Published in final edited form as:
Support Care Cancer. 2014 December ; 22(12): 3209–3217. doi:10.1007/s00520-014-2334-9.

The Dyadic Effects of Coping and Resilience on Psychological Distress for Cancer Survivor Couples

Jung-won Lim, PhD[1], **En-jung Shon, MSW**[2], **Minso Paek, PhD**[3], and **Barbara Daly, PhD**[4]

[1]College of Social Welfare, Kangnam University

[2]Mandel School of Applied Social Sciences, Case Western Reserve University

[3]Departmen of Social Sciences and Health Policy, Wake Forest Baptist Health

[4]Frances Payne Bolton School of Nursing, Case Western Reserve University

Abstract

Purpose—This study aimed to examine the actor and partner effects of coping and resilience characteristics on psychological distress in cancer survivors and their spouses and to examine the mediating role of resilience characteristics in the relationship between coping and psychological distress.

Methods—A total of 91 breast, colorectal, and prostate cancer survivor-spouse dyads were recruited from the University Hospital registry in Cleveland, Ohio. Standardized questionnaires that assessed psychological distress, reframing and acquiring social support coping, and resilience characteristics were used.

Results—The Actor-Partner Interdependence Mediation Model demonstrated that the resilience of the survivors and spouses was a strong predictor of their personal psychological distress. Survivors' and spouses' own resilience mediated the association between their reframing coping and psychological distress. However, only the survivor model confirmed the mediating effect of resilience characteristics in the relationship between social support coping and psychological distress. In addition, spouse psychological distress was influenced by survivor resilience, indicating a spouse-partner effect in the relationship between resilience characteristics and psychological distress.

Conclusions—Our findings provide insight into the relationships between coping, resilience characteristics, and psychological distress at the individual and dyadic levels. Enhancing cancer

Jung-won Lim, PhD (Corresponding author), Associate Professor, College of Social Welfare, Kangnam University, 111 Gugal-dong, Giheung-gu, Yongin-si, Gyeonggi-do, Korea, jungwonlim@kangnam.ac.kr, Telephone: 82-31-280-3216.
En-jung Shon, MSW, Doctoral student, Mandel School of Applied Social Sciences, Case Western Reserve University, 10900 Euclid Ave, Cleveland, OH 44106, United States, exs350@case.edu
Minso Paek, PhD, Post-doctoral fellow, Department of Social Sciences and Health Policy, Division of Public Health Sciences, Wake Forest University School of Medicine, Medical Center Boulevard, Winston-Salem, NC 27157, minnie510@gmail.com
Barbara Daly, PhD, The Gertrude Perkins Oliva Professor in Oncology Nursing, Frances Payne Bolton School of Nursing, Case Western Reserve University, 10900 Euclid Ave, Cleveland, OH 44106, United States, bjd4@case.edu

Conflict of Interests:
None of the sponsors played any role in the study design, the collection, analysis, or interpretation of data, the writing of the manuscript, or in the decision to submit it for publication. We have full control of all primary data and agree to allow the journal to review our data if requested.

survivors' and their spouses' positive thoughts and available external resources can improve resilience, and in turn reduce their psychological distress of couples coping with cancer.

Keywords

Coping; Dyadic relationship; Psychological distress; Resilience

Introduction

Breast, colorectal, and prostate cancers are among the most frequently diagnosed cancers and are major causes of mortality in males and females in the United States [1]. While many persons with cancer survive for years after the initial diagnosis, a large proportion of cancer survivors continue to experience psychological distress [7, 27]. For example, depression and anxiety are known to be common psychological symptoms in cancer survivors [26], and more than 35% of cancer survivors experience depressive symptoms during the cancer survivorship phases [42]. Somatization can also be induced by an increased sense of physical vulnerability [12].

As a major source of support for cancer survivors [3], spouses tend to provide informal cancer care that meets the survivors' multidimensional needs (i.e., symptom management, and emotional support) [24]; thus they also may experience psychological distress [22]. A number of studies have found a significant correlation between distress in patients and partners [21]. That is, the effect of cancer on a spouse affects the cancer survivor's adaptation to cancer-related distress, and the stressful situation faced by cancer survivors may cause psychological distress in the spouse and affect the spouse's adjustment to stressful situations [8].

In general, coping refers to the set of cognitive and behavioral strategies used by an individual to manage the demands of stressful situations [19]. Adaptive coping strategies (e.g., problem-solving) in cancer survivors have been shown to be associated with decreased psychological distress [13, 30], whereas maladaptive coping strategies (e.g., avoidance) are associated with increased distress [30, 36]. Beyond individual coping, mutuality and interdependence may influence responses to a specific shared distress because couples tend to react to disease as a unit (referred to as '*dyadic coping*') [10]. Badr and colleagues [5] investigated the relationship between dyadic coping and distress in cancer survivor couples and found that common positive dyadic coping (e.g., joint problem-solving) is associated with better dyadic adjustment and that common negative dyadic coping (e.g., mutual avoidance) is associated with greater cancer-related distress.

According to Bodenmann (2005)'s classification of coping, there are three forms of coping that follow a dynamic temporal order: 1) individual coping, 2) dyadic coping, and 3) seeking social support from others. When individual coping is not appropriate, dyadic coping becomes important. If dyadic coping is not successful, seeking social support from others may be necessary to manage the stressful situation. Nevertheless, these coping efforts can be activated together. The current study focused specifically on reframing and acquiring social support coping to further investigate the effects of the 'dyadic' and 'seeking social support from others' coping strategies on distress in couples. Among diverse dyadic coping

strategies [31], the current study is interested in reframing coping, which is one of the positive supportive dyadic coping strategies. Reframing coping has been identified in the resilience literature as being a protective factor which decreases the probability of poor adaptive outcomes [11]. Some evidence that helping the partner to reframe the situation plays a beneficial role in adaptation to cancer exists [4].

Resilience is often defined as a dynamic process that encompasses a behavioral and psychological manifestation of positive adaptation in the face of adversity [41]. According to Kumpfer [28], the Resilience Framework describes how individual, environmental, and situational factors are associated to explain individual differences in achieving positive psychosocial outcomes (i.e., resilient reintegration). More specifically, internal resilience characteristics mediate the link between person-environment transactional processes (i.e., coping) and adaptation; i.e., cognitive reframing and active coping, which can help people transform a high-risk environment into a more protective environment, is positively associated with internal resiliency factors and, in turn, improve the capacity to adapt [40].

However, the Resilience Framework did not extend beyond the individual model. The Resilience Framework at the dyadic level, which consider the interdependence between cancer survivor couples, may be necessary to better understand the resilience process in couples, given characteristics of resilient people in coping with cancer, i.e., a sense of responsibility for others, a willingness to care for others, and the ability to be empathetic to the needs of others [20, 28]. Some studies have demonstrated that resilient people are responsive and active in the relationships with others and elicit more positive responses from their associates [14, 25].

The current study aimed to understand the relationships of coping, resilience characteristics, and psychological distress in cancer survivor-spouse dyads under the Resilience Framework. Overall, the assumption that the association between coping and psychological distress is mediated by resilience characteristics at the individual and dyadic levels has been made to test the following hypotheses.

Hypothesis 1. Own reframing and acquiring social support coping strategies are positively related to one’s resilience characteristics, which are, in turn, negatively associated with one’s own psychological distress.

Hypothesis 2. Own reframing and acquiring social support coping strategies positively predict own resilience characteristics, which in turn negatively predict the partner’s psychological distress.

Methods

Sample

The participants were selected from the University Hospital Cancer Registry in Cleveland between February 2011 and February 2012. Cancer survivors were included if they met the following eligibility criteria: (a) aged 18 years or older at diagnosis; (b) diagnosed with breast, colorectal, or prostate cancer (stage I–III) within the previous 1–5 years; (c)

completed active treatment; (d) received no diagnosis of another type of cancer; (e) had no major disabling medical (e.g., stroke) or psychiatric (e.g., schizophrenia) conditions; and (f) were European-, African-, or Asian-Americans. Spouses who had been living with a cancer survivor at the time of cancer diagnosis, and had not been diagnosed with any type of cancer were eligible. Because more than 90% of the population in Cleveland is European- and African-American, and too few eligible Asian-Americans (n=1) agreed to participate, this study included only European- and African-Americans, excluding Asian-Americans.

Data Collection Procedures

The investigators mailed invitation letters to potential participants whose contact information was obtained from the registry. Survivors who did not respond to the invitation letters received a telephone call from a research assistant (RA) 2 weeks after the invitation letters were mailed. If the potential participant was interested, the RA then conducted a screening over the phone to assess eligibility. Eligible participants were mailed a questionnaire and consent form and were asked to return these items in an enclosed prepaid envelope within 3 weeks. If the survivors had not returned the survey after the fifth follow-up phone call, they were considered non-respondents. A $20 gift certificate was given to each the survivor and spouse as compensation.

If a survivor agreed to invite her/his spouse during the screening process, we asked the survivor whether he/she would prefer that we contacted his/her spouse via a direct or indirect (through the survivor) route. If the survivor did not agree to her/his spouse's participation, both the survivor and the partner were excluded from the study. If the spouse agreed to participate, a brief telephone screening was conducted to assess the spouse's eligibility. The survey administration procedures were identical to those used for the survivors. The study was approved by the Institutional Review Board.

Instruments

Psychological distress—Psychological distress was assessed using the Brief Symptom Inventory-18 (BSI-18), which is an 18-item self-report measure of psychological symptoms experienced over the previous 7 days [15]. The BSI-18 consists of 1 broad factor (Global Severity Index; GSI) and 3 subscales: somatization (6-item), depression (6-item), and anxiety (6-item). Each subscale was rated on 5-point Likert scales and scored by summing the values for the subscale items; high scores indicate high levels of distress. The GSI means the respondent's overall psychological distress by summing the values of the 3 subscales (range 0–72). The reliability coefficients were 0.91 for survivors and 0.81 for spouses.

Coping—Coping was assessed using the Family Crisis Oriented Personal Evaluation Scales (F-COPES) [33]. The F-COPES is a self-report measure designed to identify the behavioral strategies used by families when faced with problems. The 29-item scale consists of 5 subscales (i.e., reframing, passive appraisal, acquiring social support, seeking spiritual support, and mobilizing the family to acquire and accept help). In this study, the reframing (the family's ability to redefine stress/situations;8-item) and the acquiring social support (the family's use of support from social ties;9-item) subscales were used. The respondent rated the items on 5-point Likert scale. The subscale scores were obtained by summing the

responses to all items; high scores indicate effective coping behavior. The Cronbach's alphas for the reframing subscale were 0.79 for survivors and 0.77 for spouses, and those for the acquiring social support subscale were 0.87 for survivors and 0.84 for spouses.

Resilience characteristics—The Brief Resilience Scale, which was designed to investigate the ability to recover from stress, was used to assess resilience characteristics [37]. Responses to this 6-item self-report measure were provided on 5-point Likert scales. The total score was calculated by averaging the responses to the 6 items; higher scores indicate better resilience. The reliability coefficients were 0.86 for survivors and 0.90 for spouses.

Demographic and medical characteristics—A self-administered questionnaire was used to obtain demographic and medical characteristics (i.e., age, gender, income, employment, ethnicity, education, cancer type and stage, types of cancer treatment, and years since diagnosis). The stress level in the marital relationship was also assessed because it plays a role in dyadic adjustments to cancer [10]. Participants were asked to respond the following question: "how much stress you have experienced in your marital relationships during the past 3 months?" Participants rated an item on a 5-point Likert scale; higher scores indicate higher levels of stress.

Data Analyses

Exploratory data analyses were conducted to describe the sample characteristics. Paired sample *t*-tests were conducted to investigate the mean differences between couples in coping, resilience characteristics, and psychological distress. Correlation analyses were performed to assess the degrees of similarity of the study variables in the survivor-spouse dyads. Differences in predictor and outcome variables by demographic and medical characteristics were examined by ANOVA to determine the covariates. The analyses were conducted using SPSS 20.0.

The Actor-Partner Interdependence Mediation Model (APIMeM) was used to assess mediation in the dyadic data [32]. In the APIMeM, *actor effects* refer to estimates of an individual's effects on herself or himself, and *partner effects* refer to the degree to which a person's outcome is influenced by their partner's scores on the variable. To test hypotheses, two mediation models that differed in the independent variable (coping) only were created to detail how each type of coping was associated with resilience characteristics and psychological distress. In the first model, reframing coping was included, and in the second model, acquiring social support coping was used as an independent variable.

Structural equation modeling was used to test the two hypotheses using AMOS 20.0. In our dataset, the number of missing values was less than 1%; therefore, missing data were addressed with full information maximum likelihood estimation [17]. First, the relationships between variables were specified based on the conceptual model. The preliminary analysis demonstrated that survivors' psychological distress scores significantly varied by cancer type and that reframing and acquiring social support copings varied by cancer stage. Additionally, the stress levels in the marital relationships of survivors and spouses were significantly associated with psychological distress, resilience characteristics, and reframing

coping. Thus, cancer type, cancer stage, and stress levels in their marital relationships were included as covariates in the final model. The corresponding variables between survivors and spouses were also allowed to correlate with one another.

The hypothesized model was evaluated using goodness of fit indices that included the chi-square statistic or discrepancy function, the ratio of the discrepancy function to the number of degrees of freedom, the root mean square error of approximation (RMSEA; acceptable fit≤0.08) [39], and the comparative fit index (CFI; acceptable model fit≥0.9) [9]. Finally, the mediating effects were tested for significance and confirmed with Sobel tests [38].

Results

Sample Characteristics

Of the 950 cancer survivors who were mailed invitation letters, 543 were accessible. Approximately 19% of the accessible individuals (n=103) completed the survey. However, 12 of them were excluded because they did not participate as a couple. Therefore, a total of 91 couples completed the survey.

The mean age of both cancer survivors and spouses was 64 years (SD=11). The participants were predominantly European-Americans, employed, relatively educated, and affluent. Because nearly one-half of the participants were diagnosed with prostate cancer (49.5%), more male than female survivors participated in this study. The average number of years since cancer diagnosis was 3.7 (SD=1.9), and 70% of the participants were diagnosed with stage II cancer (Table 1).

Regarding the dyadic correlation (Table 2), couples were moderately similar with respect to their levels of social support coping and psychological distress. However, the reframing coping and resilience levels of the dyads were not significantly related. The corresponding within-dyad correlations for spouses ($0.06 \leq r \leq 0.44$) were relatively low compared to the correlations for survivors ($0.25 \leq r \leq 0.54$). A paired-sample t-test showed that psychological distress, coping, and resilience scores were not different between couples.

Hypotheses Testing

The hypothesized reframing ($X^2(23)=24.81$, CFI=0.99, RMSEA=0.03) and social support coping models ($X^2(23)=23.34$, CFI=0.99, RMSEA=0.01) produced excellent fits. In these models (Figure 1), the covariates were significantly associated with coping, resilience characteristics, and psychological distress (Table 3).

Hypothesis 1—For the reframing coping model, the actor effects between reframing coping and resilience characteristics were positive; i.e., the increased use of own reframing coping was related to increased own resilience. Both survivor and spouse actor effects of resilience characteristics on distress were also observed, which indicates that individuals' levels of resilience were associated with their own psychological distress. In the relationship between reframing coping and distress, there were neither survivor nor spouse actor effects. The reframing coping and resilience variables accounted for 38.6% of the variance in the survivors' distress and 25.9% of the variance in the spouses' distress.

The social support coping model was similar to the reframing coping model. However, the actor effect between social support coping and resilience characteristics was not observed for spouses. The social support coping and resilience variables accounted for 38.7% of the variance in the survivors' psychological distress and 25.1% of the variance in the spouses' distress.

Regarding the mediating effect, in the reframing coping model, both indirect effects were significant in the survivors and spouses (hypothesis 1), indicating that one's own resilience mediated the association between one's own reframing coping and one's own distress. A Sobel test confirmed such mediating effects for the survivors ($z=-3.19, p<0.01$) and for spouses ($z=-2.36, p<0.05$). In the social support coping model, only the mediating effect for survivors emerged and was confirmed ($z=-1.93, p<0.05$), which indicates that the survivors' efforts to acquire social support improved their abilities to recover from stress, which, in turn, reduced their own distress.

Hypothesis 2—In both models, only the spouse-partner effect between resilience characteristics and psychological distress was significant. It indicates that the survivors' abilities to recover from stress predicted the spouses' distress. However, there was no evidence of a partner effect in the relationship between resilience characteristics and psychological distress for the survivors. Neither survivor nor spouse partner effects in other relationships were observed.

The mediating effect of the survivors' resilience on the relationship between the survivors' reframing coping and the spouses' distress (hypothesis 2) was supported by a Sobel test ($z=-1.99, p<0.05$); i.e., the survivors' use of reframing coping was positively associated with their abilities to recover from stress, which, in turn, reduced their spouses' distress. However, the mediating effect of the survivors' resilience on the relationship between the survivors' social support coping and the spouses' psychological distress was not confirmed ($z=-1.53, p=0.13$).

Discussion

The present study intended to examine the dyadic associations among coping, resilience characteristics, and psychological distress in couples coping with cancer within the Resilience Framework. The trauma of a cancer diagnosis and treatment can influence the psychological distress of survivors and spouses. A growing literature has developed that examines dyadic stress and coping and the significance of these factors for adjustment in cancer survivor couples [10, 22, 29, 30]. Nevertheless, few studies of the resilience process in the relationship between coping and distress at the dyadic level have been performed. To our knowledge, this is the first study investigating the impact of the dyadic nature of resilience on psychological distress in couples coping with cancer.

First, we found an actor effect of resilience on distress in cancer survivors and spouses, which is consistent with the results of previous studies [11, 16, 23]. According to the Resilience Framework, resilience is influenced by the interactions between a variety of person-environmental factors that contribute to the development of resilience and,

ultimately, physical and mental health outcomes [28]. These outcomes indicate that family members should be considered as major sources of support for survivors who can facilitate psychosocial adaptation. It also suggests that enhancing resilience could result in the reduction of psychological distress in survivors and spouses.

Consistent with previous studies [18], this study specifically confirmed actor effects of reframing and social support copings on resilience in cancer survivors, indicating that positive thoughts and the use of external coping may lead to resilience in the adjustment to cancer. This result suggests that the ability to cope and transform a high-risk environment into a more protective environment affects the resilience of cancer survivors. This explanation may aid the understanding of why some individuals are able to develop adaptive competence regardless of their exposure to extreme adversity [11]. However, this study did not reveal an actor effect of social support coping on resilience in spouses. Our finding indicates that it is not always the case that seeking social support from outside of the couple will build resilience for spouses. It may imply that the willingness of spouses to seek social support is the only substantial solution to deal with cancer survivors' problems rather than resilience enhancement. Furthermore, indeed, spouses may not want to ask for support from others as a way to protect their partner from their own stress. It supports the classification of coping that follows a temporal order, suggesting that successful dyadic coping should precede seeking social support to better manage the stressful situation.

Our results demonstrated that spouses' distress is not solely related to their own resilience but also to the survivors' resilience. It indicates that spouses may have an additional burden; i.e., the obligation that they must meet the survivors' demands and needs that extend beyond their capacities to recover from cancer-related stressors. Conversely, spouses may consider their loved ones' resilience as another protective factor that can reduce their distress. This result contributes to the literature by providing specific reasons for the levels of distress that may be experienced by spouses.

Meanwhile, the psychological distress of the survivors was not influenced by their partners. Because cancer survivors tend to be overwhelmed by cancer diagnoses and treatment, they may not pay attention to spouses' distress and resilience. Additionally, this finding may be influenced by the gender effect, given that more male survivors participated in our study. It is known that men are more centered on approaching matters, and more preoccupied with the acquisition of status and independence, while women are more expressive, and more concerned with the development of intimacy [2]. Such distinct gender characteristics may be related to the extent to which survivors develop own psychological distress. However, the distresses of survivors and spouses were more strongly correlated in our study compared to other studies [22], thus we can conclude that the extent to which survivors and spouses perceive psychological distress may be different and may be influenced by the complex interdependence of couples.

Our results of the mediation models suggest that interventions aimed at enabling individuals to develop effective coping strategies can improve resilience by enhancing individuals' positive thoughts, and available external resources, which, in turn, reduce distress. Additionally, the manner in which survivors cope with stress may indirectly influence their

spouses' distress and that efforts to maximize the survivors' resilience can ultimately reduce psychological distress of couples. Therefore, health professionals should assess cancer survivor couples based on the positive strengths and assets available to them. Understanding the role of resilience in the relationship between coping and distress at a dyadic level can be also beneficial to health care practitioners and encourage the application of strength- and couple-based approaches to improve psychosocial adaptation among cancer survivors-spouses dyads. Given that caregiving burden undermines the long-term psychological adjustment of spouses and to some extent cancer patients [34], supportive care programs that are effective to manage spouses' burden and cope with their stress may be also necessary in reducing psychological distress.

Several limitations should be noted. First, our data were collected through self-reports; therefore, the results may not reflect objective psychological distress. Second, the results may not be generalizable to all populations due to the small sample size and a low response rate. Despite concerted efforts to recruit more African-American and Asian-American couples into our study, these minority groups were not well represented. The recruitment challenges regarding African- and Asian-Americans and couples will be reported in a subsequent paper. Replication of the current study on a larger and representative sample of cancer patients is required. Third, it should be acknowledged that the current study has a potential self-selection bias which can come from the low rate of couples who agreed to participate in this study. As with most survey studies based on volunteer participation, people who agree to be involved in the study are often those who are in better health and have less psychological distress; it could lead to an underestimation of the psychological distress of couples and thus of dyadic effect. Selection bias is also a problem to generalize our results. Fourth, the results are based on cross-sections, and causality cannot be assumed; thus alternative interpretations of the findings may be possible due to lack of this study's ability to observe temporal relations. These results must be interpreted with caution. Finally, the Resilience Framework was not fully applied in this study because of the small sample size. Future studies should consider other significant factors (e.g., positive emotions) that may influence distress at the individual and dyadic levels.

Taken together, our results indicate the need for interdisciplinary, time-limited interventions that are designed to enhance coping skills and reinforce effective adjustments in couples that address the effects of cancer on their lives [35]. Couple-based and psychological and behavioral interventions for couples can enable successful preparation for psychosocial challenges, management of cancer-related side effects, and creation of a supportive context in which the couple can address these challenges together [6].

Acknowledgments

This work funded through the National Institute of Nursing Research (1P30NR011907).

Abbreviations

APIMeM The Actor-Partner Interdependence Mediation Model

BSI-18	Brief Symptom Inventory-18
CFI	Comparative Fit Index
F-COPES	Family Crisis Oriented Personal Evaluation Scales
GSI	Global Severity Index
RA	Research Assistant
RMSEA	The Root Mean Square Error of Approximation

References

1. American Cancer Society. Book Cancer Facts and Figures 2014. City: American Cancer Society; 2014. Cancer Facts and Figures 2014. In: Editor (ed)^(eds)
2. Aries, E. Reconsidering the differences. New York: Oxford University Press; 1996. Men and women in interaction.
3. Ashing-Giwa KT, Padilla G, Tejero J, Kagawa-Singer M. Understanding the breast cancer experience of Asian American women. Psychooncology. 2003; 12:38–58. [PubMed: 12548647]
4. Aspinwall LG, MacNamara A. Taking positive changes seriously. Cancer. 2005; 104:2549–2556. [PubMed: 16247781]
5. Badr H, Carmack CL, Kashy DA, Cristofanilli M. Dyadic coping in metastatic breast cancer. Health Psychol. 2010; 29:169–180. [PubMed: 20230090]
6. Badr H, Krebs P. A systematic review and meta-analysis of psychosocial interventions for couples coping with cancer. Psychooncology. 2012; 22:1688–1704. [PubMed: 23045191]
7. Ben-Zur H. Your coping strategy and my distress: Inter-spouse perceptions of coping and adjustment among breast cancer patients and their spouses. Families, Systems, & Health. 2001; 19:83–94.
8. Ben-Zur H, Gilbar O, Lev S. Coping with breast cancer: patient, spouse, and dyad models. Psychosom Med. 2001; 63:32–39. [PubMed: 11211062]
9. Bentler PM. Comparative fix indexes in structural models. Psychol Bull. 1990; 107:238–246. [PubMed: 2320703]
10. Bodenmann, G. Dyadic coping and its significance for marital functioning. In: Revension, TA.; Kayser, K.; Bodenmann, G., editors. Couples coping with stress: emerging perspectives on dyadic coping. Washington, DC: APA; 2005. p. 33-49.
11. Catalano D, Chan F, Wilson L, Chiu C-Y, Muller VR. The buffering effect of resilience on depression among individuals with spinal cord injury: A structural equation model. Rehabilitation Psychology. 2011; 56:200–211. [PubMed: 21843016]
12. Chambers SK, Lynch BM, Aitken J, Baade P. Relationship over time between psychological distress and physical activity in colorectal cancer survivors. J Clin Oncol. 2009; 27:1600–1606. [PubMed: 19255326]
13. David D, Montgomery GH, Bovbjerg DH. Relations between coping responses and optimism-pessimism in predicting anticipatory psychological distress in surgical breast cancer patients. Pers Individ Dif. 2006; 40:203–213. [PubMed: 19079761]
14. Demos, EV. Resiliency in infancy. In: Dugan, TF.; Coles, R., editors. The child in our times. New York: Brunner/Mazel; 1989. p. 3-22.
15. Derogatis, LR. Brief Symptoms Inventory (BSI) 18 administration, scoring, and procedures manuel. Minneapolis, MS: National Computer Systems Inc.; 2000.
16. Diehl M, Hay EL. Personality-related risk and resilience factors in coping with daily stress among adult cancer patients. Research in Human Development. 2013; 10:47–69. [PubMed: 23646033]
17. Enders C, Bandalos D. The relative performance of full information maximum likelihood estimation for missing data in structural equation models. Structural Equation Modeling. 2001; 8:430–457.

18. Everall R, Altrows J, Paulson B. Creating a future: A study of resilience in suicidal female adolescents. Journal of Counselling and Development. 2006; 84:461–470.
19. Folkman S, Moskowitz JT. Coping: pitfalls and promise. Annu Rev Psychol. 2004; 55:745–774. [PubMed: 14744233]
20. Fredrickson BL, Tugade MM, Waugh CE, Larkin GR. What good are positive emotions in crises? A prospective study of resilience and emotions following the terrorist attacks on the United States. J Pers Soc Psychol. 2003; 84:365–376. [PubMed: 12585810]
21. Gilbar, O.; Ben-Zur, H. Cancer and the family: distress and coping. Springfield, IL: Charles C Thomas; 2002.
22. Hagedoorn M, Sanderman R, Bolks HN, Tuinstra J, Coyne JC. Distress in couples coping with cancer: a meta-analysis and critical review of role and gender effects. Psychol Bull. 2008; 134:1–30. [PubMed: 18193993]
23. Hjemdal O, Vogel PA, Solem S, Hagen K, Stiles TC. The relationship between resilience and levels of anxiety, depression, and obsessive-compulsive symptoms in adolescents. Clinical Psychology & Psychotherapy. 2011; 18:314–321. [PubMed: 20806419]
24. Hodgkinson K, Butow P, Hunt GE, Wyse R, Hobbs KM, Wain G. Life after cancer: couples' and partners' psychological adjustment and supportive care needs. Support Care Cancer. 2007; 15:405–415. [PubMed: 17043776]
25. Hou WK, Lam JHM. Resilience in the year after cancer diagnosis: a cross-lagged panel analysis of the reciprocity between psychological distress. J Behav Med. 2014; 37:391–401. [PubMed: 23423664]
26. Institute of Medicine. Cancer care for the whole patient: meeting psychosocial health needs. Washington, D.C.: National Academy Press; 2007.
27. Institute of Medicine. Cancer care for the whole patient: meeting psychosocial health needs. Washington, D.C.: National Academy Press; 2008.
28. Kumpfer, K. Factors and processes contributing to resilience: The Resilience Framework. In: Glantz, MD.; Johnson, JL., editors. Resilience and development: Positive life adaptations. New York: Kluwer Academic/Plenum Press Publishers; 1999.
29. Kunzler A, Nussbeck FW, Moser MT, Bodenmann G, Karen K. Individual and dyadic development of personal growth in couples coping with cancer. Supportive Care Cancer. 2014; 22:53–62.
30. Lafaye A, Petit S, Richaud P, Houede N, Baguet F, Cousson-Gelie F. Dyadic effects of coping strategies on emotional state and quality of life in prostate cancer patients and their spouses. Psychooncology. 2014 In press.
31. Lazarus, RS.; Folkman, S. Stress, appraisal, and coping. New York: Springer; 1984.
32. Ledermann T, Macho S, Kenny DA. Assessing mediation in dyadic data using the actor-partner interdependence model. Structural Equation Modeling. 2011; 18:595–612.
33. McCubbin, HI.; Larsen, A.; Olson, DH. Family crisis orientated personal evaluation scales (F COPES). In: McCubbin, HI.; Thompson, AI., editors. Family assessment inventories for research and practice. Madison, WI: University of Wisconsin-Madison; 1987. p. 193-207.
34. Milbury K, Badr H, Fossella FV, Pisters KM, Carmack CL. Longitudinal associations between caregiver burden and patient and spouse distress in couples coping with lung cancer. Supportive Care Cancer. 2013; 21:2371–2379.
35. Resenders LA, McCorkle R. Spousal responses to prostate cancer: An integrative review. Cancer Invest. 2006; 24:192–198. [PubMed: 16537189]
36. Roesch SC, Adams LS, Hines A, Palmores A, Vyas P, Tran C, Pekin S, Vaughn AA. Coping with prostate cancer: A meta-analytic review. J Behav Med. 2005; 28:281–293. [PubMed: 16015462]
37. Smith BW, Dalen J, Wiggins K, Tooley E, Christopher P, Bernard J. The breif resilience scale: assessing the ability to bounce back. International Journal of Behavioral Medicine. 2008; 15:194–200. [PubMed: 18696313]
38. Sobel, ME. Asymptotic confidence intervals for indirect effects in structural equation models. In: Leinhart, S., editor. Sociological Methodology. San Francisco: Jossey-Bass; 1982. p. 290-312.
39. Steiger JH. Structural model evaluation and modification: An interval estimation approach. Multivariate Behavioral Research. 1990; 25:173–180.

40. Stewart DE. A systematic review of resilience in the physically ill. Psychosomatics. 2011; 52:199–209. [PubMed: 21565591]

41. Todd JL, Worell J. Resilience in low-income, employed, African American women. Psychology of Women Quarterly. 2000; 24:119–128.

42. Zabora J, BrintzenhofeSzoc K, Curbow B, Hooker C, Piantadosi S. The prevalence of psychological distress by cancer site. Psychooncology. 2001; 10:19–28. [PubMed: 11180574]

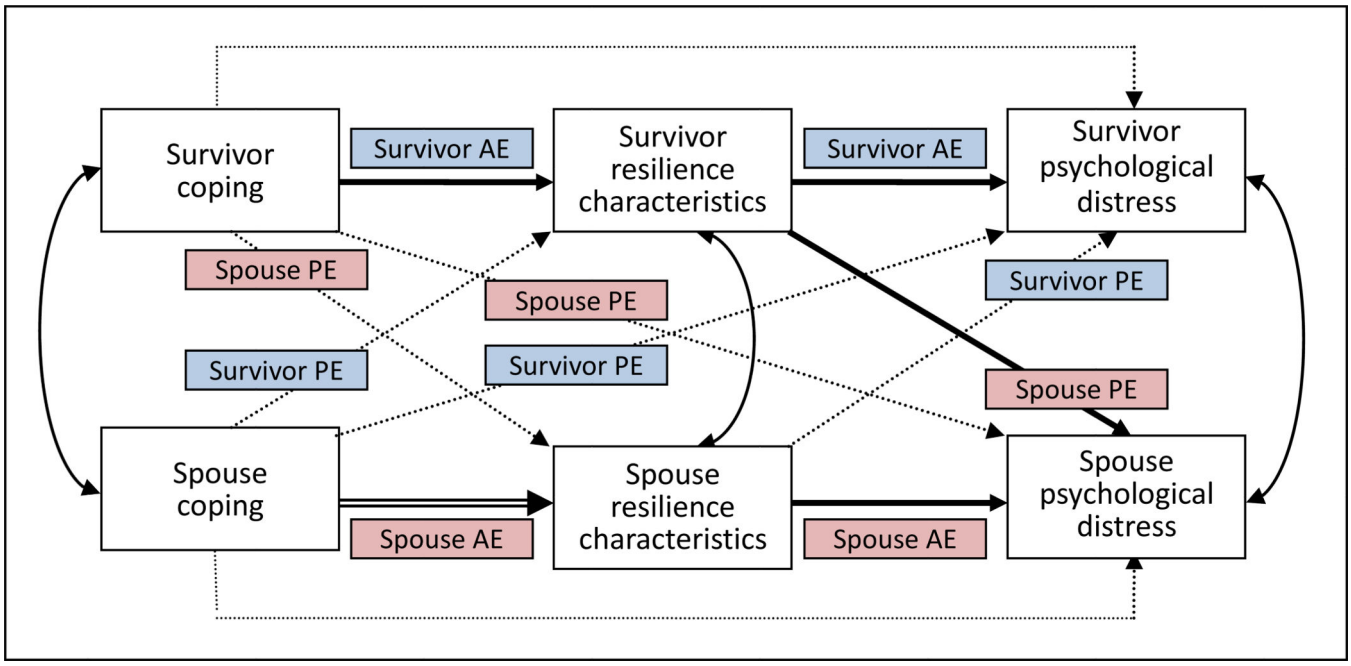

Figure 1. The Dyadic model of coping, resilience, and psychological distress

Note. Solid lines refer to significant paths at $p<0.05$; dotted lines refer to non-significant paths at $p<0.05$; double line refers to a different result by types of coping; AE=Actor effect; PE=Partner effect; Survivor PE=a survivor's outcome is influenced by his/her partner's scores; Spouse PE=a spouse's outcome is influenced by his/her partner (survivor)'s scores.

Table 1

Demographic and medical characteristics of participants (91 dyads)

Variables	Survivors	Partners
	N(%)	
Gender		
Male	58(63.7)	32(35.2)
Female	33(36.3)	59(64.8)
Household income		
<$25,000	10(11.6)	10(11.6)
$25,001–$45,000	20(23.3)	20(23.3)
$45,001–$75,000	17(19.8)	17(19.8)
>$75,000	39(45.4)	39(45.4)
Employment		
Unemployed	11(12.10)	24(26.7)
Employed	80(87.90)	66(73.3)
Ethnicity		
European-American	74(81.3)	74(82.2)
African-American	17(18.7)	15(16.7)
Other	0	1(1.1)
Education		
<High school	5(5.5)	4(4.4)
High school graduate	18(19.8)	26(28.9)
>High school	68(74.7)	60(66.7)
Cancer type		
Breast	28(30.8)	
Colorectal	18(19.8)	
Prostate	45(49.5)	
Stage of diagnosis		
I	23(25.6)	
II	63(70.0)	
III	4(4.4)	
Types of Cancer Treatment(yes)		
Surgery	70(79.6)	
Radiotherapy	53(58.2)	
Chemotherapy	27(30.0)	
	Mean(SD)	
Age	64.2(10.5)	63.8(11.1)
Years since diagnosis	3.7(1.9)	
The stress level of marital relationship	4.0(1.3)	4.3(1.0)

Table 2

Inter-correlations, Means, and SDs of the Study Variables

Variables	1	2	3	4
1.Reframing coping	**.15**	.06	.29**	−.24*
2.Social support coping	.31**	**.26***	.12	−.08
3.Resilience characteristics	.44***	.25*	**.03**	−.44***
4.Psychological distress	−.36***	−.29**	−.54***	**.57*****
Mean(SD)				
Survivors	29(5)	23(7)	4(1)	20(12)
Spouses	30(5)	24(7)	4(1)	22(11)
Paired t	−1.80	−0.42	0.97	−1.77

* $p<0.05$,

** $p<0.01$,

*** $p<0.001$; correlation coefficients above each diagonal correspond to spouses, and coefficients below each diagonal correspond to survivors.

Table 3

Dyadic effects of coping and resilience in predicting psychological distress

		Standardized Estimate	Standardized Indirect effects
The effect of Reframing Coping			
Reframing coping→Resilience	Survivor AE	0.425***	
	Spouse AE	0.283**	
	Survivor PE	0.080	
	Spouse PE	0.055	
Resilience→Psychological distress	Survivor AE	−0.430***	
	Spouse AE	−0.412***	
	Survivor PE	−0.005	
	Spouse PE	−0.226*	
Reframing coping→Psychological distress	Survivor AE	−0.056	−0.398
	Spouse AE	−0.083	−0.302
	Survivor PE	−0.149	−0.083
	Spouse PE	−0.018	−0.252
Covariates	Cancer type(breast) →Survivor distress	−0.25***	
	Survivor MR →Survivor reframing coping	0.36***	
	Cancer stage →Survivor reframing coping	−0.22*	
	Spouse MR →Partner reframing coping	0.22*	
	Survivor MR →Survivor distress	−0.17*	
The effect of acquiring social support coping			
Social support coping→Resilience	Survivor AE	0.212*	
	Spouse AE	0.075	
	Survivor PE	0.084	
	Spouse PE	0.165	
Resilience→Psychological distress	Survivor AE	−0.437***	
	Spouse AE	−0.431***	
	Survivor PE	−0.028	
	Spouse PE	−0.235*	
Social support coping→Psychological distress	Survivor AE	−0.126	−0.097
	Spouse AE	0.018	−0.052
	Survivor PE	0.018	−0.039
	Spouse PE	−0.056	−0.121

		Standardized Estimate	Standardized Indirect effects
Covariates	Cancer type(breast) → *Survivor distress*	−0.23***	
	Survivor MR → *Survivor resilience*	−0.32***	
	Partner MR → *Survivor resilience*	0.20	
	Survivor MR → *Survivor distress*	0.23*	

Note. AE=Actor Effect; PE=Partner Effect; MR=Stress levels in marital relationships;

* $p<0.05$;

** $p<0.01$;

*** $p<0.001$