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The influence of breast cancer survivors' Perceived partner social support and need satisfaction on depressive symptoms: A longitudinal analysis

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The present study examines the ways in which breast cancer survivors' perceptions of emotional and instrumental social support from an intimate partner and need satisfaction in their partner role influence depression during and after breast cancer treatment. Our sample was comprised of 163 women who were an average of 57 years old, mostly White/Caucasian, and diagnosed primarily with early-stage breast cancer. Longitudinal data were analysed using both multilevel and structural equation modelling. Results reveal that (a) greater perceived partner emotional support is associated with lowered levels of depression at each wave, (b) partner-role need satisfaction mediates the relationship between perceived partner emotional support and depression at each wave, (c) perceived partner emotional support predicts subsequent changes in depression by way of need satisfaction and (d) depression prospectively predicts lowered perceptions of partner emotional and instrumental support. The findings confirm that basic need satisfaction, within intimate relationships, is an important predictor of lowered depression among breast cancer survivors.

Keywords: breast cancer; need satisfaction; depression; social support

Introduction

One in eight women will be diagnosed with breast cancer during the course of their lifetime (American Cancer Society, 2007). Research has revealed that some women experience psychological distress during breast cancer treatment and survivorship (e.g. Bardwell et al., 2006; Gallagher, Parle, & Cairns, 2002; Hagedoorn et al., 2008; Hoskins, Budin, & Maislin, 1996; Osborne, Elsworth, Sprangers, Oort, & Hopper, 2004; Primo et al., 2000). Levels of distress and depression among breast cancer survivors are influenced by the quality of their relationship with their intimate partners (see Helgeson & Cohen, 1996; Nelles, McCaffrey, Blanchard, & Ruckdeschel, 1991 for reviews). A recent meta-analysis, which focused on couples dealing with cancer, shows that cancer patients' levels of distress are correlated with their partner's level of distress, suggesting the importance of intimate relationships in understanding psychological adjustment to cancer (Hagedoorn et al., 2008). Survivors' perceptions of social support from their intimate partners and of their own functioning in their partner role may also be influenced by breast cancer treatment and survivorship.

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Although much research (e.g. Alferi, Carver, Antoni, Weiss, & Duran, 2001; Helgeson & Cohen, 1996; Manne, Ostroff, & Winkel Manne, 2007; Manne, Ostroff, Winkel, Grana, & Fox, 2005; Manne, Taylor, Dougherty, & Kemeny, 1997; Nelles et al., 1991; Wimberly, Carver, Laurenceau, Harris, & Antoni, 2005) has shown that greater social support from relationship partners is associated with lower levels of distress and depression among breast cancer survivors, much less research has focused on what relational processes account for this robust association. The current work seeks to understand whether psychological need satisfaction that survivors' garner from fulfilling the intimate partner role is one such relational process. Theoretically, close relationships function to satisfy basic psychological needs (Ryan & Solky, 1996). Deci and Ryan state that these needs are 'innate psychological nutrients that are essential for ongoing psychological growth, integrity, and well-being' (Deci & Ryan, 2000, p. 229) and that the three basic psychological needs are autonomy, relatedness and competence. Studies (Hodgins, Koestner, & Duncan, 1996; La Guardia, Ryan, Couchman, & Deci, 2000; Prager & Buhrmester, 1998; Ryan & Lynch, 1989) show that both needs for relatedness and needs for autonomy are likely to be mutually satisfied within close relationships. Deci and Ryan (1991) define relatedness as the 'desire to feel connected to others' (p. 231) and autonomy as the desire to 'self-organise experience and behaviour and to have activity be concordant with one's integrated sense of self' (Deci & Ryan, 1991, p. 231).

Using theories by Ryan and Solky (1996) as well as Bettencourt and colleagues (e.g. Bettencourt, Molix, Talley, & Sheldon, 2006), we propose that the satisfaction of psychological needs through fulfilling the role of relationship partner may, in part, account for the association between perceptions of partner social support and distress among breast cancer survivors. The current longitudinal study surveyed breast cancer survivors in intimate relationships to test whether survivors' psychological need satisfaction, derived from their fulfilment of the partner role, mediates the relationship between perceived partner social support and distress.

Background literature

As important for the current work, breast cancer survivors who are in intimate relationships identify their partners as the primary source of social support, both during and after treatment (e.g. Harrison, Maguire, & Pitceathly, 1995; Manne et al., 2005; Pistrang & Barker, 1995). Only two studies (Alferi et al., 2001; Manne et al., 2005) have adopted longitudinal designs to provide compelling evidence that perceptions of partner supportive as well as unsupportive behaviours influence levels of psychological distress among newly diagnosed breast cancer survivors. Alferi et al. (2001) surveyed women with breast cancer prior to surgery, soon after surgery and during the first year of survivorship. The results revealed that perceptions of partner support were negatively associated with concurrent levels of distress at each of the three time points. In addition, their analyses revealed that greater perceptions of partner instrumental and emotional social support prior to breast cancer surgery were inversely associated with improvements in women's feelings of distress soon after surgery, but no other prospective correlations were revealed. Because Alferi et al. considered these tests as 'exploratory', they conducted only correlational analyses and did not investigate possible mediators of these associations. Due to the dependent and complex nature of longitudinal data, more studies are needed which use multilevel and structural equation modelling to provide more appropriate and powerful tests of hypotheses. Notably, Alferi et al. (2001) failed to reveal that

psychological distress negatively influenced survivors' subsequent perceptions of instrumental and emotional social support provided by their partner. Such complex associations were, however, revealed by Brady and Helgeson (1999) and Bolger, Foster, Vinokur, and Ng (1996) who showed that higher levels of distress among survivors after a recurrent breast cancer diagnosis were also associated with decreases in their partner's emotional social support 6 months later. Taken together, these results provide some evidence that not only does social support influence subsequent levels of distress, but higher levels of distress may also erode survivors' social support over time.

Recent findings (Bloom, 1982; Brady & Helgeson, 1999; Manne et al., 2005) reveal that it is fruitful to explore psychological mediators of the association between perceived social support and distress among breast cancer survivors. Although Manne et al. (2005) did not measure perceptions of partner social support, the longitudinal study of breast cancer asked patients to rate their partners' overtly negative (e.g. shouting) and withdrawal behaviours (i.e. unsupportive behaviours). Despite that Manne et al. did not report any prospective changes among the variables, their results showed that at each of three time points, participants' reports of their intimate partner's unsupportive behaviours were associated with greater psychological distress. Also, the results suggested that participants' levels of avoidant coping partially mediated these associations.

Need satisfaction as a mediator

Ryan and Solky (1996) argue that supportive social relationships may bolster psychological well-being because these relationships contribute to autonomy and relatedness needs. Likewise, they propose that social relationships that fail to provide basic psychological needs may undermine psychological well-being. There is some empirical evidence to support their theories (Niemic et al., 2006; Prager & Buhrmester, 1998). For example, Prager and Buhrmester conducted a study of cohabiting couples and utilised a combined measure of global levels of agentic (i.e. autonomy) and communal (i.e. relatedness) need fulfilment. Their results showed that agentic/communal need fulfilment mediated the association between levels of intimacy (i.e. listening and understanding, affective tone) in relationship interactions and psychological distress and well-being.

Our work (Bettencourt, Molix, Talley, & Sheldon, 2006; Bettencourt & Sheldon, 2001) has emphasised the importance of social roles in relationships as mechanisms for psychological need satisfaction. A social role is defined as 'a behavioural repertoire characteristic of a person or a position, a set of standards, descriptions, norms or concepts held for the behaviours of a person or social position' (Biddle, 1979, p. 9). The role of close-relationship partner has the capacity to satisfy basic needs for relatedness by allowing for positive interactions between partners that are assumed to create a sense of being valued by and connected to a partner (Bettencourt et al., 2006). At the same time, the role has the capacity to satisfy basic needs for autonomy when the relationship supports individuals' desires and goals (Bettencourt et al., 2006). Consistent with the assertion that social roles may provide an opportunity for the satisfaction of basic psychological needs, studies (Bettencourt & Sheldon, 2001; Sheldon & Bettencourt, 2002) have shown that the fulfilment of basic psychological needs by way of social roles contributes to psychological well-being. Although these findings did not examine need satisfaction within the intimate partner role, the results reveal that higher levels of relatedness and autonomy need satisfaction within certain roles are associated with greater psychological well-being.

The current study is a longitudinal study of breast cancer survivors, conducted with four primary purposes. We conducted analyses to determine whether (1) perceived partner emotional and instrumental social support and need satisfaction within the partner-role predicted depression at each time point, (2) the predicted relationship between perceived partner emotional and instrumental social support and depression was mediated by need satisfaction within the partner role at each time point, (3) perceived partner emotional and instrumental social support predicted subsequent changes in depression by way of need satisfaction within the partner role and (4) reports of depression predicted subsequent changes in perceived partner emotional and instrumental social support.

We hypothesised that breast cancer survivors' perceptions of partner social support and need satisfaction within the intimate relationship were inversely related to levels of depression. We also proposed that need satisfaction within the partner role would mediate the relationship between perceived partner social support and depression both concurrently and prospectively. In addition, we hypothesised that higher perceptions of partner social support would be predictive of lowered levels of depression over time, and conversely and consistent with Bolger et al. (1996), that higher levels of depression would be related to lowered perceptions of partner social support over time. Importantly, researchers (Hagedoorn et al., 2008; Helgeson & Cohen, 1996) have argued that partners of cancer patients are primarily sources of emotional support and no longer provide substantial instrumental support due to improved medical care. Thus, we entertained the possibility that perceptions of only partner emotional support, but not partner instrumental support, would predict levels of depression and be mediated by need satisfaction met by fulfilling the partner role.

Method

Participants

Participants were 163 breast cancer survivors who were part of a larger sample in a longitudinal study of adjustment to breast cancer ($n = 244$). Participants from the larger sample who were not involved in an intimate relationship (i.e. married, cohabitating) at baseline ($n = 77$) or did not respond to questions regarding their spousal/partner role ($n = 4$) were excluded from the current analyses.¹ Participants were recruited by oncology nurses at nine radiation clinics in Missouri. Eligible patients were (a) female, (b) 18 years of age or older, (c) undergoing radiation treatment at one of the participating clinic sites and (d) English speaking. That we recruited these radiation patients for the study was a matter of opportunity (i.e. convenience sampling). Of the participants, 79% had completed chemotherapy treatment by the second assessment, 15% did not have chemotherapy and for 6% this information was not reported. Table 1 shows additional characteristics of the study sample at baseline.

Procedure

A nurse at a participating radiation oncology clinic provided the baseline survey (Wave 1) to eligible patients during their first week of radiation therapy. Of those patients who received a packet from a nurse, approximately 59% elected to return the survey. No data on reasons for refusal or demographics are available for patients who refused to participate. The second survey (Wave 2) was mailed by the research staff directly to participants 12 weeks after the start of their radiation treatment. The third survey

Table 1. Baseline characteristics of participants.

Characteristic	<i>n</i>	%	<i>M</i>	<i>SD</i>
Age			57.33	11.22
Relationship status				
Married	154	94.5		
Living w/significant other	9	5.5		
Race/ethnicity				
Black	4	2.5		
White	154	94.5		
Other	3	1.8		
Income				
Less than \$15,000	11	6.7		
15–35K	37	22.7		
35–55K	39	24.0		
55–75K	20	18.5		
75–95K	21	12.8		
Over 95,000	25	15.3		
No. of children living in home			0.72	1.10
0	96	58.9		
1	38	23.3		
≥2	19	17.8		
Miles to clinic			29.49	30.45
Stage of Cancer				
<i>In situ</i>	15	9.2		
Stage 1	83	50.9		
Stage 2	38	23.3		
Stage 3	14	8.6		
Stage 4	2	1.2		
Unknown/missing	11	6.7		
Comorbid illnesses			0.85	1.15
Perceived partner emotional social support (range 1–6)			5.39	1.07
Perceived partner instrumental social support (range 1–6)			5.35	1.02
Role-related need satisfaction (range 1–7)			5.45	1.31
Depression composite			−0.01	0.89

Note: The depression composite variable used in multilevel analyses was created by standardising the participants' mean scores on each measure of depression and then averaging those resulting scores. The unstandardised mean of the CES-D scale was 14.04 (SD = 11.80) and the unstandardised mean of the POMS-Depression subscale was 0.93 (SD = 0.81).

(Wave 3) was mailed by the research staff directly to participants 24 weeks after the start of their radiation treatment. Participants were paid \$25 for each survey. The survey included measures of perceived partner social support, need satisfaction in the partner role, and depression. Each survey also included others measures which will not be discussed in the current report.

Over the three waves of data collection, 163 patients responded to the Wave 1 survey, 151 responded to Wave 2 and 147 responded to Wave 3. Comparisons were made between the 144 participants who completed all three waves of data collection and those 19 that missed one or both follow-up surveys. Participants who completed all three waves and those that only participated in the baseline survey did not differ on any disease or illness variable (stage of cancer, number of co-morbid illnesses, physical symptoms),

demographics (age, education, number of cohabitating children, income) or psychological characteristic (depression).

Measures

Patients' perceived partner social support

Survivors' perceptions of social support from their partner were assessed using items developed by Alferi et al. (2001). There are two items for the assessment of instrumental support and two items for the assessment of emotional support. Examples include, 'How much do you feel you can count on your spouse to carry out daily chores while you recuperate?' and 'How much do you feel you can count on your spouse to let you talk to him about your illness?' Breast cancer survivors responded to each question on a 6-point Likert-type scale (1 = not at all, 6 = a lot). In the current sample, the perceived partner emotional support scale ($\alpha = 0.97, 0.98$ and 0.95 at Waves 1, 2 and 3, respectively) and the instrumental support scale ($\alpha = 0.87, 0.84$ and 0.78 at Waves 1, 2 and 3, respectively) were internally reliable.

Need satisfaction in the partner role

To measure the extent to which breast cancer survivors felt their needs of relatedness and autonomy were being met due to the fulfilment of their partner role, we included a known measure of need satisfaction (Bettencourt & Sheldon, 2001; Sheldon & Bettencourt, 2002). This measure is designed to tap an intra-personal experience of need satisfaction within a social role. For ease of reference, we refer to this measure as 'role-related need satisfaction' in the methods and results. Patients' fulfilment of relatedness and autonomy needs were each measured with two items. Examples of the items are: 'When I carry out my spouse/partner role, I feel close to my partner,' and 'When I carry out the role of spouse/partner, I feel free to be myself.' Participants indicated their level of agreement using a scale from 1 (strongly disagree) to 6 (strongly agree). As has been done in other studies (e.g. Sheldon & Elliot, 1999; Sheldon & Niemiec, 2006) and to improve the reliability of the role-related need satisfaction measure, the four items were combined into a single index ($\alpha = 0.84, 0.87$ and 0.89 at Waves 1, 2 and 3, respectively).

Depression

The Center for Epidemiologic Studies-Depression Scale (CES-D; Radloff, 1977) was used as one measure of depressive symptomology. On this 20-item scale, participants rated the intensity and frequency of depressive symptoms they had experienced in the previous week on a 4-point Likert-type scale (0 = 'Rarely or none of the time'; 3 = 'Most or all of the time'). Example items include, 'I felt sad' and 'I had crying spells.' The Profile of Mood States – Depression Subscale (McNair, Lorr, & Droppelman, 1981) was used as a second measure of depressive affect. It includes seven adjectives (e.g. 'unhappy,' 'blue' and 'hopeless'). Participants rated the degree to which they are feeling each on a 5-point Likert-type scale (0 = 'Not at all'; 4 = 'Extremely'). Both scales are used often in studies of breast cancer and psychological health, and the measures were highly correlated at each Wave (0.76, 0.70 and 0.82, respectively). As has been done in other studies (e.g. Hankin, Abramson, Miller, & Haefel, 2004; Hankin, Kassel, & Abela, 2005) a composite depression variable was created for multilevel analyses by standardising the participants' mean scores on each measure of depression and then averaging those resulting scores

Table 2. Median partial correlations for the primary variables across three waves.

	Partner emotional social support	Partner instrumental social support	Role-related need satisfaction
Partner emotional social support	–	–	–
Partner instrumental social support	0.67*	–	–
Role-related need satisfaction	0.60*	0.50*	–
Depression composite	–0.23*	–0.17*	–0.49*

Notes: All correlations are partial, controlling for effects of covariates.

* $p < 0.05$.

(combined subscales $\alpha = 0.86$, 0.82 and 0.90 at Waves 1, 2 and 3, respectively). We recognise that the CES-D is a measure of depressive symptoms and that the POMS – Depression subscale is a measure of depressed mood. Nevertheless, we refer to this composite variable as ‘depression’ while acknowledging the complex nature of this construct. Table 2 provides correlations between baseline characteristics.

A number of variables were used as covariates in the subsequent analyses. These included age, the number of co-morbid illnesses with which participants were currently diagnosed, whether they were living with children, the number of miles they lived from the radiation treatment centre, the level of physical symptoms they experienced during radiation treatment, and their annual household income. Physical symptoms were measured with items from several reports because of their appropriateness for the current sample (Anderson & Tewfik, 1985; Ganz & Coscarelli, 1995; Whelan, Levine, Julian, Kirkbride, & Skingley, 2000). Specifically, participants used a 10-point scale to rate the following symptoms: appetite loss, weight loss, arm pain, chest wall pain, shoulder pain, decreased arm mobility, and swelling of the arm (‘1 = not at all’ to ‘10 = severe’; Anderson & Tewfik, 1985; $\alpha = 0.72$). Finally, a measure of relationship satisfaction was included in the Wave 3 survey and was comprised of three items from the Kansas Marital Satisfaction Scale (Schumm et al., 1986; current sample $\alpha = 0.98$). Participants were asked to rate items on a 1 (Extremely Dissatisfied) to 7 (Extremely Satisfied)-point, Likert-type scale (e.g. ‘How satisfied are you with your spouse/partner?’).

To accomplish the goals of this article, we used multilevel modelling to test whether survivors’ reports of the support provided by their partner and their own reports of role-related need satisfaction accounted for variability in depression during and after radiation treatment, as well as to test whether role-related need satisfaction mediated the relationship between perceived partner support and depression. Using a structural equation model, we tested whether perceived partner support was associated with changes in depression over time via role-related need satisfaction (i.e. mediation) as well as whether levels of depression predicted changes in perceived partner support over time.

Results

Prior to analyses, the data were assessed for normality. The measures of perceived partner support were negatively skewed; a squared transformation improved the normality of their distributions.

Multilevel analyses

Analytic plan

Because the data conformed to a multilevel data structure in which observations at each wave were nested within individuals, we ran analyses with HLM v. 6.04 (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2004), a statistical software package allowing for multilevel random coefficient models. HLM is ideal for these data structures because multilevel models provide more accurate parameter estimates than ordinary least squares methods (Bryk & Raudenbush, 2002) and allow for missing data.

The Level-1, within-person models assumed the basic form:

$$\text{DepMean}_{ij} = B_{0j} + B_{1j}(\text{Wave})_{ij} + B_{2j}(\text{PartEmoSS})_{ij} + B_{3j}(\text{PartInstSS})_{ij} + r_{ij} \quad (1)$$

In this model, DepMean_{ij} is person j 's score on the depression measure at Wave i ; B_{0j} is a random coefficient representing person j 's initial level of depression at baseline; B_{1j} is a random coefficient representing person j 's linear rate of change on depression over time (i.e. fixed at 0, 3 and 6.5 months since the baseline survey); B_{2j} and B_{3j} are fixed coefficients representing the effects of relative increases and decreases in person j 's perceived partner emotional and instrumental support (with scores centred around person j 's mean) on their level of depression, above and beyond what could be expected (that is estimated) due to the passage of time (i.e. initial status, linear rate). The r_{ij} term represents the error associated with each measure of depression, not accounted for by the other intra-individual variables contained in the model (McCullough, Fincham, & Tsang, 2003). A similar model structure was also utilised for the test involving the influence of role-related need satisfaction on depression.

The Level-2, between-person model accounts for individual differences in the Level-1 coefficients. Level-2 variables were measured at Wave 1 and included demographic/control variables. Each of the potential Level-2 control variables (listed in Methods section) were tested individually as potential predictors of the intercept and slope variables. Only those variables that were significantly associated with intercept and slope values were retained as control variables. Thus, to model individual differences which may further explain fluctuations in levels of depression, we included in all multilevel model analyses the appropriate covariates, which were centred around their grand means (with the exception of the dichotomous covariate – the presence of a child in the home). We also controlled for between-person variability in mean differences in perceptions of partner emotional and instrumental support as well as between-person mean differences in role-related need satisfaction by including baseline assessments of these variables in the Level-2 equation (Bryk & Raudenbush, 2002). The basic Level 2 (person-level) models were:

$$B_{0j} = \gamma_{00} + \gamma_{01}(\text{Age})_j + \gamma_{02}(\text{W1Symptoms})_j + \gamma_{03}(\text{W1LivKid})_j \\ + \gamma_{04}(\text{W1Miles})_j + \gamma_{05}(\text{W1EmoSS})_j + \gamma_{06}(\text{W1InsSS})_j + \gamma_{07}(\text{W1RelAut})_j + u_{0j}$$

$$B_{1j} = \gamma_{10} + \gamma_{11}(\text{Income})_j + u_{1j}$$

$$B_{2j} = \gamma_{20}$$

$$B_{3j} = \gamma_{20}$$

In this model, γ parameters represent the grand mean of the person-level means (β_{ij} 's) from the Level-1 models (see Equation (1)). The residual terms (e.g. u_{0j}) represent the variance of u_{0j} not accounted for by the Level-2 parameters. Krull and MacKinnon (2001)

showed that criteria outlined by Baron and Kenny (1986) for testing mediation can be used in multilevel models as well. Because our data included Level-1 predictors (intimate partner emotional and instrumental social support) and mediator (partner-role need satisfaction) variables that were fixed, we utilised the methods outlined by Baron and Kenny as well as Sobel's (1982) mediation test. Standardised coefficients (β) were calculated by hand (Hox, 2002).

Results

A conditional base model was constructed to estimate initial status and linear growth in depression over time. The results revealed that the initial status, $B=0.18$, $SE=0.07$, $t(152)=2.61$, $p<0.05$, and the linear, random time effect, $B=-0.07$, $SE=0.01$, $\beta=-0.21$, $t(429)=-6.92$, $p<0.001$, were significant. The results suggest that survivors' initial levels of depression were significantly greater than zero and that they experienced significant declines in levels of depression over time. In addition, separate examinations of variance components revealed that 27% and 33% of the total variance in survivors' perceptions of emotional and instrumental partner support occurs at Level-1 (within-person), respectively, and 37% of the total variance in their role-related need satisfaction occurs at this level. These results suggest that there is variance within-person (across time) in perceptions of social support and need satisfaction above and beyond that which is expected to occur between-individuals.

Next, a model was run that included within-person perceived emotional and instrumental partner support as well as between-person control variables. Level-one variables were centred within person, modelling individual fluctuations in those variables. This allowed us to examine whether participants were contemporaneously less depressed at a given time point (i.e. whether they have less depression than would be expected on the basis of their initial status and linear change estimates) when they perceived greater emotional and instrumental social support from their intimate partner than is typical for them (see Equation (1)). For the average breast cancer survivor, a relatively high level of perceived emotional partner support (above her own mean) was associated with a decline in depression, $B=-0.02$, $SE=0.01$, $\beta=-0.23$, $t(415)=-2.70$, $p<0.05$, whereas changes in levels of perceived instrumental partner support (above her own mean) were unassociated with depression levels, $B=0.00$, $SE=0.01$, $\beta=0.01$, $t(415)=0.18$, n.s. That is, during waves in which breast cancer survivors reported more partner emotional support than was typical for them, they tended to report lower levels of depression at that same time point than would have been expected based on their initial depression and linear change estimates.

The second multilevel model was run predicting depression from role-related need satisfaction. For the average breast cancer survivor, a higher level of role-related need satisfaction (above her own mean) was associated with a significant decline in depression, $B=-0.13$, $SE=0.04$, $\beta=-0.19$, $t(414)=-3.22$, $p<0.01$. During waves in which breast cancer survivors reported more role-related need satisfaction than was typical for them, they reported lower levels of depression than would have been expected based on their initial and linear change estimates.

Finally, we examined whether results suggested that role-related need satisfaction was a mediator of the association between perceived partner emotional support and depression. Coefficients resulting from regressing the predicted mediator, namely, partner-role-related need satisfaction, on the predictor variables, namely, perceived partner emotional support, $B=0.06$, $SE=0.01$, $\beta=0.47$, $t(412)=8.30$, $p<0.001$, and perceived partner instrumental

support, $B=0.01$, $SE=0.01$, $\beta=0.07$, $t(412)=0.96$, n.s., revealed that only emotional partner support was significantly related to the mediator variable. The final model in which both of the support variables and the mediator were included revealed that role-related need satisfaction remained reliably associated with depression, $B=-0.11$, $SE=0.04$, $\beta=-0.16$, $t(409)=-2.36$, $p<0.05$, but that the association between perceived partner emotional support and depression became unreliable, $B=-0.01$, $SE=0.01$, $\beta=-0.11$, $t(409)=-1.51$, n.s. The results are consistent with the hypothesis that role-related need satisfaction functions as a mediator of the association between perceptions of emotional support from a partner and depression. The Sobel test ($Z=-2.86$, $p<0.01$) also supported this interpretation.

Cross-lagged Models

Analytic plan

The availability of multiple waves of data provides a valuable opportunity to test the ways in which changes in perceived partner support and role-related need satisfaction may be associated with changes in depression while controlling for the stable aspects of these variables measured across time. A path model was fit in MPLUS (Muthén & Muthén, 2001) using maximum likelihood estimation.

Results

The results of the path model are also presented in Figure 1. Only the paths that are statistically significant are shown. Stationarity for causal paths across time between the same constructs was assumed (i.e. assuming causal effects do not change in magnitude over time; Breckler, 1990; Little, Preacher, Selig, & Card, 2007).

According to goodness of fit indices outlined in Hu and Bentler (1998) and McDonald and Ho (2002), the final model provided a good fit to the data, $\chi^2(98)=113.18$, $p>0.10$, $CFI=0.99$, $TLI=0.99$, $RMSEA=0.03$.² As shown in Figure 1, our final model revealed that breast cancer survivors who perceived higher levels of partner emotional support at Wave 1 also reported greater role-related need satisfaction at Wave 1. Breast cancer survivors who perceived high levels of role-related need satisfaction at Wave 1 reported a decrease in depressive symptoms from Wave 1 to Wave 2. Moreover, controlling for previous reports of depression and perceived partner support, there was evidence that breast cancer survivors who perceived higher levels of partner support at Wave 2 reported greater role-related need satisfaction at Wave 2, which, in turn, was associated with a decrease in depressive symptoms from Wave 2 to Wave 3.

Consistent with previous findings (e.g. Brady & Helgeson, 1999), the results also revealed that breast cancer survivors who reported greater levels of depression at Wave 1 perceived a marginal decrease in partner emotional support from Wave 1 to Wave 2. Notably, there was also evidence that breast cancer survivors who reported greater levels of depression at Wave 1 perceived a decrease in partner instrumental support from Wave 1 to Wave 2. Similarly, controlling for previous reports of depression and the respective type of perceived partner support, there was evidence that breast cancer survivors who reported higher levels of depression at Wave 2 reported a marginal decrease in partner emotional support from Wave 2 to Wave 3, as well as in a notable decrease partner instrumental support from Wave 2 to Wave 3.

further the importance of partner instrumental support for breast cancer survivors, we conducted an exploratory analysis including this Wave 3 measure of relationship satisfaction in our cross-lagged model. We did so by regressing relationship satisfaction on Wave 3 reports of instrumental social support, emotional social support, and depression. The results of this revised model, $\chi^2(113) = 140.19$, $p < 0.05$, CFI = 0.98, TLI = 0.98, RMSEA = 0.04, revealed that, at Wave 3, both perceived partner instrumental support and emotional support were uniquely associated with levels of relationship satisfaction (while controlling for the association between depression and relationship satisfaction). These findings provide some evidence that breast cancer survivors' perceptions of instrumental support are important for their adjustment.

Discussion

The present study examined the ways in which women's perceptions of social support from an intimate partner and need satisfaction in their partner role influenced depression during and after radiation treatment for breast cancer. The findings corroborate those of previous studies of breast cancer survivors and compliment the larger literature on the importance of relational need fulfilment and psychological adjustment (e.g. Prager & Buhrmester). More importantly, the findings uncover new evidence about the nature of the relationships between perceived social support, role-related need satisfaction, and depression among breast cancer survivors.

Consistent with previous studies (e.g. cf Alferi et al., 2001; Epping-Jordan et al., 1999; Manne et al., 2005; Stommel, Kurtz, Kurtz, Given, & Given, 2004), the present results reveal that breast cancer survivors experience normative decreases in depression during the months following breast cancer treatment. Our findings also confirm concurrent negative associations between breast cancer survivors' perceptions of partner emotional support and levels of psychological distress (Alferi et al., 2001; Brady & Helgeson, 1999; Helgeson & Cohen, 1996; Manne et al., 2005; Nelles et al., 1991), but did not support these associations with partner instrumental support. The current research extends studies (Bloom, 1982; Brady & Helgeson, 1999) that have examined mediating factors that may further account for the robust relationship between perceived social support and psychological distress among breast cancer survivors.

Importantly, the results suggest that higher levels of psychological need satisfaction in the partner role are associated with lower levels of depression. These results are consistent with those reported by Bettencourt and Sheldon (2001) but are among the first to reveal these associations with (1) a measure of depression, (2) a sample of breast cancer survivors and (3) a focus on the role of intimate partner. Moreover, the present study provides new evidence that partner-role need satisfaction mediates concurrent relationships between perceived partner support and depression during and after breast cancer treatment. These latter findings are among the first to provide empirical evidence that support Ryan and Solky's (1996; see also Deci & Ryan, 1991) theories that supportive social relationships contribute to basic psychological need satisfaction, which, in turn, influences psychological adjustment. Notably, our analysis of change over time supported that need satisfaction within the partner role partially accounts for the influence of perceived partner emotional support on changes in depression over time.

The current findings suggest that breast cancer survivors' levels of depression prospectively predict perceptions of partner emotional and instrumental social support, such that higher levels of depression predict somewhat reliable declines in survivors'

perceptions of their partner's emotional support and considerable declines in perceptions of their partner's instrumental support. These latter results are consistent with a small set of similar findings (Alferi et al., 2001; Brady & Helgeson, 1999). These results contribute to the growing literature suggesting that a lack of psychological health may erode social support for breast cancer survivors (e.g. Alferi et al., 2001). Finally, our exploratory analyses provided some evidence that perceived partner emotional and instrumental support are both independent predictors of relationship satisfaction in samples of breast cancer survivors (see also Wimberly, 2008).

There are several limitations associated with the current report. First, these findings can only provide tentative evidence for a 'causal' chain linking perceived partner support, partner-role need satisfaction, and depression levels. Nevertheless, longitudinal methods may be the most appropriate for uncovering compelling evidence for causal and reciprocal effects when studying patient samples. Second, although the findings suggest that greater levels of depression may erode social support from a partner, in this study, only self-reported perceptions of partner support but not actual instances of partner support were measured (Bolger et al., 1996). Nevertheless, Manne et al. (2005) provide evidence that it is a survivors' perceptions of a partner's behaviour, as opposed to their partner's reports of her or his own behaviour, that are most important in predicting their own levels of depression. Third, although the magnitude of some effect sizes were relatively small, these findings are consistent with other health-related research that often finds that effect sizes are small because outcomes are multiply determined (Pierce et al., 2000). Studies suggest that the maximum value of any one effect decreases as the number of potential predictors increases (Adahi & Diener, 1989; Strube, 1991). Considering how many factors are related to depression, especially during times of adverse health, it is expected that some of the associations account for a relatively small amount of variance. Finally, the participants in our sample were female, predominately White/Caucasian, and all were residents in Missouri, and as such, the findings may be limited in their generalisability.

Notwithstanding these limitations, these findings are among the first to provide empirical support for the hypothesised associations between social support, role-related need satisfaction, and depression among breast cancer survivors who are in marital and cohabiting relationships. Supporting theorising that quality interactions and partner social support may be associated with greater role-related need satisfaction within relationships (Bettencourt et al., 2006; see also Ryan & Solky, 1996), the current study provided evidence that, for breast cancer survivors, perceptions of partner social support were indicative of feelings of psychological need satisfaction within the partner-role specifically. Theories by Ryan & Solky (1996) suggests that relationships that contribute to the satisfaction of basic psychological needs decrease psychological distress because these relations foster enhanced self-regard, acceptance, and feelings of connectedness.

Future directions and clinical implications

The present findings suggest important areas for future studies of the psychological experiences of breast cancer survivors in intimate relationships. First, whereas we focused on survivors' levels of depression, future studies should examine the association between role-related need satisfaction and other important outcomes. For example, future studies may want to examine interpersonal outcomes, such as relationship functioning (Harter, 1997; Rankin-Esquer, Burnett, Baucom, & Epstein, 1997), as well as intrapersonal indicators of eudemonic happiness, which are more often the focus of Self-Determination

Theory research. Second, future research may seek to provide a better understanding of the examined relationships over a longer period of time, as these processes may continue to change over the course of survivorship. Third, the present focus was on the intimate partner role because it has been suggested that intimate relationships are particularly influential in breast cancer survivors' recovery (Alferi et al., 2001; Bolger et al., 1996), as compared to other close relationship partners (e.g. female family members, friends). Nevertheless, because breast cancer survivors are likely to have a number of social roles that contribute to their need satisfaction, future studies should examine psychological need satisfaction in other social roles. Finally, we expect that the results of this study will replicate in other patient groups, but this assertion has yet to receive empirical support.

The present research confirms that intimate relationship partners play an important role in the treatment and recovery process of breast cancer patients and survivors. At the broadest level, our findings suggest that therapies involving breast cancer survivors may want to focus more on interpersonal and spousal relationships (e.g. Christensen, 1983; Manne et al., 2005). To date, researchers that have implemented couple-based interventions have reported positive effects on individual and relationship functioning (Baucom et al., 2008; Manne et al., 2007). As Hagedoorn et al. (2008) notes, distress in couples coping with cancer is characterised as an 'interdependent emotional system' in which one partner may transmit distress to the other via emotional contagion. Thus, in order for relationship partners to avoid a downward spiral of mutually reinforced psychological distress, it is important for couple-focused interventions to focus on mutual, supportive communication between intimate partners (Manne et al., 2007). Another beneficial avenue for couple-focused interventions may include a focus on basic need satisfaction within the relationship. The current work suggests that when fulfilling her social roles, it is vital that a survivor feels that her behaviour is freely chosen and accepted by other role partners. Ultimately, we must seek to better understand how close relationships contribute to the psychological adjustment of breast cancer survivors in particular and cancer survivors in general.

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Notes

1. No information was collected regarding participants' sexual orientation. Eligible breast cancer survivors only need to self-report that they were in a spouse or partner role and that they were married or cohabitating.
2. We also tested an alternative mediation model with a path from perceived partner emotional support at Wave 1 (controlling for covariates and perceptions of instrumental partner support) pointed to role-related need satisfaction at Wave 2 ($\beta=0.09$, $SE=0.01$, $p<0.001$) and a path from role-related need satisfaction at Wave 2 pointed to depression at Wave 3 ($\beta=-0.25$, $SE=0.05$, $p<0.001$). Finally, a direct path from perceived partner emotional support at Wave 1 to depression at Wave 3 was included ($\beta=0.00$, $SE=0.01$, $p>0.20$). Although this model does not use all available data points, it provided an acceptable fit to our data, $\chi^2(10)=19.02$, $CFI=0.97$, $TLI=0.95$, $RMSEA=0.07$. These results were highly consistent with our hypotheses and provided the added benefit of replication of our overall model.

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