

A Randomized Controlled Trial of Emotionally Expressive Writing for Women With Metastatic Breast Cancer

Carissa A. Low
University of Pittsburgh

Annette L. Stanton, Julienne E. Bower, and
Lauren Gyllenhammer
University of California, Los Angeles

Objective: To test the effects of emotionally expressive writing in a randomized controlled trial of metastatic breast cancer patients and to determine whether effects of the intervention varied as a function of perceived social support or time since metastatic diagnosis. **Design:** Women ($N = 62$) living with Stage IV breast cancer were randomly assigned to write about cancer-related emotions (EMO; $n = 31$) or the facts of their diagnosis and treatment (CTL; $n = 31$). Participants wrote at home for four 20-min sessions within a 3-week interval. **Main Outcome Measures:** Depressive symptoms, cancer-related intrusive thoughts, somatic symptoms, and sleep quality at 3 months postintervention. **Results:** No significant main effects of experimental condition were observed. A significant condition \times social support interaction emerged on intrusive thoughts; EMO writing was associated with reduced intrusive thoughts for women reporting low emotional support ($\eta^2 = .15$). Significant condition \times time since metastatic diagnosis interactions were also observed for somatic symptoms and sleep disturbances. Relative to CTL, EMO participants who were more recently diagnosed had fewer somatic symptoms ($\eta^2 = .10$), whereas EMO participants with longer diagnosis duration exhibited increases in sleep disturbances ($\eta^2 = .09$). **Conclusion:** Although there was no main effect of expressive writing on health among the current metastatic breast cancer sample, expressive writing may be beneficial for a subset of metastatic patients (including women with low levels of emotional support or who have been recently diagnosed) and contraindicated for others (i.e., those who have been living with the diagnosis for years).

Keywords: expressive writing, emotional expression, metastatic breast cancer, psychological adjustment

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Emotionally expressive writing is a brief experimental procedure which has been widely investigated in healthy samples (Smyth, 1998) and clinical populations (Frisina, Borod, & Lepore, 2004). The expressive writing paradigm (Pennebaker & Beall, 1986) typically asks participants to write about stressor-related emotions and thoughts for 20 min on four occasions. Despite their brevity and simplicity, expressive writing interventions have produced significant reductions in physical symptoms among early stage breast and prostate cancer patients (Rosenberg et al., 2002; Stanton et al., 2002) and improvements in sleep quality among metastatic renal cell carcinoma patients (de Moor et al., 2002), with mixed evidence for psychological outcomes. To date, no studies have tested the intervention's effects among women with metastatic breast cancer (MBC). In addition, given evidence that contextual factors influence the outcomes of expressive writing and other psychological interventions (e.g., Stanton, 2005), the conditions under which disclosure confers benefit warrant study.

MBC (i.e., breast cancer that has spread to bone, brain, viscera, or other distant sites) has the potential to elicit profound emotions and affect relationships, life goals, daily activities, and sense of control (Luoma & Hakamies-Blomqvist, 2004). MBC is chronic, incurable, and usually life-limiting, with only 26% of women diagnosed with MBC expected to survive for 5 years (American Cancer Society [ACS], 2006). Though the psychosocial experiences of women living with MBC are understudied relative to early stage disease, converging lines of evidence highlight the relevance of emotional expression to adjustment to MBC. For example, two cross-sectional studies suggest that coping strategies aimed at suppressing cancer-related emotions are associated with lower quality of life and greater mood disturbance among MBC patients (Classen, Koopman, Angell, & Spiegel, 1996; Kershaw et al., 2004). Supportive-expressive therapy, which encourages the expression of cancer-related emotions and existential concerns, reduces distress and improves quality of life among patients with MBC (Classen et al., 2001; Goodwin et al., 2001; Kissane et al., 2007; Spiegel, Bloom, & Yalom, 1981). However, there are significant barriers to implementing group interventions in metastatic cancer populations, particularly recruitment and compliance difficulties resulting from patients' compromised health, intensive medical treatment schedules, and inability to commit to future appointments (Edmonds et al., 1999). Because emotionally expressive writing can be done at home, at the convenience of the participant, writing interventions hold significant promise as an

Carissa A. Low, Department of Psychiatry, University of Pittsburgh; Annette L. Stanton, Julienne E. Bower, and Lauren Gyllenhammer, Departments of Psychology, University of California, Los Angeles.

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Correspondence concerning this article should be addressed to Carissa A. Low, Department of Psychiatry, University of Pittsburgh, 3811 O'Hara Street, Pittsburgh, PA 15213. E-mail: lowca@upmc.edu

adjunct supportive treatment for patients living with MBC and other serious illnesses.

The goal of the current study was to test the effects of expressive writing in a randomized, controlled trial of MBC patients. We hypothesized that women randomized to write about cancer-related emotions would show reductions in distress (i.e., cancer-related intrusive thoughts and depressive symptoms) as well as improvements in physical health (i.e., somatic symptoms and sleep quality) 3 months following the intervention, relative to women who wrote about the facts of their cancer diagnosis and treatment. Given limited research on social and disease-related contexts as moderators of expressive writing, a second goal was to determine whether the effects of the intervention varied as a function of two potential moderating variables: perceived emotional support and time since metastatic diagnosis. Our hypothesis regarding emotional support was guided by social constraint theory, which suggests that women whose ability to express thoughts and feelings about a stressor is constrained by inadequate social resources may be at risk for worse adjustment (e.g., Zakowski et al., 2004). We hypothesized that expressive writing, by providing an opportunity for cognitive and emotional processing, might buffer the relationship between low social support and adjustment, such that women who report low levels of emotional support would benefit most from the writing intervention. Because our sample was heterogeneous with respect to time since metastatic diagnosis, we also expected that women who had been living with the disease for a longer time would have had more time to process the diagnosis and develop effective coping strategies. Consistent with this idea, a recent meta-analysis of 146 disclosure studies (Frattaroli, 2006) reported that effect sizes were greater when participants wrote about more recent stressors. Thus, we hypothesized that women who were more recently diagnosed with metastatic cancer would benefit more from the expressive writing intervention than those who had been living with the diagnosis for a longer time.

Method

Participants

Participants were 62 women with a diagnosis of Stage IV breast cancer who were able to complete the writing exercise and assessments in English. Any current medical treatment for cancer was allowed. Sample size ($N > 52$) sufficient to provide 80% power to detect a main effect was determined using the effect sizes observed in previous expressive writing studies with early stage breast cancer patients ($d = .89$ for somatic symptoms; Stanton et al., 2002) and metastatic renal cell carcinoma patients ($d = .99$ for sleep quality; de Moor et al., 2002), although a larger sample would be necessary to detect the smaller aggregated effect size reported in recent meta-analyses (aggregated d 's = .07 to .21; Frattaroli, 2006; Frisina, Borod, & Lepore, 2004).

Procedure

The study was conducted between October 2006 and April 2009. Participants were recruited from one of three sources: a larger, descriptive research study (Stanton et al., under review), if they consented to be contacted for future studies; flyers posted in UCLA oncology clinics and a community breast cancer practice;

and a posted advertisement on the www.bcmets.org listserv, an online resource for individuals living with MBC. All contact with participants was via phone, postal mail, or e-mail. The research protocol was described via phone to interested women using a standardized script, and if women decided to enroll, written informed consent was obtained by mail.

Participants completed baseline assessments and returned them by mail. In addition to questionnaires, saliva samples were collected for determination of cortisol (data not reported in this manuscript). Upon receipt of completed questionnaires, participants were randomized to either the emotional or control writing condition and mailed a packet of sealed envelopes containing writing instructions as well as return envelopes and materials for the writing exercise. The randomization schedule was created by a biostatistician using a computerized random numbers generator. Sequentially numbered envelopes were used to conceal allocation. Instructions for the experimental conditions were adapted from Pennebaker and Beall (1986) and Stanton et al. (2002) and are available from the authors upon request.

After women received materials for the writing exercises, they called the research office to schedule four 20-min sessions within a 3-week interval at their convenience. Following a procedure used in previous expressive writing research with cancer patients and loved ones (e.g., Bishop, Lee, Stanton, & Wingard, 2004; Zakowski et al., 2004), a trained research assistant telephoned women at the beginning of each session to read the instructions to the participant, then called again 20 min later to ask women to stop writing. Condition assignment was revealed to the assistant reading instructions during the first writing session. After each writing session, women mailed their essays to the research office.

Outcome measures were assessed by mailed questionnaire 3 months after the final writing session. Women were compensated \$80 for their participation in the study and fully debriefed following receipt of their postwriting questionnaires.

Measures

Dependent variables. Participants completed the four dependent measures at study entry and 3 months after the final writing session. The Center for Epidemiologic Studies–Depression Scale (CES–D; Radloff, 1977) contains 20 items that assess the frequency of depressive symptoms in the past week. The 7-item Intrusions subscale of the Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1977) was administered to assess how distressing cancer-related intrusive thoughts (e.g., “I thought about it when I didn’t mean to.”) had been over the past week. Negative somatic symptoms were assessed using a measure developed by Pennebaker (1982), which has been shown to be responsive to the expressive writing intervention (Stanton et al., 2002). This scale asks participants to report the number of days in the past month on which they experienced each of nine somatic symptoms (e.g., headache, stomach ache, chest pain, runny/congested nose, faintness/dizziness, shortness of breath, racing heart, stiff/sore muscles, coughing/sore throat). The Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989) assesses sleep quality over the past month and yields a total sleep disturbance scale, with scores of 5 or above on the PSQI indicative of clinically significant sleep disruptions (Buysse et al., 1989). This scale has been used as an outcome

measure in previous trials of expressive writing in advanced cancer samples (de Moor et al., 2002).

Other variables. At study entry, perceived emotional support was assessed using adapted items from a study of early stage breast cancer patients (Alferi et al., 2001). For each of three specific sources (i.e., friends, partner, and family other than partner), two items were used to assess perceived emotional support: "How much do you feel you can count on ____ to: let you talk to them about your illness? Give you emotional support and affection?" Participants responded on a scale ranging from "not at all" to "a lot."

A brief questionnaire assessing age, ethnicity, education level, and marital status as well as information about potentially relevant medical variables (i.e., time since diagnoses; site of metastases) was completed before randomization. At 3 months, women responded to items regarding their reactions to participation (Stanton et al., 2002).

Statistical Analyses

Preliminary *t* test and chi-square analyses were conducted to ensure that experimental groups did not differ on any demographic (i.e., age, education, marital status, employment status) or cancer-related variable (i.e., time since initial breast cancer diagnosis, time since MBC diagnosis, metastatic sites). Primary analyses were ANCOVAs, entering baseline value of the relevant dependent variable as a continuous independent variable (to control for nonsignificant chance variation between groups at baseline) and experimental condition as a categorical independent variable. In addition to main effect analyses, analyses were also conducted to determine whether intervention effects vary as a function of social support or time since metastatic diagnosis. Linear regression analyses were used to examine moderators, in which potential moderators were centered and included as continuous independent variables, along with baseline values of dependent variables, dummy-coded experimental condition (CTL = 0 and EMO = 1), and the condition \times moderator interaction term. Significant condition \times moderator interactions were interpreted following the recommendations of Aiken and West (1991); specifically, separate regression equations were calculated for high (1 *SD*) and low (−1 *SD*) levels of the moderator and the significance of the slopes of each regression line examined to determine whether the value of the simple slope differed from zero. Sample size varied somewhat in each analysis, owing to missing data on particular scales for some participants. Because of questionnaire formatting, the somatic symptom measure was likely to be overlooked by participants, resulting in some missing data on this scale.

Results

Sample Characteristics

A total of 110 women were mailed letters describing the study or responded to the posted or online advertisements. Of these, 34 declined to participate, most commonly because they were too sick or too busy to commit to the writing sessions. The remaining 76 women were randomly assigned to EMO ($n = 38$) or CTL ($n = 38$). One woman was not able to complete her writing sessions within the 3-week interval and was dropped from the study, and

the remaining 75 completed the writing. The current analyses are based on the 31 patients in the EMO group and the 31 in the CTL group who completed the postwriting assessment. Eleven women died during the follow-up period, and two women did not return their questionnaires and could not be reached. Women who did not complete the project did not significantly differ on any demographic or cancer-related variable or on baseline levels of outcome variables.

No statistically significant differences were observed between the two experimental conditions with respect to demographic or cancer-related variables or experience with cancer support groups, psychotherapy, or journaling ($ps > .20$). Across the entire sample, the average age was 53.8 years ($SD = 10.3$, range = 29 to 78). Most women were college educated (74%), married or living as married (71%), White (87%), and not working outside the home (78%). On average, women had first been diagnosed with breast cancer 7.9 years ago ($SD = 67$ months) and had been living with their Stage IV diagnosis for 3.3 years ($SD = 28.1$ months). Most women had bone metastases (69%; 16% lung metastases, 44% liver metastases, 10% brain metastases). In addition, most participants had at least some experience with cancer support groups (72%), talking with a mental health professional about cancer (63%), or journaling about the cancer experience (63%).

All moderator and outcome variables were normally distributed. There were no significant group differences at study entry on depressive symptoms, intrusive thoughts, sleep disturbances, somatic symptoms, or perceived emotional support (all $ps > .17$). At study entry, the mean CES-D score was 12.4 ($SD = 7.87$), which is below the clinical cutoff of 16 and comparable to the average score observed in a previous sample of MBC patients ($M = 12.6$; Koopman et al., 2002). The mean IES-intrusion score in the current sample ($M = 10.3$, $SD = 8.14$) was lower than that observed in a previous sample of MBC patients ($M = 16.5$; Butler et al., 1999). We were not able to identify previous MBC samples that completed the PSQI or somatic symptom measure for comparison purposes. However, mean score on the PSQI was comparable to the mean score observed in non-MBC patients (7.1 in the current sample vs. 7.0 in a sample of 102 non-MBC patients; Carpenter & Andrykowski, 1998), whereas mean somatic symptom score (48.3, $SD = 40.01$) was greater in the current sample compared to early stage breast cancer patients ($M = 34.5$, Stanton et al., 2002). On average, women in the current study perceived their social support networks to be moderately to quite a bit emotionally supportive ($M = 3.6$, $SD = .85$). Thus, the current sample appeared to be relatively well-functioning, but 34% reported clinically significant depressive symptoms and 74% endorsed significant sleep disturbances at baseline. Depressive symptoms scores were significantly correlated with intrusive thoughts ($r = .56$, $p < .001$), sleep disturbances ($r = .30$, $p = .019$), and somatic symptoms ($r = .53$, $p < .001$), but none of the correlations between the other three outcome variables were significant.

Manipulation Check and Essay Ratings

An independent rater unaware of condition assignment read all transcribed essays in random order and recorded which condition instructions they most reflected. The rater correctly classified 94% of the essays, indicating excellent adherence to writing instructions.

At 3 months, participants rated the extent to which they had thought about what they wrote, talked to others about what they wrote, felt the research project had positive or negative long-lasting effects, and how much the project increased their understanding of their experience from 1 (not at all) to 7 (extremely). In contrast to previous trials, in which participants completed essay ratings immediately after each writing session (Stanton et al., 2002; Zakowski et al., 2004), independent *t* tests revealed no significant group differences in these ratings at follow-up ($p > .20$), although mean ratings for “thought about what you wrote about” and “increased your understanding of your experience” were somewhat higher in the EMO than the CTL condition (3.35 vs. 2.74 and 3.29 vs. 2.84, respectively).

Effects of Intervention

ANCOVAs conducted on CES-D, IES-Intrusion, PSQI, and somatic symptom scores, controlling for baseline values on each dependent variable, revealed no main effects for experimental condition (see Table 1). Perceived emotional support at study entry interacted with experimental condition to predict IES-Intrusion, $F(1, 56) = 11.61, p = .001$. The interaction plot is presented in Figure 1. As predicted, for women with high levels of perceived emotional support at study entry, the effect of the intervention was not significant ($\beta = .19, t(56) = 1.63, p = .11, \eta^2 = .05$). However, for women reporting low levels of emotional support, the effect of experimental condition was significant ($\beta = -.37, t(56) = -3.19, p = .002, \eta^2 = .15$), with women in the emotionally expressive condition exhibiting lower levels of intrusive thoughts about cancer at follow-up. We calculated regions of significance at $\alpha = .05$ (Preacher, Curran, & Bauer, 2006), which suggested that the EMO intervention reduced intrusive thoughts for women with less than mean level of emotional support ($M < 3.38$). The interaction between condition and emotional support was a marginally significant predictor of somatic symptoms, $F(1, 37) = 3.29, p = .08$, with a similar pattern of benefit for women with low perceived emotional support but not those reporting high levels of support. Condition \times social support interactions were not significant predictors of depressive symptoms or sleep quality.

We also tested interactions with time since metastatic diagnosis. The condition \times time since metastatic diagnosis was significant for somatic symptoms at follow-up, $F(1, 37) = 4.83, p = .034$. Results were consistent with hypotheses in that there was a significant benefit of the intervention for more recently diagnosed women ($\beta = -.40, t(37) = -2.05, p = .048, \eta^2 = .10$), specifically women diagnosed less than 20 months ago, but no effect for

women with longer diagnosis duration ($\beta = .16, t(37) = .98, p = .33, \eta^2 = .03$). Although metastatic diagnosis duration was treated as a continuous variable in analyses, estimated values for low ($M - SD = 12$ months) and high ($M + SD = 5.5$ years) diagnosis duration are plotted in Figure 2 for illustrative purposes. A significant effect also emerged for the condition \times time since metastatic diagnosis interaction on sleep quality, $F(1, 57) = 5.49, p = .023$; Figure 3. Contrary to hypothesis, there was no significant effect of the intervention on sleep among more recently diagnosed women ($\beta = -.15, t(57) = -1.11, p = .27, \eta^2 = .02$). However, women who had been living with their metastatic diagnosis for longer and who were randomized to the EMO condition exhibited greater sleep disturbances at follow-up ($\beta = .31, t(57) = 2.30, p = .025, \eta^2 = .09$). Computing the region of significance revealed that the EMO intervention was associated with increased sleep disturbances for women who had been diagnosed more than 4.7 years ago. Condition \times months since metastatic diagnosis interactions were not significant for either measure of psychological distress.

Discussion

The primary aim of this study was to examine the effects of a home-based expressive writing intervention among MBC patients, with a secondary goal of investigating whether these effects varied as a function of perceived emotional support and time since metastatic diagnosis. Contrary to hypotheses, expressive writing did not produce reductions in psychological distress (i.e., general depressive symptoms and cancer-specific intrusive thoughts) or improvements in physical health (i.e., fewer sleep disturbances and somatic symptoms). This finding is inconsistent with previous trials conducted with early stage breast cancer patients (Stanton et al., 2002) as well as newly diagnosed metastatic renal cell carcinoma patients (de Moor et al., 2002). However, to our knowledge, this is the first randomized controlled trial to examine the effects of emotionally expressive writing among MBC patients, and several characteristics of the current sample are distinct from these previous samples. First, most women in our sample reported that they had taken action to process and express their cancer-related emotions before participating in our study. For example, three-quarters had attended a cancer support group (vs. less than half in Stanton et al., 2002) and two-thirds had previously written in a journal about the cancer experience. Thus, the lack of main effects in the current study may be because of the fact that most women had already engaged in significant emotional processing and expression about their cancer before randomization. Unfortunately, given the frequency of these experiences in our sample, the study was not powered to detect whether the intervention was efficacious among the 10 women who had not previously participated in a cancer support group or talked with a mental health professional about cancer. Our study also differed from previous studies in that the control group was also instructed to write about their cancer, which may have been a more stringent control condition than, for example, health behaviors (de Moor et al., 2002).

Another notable characteristic is the medical heterogeneity of our sample. While previous studies recruited patients at a particular stage in the cancer trajectory, such as immediately following diagnosis and before beginning an experimental treatment regimen (de Moor et al., 2002) or after completing adjuvant treatment (Stanton et al., 2002), we observed significant variability in how

Table 1
Follow-Up Adjustment Scores by Experimental Condition

	EMO (<i>n</i> = 31)	CTL (<i>n</i> = 31)	Partial η^2
CESD	12.8 (1.48)	13.2 (1.48)	.001
IES-Intrusion	8.7 (.94)	10.1 (.96)	.018
PSQI	7.1 (.51)	6.6 (.51)	.01
Somatic Symptoms	50.3 (6.94)	54.1 (8.01)	.003

Note. Mean scores at three-month follow-up, adjusted for baseline values. Standard errors appear in parentheses.

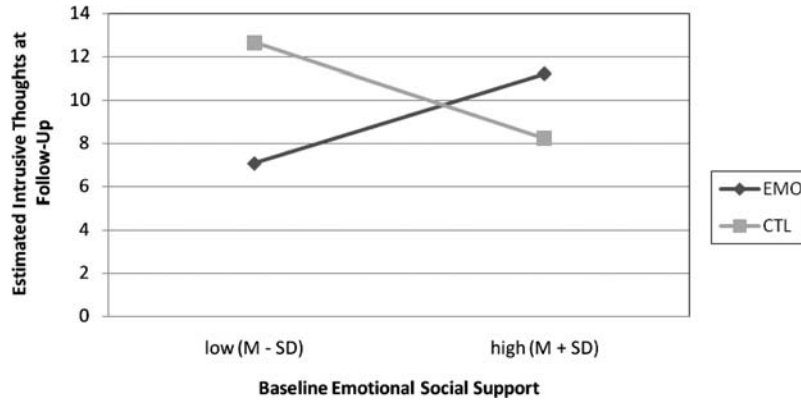


Figure 1. Significant interaction of experimental condition and emotional support (calculated as $M \pm SD$) on IES-Intrusion scores at 3-month follow-up.

long participants had been living with MBC. Indeed, we found that the effects of the intervention were moderated by time since metastatic diagnosis. Women who had been recently diagnosed appeared to benefit from the intervention with respect to somatic symptoms, whereas there was no effect on somatic symptoms for women that had been living with MBC for longer. However, women who had been living with the diagnosis for a longer time appeared to be adversely affected by the expressive writing intervention with respect to sleep, reporting more sleep disturbances at follow-up relative to the control group. Perhaps for women who have been living with a diagnosis of MBC for several years, asking them to revisit negative thoughts and emotions has detrimental effects on sleep. It is also possible that women who had been living with the diagnosis for a longer time were more likely to be facing mortality concerns than the more recently diagnosed and that writing about these existential concerns resulted in disrupted sleep. We will explore whether the content of participants' essays differed by time since diagnosis in future analyses.

We also examined perceived emotional support as a moderator of intervention effects. This hypothesis was guided by social constraint theory, which suggests that the absence of social outlets for emotional expression and processing has a negative effect on

adjustment to stressful situations. As hypothesized, women reporting low emotional support benefited from the opportunity to express and process cancer-related emotions, which was reflected in decreased intrusive thoughts at 3 months. These results are consistent with an earlier writing trial with cancer patients, and suggest that expressive writing may represent a useful intervention for individuals who lack opportunities for emotional expression in their social environments (Zakowski et al., 2004).

Limitations of the current study warrant mention. First, the sample was predominantly White and well educated, and results may not generalize to individuals with less education, to ethnic minority groups, or to men. Second, physical health outcome measures relied on self-report. Although physical symptoms and sleep disturbances have been examined in previous expressive writing studies and are elevated in MBC patients (Koopman et al., 2002), future research should examine biological markers that might be clinically relevant for MBC patients. Although the sample of 31 women per condition at follow-up is larger than as those in previous expressive writing trials reporting main effects (de Moor et al., 2002; Stanton et al., 2002), our study may have been underpowered to detect main effects, particularly for psychological outcomes, as well as moderated effects. Thus, replication of the

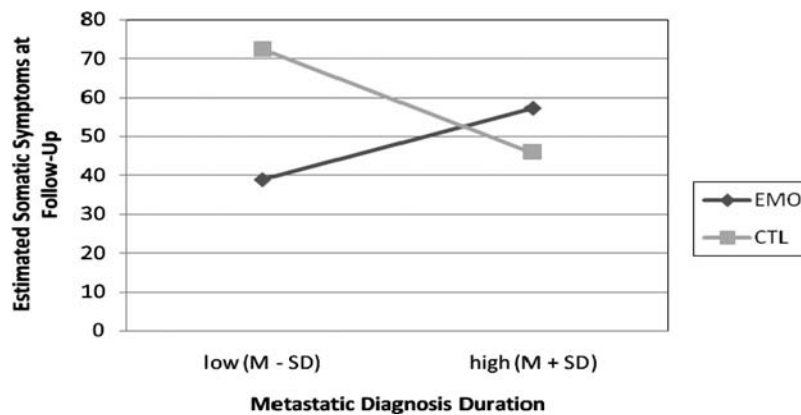


Figure 2. Significant interaction of experimental condition and months since metastatic diagnosis (calculated as $M \pm SD$) on somatic symptom scores at 3-month follow-up.

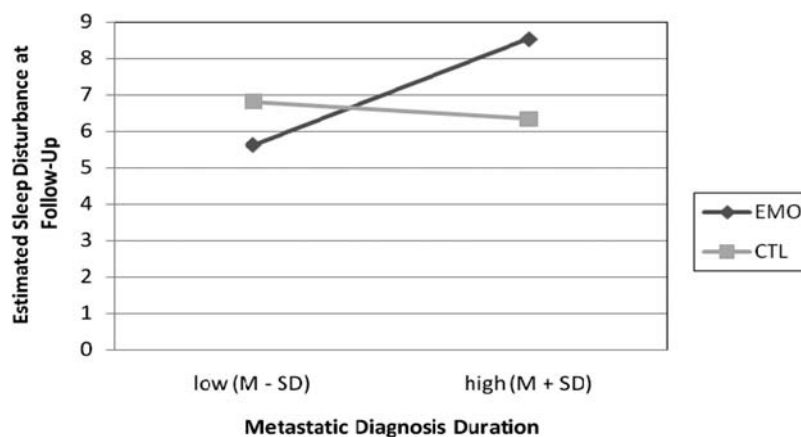


Figure 3. Significant interaction of experimental condition and months since metastatic diagnosis (calculated as $M \pm SD$) on PSQI scores at 3-month follow-up.

current design in a larger sample will be another important goal for future research. Future research may also benefit from exploration of alternative writing topics, such as the perceived benefits of the cancer experience (Stanton et al., 2002) or a noncancer related control topic.

Strengths of the study include the application of the expressive writing paradigm to a novel and understudied clinical population, the randomized controlled design, the inclusion of both psychological and physical health outcome variables, and the 3-month follow-up period. Although there was no main effect of expressive writing on health among the current MBC sample, analyses provide suggestive evidence that expressive writing may be beneficial for a subset of MBC patients and contraindicated for others. Emotionally expressive writing holds promise as a cost-effective, brief psychosocial intervention for women living with MBC who have been recently diagnosed or who report low levels of social support.

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