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# Loss of Resources as Mediators between Interpersonal Trauma and Traumatic and Depressive Symptoms among Women with Cancer<sup>1</sup>

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**COMPETING INTERESTS:** None declared.

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## Abstract

We hypothesized that loss of interpersonal, financial and work resources would mediate the relationship between physical and sexual abuse, cancer-related Posttraumatic Stress Disorder (PTSD) symptoms, noncancer-related PTSD symptoms and depressive mood among women with cancer. Participants were 64 women with heterogeneous cancers (64.1% breast cancer) seeking outpatient treatment. Structured interviews were conducted to assess for pre-cancer interpersonal trauma, recent loss of interpersonal, financial and work resources, cancer-related PTSD symptoms, noncancer-related PTSD symptoms and depressive mood. Only interpersonal loss mediated the relationship between earlier interpersonal trauma and current PTSD symptoms and depressive mood. Implications of the findings are discussed.

## Keywords

- *cancer*
- *resources*
- *trauma*
- *women*

THE EXPERIENCE of being diagnosed and treated with cancer presents major psychological challenges, with some individuals being more resilient and others being more vulnerable. One factor that may affect the psychological response of cancer patients is precancer history of traumatic experiences. Precancer traumatic history has been found to predict current psychological distress (Andrykowski & Cordova, 1998; Baider, Goldsweig, Ever Hadani, & Peretz, 2006; Baider, Peretz, & De-Nour, 1993; Baider et al., 2000; Green et al., 2000; Salmon et al., 2006). Prior interpersonal trauma (i.e. child and/or adult physical and sexual abuse), in particular, may make individuals with cancer vulnerable to current psychological distress (Green et al., 2000). Rather than having a direct impact, prior trauma often has a broadband impact, affecting many aspects of life such as interpersonal, financial and work resources (Beitchman et al., 1992; Briere & Runtz, 1993; Helgeson, Snyder, & Seltman, 2004; Koopman et al., 2002; Neumann, Houskamp, Pollock, & Briere, 1996; Schumm, Hobfoll, & Keogh, 2004). This would place women with interpersonal trauma at heightened risk for psychological distress because they would have deteriorated resource reservoirs to call upon as they face cancer's challenges (Johnson, Palmieri, Jackson, & Hobfoll, 2007).

In this study we examined how interpersonal trauma might lead to loss of resources, specifically interpersonal, financial and work resources, and how loss of these resources might, in turn, lead to psychological distress in women with cancer. These resources were chosen because they represent several key resource domains that affect women's lives. Interpersonal trauma included both childhood and adulthood abuse. Specifically, childhood abuse included sexual and physical/emotional abuse at the age of 15 or less and adulthood abuse included sexual and physical abuse at the age of 16 and over. Psychological distress included cancer-related post-traumatic stress symptoms, noncancer-related post-traumatic stress symptoms and depressed mood.

Several studies have studied the occurrence of depression in cancer patients (Breitbart, 1995; Derogatis et al., 1983; McDaniel, Musselman, Porter, Reed, & Nemeroff, 1995; Mermelstein & Lesko, 1992; Spiegel, 1996). According to these studies the rate of depressive disorders in oncology patients may be as high as four times that of the general population with as many as half of all cancer patients experiencing symptomatology, which would qualify for clinical diagnosis of depression. Although estimates of

prevalence vary widely across studies, in a recent review by Massie (2004) prevalence rates for depression spectrum syndromes was reported to range from 0 percent to 58 percent and for major depression from 0 percent to 50 percent.

Cancer patients may also experience PTSD symptoms. Cancer manifests critical attributes of a traumatic life event and it fulfills the criterion of a major threat to health and life (Deimling, Kahana, Bowman, & Schaefer, 2002). As such, recent research has shown that cancer is capable of generating symptoms that approximate or indicate PTSD (for a review see Kangas, Henry, & Bryant, 2002).

Several factors have been found to predict psychological distress in women with cancer. Precancer traumatic events including interpersonal trauma, is one factor that has been found to predict traumatic symptoms and depressive mood in women with cancer (Andrykowski & Cordova, 1998; Baider et al., 1993, 2000, 2006; Green et al., 2000; Salmon et al., 2006). However, the mechanism through which interpersonal trauma during childhood or adulthood effects psychological distress has yet to be examined. This study provides a theoretical framework to explain the relationship between interpersonal trauma and psychological distress in women with cancer. Based on the Conservation of Resources theory (COR) (Hobfoll, 1989, 1998) and the social deterrence-deterioration model by Kaniasty and Norris (1993; Norris & Kaniasty, 1996) a possible pathway through which trauma predicts psychological distress involves loss or depletion of key resources to deal with the trauma.

The COR theory posits that significant resource loss or threat of significant resource loss may result in general psychological stress and in an array of psychological outcomes (e.g. depressive symptoms, PTSD). It also predicts that resources tend to travel in lifelong 'caravans'. As such, losses in childhood increase individuals' vulnerabilities later in life by increasing the likelihood that individuals will experience resource loss spirals. The literature on the long-term impact of early interpersonal trauma on adult survivors suggests that women with interpersonal trauma may be particularly susceptible to loss of interpersonal resources (Cole & Putnam, 1992; Davis & Petretic-Jackson, 2000; Neuman et al., 1996; Polusny & Follette, 1995). Trauma can create recurrent spirals of interpersonal resource loss by immersing women in an environment that both initiates cycles of trauma and loss of resources by affecting the person's cognitive, emotional and coping

functioning (Beitchman et al., 1992; King, King, Foy, Keane, & Fairbank, 1999; Melchert, 2000). For instance, women with a history of childhood sexual abuse are likely to feel powerless and feel that they have no control over their bodies and their fate, which in turn disempowers them to be assertive and increases the likelihood to be revictimised (Davis & Petretic-Jackson, 2000). History of interpersonal trauma may also affect women's employability and finances. Women with a history of abuse may experience feelings of worthlessness, withdrawal, low self-esteem, high levels of depression, anxiety and PTSD (Beitchman et al., 1992; Briere & Runtz, 1993; Nishith, Mechanic, & Resick 2000; Rodriguez, Ryan, Vande Kemp, & Foy, 1997; Schaaf & McCanne, 1998). These, in turn, can negatively affect employment. Even when abused women are employed, they are more likely to have medical problems that affect their job performance and make it harder to maintain employment (Lloyd, 1997). Not surprisingly, victims of abuse often experience financial hardships and chronic economic stress (e.g. Brush, 2000; Cadzow, Armstrong, & Fraser, 1999; Ennis, Hobfoll, & Schroeder, 2000; Kotch et al., 1995; Tolman & Rosen, 2001).

Similarly cancer can create ongoing difficulties in different life domains such as financial, interpersonal and work, and these result in resource losses that may lead to depression and PTSD. Several factors such as physical limitations (Paci et al., 1996), memory loss (Schagen et al., 1999), lack of control over schedules, need for transportation and type of work performed (Satariano & DeLorenzo, 1996) may result in losses related to employment in cancer patients by increasing job strains such as having problems fulfilling expectations and maintaining productivity or work quality. Moreover, cancer represents an overwhelming financial challenge that can undermine financial and material resources important for coping with the traumatic event and for enjoying day-to-day living (Cordova et al., 1995). Because caregivers and family may not respond to these needs or may not be clear on how they should respond, secondary losses may follow such that women lose the ability to perform work and lose confidence in others when they do not respond, further resulting in relationship losses as arguments and hard feelings ensue.

According to the support deterioration model by Kaniasty and Norris (1993; Norris & Kaniasty, 1996) initial demands of natural-induced trauma lead to support deterioration and this in turn

results in psychological distress. A general adaptation of this model would suggest that a new trauma produces overdemand on resources that results in resource erosion especially for those already lacking resources precisely when people need to call on these resources (Hobfoll, 1989, 1998). Given that survivors of interpersonal trauma and of cancer experience loss of different resources such as interpersonal, financial and work resources, this model provides a compelling framework for conceptualizing the impact of interpersonal trauma and adulthood resource losses on psychological distress among women with cancer.

Based on this model, strains associated with the disease can reduce available support and threaten interpersonal relationships. Approximately 25 percent of cancer patients have specific interpersonal problems with a larger proportion describing hurtful interactions (Dunkel-Schetter, 1984; Lichtman, Taylor, & Wood, 1987). Individuals may also deny or attempt to conceal their problems (i.e. underreport fatigue) and withdraw because of reduced energy and visible effects of the disease (e.g. hair loss). Friends may be unsure what to say, feel uneasy communicating with the patient and withdraw from close friendships (Peters-Golden, 1982). Similarly, the experience of cancer can also create challenges for a marriage or a significant relationship. Some evidence suggests that cancer patients and their partners often report high levels of marital dissatisfaction and that troubled relationships can worsen and cause ongoing serious conflict, which then can lead to increased psychological distress (Lichtman et al., 1987). Consistent with the support deterioration model, studies show that persons who experience negative life events report low levels of perceived support and have smaller supportive networks (Harmer, Sanderson, & Mertin, 1999). Also, higher levels of chronic strains from financial and home domains are related to lower levels of social support and higher levels of psychological distress (e.g. Pearlin, Menaghan, Lieberman, & Mullan, 1981).

In conclusion, based on research in the areas of trauma and cancer, it is important to examine the impact of interpersonal trauma in women with cancer especially in light of research showing that repeated trauma exposure to a variety of traumatic events increases the likelihood of a pathological response (Andrykowski & Cordova, 1998; Dougall, Herberman, Delahanty, Inslight, & Baum, 2000; Peretz, Baider, Ever-Hadahi, & De-Nour, 1994). One avenue through which past trauma affects new trauma is by depleting or overwhelming resources

Table 1.

Variable	Statistics		
	<i>M</i>	<i>SD</i>	% (Column)
Age at the time of interview (yrs)	53.4	11.27	
Age at the time of Diagnosis (yrs)	51.6	11.13	
Time since Diagnosis (months)	20.3	27.06	
		(range 2–117)	
Ethnicity			
European American			85.9
African American			12.5
Other			1.6
Education			
Some high school			7.8
High school graduate			28.1
Some college			31.3
College graduate			23.4
Post-graduate			9.4
Employment			
Yes			40.6
No			59.4
Yearly household income			
Less than \$25,000			21.9
\$25,001–\$55,000			40.6
More than \$55,001			35.9
Not reported			1.6
Marital status			
Married			60.9
Single			14.1
Living with partner			1.6
Divorced/separated			20.3
Widowed			3.1
Having children under 17yrs-old			
Yes			59.4
No			40.6

individuals need in order to cope decisively with the new trauma. As such women with cancer who have a history of interpersonal trauma may be immersed into cycles of resource loss, whereby having a deteriorated resource reservoir to utilize in order to deal with yet another trauma, cancer.

Hypotheses in this study focused on the mediational role of resource loss. The following hypotheses were examined:

1. Loss of interpersonal trauma will predict greater cancer-related PTSD symptoms, noncancer-related PTSD symptoms and depressive mood.

2. Interpersonal trauma will predict loss of interpersonal, financial and work resources.
3. Loss of interpersonal, financial and work resources will predict greater cancer-related PTSD symptoms, noncancer-related PTSD symptoms and depressive mood.
4. Loss of interpersonal, financial and work resources will mediate the impact of interpersonal trauma on cancer-related PTSD symptoms, noncancer-related PTSD symptoms and depressive mood such that women with interpersonal trauma will experience greater loss of interpersonal, financial and work resources, and this in turn will lead to greater cancer-related PTSD symptoms, noncancer-related PTSD symptoms and depressive mood.

## Method

### Participants

Participants were 64 female cancer patients treated at an outpatient oncology office located in a mid-sized, Midwestern city serving predominately European American and African American, low income individuals. Only participants who met the following criteria were eligible for participation: (a) females 18 years of age or older; (b) diagnosed with primary, biopsy proven, cancer.

### Measures

**Demographic and medical variables** The demographic variables included, age, age at diagnosis, time since diagnosis, ethnicity, education, employment status, yearly household income, marital status and number of children under the age of 17 (see Table 1). Pertinent medical information including primary site of cancer at the time of diagnosis, stage of cancer at diagnosis, recurrence, metastasis, types of treatments received to time of the interview and menopausal status was obtained from the medical chart (see Table 2).

### Childhood abuse

Seven items from the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 1994) were used to assess childhood sexual (e.g. 'Since you were 15 years old or younger did anybody put his penis or other objects in your mouth, vagina or anus against your will?'), childhood physical/emotional abuse ('Since you were 15 years old or younger were you beaten with a belt, cord or some other hard object?') and witness to violence

Table 2. Medical variables (N = 64)

Variable	% (Column)
Primary site of Cancer at	
Breast the time of diagnosis	64.1
Ovarian	4.7
Gastrointestinal	12.5
Lung	6.3
Myeloma	4.7
Hodgkin's Disease	3.1
Leukemia	1.6
Unknown	3
Stage at Diagnosis	
Stage I	10.9
Stage II	39.1
Stage III or IV	39.1
Unknown	10.9
Recurrence	
Yes	25
No	75
Metastasis	
Yes	26.6
No	73.4
Metastasis site	
Bone	33.8
Liver	30.1
Lung	18.7
Other	17.4
Treatment	
Chemotherapy	96.9
Radiation	39.1
Tamoxifen	17.2
Mastectomy	37.5
Lumpectomy	32.8
Surgery	20.3
Bone marrow transplant	3.1
Other	6.3
Menopausal status	
Pre-menopause	25
Post-menopause	71.9
Peri-menopause	3.1

(e.g. 'Since you were 15 years old or younger, did you see the physical abuse of another person?'). These items were answered on a five-point scale ('never true' to 'very often true') and a total score was obtained by adding all items. The alpha coefficient for this sample was .81.

### Sexual assault in adulthood

Three items from the National Women's Study (NWS) (Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993) were used to assess number of occurrences of penetrative rape, sexual molestation and attempted sexual assault since the age of 16 (e.g. 'Since I was 16 years old, someone forced me to

have vaginal sex and by vaginal sex we mean putting a penis in your vagina'). The total number of sexual assaultive acts was computed by summing the total number of occurrences for all three items.<sup>2</sup>

### Partner-perpetrated severe physical assault

Severe physical assault in adulthood was measured using seven items of the physical assault subscale of the revised version of the Conflict Tactics Scale (CTS; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). These correspond to physical assaultive acts that could result in severe harm or death (e.g. used gun or knife, burned or scolded, kicked) and were used to assess severe physical assault that participants received from their partners since the age of 16 years. The items were answered on a seven-point scale ('0 times' to 'more than 20 times'). In accordance with published guidelines to estimate the number of received assaults, each point on the scale was converted to the median number of assaults for the corresponding number range on the scale. For instance, the number range '3-5 times' was coded as a value of '4'. A value of 25 assaults was used to estimate 'more than 20 times'. In this study, the internal reliability was very good ( $\alpha = .85$ ).

### Adult victimization

An adult victimization variable was created by adding the total scores of the two scales used to measure sexual and physical assault in adulthood. The scores of both scales were first converted to standard scores, and then they were summed up. Previous research has also combined sexual and physical victimization items in the assessment of adult victimization based on a review of literature, which demonstrated that childhood sexual abuse victims are likely to be both sexually and physically revictimized as adults (Messman-Moore & Long, 2000; Nishith et al., 2000).<sup>3</sup> In this study adult sexual and physical abuse were also moderately correlated (.63,  $p < .001$ ).

### Recent loss of resources

An abbreviated version of the Conservation of Resources Evaluation (COR-E; Hobfoll & Lilly, 1993) was used to assess whether women have encountered stressful conditions that resulted in loss of resources. The COR-E is a widely used measure and well validated and referenced. Resource loss has been found to be the best predictor of stress reactions in a variety of studies in medical settings (e.g. Gronskaya Palesh et al., 2006; Johnson et al., 2007; Lane & Hobfoll, 1992; Schumm et al., 2004; Vranceanu, Hobfoll, & Johnson, 2007).

Participants indicated the degree to which they had lost or had threatened loss of resources on a three-point scale (no threat or loss, some threat or loss, a great deal of threat or loss) during the past three months. Three subscales were used to assess loss of interpersonal, financial and work resources. The items included on these subscales were chosen based on a factor analysis. A score was obtained for each subscale by adding the total number of items of the subscale.

To assess interpersonal loss, nine items ( $\alpha = .67$ ) were used to measure the extent women have encountered stressful conditions that result in loss of interpersonal resources (e.g. good relationship with partner, loyalty of friends). Financial loss was measured by nine items ( $\alpha = .92$ ), which measured stressful conditions that result in loss of financial resources (e.g. adequate income, savings or emergency money). In order to assess work loss, seven items ( $\alpha = .56$ ) were used to measure the extent participants have encountered stressful conditions that result in loss of work resources (e.g. time for work, help with tasks at work).<sup>4</sup>

#### *Abuse/assault-related PTSD*

The 17-item PTSD Symptom Scale-Interview (PSS-I; Foa, Riggs, Dancu, & Rothbaum, 1993) was used to assess severity of abuse-related PTSD symptoms during the past month. To screen for the potential of abuse-related PTSD, participants were first asked 'have you ever been very emotionally upset because of sexual, physical or any other abuse that you've experienced?' Participants, who stated that they had been emotionally upset because of abuse, were asked to respond to the items on a four-point scale ('not at all' to 'very much'). Scores of '0' were entered for all items if no upset occurring to abuse was reported. To assess symptom severity, items were answered. PSS-I yields a total score as well as sub-scores for re-experiencing, avoidance and arousal subscales. In this study, a total score was computed by summing up all items ( $\alpha = .91$ ).

#### *Cancer-related traumatic symptoms*

The IES-R (Weiss & Marmar, 1996) is a reliable and valid 22-item scale that measures the intrusive, avoidant and hyperarousal components of the stress response. Participants responded to statements regarding their cancer experience (e.g. I thought about my cancer when I didn't mean to) and endorsed their frequency in the past four weeks (0 = Not at all, 1 = A little bit, 2 = Moderately, 3 = Quite a bit and 4 = Extremely). The scoring of the IES-R

was consistent with the scoring guidelines suggested by Weiss and Marmar (1997). For this study a total score was calculated and used for the analyses ( $\alpha = .91$ ). For the purpose of interpretation the total score of the original IES (Horowitz, Wilner, & Alvarez, 1979; Zilberg, Weiss, & Horowitz, 1982) was calculated and was used to statistically describe the participants of this study.

#### *Depressive mood*

The 20-item Center for Epidemiologic Studies—Depression Scale (CES-D; Radloff, 1977), was used to assess depressive symptoms during the past week. Scores range from 0–60, with higher scores indicating greater depressive symptomatology. Scores greater or equal to 16 were used to identify individuals with clinically significant depression (Cordova, Cunningham, Carlson, & Andrykowski, 2001) ( $\alpha = .88$ ).

#### *Procedure*

Women in the waiting room of the oncology office were individually approached about their willingness to participate in a research study about women with cancer and psychological well-being. In consideration for their participation, participants were told that they would be given parking passes for the hospital's garage valid for the day of the interview.

The researcher explained that the study was neither part of nor would influence their treatment in any way. Approximately 87 percent of the women approached, participated in the study. Women who refused to participate reported being tired, not having time or not wanting to talk about their cancer. No further information was obtained about the participants that refused to participate in the study. Participants were interviewed in a private room of the oncology office by a trained interviewer. Prior to initiating the interview, participants signed and were given a copy of the consent form.

## **Results**

#### *Descriptive analyses*

Participants ranged in age from 26 to 77 years, with a mean age of 53.4 years ( $SD = 11.27$ ). The ethnic composition of the sample was 85.9 percent European American, 12.5 percent African American and 1.6 percent other. The majority of the women were married (60%) with an annual household income between \$25,001 and \$50,000 (40.6%). At the time of the interview 40.6 percent were employed and 59.4 percent had children under the

age of 17 years living in the household. Educationally, 31.3 percent of women had completed some college and 28.1 percent were high school graduates.

The majority of women was diagnosed with breast cancer (64.1%) and had received chemotherapy (96.9%). The average age at the time of diagnosis was 51.6 years (SD = 11.13) and the mean time since diagnosis was 20.3 months. Only 26.5 percent of women reported having recurrence and progression of their cancer with the most common sites of metastasis being bone (33.8%) and liver (30%).

Most women (59.4%) reported having experienced one or more incidences of childhood abuse. In addition, one or more incidents of adult sexual abuse was reported by 15.6 percent of women, and 17.2 percent reported having experienced at least one severe physical assault from their partner since they were 16 years old. Among women in this study, 19 percent reported having experienced both childhood and adult sexual or physical abuse.

Losses in primary support groups, work and finances were also common. The majority of women (60.9%) reported loss of financial resources, 20.3 percent reported loss of work-related resources and 48.4 percent reported loss in their relationships during the past three months. Furthermore, scores on the PSS-I indicated that 11.2 percent of women met at least moderate symptom levels of current abuse-related PTSD.<sup>5</sup> With respect to cancer-related PTSD symptoms, 25.3 percent of the sample scored in the high range ( $\geq 30$ ) for the IES total score, 4.8 percent scored 20 or above on the IES Intrusion subscale and 9.5 percent scored above the same cutoff for the IES Avoidance subscale. Finally, CES-D scores indicated that 34.4 percent of women experienced clinically significant levels of depressive mood (i.e. scores  $\geq 16$ ).

### *Preliminary analyses*

A number of demographic variables (e.g. age, income; Cordova et al., 1995; Smith, Redd, Peyser, & Vogl, 1999) have been suggested to impact levels of emotional distress in patients with cancer. Research examining the impact of medical variables on emotional distress in cancer patients has been mixed with a study suggesting a positive association between the two (stage of disease, prognosis status; Kelly et al., 1995) and another one finding no such associations (Tjemsland, Soreide, & Malt, 1998). In this study, due to the

small sample size, regression analyses were used to determine only statistically significant variables to use as covariates in subsequent analyses. Separate regression analyses were examined for each of the outcome variables with either the demographic or the medical variables assessed in this study used as independent variables. These analyses revealed that among the demographic variables only employment was significantly related to abuse-related PTSD symptoms, cancer-related PTSD symptoms and depressive mood with unemployed women having greater symptoms. However, employment was not considered in the final analyses since employment-related loss variables are included in the model examined. None of the medical variables were found to significantly predict any of the three outcome variables and therefore none of the medical variables were included as covariates. However, we would like to mention that when we ran the analyses using the medical variables assessed in this study as a covariate, despite concerns related to the small sample size, the significance of the findings did not change.

### *Hypothesis testing*

To test the mediational hypotheses of this study, correlations were first examined in order to satisfy the criteria stated by Baron and Kenny (1986) (see Table 3). As such mediation was inferred when the following criteria were met: (a) the direct relationship between the predictor and the outcome variable was significant; (b) the predictor was significantly related to the mediator; (c) the mediator was significantly related to the outcome variable; and (d) the previously significant direct relationship between the predictor and the outcome variable was significantly reduced in magnitude after the mediator was accounted for.

Correlational analyses revealed that childhood and adulthood abuse were only significantly related to interpersonal loss. No significant relationships were found between childhood abuse and adult victimization and loss of financial and work resources. Hence, further model testing only considered interpersonal loss as a mediator. Moreover, childhood abuse was not significantly correlated with cancer-related PTSD symptoms. Therefore, the mediational role of interpersonal loss for the relationship between childhood abuse and cancer-related PTSD symptoms was not tested.



Table 3. Pearson Product Moment Correlations (n = 64)

	1	2	3	4	5	6	7	8	Mean	SD	Range
1. Childhood Abuse	–	.084	.295**	.123	–.110	.356**	.149	.270*	2.56	4.17	0–27
2. Adult <sup>1</sup> Victimization	–	–	.248*	–.038	–.067	.719**	.466*	.490**	–	–	–
3. Interpersonal Loss	–	–	–	.417**	–.042	.502**	.485**	.639**	1.17	1.78	0–8
4. Financial Loss	–	–	–	–	.228	.147	.133	.322**	3.64	4.92	0–18
5. Work Loss	–	–	–	–	–	–.112	.004	–.079	1.0	1.09	0–6
6. PSS-I	–	–	–	–	–	–	.632**	.614**	3.31	7.93	0–34
7. IES-R	–	–	–	–	–	–	–	.735**	2.98	2.06	0–9.42
8. CES-D	–	–	–	–	–	–	–	–	13.14	10.5	0–48

Note. \* $p < .05$ . \*\* $p \leq .01$ .

<sup>1</sup> This variable was created by adding the items from the NWS and the CTS scales. NWS:  $M = 1$ ,  $SD = 1.58$ ,  $Range = 0–8$ . CTS:  $M = 2.62$ ,  $SD = 13.86$ ,  $Range = 0–109$ .

After satisfying the first criterion of Baron and Kenny (1986; see Table 4), three separate hierarchical multiple regressions were conducted in order to examine whether interpersonal loss mediated the relationships between interpersonal trauma (childhood abuse and adult victimization) and current psychological distress (cancer-related and abuse-related PTSD symptoms and depressive mood). Significant mediation effects were examined by calculating the modification of the Sobel Test (Baron & Kenny, 1986). Table 4 shows the results of all three regressions.

#### *Mediation of the association between adult victimization and cancer-related PTSD symptoms*

Results from step-1 indicated that adult victimization accounted for a significant amount of variance in cancer-related PTSD symptom severity  $F(2, 62) = 17.07$ ,  $p < .001$ . At step-2, interpersonal loss accounted for an additional significant amount of variance in cancer-related PTSD symptom severity,  $Fchange(1, 61) = 14.14$ ,  $p < .001$ . When interpersonal loss was entered in step-2 the beta coefficients associated with adult victimization decreased from  $\beta = .47$  to  $\beta = .37$  supporting a partial mediation effect exerted by interpersonal loss. According to the modification of Sobel test (Baron & Kenny, 1986), this mediation effect was not statistically significant ( $z = 1.69$ ,  $p > .05$ ).

#### *Mediation of the association between childhood abuse and adult victimization and abuse-related PTSD symptoms*

Results from regression analyses showed that childhood abuse and adult victimization accounted for a significant amount of variance in abuse-related PTSD symptom severity,  $F(2, 61) = 46.60$ ,  $p < .001$ . At step-2 interpersonal loss predicted an additional significant amount of variance in abuse-related PTSD symptoms,  $Fchange(1, 62) = 12.45$ ,  $p < .001$ . When interpersonal loss was entered in step-2, beta coefficients associated with childhood abuse decreased from  $\beta = .29$  ( $p < .01$ ) to  $\beta = .22$  ( $p < .001$ ) indicating that interpersonal loss partially mediated the impact of childhood abuse on women's abuse-related PTSD symptom severity. The relationship of adult victimization and abuse-related PTSD symptom severity was also partially mediated by interpersonal loss. When interpersonal loss was entered in step-2, the relationship of adult victimization and abuse-related PTSD symptom severity remained significant and the beta coefficients associated with adult victimization decreased from  $\beta = .69$  ( $p < .001$ ) to  $\beta = .63$  ( $p < .001$ ). Using the Baron and Kenny modification of the Sobel test, the reduction due to childhood abuse ( $z = 1.94$ ,  $p = .05$ ) was of borderline significance, whereas the reduction due to adult victimization ( $z = 1.66$ ,  $p > .05$ ) was not statistically significant.

Table 4. Hierarchical Multiple Regression Equation for Cancer-Related PTSD Symptom Severity (N = 64)

Dependent Variable	Independent Variable	B	Beta	SE	R <sup>2</sup>	Adjusted R <sup>2</sup>	ΔR <sup>2</sup>
Interpersonal Loss	Step 1						
	Childhood Abuse	.13*	.29*	.052	.087*	.073*	.087*
	Adulthood Abuse	.25*	.24*	.12	.062*	.047*	.062*
Cancer-Related PTSD	Step 1						
	Adult Abuse	3.9*	.47***	.94	.22***	.20***	.22***
	Step 2						
	Interpersonal Loss	3.4*	.39***	.89	.36***	.34***	.15***
Abuse-Related PTSD	Step 1						
	Childhood Abuse	.57*	.29***	.15			
	Adulthood Abuse	3.1*	.69***	.36	.60***	.59**	.60***
	Step 2						
	Childhood Abuse	.42*	.22**	.15			
	Adulthood Abuse	2.8*	.63***	.34			
Depressive Mood	Step 1						
	Childhood Abuse	.58*	.23*	.27			
	Adulthood Abuse	2.7*	.47**	.63	.29**	.27**	.29**
	Step 2						
	Childhood Abuse	.22*	.085	.23			
	Adulthood Abuse	2.1*	.35**	.53			
	Interpersonal loss	3.1*	.53**	.56	.53**	.51**	.24**

Note: \* $p \leq .05$ , \*\* $p \leq .01$ , \*\*\* $p \leq .001$ .

**Mediation of the association between childhood abuse and adult victimization and depressive mood**

Results from step-1 indicated that childhood abuse and adult victimization accounted for a significant amount of variance in depressive mood  $F(2, 61) = 12.63, p < .001$ . At step-2 interpersonal loss predicted an additional significant amount of variance in depressive mood,  $F_{change}(1, 60) = 30.60, p < .001$ . The relationship between childhood abuse and depressive mood became nonsignificant in step-2, such that once interpersonal loss was included in the regression equation, the beta coefficients associated with childhood abuse decreased from significant ( $\beta = .23, p < .05$ ) to nonsignificant ( $\beta = .08, p > .05$ ). This indicates that interpersonal loss mediated the relationship between childhood abuse and depressive mood. Furthermore, when interpersonal loss was entered in the regression equation, the beta coefficients associated with adult victimization decreased from  $\beta = .47$

to  $\beta = .35$  but remained significant ( $p < .01$ ). This indicates that interpersonal loss partially mediated the impact of adult victimization on depressive mood. A modification of the Sobel test (Baron & Kenny, 1986) revealed that the mediation effect was statistically significant for childhood abuse ( $z = 2.004, p < .05$ ) but not for adult victimization ( $z = 1.66, p > .05$ ).

**Discussion**

Women with repeated exposure to a variety of traumatic experiences are at heightened risk for psychological distress. In spite of this, no research to our knowledge has examined a mechanism through which interpersonal trauma impacts psychological distress in women with cancer. To this end, the purpose of the present study was to examine how interpersonal trauma might lead to loss of resources, specifically interpersonal, financial and work resources, and how loss of these resources might, in turn, lead to psychological distress in women

with cancer. Our findings suggest that interpersonal trauma impacts PTSD and depressive symptoms of women with cancer by causing deterioration of their interpersonal resources but not through deterioration of their financial or work-related resources. This is one of the first studies illustrating a mechanism by which trauma affects PTSD and depressive symptoms among women with cancer.

In particular, higher levels of adult victimization predicted cancer-related PTSD symptoms. This finding is congruent with the hypothesis that repeated trauma exposure, as well as exposure to different types of trauma, increases susceptibility to psychological distress from a subsequent trauma (Andrykowski & Cordova, 1998; Bremner, Southwick, Johnson, Yehuda, & Charney, 1993). These findings are also comparable with a recent study by Green et al. (2000), who found that among women with early-stage breast cancer, sexual and physical trauma predicted cancer and noncancer PTSD and depressive symptoms. Unlike adult abuse, childhood abuse did not predict cancer-related PTSD symptoms. This might suggest that trauma victims are more likely to have intrusive recollections of the most recent trauma (i.e. adult victimization) (Davidson & Baum, 1993), which are then activated with the cancer experience.

Interpersonal resource loss also predicted cancer and noncancer PTSD symptoms and depressive mood whereas work and financial loss did not. These findings are consistent with literature demonstrating that interpersonal relationships play an important role in the psychological well-being of cancer patients (Butler, Koopman, Classen, & Spiegel, 1999; Manne, Taylor, Dougherty, & Kennedy, 1997; Pistrang & Barker, 1995; Widows, Jacobsen, & Fields, 2000). Likewise, Hampton and Frombach (2000) found that women, compared to men who were more concerned with work and finances, reported relational aspects of cancer as most stressful. Although some evidence suggests that financial resources predict cancer-related traumatic stress symptoms (Cordova et al., 1995), this study is consistent with research that provides no linkage between financial resources (e.g. income) and cancer-related traumatic symptoms (Koopman et al., 2002). Despite the number of differences and similarities among the three studies there is one difference between our study, the study by Koopman and colleagues (2002) and the one by Cordova and colleagues (1995) that may account for the results, namely the different assessment

instruments used to assess traumatic stress symptoms. When assessing traumatic stress symptoms using the IES scale there was no association between financial resources and traumatic symptoms. However, in the study by Cordova and colleagues (1995) financial resources predicted cancer-related traumatic stress symptoms when using the PTSD Checklist-Civilian Version scale (PCL-C).

In addition to the direct effects, indirect effects of interpersonal trauma on cancer and abuse-related PTSD symptoms and depressive mood were also significant. Specifically, interpersonal loss was the only mediator of the relationship between interpersonal trauma and current PTSD symptoms and depressive mood. Two possible explanations may be advanced to account for these findings. First, this finding is consistent with the signature of abuse hypothesis (Schumm, Hobfoll, & Keogh, 2004). According to this hypothesis, trauma and resources loss may be domain-specific. Specifically, interpersonal trauma leads to resource loss that is likely to be congruent in nature to the trauma experienced (i.e. interpersonal). Due to its interpersonal nature, interpersonal trauma leads to increased sensitivity to interpersonal stressors and leaves the survivors with fewer interpersonal resources needed to adequately form and maintain healthy relationships. Subsequently, interpersonal loss leaves trauma victims vulnerable to developing PTSD symptoms and depressive mood. Second, the present study is consistent with the model suggested by Kaniasty and Norris (1993; Norris & Kaniasty, 1996) in victims of natural disaster. In this regard, trauma wears down victims' interpersonal resources, leading to psychological distress, as predicted by COR theory (Hobfoll, 1989).

It is noteworthy that there was a significant association between cancer-related PTSD symptoms and abuse-related PTSD symptoms. Several explanations may account for this relationship. As explicated in Janoff-Bulman's (1992) model, not having processed previous trauma makes individuals vulnerable for a pathological reaction to current trauma. Second, prior interpersonal trauma may compound PTSD reactions because it may deplete people's available resources to cope with subsequent stressors and with fewer intact resources, women would be more likely to be suffering partial or residual PTSD at the time of subsequent stressors (Freedman, Brandes, Peri, & Shalev, 1999; King et al., 1999). Third, prior stressful events might influence adjustment and reaction to current stressor

by affecting primary (evaluation of whether an event is a threat, loss or challenge) and secondary (judgments about what can be done to cope with the event) appraisals of the stressor (Lazarus & Folkman, 1984). Having experienced lifetime stressors may put cancer patients at risk for negative appraisals about their cancer and therefore, make them more likely to feel overwhelmed and threatened by it. As such, cancer patients might find it difficult to think positively about their cancer and might feel an array of negative feelings (e.g. anger, sadness) and that life has been so unfair to them.

Several limitations of the study should be considered. These include the small sample size, the cross-sectional design of the study which limits the ability to determine the directionality of the relationships and the retrospective nature of reporting memories of abuse (Widom & Morris, 1997). In addition, the sample of the current study consisting predominantly of European American, college educated, middle class women, may have limited generalizability of findings to a more diverse population. In a similar vein, the results of this study may have been affected by the high degree of homogeneity of our sample in a number of medical variables. For example, the majority of the women had breast cancer, Stage I or Stage II. This homogeneity may account for the nonsignificant role of medical variables in this study. Even when we included some of the medical variables, such as type of treatment or stage of disease, in the analyses, the significance of the findings remained the same. Finally, the current study only examined some of the key resources that could be used to illuminate the mechanism between interpersonal trauma and psychological distress in women with cancer. It is possible that the relationships examined in this study may be influenced by factors that were not the focus of the study. As such, it would be worthwhile if future research examines the role of psychological variables such as self-esteem, social support as well as physiological variables (e.g. cortisol) that have been found to be associated with psychological distress in women with trauma and in women with cancer.

Despite these limitations, this study has important clinical implications for assessment and treatment of women with cancer. Specifically, the findings reinforce the importance of screening for a variety of symptoms, including PTSD and depressive symptoms

as well as for history of interpersonal trauma when individuals are being treated for cancer. Women who have experienced interpersonal trauma may be at particular risk for psychological distress and may have greater difficulty in adjusting to the illness. As such, they may need additional psychological help. Based on the results of this study focus should be on the reservoir of interpersonal resources.

In conclusion, this study highlights the importance of interpersonal trauma and interpersonal loss in the development of PTSD symptoms and depressive mood. Women with cancer should be screened for a variety of symptoms including PTSD and depressive mood. Although some women may be more resilient, others are likely to show sustained and increased levels of psychological distress. Women with histories of interpersonal trauma may be at particular risk for poor adjustment to the illness and assessment in these domains will help to identify women who need additional help. Moreover, this study provided a common mechanism for the development of depressive mood and cancer and noncancer PTSD symptoms, which involves the focal role of interpersonal resource loss.

## Notes

1. The results of this study were presented at the European Health Psychology Society Conference, held in Kos, Greece, in September 2003.
2. Reliability for this scale is not applicable because occurrence of one incident does not portend another. More is worst.
3. We combined physical and sexual assault in childhood and again in adulthood because both are interpersonal trauma and have been shown to have overlapping effects (Bernstein et al., 1994; Higgins & McCabe, 2000). Separating them reduced power for the tested model without any gain in terms of findings. Also, we did not have separate hypotheses for sexual and physical abuse.
4. Although some of the alphas are low for resource loss, this is acceptable because loss of financial resources, for example, does not necessarily portend loss of another. Nevertheless, more financial losses are more stressful.
5. Following previous research (Foa et al., 1993; Nishith et al., 2000), scores between 10 and 20 on the PSS-I indicated moderate symptom levels.

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