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A Retrospective Study Predicting Psychological Vulnerability in Adult Daughters of Breast Cancer Patients

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This study was an attempt to identify vulnerability factors in two cohorts of daughters of breast cancer patients. One cohort consisted of daughters whose mothers survived breast cancer and the other consisted of daughters whose mothers died from breast cancer. The results revealed significant main effects. Greater caretaking involvement was associated with higher levels of cancer-related grief. Maternal loss to breast cancer predicted higher levels of cancer-related depression. Also, a history of a depression diagnosis in the daughters was associated with current depressive symptoms. Several significant interactions also emerged. Survival status of the mother and level of daughters' involvement in mother's breast cancer was shown to significantly affect the daughters' current depressive symptoms. Daughters who reported the lowest level of involvement with their mother's breast cancer reported the highest level of current depressive symptoms. Daughters who were less than 12 years of age at the time of their mother's diagnosis reported significantly higher current state anxiety than daughters who were 12 to 19 at the time of their mother's diagnosis. Daughters whose mothers died from breast cancer, who also had a past diagnosis of depression, reported significantly higher levels of cancer-related depression than daughters without a past diagnosis of depression. We concluded that maternal death among daughters who reported very low caretaking involvement reflects the most significant vulnerability to show current depressive symptoms. We also concluded that daughters possessing potential genetic vulnerability to depression are the most sensitized to traumatic life events such as maternal illness and death.

Keywords: breast neoplasms, genetic predisposition to disease, caregivers, mother–child relations, psychological factors

Few stresses in life are as powerful or long-lasting as the death of a close family member (Stroebe, Schut, & Stroebe, 2007). Bereavement is a harrowing experience and reactions range from mild and relatively short-lived to extreme and long-lasting over many years.

Much research effort has been directed at identification of risk factors to understand why people are affected by bereavement in different ways; why some people have extreme or long-term reactions, while others do not. Although research has elucidated general outcomes of bereavement, considerable gaps in knowledge persist as literature in the field has focused primarily on spousal loss (Stroebe et al., 2007). Far fewer studies have focused on the long-term impacts of the death of a close family member on adult children, especially daughters of mothers who die from breast cancer.

For women whose mothers died from breast cancer, the distress associated with maternal loss is compounded by living with the lifelong threat of increased risk to the disease that took the lives of their mothers. Family history of breast cancer is a significant life stressor (Bovb-

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jerg, Valdimarsdottir & Zachariae, 1999), and considerable evidence demonstrates that high-risk women experience greater levels of general as well as cancer-specific psychosocial distress (Gilbar, 1998; Bovbjerg & Valdimarsdottir, 2001; Baider, Ever-Hadani & Kaplan De-Nour, 1999; Zakowski et al., 1997). The chronic stress associated with high-risk status is often compounded by a series of cancer-related traumatic events, particularly among women with maternal loss to breast cancer. Consistent with this hypothesis, Erblich, Bovbjerg, and Valdimarsdottir (2000) found that women whose mothers died from breast cancer demonstrated higher cancer-related distress than women whose mothers survived breast cancer. In accordance with cumulative risk theory (Masten, 2001), additional risk factors and experiences may be associated with increased vulnerability to later psychological maladaptation among these maternally bereaved daughters.

Serving as a caregiver to a mother with breast cancer is widely known to be related to both physical and emotional burden (Kim & Schulz, 2008) and higher than average bereavement-related depressive symptoms (Wyatt, Friedman, Given, & Given, 1999). Increased rates of both physical and psychological difficulties have been observed among daughters of breast cancer patients who had been maternal caretakers. In a study directly comparing caregiver strain of husbands versus daughters in caring for wives/mothers with breast cancer, daughters were significantly more likely to demonstrate symptoms of depression and anxiety (Bernard & Guarnaccia, 2003). Regarding the long-term effects of caregiving experiences, maternal caregiving was not shown to be related to higher distress in a study of the longstanding adjustment of daughters of breast cancer patients (Erblich et al., 2000). However, the experience of both having been a maternal caregiver and having their mother die of breast cancer was linked with elevated levels of general depressive symptoms and cancer-specific distress and (Erblich et al., 2000). This suggests the need to consider caregiving and additional risk factors in developing a more complete model of bereavement adjustment in daughters of breast cancer patients.

A second potential vulnerability factor to affect present-day emotional symptomatology is the developmental stage of daughters at the time of

mother's breast cancer diagnosis, particularly among women with early maternal loss to breast cancer. Research shows that younger age predicts greater postbereavement psychological maladaptation (Stroebe et al., 2007), and that maternal loss in childhood may lead to psychobiologic and psychological dysfunctions in adult life (Low, Thurston & Matthews, 2010; Cohen, Janicki-Deverts, Chen, & Matthews, 2010). Research of maternally bereaved women reported that younger daughters had more problems with bereavement adjustment including greater grief, more somatic symptoms, and less acceptance of their mother's death (Moss, Moss, Rubinstein & Resch, 1993).

Among children whose parent has cancer, higher levels of distress have been observed among adolescents and young adults (Compas, Worsham, Ey & Howell, 1996), as well as in adolescent girls whose mothers had cancer (Compas et al., 1994). With regard to daughters of breast cancer patients, studies report greater adjustment difficulties among women who were younger at the time of their mother's breast cancer diagnosis (Wellisch, Gritz, Schain, Wang, & Siau, 1992) and whose mothers died of breast cancer at a younger age (Erblich et al., 2000). Because extant research primarily focuses on loss experienced during adulthood, studies of daughters of breast cancer patients with loss experiences in childhood, adolescence, and adulthood are needed to ascertain if there are developmental periods of more etiologic significance.

Personal history of depression represents another predisposing vulnerability to potentially affect current emotional status among bereaved individuals. Evidence indicates that prebereavement depression heightens the risk of depression in bereavement (Mireault & Compas, 1997; Raphael, Minkov, & Dobson, 2001). Similarly, studies of caregivers to patients with cancers demonstrate greater vulnerability to negative postbereavement psychosocial outcomes among caregivers with a previous psychological symptomatology (Chiu et al., 2010; Kelly et al., 1999). However, further research of the effects of prebereavement psychological symptomatology is needed (Stroebe et al., 2007). To our knowledge, no previous study has investigated whether history of depression affects the relation between maternal loss to breast cancer

and present-day psychosocial adjustment in women at high risk for breast cancer.

These daughters may fail to fit any general model of bereavement adjustment in view of the specific emotional significance of their mother's illness (Bernard & Guarnaccia, 2003). Beyond the loss of the sense of safety and predictability, the loss of the relationship they used to have with their mother prior to the illness can also compound distress (Lewis & Hammond, 1996, 1992). Further, because the loss of the relationship is not often socially recognized or socially validated as a loss, individuals may not feel as if they deserve to grieve the loss of the relationship. This can be understood as "disenfranchised grief," where the loss of the relationship itself is not considered or socially defined as significant and grieving is therefore not socially validated (Doka, 1989). Disenfranchised grief can intensify the emotional reactions to the loss while at the same time precluding social support (Doka, 1989). The emotional distress experienced by the loss of a parent and significant relationship can also be compounded by other factors, such as serving as a caregiver.

The present study is an attempt to examine the adjustment, level of caregiving involvement, developmental stage at time of mother's breast cancer diagnosis, and personal history of depression in two groups of daughters of breast cancer patients. For one group their mothers survived and for the other their mothers died from breast cancer. A set of research questions and hypotheses emerge from the literature that this study can bear upon. We expected that:

1. Survival status of the mother, level of caretaking involvement, developmental stage at the time of mother's diagnosis, and personal history of depression would be associated with general and cancer-specific psychosocial functioning, over and above demographic and health-related variables.

- a. Having a mother who died from breast cancer will contribute to poorer current psychosocial functioning.
- b. Having had a higher level of caregiving involvement in their mother's breast cancer will be associated with poorer current psychosocial functioning.
- c. Having been a child or adolescent at time of mother's diagnosis will contribute to poorer current psychosocial functioning.

- d. Having a personal history of depression will contribute to poorer current psychosocial functioning.

2. Survival status of the mother would moderate the effects of the aforementioned hypothesized set of predictors.

- a. Mother's survival status would moderate the effect of level of caregiving involvement on the daughters' current psychosocial functioning.

- b. Mother's survival status would moderate the effect of developmental stage at time of mother's diagnosis in terms of current psychosocial status.

- c. Mother's survival status would moderate the effect of personal history of depression on the daughters' current psychosocial functioning.

Method

Participants and Procedures

The data for the present study were obtained during the patients' initial visit to the UCLA Revlon Breast Center High Risk Clinic. The High Risk Clinic is a multidisciplinary center that serves patients at familial risk for breast cancer. During their initial visit to the clinic, patients are individually seen and counseled by an oncologist, a genetics counselor, a nurse practitioner, a nutritionist, and a psychologist; most patients also receive a mammogram. During follow-up visits, patients are seen by specific members of the team according to the patient's needs.

Institutional Review Board approval was granted prior to data collection. The information presented here was obtained during the patients' initial consultation with the team psychologist. Women were eligible for participation if their biological mother had been diagnosed with breast cancer, were at least 18 years old, were English-speaking, and had never themselves been diagnosed with breast cancer. Only one percent of eligible patients declined participation, and data for 196 consecutive patients from the High Risk Clinic were available for analyses for the current study. Following informed consent, participants completed baseline questionnaires assessing depression and anxiety symptoms and a semistructured clinical interview, in which psychosocial background information was obtained, including participants' experiences during their mother's diagnosis and treatment of breast cancer. After the interview, the psychologist remained available to answer participants' questions regarding the study or to address specific issues brought up during the interview.

Measures

Predictor variables. Information was obtained regarding the survival status of the participants' mothers (survived or passed away from breast cancer), participants' perceived level of caregiving involvement with their mother's breast cancer (1 = *very low* to 4 = *very high*), development stage at the time of their mother's breast cancer diagnosis (less than 12 years old, 12–19, and more than 19 years old), and personal history of a depression diagnosis.

Outcome variables. The Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) was used to assess current depressive symptomatology. The CES-D consists of 20 items and scores may range from 0 to 60, with higher scores signifying the presence of more symptomatology. The test has excellent concurrent validity (levels up to $r = .72$) and split-half and coefficient alpha reliability ($r = .85$ for general population; $r = .90$ for clinical population); the internal consistency for the current study sample was strong ($\alpha = .92$). Although not constituting a clinical diagnosis of depression, scores at or above 16 on the CES-D are considered indicative of clinically significant symptoms of depression.

The State–Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, 1970) was used to evaluate current level of anxiety (“state anxiety”) and a characterological or enduring level of anxiety (“trait anxiety”). The STAI contains 40 items and responses are measured on a 4-point Likert scale, with higher scores signifying the presence of higher levels of anxiety. This test has excellent concurrent validity (levels up to $r = .80$) and reliability ($r = .77$). The STAI manual reports high internal consistency for both the trait scale and the state scale, which was replicated in this study ($\alpha = .89$, for state anxiety; $\alpha = .91$, for trait anxiety).

To assess cancer-related depression and cancer-related grief, participants were asked to rate their current level of depression and grief over their mother's breast cancer. Each was assessed on a 4-point scale (1 = *not at all* to 4 = *a lot*).

Covariates. The following variables were considered as potential covariates: age in years at interview, ethnicity (Caucasian or non-Caucasian), marital status, educational attainment, employment status (currently employed

or not currently employed), number of breast biopsies, and computed breast cancer risk (using the Gail model, see Gail et al., 1989).

Statistical Analyses

Analysis of covariance (ANCOVA) was used to assess the effects of survival status of the mother and a group of selected predictors on several dependent variables. The ANCOVA models were performed to examine differences between daughters whose mothers died and those whose mothers survived breast cancer on the outcome variables of current depression, state anxiety, trait anxiety, cancer-related depression, and grief related to their mother's cancer. Potential covariates shown as significant predictors of any of the outcome variables were included in each of the ANCOVA models. Survival status of the mother, age (i.e., developmental stage) at time of mother's diagnosis, level of involvement in mother's breast cancer, and past depression diagnosis served as primary predictor variables, along with the two-way interactions between survival status of the mother and each of the three other primary predictors (i.e., age at time of mother's diagnosis, level of involvement in mother's cancer, and past diagnosis of depression). Post hoc analyses were Bonferroni corrected.

Since the effects of multiple predictors were considered, a custom model limited to main effects and two-way interaction terms was specified. A full-factorial design would have allowed for a more thorough examination of the independent contributions of predictors as well as all possible interactions. Because we did not anticipate the existence of three- or four-way interactions, and, even if shown to exist, because of the interpretation difficulties that usually accompany the existence of such higher order interactions, the analysis included only the main effects for each predictor and two-way interactions between survival status of the mother and the three other primary predictors (Stolle, Robbennolt, Patry, & Penrod, 2002).

Results

A total of 196 (94 mother died from breast cancer; 102 mother survived) participants were included in the study. Table 1 shows back-

Table 1
Demographic Characteristics of Daughters Whose Mother Died From Breast Cancer Compared to Those Whose Mother Survived

	Mother deceased (<i>n</i> = 94)	Mother survived (<i>n</i> = 102)	Total sample (<i>n</i> = 196)
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Married	56 (59.58)	62 (60.78)	118 (60.20)
Ethnicity			
Caucasian	69 (73.40)	67 (65.69)	136 (69.39)
Non-Caucasian	11 (11.70)	16 (15.69)	27 (13.78)
Not specified	14 (14.89)	19 (18.63)	33 (16.84)
Education			
High school	3 (3.19)	9 (8.88)	12 (6.12)
Some college	19 (20.21)	15 (14.71)	34 (17.35)
College graduate	25 (26.60)	39 (38.24)	64 (32.65)
Graduate school	47 (50.00)	39 (38.24)	86 (43.88)
Employed	69 (73.40)	80 (78.43)	149 (76.02)
Previous breast biopsy	32 (34.04)	35 (34.31)	67 (34.18)
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Age in years*	42.28 (10.48)	39.16 (8.63)	40.65 (9.66)
Years since mother's diagnosis*	19.69 (10.78)	11.96 (10.68)	15.67 (11.38)
Computed risk of breast cancer	17.77 (7.35)	19.32 (7.44)	18.58 (7.42)

* *p* < .05.

ground characteristics of the sample. With respect to age, the overall sample was relatively young (*M* = 40.65, *SD* = 9.66) and exhibited absolute breast cancer risks moderately higher than that in the general population (18.58% calculated lifetime risk). Additionally, the majority of participants were Caucasian (69.39%, *n* = 136), married (60.20%, *n* = 118), and had a college or advanced degree (76.54%, *n* = 150). The background characteristics of these

two groups were not significantly different except for age, *t*(180.57) = -2.27, *p* = .025, and number of years since mother's breast cancer diagnosis, *t*(194) = -5.04, *p* < .001. Compared to those whose mothers survived, participants whose mothers died from breast cancer were significantly older and reported a greater number of years since their mothers were diagnosed (see Table 1). Analyses of potential covariates with respect to the study outcomes revealed that

Table 2
F Values for Analyses of Covariance Models

	Current depression (CES-D) (<i>df</i>) <i>F</i>	State anxiety percentile (<i>df</i>) <i>F</i>	Trait anxiety percentile (<i>df</i>) <i>F</i>	Cancer- related depression (<i>df</i>) <i>F</i>	Cancer- Related Grief (<i>df</i>) <i>F</i>
Main effects					
Mother survival (A)	(1, 161) 2.82 [†]	(1, 154) 0.36	(1, 153) 2.35	(1, 178) 4.57*	(1, 179) 3.09 [†]
Age at mother's BC diagnosis (B)	(2, 161) 0.02	(2, 154) 0.56	(2, 153) 1.64	(2, 178) 0.59	(2, 179) 0.09
Caregiving involvement (C)	(3, 161) 2.12 [†]	(3, 154) 0.35	(3, 153) 0.18	(3, 178) 1.07	(3, 179) 13.72*
Past depression diagnosis (D)	(1, 161) 4.23*	(1, 154) 0.62	(1, 153) 0.01	(1, 178) 2.00	(1, 179) 0.39
Age at time of interview	(1, 161) 5.73*	(1, 154) 15.03*	(1, 153) 21.15*	(1, 178) 0.01	(1, 179) 0.11
Two-way interactions					
A × B	(2, 161) 0.58	(2, 154) 6.79*	(2, 153) 2.54 [†]	(2, 178) 1.25	(2, 179) 0.78
A × C	(3, 161) 2.86*	(3, 154) 3.33*	(3, 153) 2.53 [†]	(3, 178) 0.90	(3, 179) 0.53
A × D	(1, 161) 0.01	(1, 154) 0.01	(1, 153) 0.21	(1, 178) 5.10*	(1, 179) 0.50

[†] *p* < .10. * *p* < .05.

age was associated with a number of the outcome measures (state anxiety, trait Anxiety, CES-D depression, $ps < .05$). Given these findings, age was used as a control variable.

The results revealed a number of significant main effects. There was a significant main effect for level of caregiving involvement on cancer-related grief, $F(3, 179) = 13.72, p < .001$, and follow-up Bonferroni-corrected pairwise comparisons indicated significantly higher levels of cancer-related grief for participants reporting high and very high levels of caregiving involvement compared to those reporting very low involvement ($M = 1.81, SE = 0.20$, for very low involvement; $M = 2.78, SE = 0.17$ for high involvement; $M = 3.18, SE = 0.14$, for very high involvement), $ps < .001$. Additionally, participants who reported very high levels of caregiving involvement (see above) had higher levels of cancer-related grief than those who reported low involvement ($M = 2.43, SE = 0.18$), $p < .001$. There was also a significant main effect for the impact survival status of the mother on cancer-related depression, $F(1, 178) = 4.57, p = .034$. Participants whose mothers died from breast cancer reported higher levels of cancer-related depression ($M = 2.04, SE = 0.15$) than those whose mothers survived ($M = 1.60, SE = 0.15$). Finally, the main effect for the influence of past depression on CES-D score was also significant, $F(1, 161) = 4.23, p = .041$. Participants with a past depression diagnosis had higher CES-D scores ($M = 15.41, SE = 2.01$) than those without past depression ($M = 11.06, SE = 1.12$). No other main effects of the predictors of interest reached statistical significance, although a number of significant trends for main effects were noted (see Table 2).

In addition to the aforementioned main effects, significant interactions also emerged. The interaction between survival status of the mother and level of daughter caregiving involvement with mother's breast cancer was shown to significantly affect daughter CES-D score, $F(3, 160) = 2.84, p = .040$ (see Figure 1). Bonferroni-corrected post hoc comparisons demonstrated that among participants whose mothers died from breast cancer, CES-D score was associated with level of caregiving involvement in mother's breast cancer $F(3, 74) = 3.83, p = .013$. Specifically, participants who reported very low involvement demonstrated significantly higher CES-D scores than participants with low involvement or high involve-

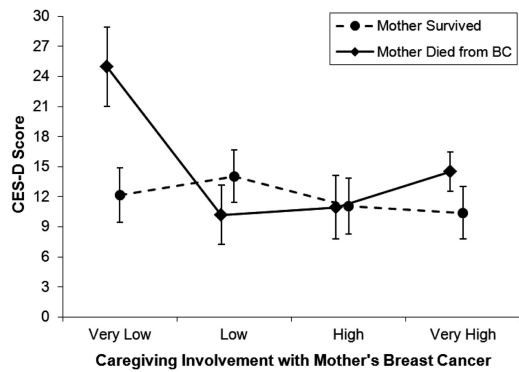


Figure 1. Effects of mother's survival and caregiving involvement on CES-D score. Error bars represent standard errors. Points are offset horizontally so that error bars are visible.

ment ($M = 24.73, SE = 3.97$, for very low involvement; $M = 9.97, SE = 2.95$, for low involvement; $M = 10.74, SE = 3.16$, for high involvement), $ps < .030$. Significant differences in CES-D scores across levels of involvement were not observed among participants whose mothers survived breast cancer, $F(3, 86) = 0.53, p = .134$.

The effect of the interaction between survival status of the mother and age at time of mother's diagnosis on state anxiety was also shown to be significant, $F(2, 155) = 6.79, p = .001$ (see Figure 2). Bonferroni-corrected post hoc analyses revealed significant effects among both participants whose mothers died from breast cancer, $F(2, 72) = 4.30, p = .017$, as well as those who mothers survived, $F(2, 81) = 3.17, p = .047$. For participants whose mothers died from breast cancer, those who were less than 12 years of age at the time of their mother's diagnosis demonstrated significantly higher state anxiety scores ($M = 84.60, SE = 2.40$) than participants who were 12–19 years of age at the time of their mother's diagnosis ($M = 76.40, SE = 2.28$), $p = .030$. In contrast, for those whose mothers survived, the highest state anxiety was shown among Participants 12–19 years old at the time of their mother's diagnosis ($M = 82.63, SE = 2.27$), whose scores were significantly higher than participants who were over 19 years old at the time of their mother's diagnosis ($M = 76.18, SE = 1.31$), $p = .042$. There was also a significant interaction between survival status of the mother and level of caregiving involve-

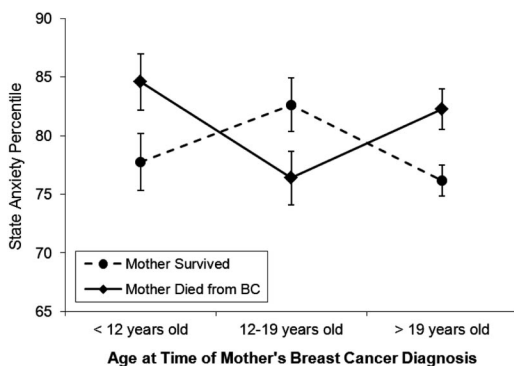


Figure 2. Effects of mother's survival and daughter age at mother's diagnosis on state anxiety. Error bars represent standard errors.

ment, $F(3, 154) = 3.33, p = .021$, but post hoc tests disentangling the interaction failed to reach statistical significance after Bonferroni correction.

Furthermore, the interaction between survival status of the mother and past diagnosis of depression was shown to significantly affect daughter cancer-related depression, $F(1, 178) = 5.10, p = .025$. As shown in Figure 3, among participants whose mothers died from breast cancer, those with a past diagnosis of depression demonstrated significantly higher levels of cancer-related depression ($M = 2.36, SE = 0.26$) than participants without a past diagnosis ($M = 1.72, SE = 0.13$), $F(1, 85) = 5.87, p = .017$. In contrast, among participants whose mothers survived breast cancer, cancer-related depression was not significantly associated with a past depression diagnosis, $F(1, 92) = 0.42, p = .520$.

Discussion

This study was an attempt to identify and highlight differences between two groups of daughters of breast cancer patients. In one group of daughters, their mothers survived breast cancer, in the other their mothers died from breast cancer. A number of specific effects emerged that lend further understanding to the long-term impacts of caregiving and its relationship to emotional functioning of these high-risk daughters. Results confirmed a number of significant main effects for the associations between daughter characteristics and general and

cancer specific psychosocial functioning (hypotheses 1a–d). Moreover, survival status of mother was shown to moderate the effects of daughter characteristics on emotional outcomes (hypotheses 2a–c). Overall, the interaction effects were more significantly and consistently associated with general and cancer-related functioning, but this was not exclusively the case.

In regard to the first hypothesis, maternal death from breast cancer, by itself, did relate to significantly greater cancer-related depression. This would be consistent with and support earlier findings of Erblich, et al. (2000). Level of caregiving involvement and cancer-related grief were also significantly related, adding support to this hypothesis. This seems consistent with Masten's concept of cumulative risk (Masten, 2001), where additional stressors such as caretaking may increase subsequent vulnerability to distress. Results demonstrated a linear relationship between cancer-related grief and caretaking, such that the more involvement the daughters had in caretaking, the more grief they endorsed. This is also consistent with the literature (Osborn, 2007; Quinn-Beers, 2001). Of note, a daughter's past history of a depression diagnosis was only significantly related to current CES-D symptoms endorsed and not to cancer-related depression or grief. This would imply that daughters with such a history are no more or less able to cope with the experience of maternal caregiving in terms of direct emotional trauma from that experience.

However, when the variables are considered in terms of the moderating effects of survival

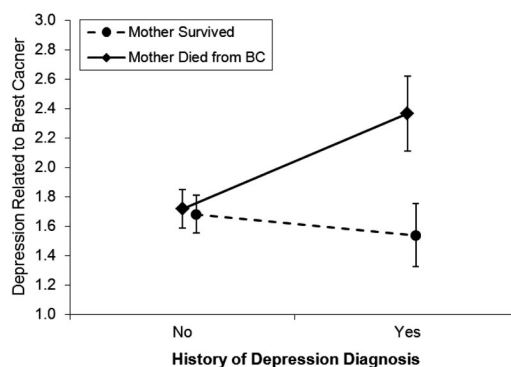


Figure 3. Effects of mother's survival and past depression diagnosis on depression related to mother's breast cancer. Error bars represent standard errors. Points are offset horizontally so that error bars are visible.

status of the mother (related to hypothesis 2), they are more potentially meaningful. For example, in regard to current depression symptoms, the most salient finding comes from the interaction of the mother's survival status and the daughter's degree of caregiving involvement at the time of the mother's illness. Maternal death among daughters who reported very low caretaking involvement reflects, by far, the most significant vulnerability to show current depression symptoms. The investigators relate this finding to the daughter having to live, on a continuing basis, with her lack of involvement in the terminal phase of her mother's life. At the most basic level, the daughter "cannot remake this tape." Perceived "very low involvement" on the part of the daughter maybe equivalent to a type of escape-avoidance coping, with depression symptoms being a well described outcome of this behavioral pattern (Mausbach et al., 2006; Pearlin, Mullan, Semple, & Skaff, 1990). The investigators view this failed sense of adequate involvement as potentially creating a volatile mixture of low self-esteem, guilt, and negative thoughts, which coalesce to reinforce the current depressive symptoms.

A very important interaction also emerged in regard to cancer-related depression. Here, the relationship of mother's survival status and the daughter's past history of depression is potent. Women with mothers who died and who have had past history of depression are significantly more likely to note their mother's cancer experience as having been more depressing for them. This seems consistent with the "kindling hypothesis." Here, the association between previous depressive episodes and the pathogenic impact of stressful life events on the development of subsequent psychosocial distress is seen as causal (Kendler, Karkowski, & Prescott, 1999). This indicates the individuals possessing potential genetic vulnerability are thereby sensitized to traumatic life events such as maternal illness and death. This is not to say such women will develop major depression following maternal illness or death. It is to say they have an increased vulnerability to onset of this sort of reactive cancer-related depression (Kendler, Thornton, & Gardner, 2000).

The data showed that mother's survival status did significantly moderate the effect of developmental stage at the time of mothers' diagno-

sis. This was reflected in terms of two significant findings related to state (current) anxiety. First, the most elevated level of state (current) anxiety was endorsed by women who were pre-adolescents at the time of their mothers' diagnosis, where their mothers died subsequently. This would concur with findings of past studies (Erblich et al., 2000; Wellisch et al., 1992). The second finding, in regard to state (current) anxiety, related to those daughters who were adolescents at the time of their mother's diagnosis, was unexpected. Contrary to our expectations, daughters with mothers who survived endorsed significantly higher current anxiety than daughters whose mothers died in the subgroup. This may be considered as potentially related to anticipatory anxiety in these daughters. As they mature and develop like their mothers, they may suffer the same fate as them, possibly losing their breasts. Mothers who survived, therefore, serve as constant reminders and reinforcers of what could happen to these daughters (Bublitzky, Fleisch, Stockburger, Schmalzle, and Schupp, 2010).

Other explanations may possibly clarify the striking relationship of very low caregiving and depression, and bear upon other findings in this study in general. It is possible that some of the daughters had poor relationships with their mothers and were therefore not involved in caretaking, a factor which, by itself, may be associated with depression. The daughter may have been away at school or lived away and thereby could not be involved in caregiving. The relationship between the daughter and fathers may have been poor, thus delimiting caregiving efforts by the daughter. The existence of depression on the part of the daughter, by itself, could delimit caregiving intentions and efforts. This would most obviously be true for that subset of daughters with a preexisting diagnosis of depression. These factors were beyond the scope of the present study but deserve mention and consideration.

The concept of disenfranchised grief, described earlier in this study, must also be considered to potentially bear upon all of the outcomes in this study (Doka, 1989). This would be especially potent for the subset (49%) that experienced maternal death. If their mourning was interfered with such that they could not effectively come to terms with the elements and

meanings of their loss, this could be expected to bear upon and intensify all of the negative outcomes evaluated in this study. The investigators have sometimes observed this disenfranchisement process in fathers and in their new spouses with very negative reactions in their daughters (Wellisch & Hoffman, 1998).

Clinical Implications

Some clinical implications of this study suggest that specific aspects of vulnerability may warrant special consideration among professionals working with populations of high-risk women. Regardless of mothers' survival status, careful clinical attention should be paid to those women who report high levels of caregiving involvement, which predicted more cancer-related grief. Careful attention should also be paid to high-risk women with a past history of depression in regard to current symptoms of depression. Potentially most important for clinicians to consider from this study data is the issue of maternal mortality, including its relationship to caregiving involvement, past depression and developmental stage at time of mothers' diagnosis.

Overall, high-risk women whose mothers died from breast cancer are at particular risk for more cancer-related as well as general emotional symptomatology. However, complicating clinical evaluation is the need to consider combinations of risk factors in predicting coping and adjustment on the part of high-risk women. In this study, mothers' survival status was a consistent, but at times contradictory, predictor of coping and adjustment. For women whose mothers died, particular clinical attention should be paid to those with very low caregiving involvement in regard to potentially greater depressive symptomatology. A history of depression and maternal loss to breast cancer may alert the clinician to potential difficulty with cancer-related depression. A particularly complex relationship for the clinician to disentangle may be that of mothers' survival and daughters' developmental stage at time of mothers' diagnosis. The clinician may expect women who were preadolescents at the time of their mothers' diagnosis and experienced maternal death to present higher levels of anxiety, while women who were adolescents at the

time of mothers' diagnosis and whose mothers survived also to present significant levels of anxiety. Thus, clinical evaluation and prediction of difficulties in these women cannot be reduced to a simple categorization based upon maternal survival versus maternal death from breast cancer.

Given the complex nature of these vulnerability factors, the investigators recommend a systematic screening strategy involving structured questionnaires specifically focused on anxiety, depression and grief, with the addition of a semistructured interview to assess the quality and nature of general and cancer-related distress, which may not be measured using objective screening instruments alone. Furthermore, the investigators favor the implementation of team meetings in the high-risk clinic setting where professionals from multiple disciplines, including mental health, share and pool their data and clinical observations. This is particularly important for patients with multiple vulnerability factors who are at risk for not returning to the clinic after their first visit (Ormseth, Wellisch, Hartoonian, & Arechiga, 2012).

Parental depression, in relationship to breast cancer, whether with single-parent mothers or two-parent families in regard to raising and parenting adolescent children, also needs to be addressed at the time of diagnosis of the mother's breast cancer. Our model for this at the present time is to do a comprehensive psychosocial interview with every woman, and hopefully including her spouse, or marital partner, with special sensitivity to the interaction of her and the partner's depression and their current capacity to address the needs of their adolescent and preadolescent children during the illness process. It is often the case in this interview that we discover that parental depression and grief are interfering with quality parenting of their dependent children. If this is the case, we do two things. First, we thoroughly discuss this clinical finding in the multidisciplinary team conference. Second, we make sure that a referral is made for the single parent or parents to see a person well-versed in family therapy and parenting skills techniques who will see the parents and children during the course of the mother's breast cancer.

Limitations and Future Research Directions

This study was a cross-sectional, self-report, retrospective design based in a university setting with inherent limitations. The demographics of the study population were heavily weighted toward Caucasian, highly educated, married women, thus delimiting generalizability to other underrepresented populations. Given this limitation, it is important for future research to recruit demographically representative samples, paying particular attention to women from underserved populations. This may necessitate a shift from university-based to community-based recruitment strategies. Studying women at high risk for breast cancer who came from families with challenges such as being parented by single mothers with breast cancer, or by two parent families struggling with poverty and racial minority status would seem particularly important. Evaluating the multifactorial relationship between characteristics such as ethnicity and poverty, culture, and psychosocial outcomes using structural equation modeling within a theoretical framework such as that proposed by [Betancourt and Lopez \(1993\)](#) may be most useful.

It is also important to note that this study relied on self-report data with the possibility of distortions of memory over time. These daughters were asked to remember back an average of 15 years since their mothers were diagnosed. Future research in this area would benefit from the implementation of a prospective study design to minimize the problems associated with retrospective data. Also, physiological or behavioral measures may complement self-report data. Future research may also consider collecting data from family collaterals. In particular, literature addressing the roles of fathers and partners in the adjustment of high-risk women is limited. Interviews with family collaterals could lead to richer, more accurate data and also inform couples and/or family interventions.

To more specifically address the issues of family type, parental depression associated with chronic illness, and adolescent outcomes, we would propose beginning with a specific and structuralized study. The current literature emphasizes the fact that adolescent depression, which merges into later life adult depression, is not related specifically or absolutely related to loss of a parent in childhood or adolescence, but more specifically to the quality of parenting

given to that adolescent after a parental death occurs ([Tennant, 1988](#); [Nickman, Silverman, & Normand, 1998](#)). We would propose to study this systematically with use of the Parental Bonding Instrument ([Parker, Templing, & Brown, 1979](#)), which systematically assesses the styles and quality of parenting after a loss such as a death from breast cancer occurs. The Parental Bonding Instrument divides the quality and styles of parenting into four discrete quadrants ranging from the most functional to the most dysfunctional. We would propose to study how women who are now young adults or adults would rate parenting by their fathers post loss of their mothers in relationship to their current psychological and psychobiologic adjustment in adult life. Ideally, obtaining parallel data from their fathers on their perception of the quality and styles of their parenting of their daughters post loss of their wives would further substantiate this study. Such data from fathers may be very difficult to get, while the data from the adult daughters is more feasible. This model could be an important start in identifying styles of parenting during illness of a mother with breast cancer to better predict later outcomes for these adolescent daughters.

More systemic relational future research potentially should involve all family members in the families of women at high risk for breast cancer. Beyond a focus on the parents of such women should be a focus on the sibling subsystem of such families. Usually, only the daughter presenting to the high-risk clinic is assessed. This assessment and intervention should be broadened to her entire sibling subsystem including her brothers. In addition, the grandparents of such high-risk women should be assessed as to their perceptions of the coping difficulties they perceive in these families. Future interventions at a systemic level might consider involvement of grandparents in improving coping of parents during the breast cancer treatment of the maternal figure. Furthermore, relational networks in families of minority women at high risk for breast cancer should be considered in systematic interventions to improve their coping when their single-parent mothers are ill with breast cancer.

Additional research to extend upon findings of the present study will further enable health care professionals to support the emotional needs of these daughters and inform the devel-

opment and implementation of targeted interventions.

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