the past 7 days, which is similar to the cancer-related distress observed in other breast cancer samples (41). Mean PTGI scores ($M = 50.09$ – 53.45 , $SD = 25.19$ – 25.46) were also comparable to those observed in other breast cancer samples (42).

Repeated measures ANOVAs indicated that there was significant change in the dependent variables over the course of follow-up. Vitality increased significantly from baseline to 6-month follow-up, $F(2, 373) = 35.29$, $p < .001$, as did reports of cancer-specific posttraumatic growth, $F(2, 371) = 6.26$, $p < .005$. Reported depressive symptoms decreased significantly from baseline to 12-month follow-up, $F(2, 371) = 4.86$, $p < .005$, and cancer-specific distress was significantly lower at 6 months than at baseline and significantly lower at 12 months than at 6 months, $F(2, 371) = 36.75$, $p < .001$. Thus, women exhibited increases in general and cancer-specific adjustment from study enrollment to 1 year after completion of treatment.

At all assessments, the strongest correlations were between the two general adjustment outcomes, vitality and depressive symptoms ($r = -.52$ to $-.65$). Cancer-specific distress was also significantly correlated with Vitality ($r = -.24$ to $-.30$) and depressive symptoms ($r = .47$ to $.52$) at each assessment, but neither general adjustment measure was associated with cancer-specific growth. However, cancer-specific distress and growth were positively correlated at baseline and at 6 months ($r = .16$ to $.25$).

Bivariate correlations between the predictor and dependent variables are shown in Table 1. As predicted, greater contextual life stress was associated with lower general adjustment at baseline and both follow-up points. However, the only significant relation between life stress and cancer-specific adjustment was that between life stress and IES-R at baseline. Correlations between coping processes and adjustment are consistent with previous research, in general indicating that EAC and other approach-oriented strategies are associated with better general and cancer-specific adjustment, whereas avoidance-oriented coping (i.e., Denial) is associated with adverse psychosocial outcomes.

REGRESSION ANALYSES

Analytic Strategy

Life stress and coping processes at baseline, as well as their interactions, were used to predict the outcomes at baseline, 6 months, and 12 months. In 6- and 12-month analyses, the baseline value on the relevant dependent variable was entered first to allow evaluation of the predictors on change in dependent variables. Because data were from a randomized, controlled trial of psychoeducational interventions and because perceived preparedness for reentry moderated effects of the intervention on outcomes, we included as covariates dummy-coded variables for the interventions (education sessions vs. print material control, and MBC videotape vs. print control), perceived preparedness, and their interactions in the regressions.

TABLE 1
Zero-Order Correlations Between Stressful Life Events and Cancer-Specific Coping at Baseline With Outcomes at Follow-Up

	SF-36 Vitality			CES-D			IES-R			PTGI		
	BL	6 mo.	12 mo.	BL	6 mo.	12 mo.	BL	6 mo.	12 mo.	BL	6 mo.	12 mo.
Contextual life stress	-.20*	-.20*	-.20*	.21*	.16*	.16*	.17*	.02	.11	.05	.07	.03
Coping scales												
Emotional approach	.16*	.13*	.18*	-.18*	-.10	-.16*	-.08	-.07	-.11	.23*	.23*	.25*
Denial	.02	-.07	-.01	.03	.18*	.06	.25*	.25*	.21*	.05	-.06	-.08
Problem-focused coping	.14*	.12	.15*	-.17*	-.08	-.10	.01	.02	-.02	.19*	.22*	.22*
Positive reframing	.15*	.10	.14*	-.19*	-.09	-.19*	-.10	-.07	-.12	.35*	.35*	.34*
Religious coping	-.02	-.06	-.02	-.08	.03	-.05	.05	.06	-.03	.28*	.32*	.28*
Acceptance	.07	.06	.09	-.25*	-.14*	-.15*	-.19*	-.12*	-.13*	-.01	.01	.06

Note. For baseline and 6 months, $n = 412$; at 12 months, $n = 397$. BL = Baseline; mo. = months; SF = Short Form; CES-D = Center for Epidemiologic Studies-Depression Scale; IES-R = Revised Impact of Events Scale; PTGI = Post-Traumatic Growth Inventory.

* $p < .012$.

We identified covariates by assessing relations of the following demographic and cancer-related variables with dependent variables at 6 and 12 months: age, marital status (yes/no), education (college or more advanced degree/no college degree), ethnicity (European American/other ethnicity), employment (at least part time/not employed), study site (Los Angeles; Washington, DC; Kansas City/Lawrence, Kansas), days from surgery to baseline assessment, chemotherapy receipt (yes/no), radiotherapy receipt (yes/no), surgery (mastectomy/breast conservation), tamoxifen receipt (yes/no). At 6 and 12 months, patient age was significantly related ($p < .05$) to all four dependent variables ($r = .11$ with SF-36 Vitality [*ns* at 12 months]; $r = -.11$ to $-.13$ with CES-D; $r = -.19$ to $-.22$ with IES-R; $r = -.24$ to $-.29$ with PTGI). Younger women reported less vitality, more depressive symptoms, more cancer-specific distress, and more cancer-related growth than did older women. Age was included as a covariate in regression analyses. No other variables were significantly associated with the SF-36, CES-D, or IES-R.

In addition to age, four other variables were associated with PTGI scores ($p < .05$). Women reported greater cancer-related growth at 6 and 12 months if they had longer diagnosis duration, chemotherapy, or mastectomy. Women who had no college degree reported significantly more posttraumatic growth than women with more education at 6 months, but not at 12 months. These findings are consistent with the literature on posttraumatic growth after cancer, which generally suggests that greater life disruption and threat (e.g., due to chemotherapy or more limited socioeconomic resources) may prompt more existential evaluation and search for meaning and that the degree of threat as well as more time to engage in cognitive processing of a stressful event are positively correlated with growth (42). In regression analyses on the PTGI, covariates included age, education, time elapsed since diagnosis, chemotherapy receipt, and mastectomy receipt.

Hierarchical multiple regressions for each dependent variable included the block of covariates (i.e., baseline values on the relevant dependent variable [for 6- and 12-month analyses], psychoeducational intervention and perceived preparedness, and relevant demographic and cancer-related covariates), life

stress, one of six coping strategies, and the Life Stress \times Coping interaction. Total scores on life stress and coping scales were centered around the group mean (i.e., each participant's score was subtracted from its condition mean) prior to entry in the equation. To provide some control for Type I error, we assessed significance of individual predictors at $p < .012$ (.05/4 for 4 dependent variables). Significant interactions were analyzed via the method of Aiken and West (43) for continuous variables. Regression analyses were conducted on all cases available at each assessment except that, for comparability, regressions on baseline data were conducted on data from women who had completed both the baseline and 6-month assessment.

Hierarchical Multiple Regression Analyses on Baseline Measures

Results of regression analyses on baseline variables including the EAC variable are presented in Table 2. No significant Coping \times Life Stress interactions emerged in these analyses, and they were dropped from the equations.

SF-36 Vitality. Lower contextual life stress and greater use of EAC were each associated with greater vitality at baseline. No other coping variables were significant predictors of baseline vitality.

CES-D. Women who were experiencing more life stressors also reported more depressive symptoms. Greater EAC was significantly associated with lower CES-D scores at baseline.

IES-R. Cancer-specific distress was related significantly to greater contextual life stress at baseline. In addition, greater Denial was associated significantly with more cancer-related distress, accounting for 9% of the unique variance in IES-R ($p < .0001$).

PTGI. At baseline, contextual life stress was not associated significantly with cancer-related posttraumatic growth. However, greater use of EAC was related to higher PTGI scores (see Table 2), as was Positive Reframing ($\Delta R^2 = 0.10$, $p < .0001$), Re-

TABLE 2
Baseline Dependent Variables Regressed on Contextual Life Stress and Emotional Approach Coping

Predictors	Dependent Variables			
	SF-36 Vitality	CES-D	IES-R ^a	PTGI ^b
Covariates				
ΔR ²	0.04**	0.10**	0.06**	0.10**
Life stress				
β	-.19	.20	.15	.02
ΔR ²	0.03**	0.04**	0.02*	0.00
Emotional approach				
β	.18	-.19	-.10	.20
ΔR ²	0.03**	0.03**	0.01	0.04**
Full model				
df	8,407	8,406	8,407	14,400
F	5.99**	10.58**	5.10**	4.63**
Total R ²	0.10	0.17	0.09	0.14

Note. The block of covariates included age, psychoeducational intervention, and perceived preparedness variables, and for the PTGI only, education, time elapsed since diagnosis, chemotherapy receipt, and mastectomy receipt. Standardized betas (β) displayed are for the final regression models. SF = Short Form; CES-D = Center for Epidemiologic Studies–Depression Scale; IES-R = Impact of Event Scale–Revised; PTGI = Post-Traumatic Growth Inventory.

^aThe coping strategy of denial also evidenced a unique significant relation with the IES-R. ^bThe coping strategies of positive reframing, religious coping, and problem-focused coping also evidenced unique significant relations with the PTGI.

* $p < .005$. ** $p < .0005$.

religious coping ($\Delta R^2 = 0.08$, $p < .0001$), and Problem-Focused coping ($\Delta R^2 = 0.03$, $p < .0005$).

Hierarchical Multiple Regression Analyses on Dependent Variables at 6 and 12 Months

Results of regression analyses on dependent variables at 6 and 12 months, including EAC as a predictor and the general adjustment outcomes as dependent variables, are presented in Table 3. Initial values on the dependent variables and the previously specified covariate blocks were controlled. In no case was contextual life stress by itself a significant predictor of the dependent variables.

SF-36 Vitality. Change in vitality from baseline to 6 months was predicted by the interaction between life stress and EAC. As displayed in Figure 1, in the context of low life stress, the use of more EAC predicted an increase in vitality at 6 months, whereas lower EAC predicted lower vitality, a pattern consistent with previous research on EAC (11). In the context of high life stress, however, this effect was reversed such that women had less vitality if they engaged in more cancer-specific EAC.

Again at 12 months, the Life Stress \times EAC interaction on change in vitality was significant. Cancer-specific EAC was significantly associated with vitality among women who had expe-

TABLE 3
General Adjustment Outcomes at 6 and 12 Months Regressed on Baseline Contextual Life Stress and Emotional Approach Coping

Predictors	Dependent Variables			
	6 Months		12 Months	
	SF-36 Vitality	CES-D	SF-36 Vitality	CES-D
Covariates				
ΔR ²	0.43**	0.24**	0.44**	0.29**
Life stress				
β	-.08	.06	-.09	.05
ΔR ²	0.00	0.00	0.00	0.00
EAC				
β	.17	-.14	.21	-.21
ΔR ²	0.00	0.00	0.01	0.01
Life Stress \times EAC				
β	-.20	.17	-.17	.16
ΔR ²	0.02**	0.02*	0.02**	0.02*
Full model				
df	10,404	10,402	10,387	10,386
F	33.00**	13.89**	33.85**	17.79**
Total R ²	0.45	0.26	0.47	0.32

Note. The block of covariates included the baseline value on the dependent variable, age, psychoeducational intervention, and perceived preparedness variables, and for the PTGI only, education, time elapsed since diagnosis, chemotherapy receipt, and mastectomy receipt. Standardized betas (β) displayed are for the final regression models. EAC = Emotional Approach Coping; SF = Short Form; CES-D = Center for Epidemiologic Studies–Depression Scale; PTGI = Post-Traumatic Growth Inventory.

* $p < .01$. ** $p < .005$.

rienced lower levels of contextual life stress, but there was no effect of EAC in the context of higher life stress (Figure 2).

CES-D. The interaction of life stress and EAC also emerged as a significant predictor of change in depressive symptoms at 6 months. As displayed in Figure 3, for women who experienced low levels of life stress, greater use of cancer-specific EAC at baseline was associated with a decrease in depressive symptoms, whereas lower EAC scores predicted more depressive symptoms. In the context of higher life stress, this effect was reversed. Greater denial was significantly associated with an increase in depressive symptoms at 6 months, accounting for 9% ($p < .0001$) of the variance.

At 12 months, a significant Life Stress \times EAC interaction also emerged. EAC predicted a decrease in depressive symptoms when women had experienced relatively low levels of stressful life events, but this coping process had no significant effect on depressive symptoms in the context of higher levels of stress (Figure 4).

IES-R. At 6 months, neither life stress nor coping was significantly associated with cancer-specific distress. At 12

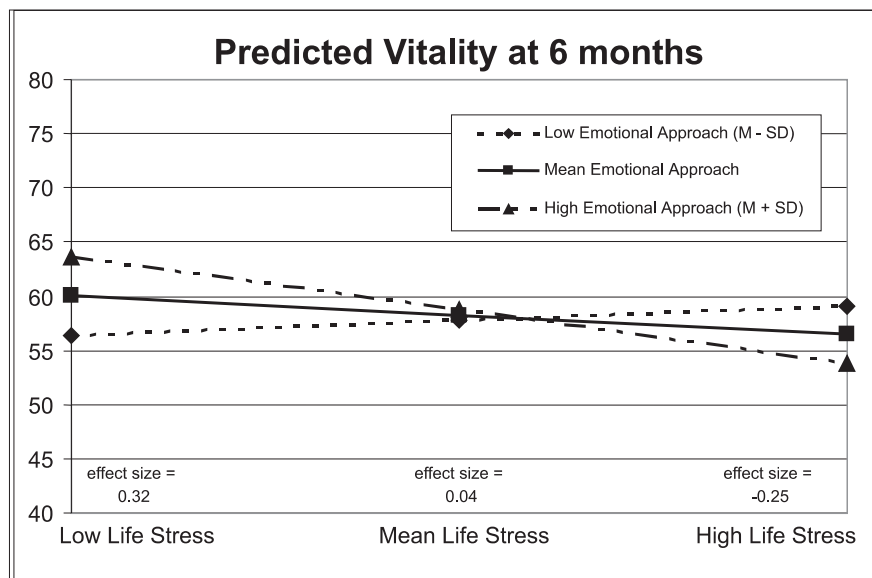


FIGURE 1 Interaction of contextual life stress with emotional approach coping on 6-month vitality.

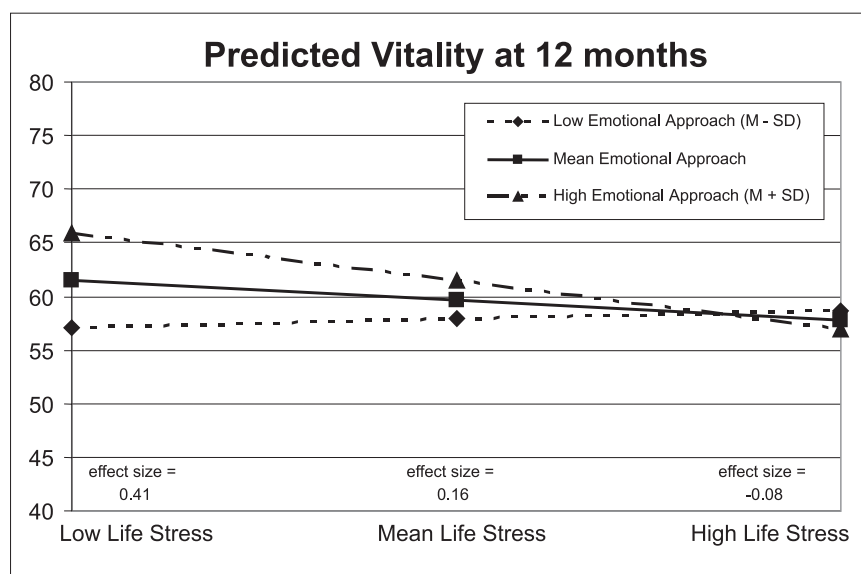


FIGURE 2 Interaction of contextual life stress with emotional approach coping on 12-month vitality.

months, greater use of cancer-specific Denial coping at baseline predicted more cancer-specific distress ($\Delta R^2 = .01, p < .01$).

PTGI. After accounting for covariates, neither stress nor coping significantly predicted PTGI scores at 6 or 12 months.

DISCUSSION

The goal of these analyses was to examine the influence of contextual stressful life events in conjunction with cancer-specific coping processes, particularly EAC, on adjustment to breast cancer survivorship over time. It is interesting to note that two thirds of participants reported at least one other recent stressful life event. As expected, life stress was associated with

significantly more depressive symptoms, lower vitality, and more cancer-specific distress at baseline, but stress did not predict changes in adjustment over time after accounting for covariates.

The finding that contextual life stress may not have a significant, cumulatively negative impact on psychosocial adjustment to breast cancer survivorship is somewhat inconsistent with previous research (16,20–23), which has reported greater depressive and posttraumatic symptoms among cancer patients who have experienced other stressful life events either in the year prior to diagnosis or in the time since diagnosis. However, there are important methodological differences between previous work and our analyses presented here. With one recent exception (44), previous reports either have been cross-sectional in

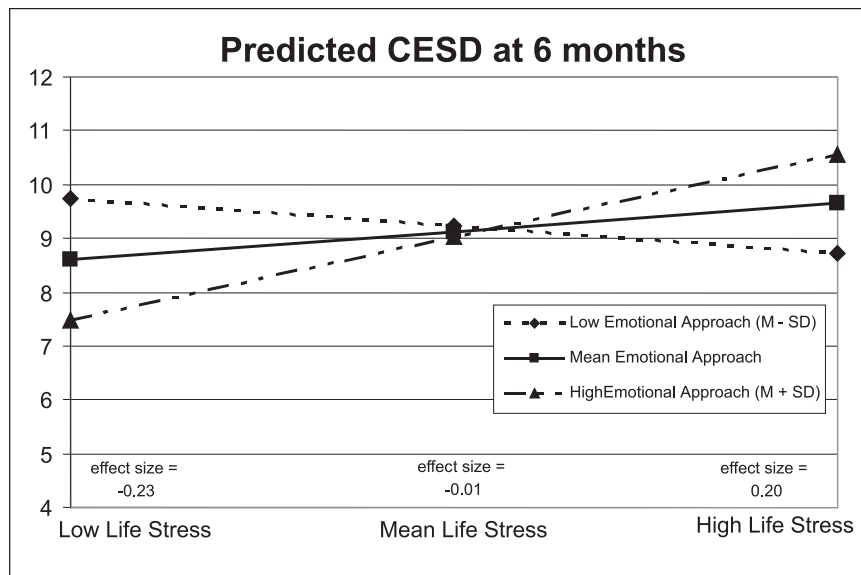


FIGURE 3 Interaction of contextual life stress with emotional approach coping on 6-month depressive symptoms (CES-D).

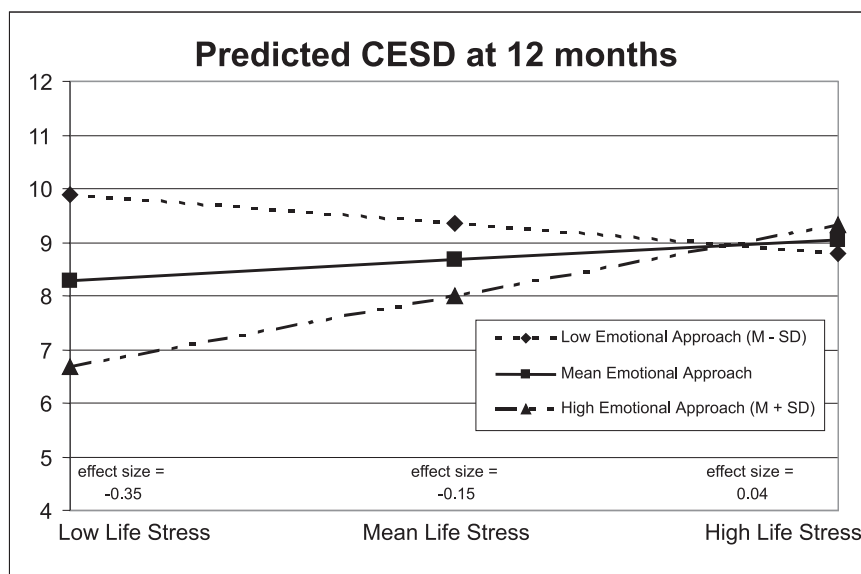


FIGURE 4 Interaction of contextual life stress with emotional approach coping on 12-month depressive symptoms (CES-D).

design or have not controlled for baseline distress in predicting adjustment at follow-up, and thus may have demonstrated significant relations because they assessed both life stress and distress simultaneously. Indeed, in our study, life stress was significantly associated with both general adjustment and cancer-specific distress at baseline. In addition, recency of stressful life events may be an important moderator of their influence, as research has demonstrated that the correlation between life events and well-being is significant only for recent events and that more distal stressors, which participants have had sufficient time to adapt to or resolve, are not significantly related to affective outcomes and life satisfaction (45). This conclusion appears contradictory to the results of another recent longitudinal study (44), in which the occurrence of

stressful life events was unrelated to quality of life after surgery but predicted adjustment at 12-month follow-up, after adjuvant treatment completion. The authors suggested that the impact of life events may be more salient after all treatment has ended. The apparent discrepancy between their findings and ours may be explained by the difference in timing of assessments. Because our baseline assessment occurred after treatment completion, the significant relationship between life stress and adjustment observed at this time may be interpreted in support of their explanation, suggesting that contextual life stress affects quality of life immediately posttreatment but that the context in which treatment occurred becomes less predictive of change in adjustment as women make the transition to survivorship.

Although we found no main effect of life stress on change in adjustment over time, contextual life stress did moderate the influence of cancer-specific coping on general adjustment. EAC has previously been linked to positive outcomes in breast cancer and other samples (11–14,39) and was predictive of fewer depressive symptoms and greater vitality among women with low contextual life stress in the current study, with small to moderate effect sizes. However, EAC was no longer associated with general adjustment at 12 months in the context of recent life stress. Interestingly, no other coping processes were moderated by the context of life stress. Instead, consistent with previous research on the negative impact of avoidance-oriented coping, denial at baseline had a direct effect on both general and cancer-specific distress, predicting more depressive symptoms at 6 months and more cancer-specific distress at 12 months.

Although zero-order correlations revealed that coping was correlated with both cancer-related distress and growth, the relationships were nonsignificant in regression analyses including covariates. It should be noted that this was a psychosocial intervention trial, and although intervention-related variables were controlled statistically, it is impossible to assess how the intervention might have influenced complex intersections of the impact of contextual life stressors, coping processes, and adjustment.

High use of cancer-specific EAC strategies in the context of high life stress at baseline predicted poorer adjustment at 6 months. It is possible that frequently approaching cancer-related emotions may preclude the resolution of other stressful life events. Given that this effect was no longer evident at 12 months, another possible explanation is that women experiencing high levels of recent or concurrent life stress have more limited psychosocial resources to manage the demands of active engagement with the negative emotions associated with breast cancer, contributing to more general distress initially as they struggle with these complex emotions but not affecting longer term adjustment.

Several limitations to the current findings must be noted. Coping strategies employed to manage the contextual stressful life events were not assessed. Thus, it is unclear whether women were using similar methods to cope with these other events as with their cancer. It also is important to note that although we typically recommend the use of distinct EAC subscales, in this study the coping strategies of emotional processing, emotional expression, and seeking social support did not yield distinct relations with outcomes. The method for assessing contextual life stress was somewhat novel. Although it has the advantage of being an objectively rated index of life stress, the life change index may be a less powerful predictor of adjustment than subjective impact of events. In addition, participants were restricted in the number of events they could report, although the finding that only 22% of women listed the maximum of three events suggests that the experience of a greater number of events would be relatively rare. We also did not assess stressors during the follow-up period. Finally, because participants were predominantly White and well educated and were all women with nonmetastatic cancer and no severe comorbid psychiatric or medical conditions, results are limited in their generalizability.

Significant strengths of this study include the longitudinal design and a large sample homogeneous with regard to phase in the cancer trajectory. The index of life stress was arguably more objective than several used in previous research. To our knowledge, this is the first report to consider the moderating role of contextual life stress on the predictive value of coping processes across time on general and cancer-specific adjustment.

In conclusion, contextual life stress does not appear to have a direct influence on change in depressive symptoms, vitality, or cancer-specific distress or growth in the first year after medical treatment of breast cancer. Instead, in our study, life stress interacted with coping to predict adjustment, such that cancer-related EAC was adaptive only in the context of low-level life stress. Future research will be necessary to determine whether life stress also moderates the effect of coping on physical health, although it may be reassuring to note that previous research has revealed no effect of life stressors on survival following a diagnosis of nonmetastatic breast cancer (46). Although the unique contribution of contextual life stress to outcomes was relatively modest in the present study, it will be important for researchers as well as clinicians to consider the role of contextual stressful life experiences in women who have confronted breast cancer diagnosis and treatment. For women experiencing other stressful life events, such as the illness or loss of a family member or financial difficulties, interventions designed to elicit emotional expression and processing around the cancer experience by themselves may not produce optimal psychosocial effects, and broader stress management interventions (47) may be more advisable in this context.

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