Predictors of Social Support and Psychological Distress in Women with Breast Cancer

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Abstract

This investigation sought to understand previous well-cited and worrisome findings that women treated for breast cancer with breast-conserving surgery compared to mastectomy experience less social support and more mood disturbance, and that social support from significant others erodes over time. Ninety-three women with breast cancer and a subset of their partners completed assessments at the time of surgical treatment and at 3 and 13 months post-treatment. Contrary to the previous findings, type of surgical treatment was not related to perceptions of social support or psychological functioning. Perceptions of social support and psychological distress decreased over time, and the discrepancy between recipients' and providers' judgments of available support increased over time. Low levels of physical functioning led to relative increases in social support, whereas high levels of psychological distress led to relative decreases in social support. Social support as rated by patients (but not their partners) was a significant predictor of changes in psychological distress.

Keywords
breast cancer, breast-conserving treatment, mastectomy, psychological distress, social support
Breast cancer threatens a woman's well-being in many ways. In addition to the physical challenges of a life-threatening illness, the psychological demands are also formidable. The course of breast cancer diagnosis, treatment, recovery, and long-term survival can contribute to psychological distress and increase the need for support. Social support, the resources provided by members of an individual's social network, is expected to be helpful during stressful situations such as dealing with illness. It may consist of instrumental, emotional, informational, or appraisal aid (House, 1981; Schaefer, Coyne, & Lazarus, 1981). Each type of assistance might be useful in dealing with the specific challenges that cancer presents, such as limitations in carrying out one's usual responsibilities, fears and concerns about the illness, clarification of treatment options, and needs for reassurance. However, there is also the possibility that intended assistance from others during an illness is unhelpful, misconstrued, inappropriate, or threatening to autonomy or self-worth (Revenson, Wollman, & Felton, 1983; Tempelaar et al., 1989; Wortman, 1984).

In studies of breast cancer patients, there is evidence that social support is associated with psychosocial benefits. For example, perceptions of available social support are, not surprisingly, related to psychological adjustment (Ell, Nishimoto, Morvay, Mantell, & Hamovitch, 1989; Funch & Mettlin, 1982; Irvine, Brown, Crooks, Roberts, & Browne, 1991; Lichtman, Taylor, & Wood, 1987; Neuling & Winefield, 1988; Zemore & Shepel, 1989). Interventions providing informational and emotional support from specialized breast care nurses have also been shown to ameliorate psychological distress (McArdle et al., 1996). Some investigations have studied the mechanisms by which social support might exert positive effects, such as through coping and self-reliance (Bloom 1982; Funch & Marshall, 1984). Another investigation revealed that social desirability accounted for much of the relationship between reported levels of social support and psychological adjustment, suggesting that characteristics of the person, rather than the situation, underlie the relationship between perceived social support and adjustment to breast cancer (Roberts, Cox, Shannon, & Wells, 1994).

Social support could be positively related to the prognosis and course of breast cancer, such as length of time to recurrence and survival, but results remain mixed (for reviews, see Reifman, 1995; Spiegel & Kato, 1996; Vernon & Jackson, 1989). In one investigation, although levels of perceived social support did not predict whether women with early stage breast cancer suffered a recurrence 5 years later, they did marginally predict longer time to recurrence in those whose cancer returned (Levy, Herberman, Lippman, D'Angelo, & Lee, 1991). Another group of investigators demonstrated that number of supportive friends, employment, extent of contact with friends, and size of social network assessed shortly after breast cancer diagnosis were related to survival 4 years later, even after controlling for clinical factors such as stage of disease and nodal status (Hislop, Waxler, Coldman, Elwood, & Kan, 1987; Waxler-Morrison, Hislop, Mears, & Kan, 1991). In contrast, being unmarried was also a significant predictor of survival. Social support has been associated with longer survival in studies of naturally occurring support and interventions that facilitated emotional support from peers (Maunsell, Brisson, & Deschénes, 1995; Spiegel, Bloom, Kraemer, & Gottheil, 1989).

Some findings concerning the role of social support have been less encouraging with respect to both its availability to women with breast cancer and its benefits. For instance, although breast-conserving surgery was developed with the intention of improving quality of life and, when combined with radiation therapy, is as effective as mastectomy for early-stage disease (Jacobson et al., 1995), women treated with these breast-sparing procedures are not necessarily psychosocially better off. One well-known prospective study reported that women treated with lumpectomy and radiation experienced less emotional support and more psychological distress during their recovery than women treated with mastectomy (Levy, Herberman, Lee, Lippman, & d'Angelo, 1989; Levy et al., 1992). Thus, it is important to determine if these detrimental effects for social support and psychological functioning are robust and replicable. In the first report of Levy et al.'s 3-month follow-up (1989), which included two distinct samples, the findings were somewhat mixed. Although in one sample the lumpectomy group scored significantly higher than the mastectomy
group on several of the subscales of mood disturbance, for the other sample, the only differences following surgery were marginal trends in the opposite direction on two of the subscales. In the 15-month follow-up report (1992), which focused on the first sample, levels of support for the mastectomy group were higher, but no longer significantly so. Group differences in mood were also attenuated at 15 months.

Only a few other investigations have examined levels of social support offered to women treated with breast-conserving versus more radical types of surgery. Steinberg, Juliano, and Wise (1985) assessed social support retrospectively (seemingly with a single item) about 14 months after surgery. Women treated with lumpectomy reported receiving more support than women treated with mastectomy. Two cross-sectional studies used a single item to assess how much support women received 2–60 months and 10–48 months post-surgery (Taylor et al., 1985; Yilmazer, Aydinler, Özkam, Aslay, & Bilge, 1994). No relationship between type of surgery and level of support was observed in either one. Pozo et al. (1992) used a multiple-item measure of support, a brief adaptation of a widely-used instrument (Cohen & Hoberman, 1983), in a study with a fully prospective design. Patients were assessed a day before surgery, 10 days after surgery, and 3, 6, and 12 months following surgery. Similarly, no differences in levels of social support between women treated with lumpectomy versus mastectomy were found at any point in time. In another prospective study that used a single-item assessment of social support, no group differences were found (Schain, d’Angelo, Dunn, Lichter, & Pierce, 1994).

In another longitudinal study, the support provided to breast cancer patients by significant others eroded over time; supporters withdrew in response to psychological distress, and the support they did provide was not instrumental in promoting physical recovery or diminishing distress (Bolger, Foster, Vinokur, & Ng, 1996). These findings bolster the notion that extreme life crises such as breast cancer tend to overwhelm close others’ supportive capacities rather than mobilize them (Bolger et al., 1996). Such erosion may stem from significant others’ unique position as supporters. They have two sources of stress to contend with: concerns about their partner’s health and future, and concerns about their own potential losses as a result of their loved one’s illness (Davis-Ali, Chesler, & Chesney, 1993). Further examination of the robustness of such a finding is also crucial to determine the long-term effectiveness of social support in severe circumstances such as life-threatening illness.

The purpose of this investigation was to examine more closely these worrisome findings concerning social support and psychological distress in women with breast cancer. We wished to verify whether type of surgical treatment is related to levels of social support and psychological distress, if, in general, levels of available social support erode over time, and how social support relates to later psychological distress. It has been documented that common ways of assessing social support, such as ratings of perceived support made by the recipient, may have limited validity. Although correlations between support recipients’ and providers’ views of support exchanged are moderate to high (Antonucci & Israel, 1986; Hobfoll & Lerman, 1989), agreement for the occurrence of specific behaviors, when corrected for chance, is low (Coriell & Cohen, 1995). Thus, in addition to recipients’ perceptions of the social support they receive, significant others’ perceptions of the social support available to recipients were also assessed. We examined the extent of discrepancies in recipients’ and significant others’ judgments of levels of social support as it might also represent an important factor contributing to psychological adjustment. Another reason for including another’s view of the support received is concern that dispositional or mood-related response biases play a role in the relationship between self-report measures of social support and psychological adjustment (Bolger et al., 1996; Vinokur, Schuler, & Caplan, 1987; Watson & Pennebacker, 1989; but see Cohen, Towbes, & Blocco, 1988). Finally, because partners represent an important source of support for women with breast cancer (Neulinger & Winefield, 1988; Pistrang & Barker, 1995; Smith, Redman, Burns, & Sagert, 1985), we focused on the support received from spouses or other partners.

This investigation examined the following questions: (a) does type of surgical treatment
predict levels of perceived social support and psychological functioning over the course of treatment and recovery? (b) to what extent do patients and their partners agree upon the amount of support received? (c) to what extent do factors such as psychological distress and physical functioning predict changes in social support over time? and (d) to what extent do levels of social support and recipient/provider discrepancies in social support predict changes in psychological status over time?

**Method**

**Participants**

Participants were 93 breast cancer patients recruited from a single hospital, 54 of whom were treated with breast-conserving surgery and 39 of whom were treated with mastectomy. Demographics for the sample are given in Table 1. The sample was predominantly White (96 percent), married (61 percent), and well educated (50 percent reporting a college education). In terms of religion, 40 percent were Catholic, 29 percent Protestant, 13 percent Jewish, and 19 percent indicated other or no religious affiliation.

**Procedure**

Potential participants were identified consecutively with an on-line record of pathology reports indicating newly diagnosed breast cancers. After obtaining permission from surgeons to contact patients, an invitation to take part in the study was mailed. Participants completed questionnaires at the time of their surgical

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**Table 1. Demographic characteristics of sample (N = 93)**

<table>
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<th>Variable</th>
<th>%</th>
<th>Variable</th>
<th>Mean</th>
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<tr>
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treatment (the majority shortly after their surgery), and 3 and 13 months post-treatment. The response rate to the first questionnaire was 46 percent, and 78 percent of those who answered the first questionnaire completed all three questionnaires. Where applicable, participants’ spouses and partners also answered a brief questionnaire. The analyses presented here are confined to 93 respondents who completed all three assessments, had in situ or early stage breast cancer and no previous breast cancer or bilateral breast cancer, and 59 of their spouses or partners who also completed all three assessments.

Demographic and disease-related characteristics were assessed at time of surgical treatment. The outcome measures were assessed at all three time points. Social support and mood disturbance were evaluated in the same way as in Levy et al.’s (1992) investigation. An additional measure of social support particular to patient populations and a measure of psychological distress were also included. Self-reported physical health status was also assessed as a potential control variable. Spouses and partners provided their judgments of the levels of social support they thought were available to their significant others on the same scales used for participants.

**Measures**

**Social support** The Social Support Scale (SSQ; Northouse, 1988) was used to assess the quality of emotional support that respondents perceived was available from spouses, relatives, friends, and health professionals. Emotional support has shown to be particularly helpful to cancer patients (Dunkel-Schetter, 1984). High levels of internal consistency and content and concurrent validity have been reported for this scale in a sample of mastectomy patients and their husbands (Northouse, 1988). Cronbach’s alpha for this scale in this sample ranged from .84 to .92 over the three time points. For judgments by spouses and partners, the range was .73 to .77.

The Medical Outcomes Study (MOS) Social Support Survey (Sherbourne & Stewart, 1991) was included because it assesses aspects of support particularly applicable to patient populations. It includes emotional/informational, tangible, and affectionate support, and positive social interaction. High internal consistency and discriminant validity were reported (Sherbourne & Stewart, 1991). Cronbach’s alpha for the total score in this sample ranged from .95 to .98 over the three time points. For judgments by spouses and partners, the range was .93 to .95.

**Mood disturbance and psychological distress** The Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1981) is a 65-item instrument assessing mood disturbance. It has been used in previous studies with breast cancer patients and high levels of internal consistency have been reported (Carver et al., 1993; Ganz, Schag, Lee, Polinsky, & Tan, 1992; Levy et al., 1992; Pozo et al., 1992; Wolberg, Romsaas, Tannen, & Malec, 1989). Convergent and discriminant validity have also been demonstrated (Reddon, Marceau, & Holden, 1985). Cronbach’s alpha for total mood disturbance in this sample ranged from .88 to .93 over the three time points.

The Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983) was included to assess psychological symptom status, beyond changes in mood. It is a 53-item scale developed from the Symptom Checklist-90-R that evaluates nine areas of psychological functioning. This instrument allows comparison to standardized norms for particular reference groups and has been used successfully in samples of breast cancer patients (Kemeny, Wellisch, & Schain, 1988; Schain et al., 1983). Its internal consistency, test–retest stability, and convergent, construct, and predictive validity have been documented in a number of populations including cancer patients (Derogatis, 1993). Cronbach’s alpha for the general severity index in this sample ranged from .94 to .96 over the three time points.

**Physical functioning** The Medical Outcomes Study (MOS) General Health Survey (Stewart, Hays, & Ware, 1988) provides a simple assessment of general health. It includes measures of physical functioning, role functioning, social functioning, mental health, health perceptions, and pain. Adequate validity has been established with breast cancer patients (Hughson, Cooper, Mc Ardle, & Smith, 1988). Because the subscales were highly intercorrelated in this sample and because we were most interested in a measure of physical health, only the physical
functioning subscale was used in the analyses presented here. Cronbach's alpha for this subscale in this sample ranged from .81 to .83.

Results

Surgical treatment group differences in demographic and health-related characteristics

The demographic characteristics of the sample are presented in Table 1. Before proceeding to the main analyses, the extent to which demographic and disease characteristics differed between surgical treatment groups was examined. It is important to account for physical status differences so that psychosocial effects may be attributed to type of surgical treatment rather than simply to medical or health-related factors. Physical condition and prognosis are related to levels of social support (Dunkel-Schetter, 1984) and are also likely related to levels of distress. Women treated with breast-conserving surgery did not differ from women treated with mastectomy in age, stage of disease, likelihood of having a partner (being married or living with a partner versus being single, separated, divorced, or widowed), or likelihood of being White versus non-White. On the physical functioning subscale of the MOS General Health Survey, there was a significant effect of type of surgical treatment over time, \(F(1, 77) = 7.00, p < .01\), indicating that women treated with mastectomy had poorer physical health. Thus, physical functioning was used as a covariate in subsequent analyses comparing surgical treatment groups.

Surgical treatment group differences in perceived social support, mood, and psychological functioning over time

The main analyses examining surgical treatment group differences in social support, mood, and psychological functioning were first performed without the physical health covariate and then repeated with the covariate. Table 2 shows the means and standard deviations for the two measures of social support, the POMS, and the BSI for the two treatment groups. Two-way ANOVAs were conducted with surgical treat-

<table>
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<tr>
<th>Measure</th>
<th>BCT</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>Treatment</th>
<th>Time</th>
<th>Treatment × time</th>
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<tbody>
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<td>Social Support Questionnaire</td>
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<tr>
<td>Surgical treatment, 3 months</td>
<td>33.89</td>
<td>3.74</td>
<td>34.01</td>
<td>4.12</td>
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<td>0.24</td>
<td>13.09†</td>
<td>0.06</td>
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<td>13 months</td>
<td>32.59</td>
<td>4.62</td>
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<tr>
<td>Surgical treatment, 3 months</td>
<td>82.91</td>
<td>13.21</td>
<td>83.56</td>
<td>13.37</td>
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<td>0.09</td>
<td>10.73†</td>
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<td>13 months</td>
<td>80.89</td>
<td>15.65</td>
<td>81.41</td>
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<td></td>
<td>79.83</td>
<td>16.41</td>
<td>76.74</td>
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<td>Profile of Mood States, total mood disturbance score</td>
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<tr>
<td>Surgical treatment, 3 months</td>
<td>37.16</td>
<td>25.37</td>
<td>40.79</td>
<td>36.56</td>
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<td>0.12</td>
<td>3.53*</td>
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<td>13 months</td>
<td>32.38</td>
<td>22.91</td>
<td>32.41</td>
<td>26.97</td>
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<td>28.60</td>
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<td>Brief Symptom Inventory, general severity index</td>
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<tr>
<td>Surgical treatment, 3 months</td>
<td>0.41</td>
<td>0.37</td>
<td>0.46</td>
<td>0.59</td>
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<td>0.12</td>
<td>4.43*</td>
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<td>13 months</td>
<td>0.36</td>
<td>0.32</td>
<td>0.39</td>
<td>0.42</td>
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<td>0.32</td>
<td>0.42</td>
<td>0.33</td>
<td>0.40</td>
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</table>

Note. Time points with different subscripts differ significantly at least the \(p < .05\) level. * Mean score over four sources of support (spouse or partner, family member, friend, and physician) for participants with spouses or partners and over three sources of support (family member, friend, and physician) for participants without spouses or partners. * \(p < .05\), † \(p < .0001\).
ment group (breast-conserving surgery and mas-
tectomy) as a between-subjects variable and
time (time of surgical treatment, and 3- and
13-month follow-up) as a within-subjects vari-
able. For the first measure of emotional social
support, the SSQ, there was no effect of treat-
ment group, a significant effect of time, and no
group by time interaction (see Table 2). Post-
hoc comparisons found that levels of social
support at 3- and 13-month follow-up were both
significantly lower than levels at the time of
surgical treatment. A similar pattern of results
was found for the second measure of social
support, the MOS Social Support Survey (see
Table 2). When each of these analyses was
repeated with physical functioning as a covari-
ate, the results remained the same.

For both the POMS total mood disturbance
score and the BSI general severity index, there
was a similar pattern of findings. For the POMS,
there was no effect of treatment group, a
significant effect of time, and no group by time
interaction (see Table 2). Post-hoc comparisons
indicated that mood disturbance scores at 13
months were significantly lower than at time of
surgical treatment. A similar pattern of findings
was observed for the BSI (see Table 2). When
each of these analyses was repeated with phys-
ical functioning as a covariate, the results were
similar except that there was no longer a
significant effect of time for mood disturbance.
Thus, in general, both levels of social support
and psychological distress decreased for both
surgical treatment groups from the time of
surgical treatment to a little over 1 year later.

In summary, there were no surgical treatment
group differences in levels of perceived social
support, mood, or psychological functioning,
even after controlling for physical status. Levels
of psychological distress were elevated but
within the normal range, and only a small
proportion of participants exhibited extreme
distress. For both groups, levels of mood dis-
urbance and psychological distress diminished
over time, as did levels of perceived social
support.

Partners’ ratings of available social
support and recipient/partner
discrepancies in ratings of available
social support

Another source of information about social
support was partners’ judgments of levels of
support available to participants. These judg-
ments can serve as a comparison to participants’
ratings and overcome the difficulty that response
biases may account for the relationship between
recipients’ ratings of perceived support and
other self-rated outcomes. The means and stand-
ard deviations for partners’ ratings of levels of
support available to participants by surgical
treatment group are shown in Table 3. An index
of recipient/partner discrepancies in judgments
of available social support was constructed by
subtracting respondents’ ratings from those of
their partners for the SSQ and the MOS Social
Support Survey. These values are shown also in
Table 3. The extent of agreement might be a
more revealing indicator than one partner’s
perceptions of support alone. For instance, nega-
tive values indicate that partners are over-
estimating the support available relative to re-
cipients’ ratings (this may represent a more
negative situation); positive values indicate that
partners are understimating the support avail-
able relative to recipients’ ratings (this may
represent a more positive situation). This index,
however, only indicates the relative disagree-
ment between perceptions of participants and
their partners. It is unknown whether observed
differences represent distortion on the part of
one, the other, or both individuals.

First, surgical treatment group differences
over time in partners’ ratings of available social
support were assessed using a two-way, mixed-
model ANOVA with surgical treatment group as
a between-subjects variable and time as a
within-subjects variable. For the SSQ, there was
no effect of treatment group, time, or a group by
time interaction (see Table 3). A similar pattern
of results was observed for the MOS Social
Support Survey (see Table 3). In contrast to
what was observed in the ratings of participants
themselves, partners did not perceive a decline
in the amount of support available to the women
over time.

Second, group differences over time in patient/
partner discrepancies in judgments of social sup-
port were assessed using a similar two-way,
mixed-model ANOVA. For the SSQ, there was
no effect of treatment group, time, or a group by
time interaction (see Table 3). For the MOS
Social Support Survey, there was no effect of
group, there was a significant effect of time, but

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Table 3. Partners’ ratings of available social support and recipient/partner discrepancies in ratings of social support by surgical treatment group

<table>
<thead>
<tr>
<th>Measure</th>
<th>BCT</th>
<th></th>
<th></th>
<th>F</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M  SD</td>
<td>M  SD</td>
<td>Treatment</td>
<td>Time</td>
<td>Treatment</td>
<td>Time</td>
</tr>
<tr>
<td>Perceived Social Support Questionnaire</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Surgical treatment</td>
<td>32.68 4.54</td>
<td>34.08 3.96</td>
<td>0.14</td>
<td>0.31</td>
<td>0.94</td>
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<tr>
<td>3 months</td>
<td>33.76 4.32</td>
<td>33.58 4.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 months</td>
<td>32.91 4.08</td>
<td>33.13 4.78</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS Social Support Survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical treatment</td>
<td>84.98 9.01</td>
<td>85.04 8.95</td>
<td>0.00</td>
<td>0.96</td>
<td>0.70</td>
<td></td>
</tr>
<tr>
<td>3 months</td>
<td>84.94 9.91</td>
<td>84.70 10.28</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 months</td>
<td>83.81 10.41</td>
<td>85.00 10.80</td>
<td></td>
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<td></td>
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<tr>
<td>Recipient/partner discrepancies in available</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Support Questionnaire</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical treatment</td>
<td>0.28 5.12</td>
<td>-0.54 6.37</td>
<td>0.00</td>
<td>2.81</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>3 months</td>
<td>-0.36 5.45</td>
<td>0.26 5.42</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 months</td>
<td>-0.66 4.01</td>
<td>0.50 5.90</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS Social Support Survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical treatment</td>
<td>1.32 10.97</td>
<td>3.48 10.65</td>
<td>0.27</td>
<td>3.95*</td>
<td>0.56</td>
<td></td>
</tr>
<tr>
<td>3 months</td>
<td>0.74 10.82</td>
<td>2.61 11.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 months</td>
<td>-0.94 13.14</td>
<td>-1.61 12.64</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Time points with different subscripts differ significantly at least the p < .05 level. * p < .05.

no group by time interaction (see Table 3). Post-hoc comparisons verified that the discrepancy at 13-month follow-up was significantly more negative than the discrepancy at time of surgical treatment, indicating that the extent that partners thought that there was more support available, relative to patients, increased over time.

Predictors of levels of social support and psychological distress over time

The previous analyses indicated that for both groups, perceived social support and psychological distress decreased over time. Next, predictors of changes in levels of social support and psychological distress, as well as the relations among these variables, were examined. Specifically, prior levels of social support, psychological distress, and physical functioning (assessed at 3-month follow-up) were used to predict changes (from 3-month to 13-month follow-up) in the MOS Social Support Survey and the BSI because both psychological distress and physical impairment could play a role in mobilizing social support. We chose to focus on the MOS Social Support Survey because it is especially relevant to patient populations and the BSI because it is a measure of more global psychological functioning beyond changes in mood. Because there were no differences in social support and psychological distress over time, these analyses were conducted collapsing across the two surgical treatment groups. Partners’ judgments of available social support were used in these analyses to avoid the difficulty of response bias introduced by using recipients’ perceptions of both social support and psychological adjustment.

Results were analyzed with both bivariate correlations and multiple regression analyses. Means, standard deviations, and Pearson correlations appear in Table 4. The bivariate correlations indicate no associations among the predictors and changes in social support. Physical functioning at 3 months was positively associated with increases in psychological distress, whereas psychological distress at 3 months was associated with decreases in psychological distress. The bivariate correlations also indicate
intercorrelations between predictors: social support and physical functioning at 3 months are positively related and physical functioning and psychological distress at 3 months are negatively related.

Levels of social support and psychological distress after 13 months were each regressed on the linear combination of physical functioning, social support, and psychological distress assessed at 3-month follow-up. The equations containing these three predictors accounted for 25 percent of the variance in the change in social support during this time interval, and 31 percent of the variance in the change in psychological distress during this time interval. The beta weights and uniqueness indices used to assess the relative importance of the three predictors in each regression are shown in Tables 5 and 6. The uniqueness index for a given predictor is the percentage of variance in the criterion accounted for by that predictor, beyond the variance accounted for by the other predictor variables. For changes in levels of social support, 3-month psychological distress and physical functioning had significant beta weights and uniqueness indices, accounting for 17 percent and 8 percent of the variance, respectively. For changes in psychological distress, only 3-month psychological distress had a significant beta weight and uniqueness index and accounted for 23 percent of the variance. Thus, poor physical functioning at 3 months led to relative increases in, or mobilization of, social support, whereas psychological distress led to relative decreases in, or erosion of, social support. In addition, levels of social support at 3 months were not associated with changes in psychological functioning.

The analyses predicting changes in psychological functioning were repeated using the patients’ own judgments of social support. This variable emerged as a significant predictor of relative decreases in psychological distress. In addition, the analyses were also repeated including both patients’ and partners’ judgments of social support and the interaction between them in order to test if the discrepancy in patient/partner ratings contributed to psychological distress. In this analysis neither party’s judgment of social support, nor their interaction emerged as a significant predictor.

Table 4. Means, standard deviations, and intercorrelations among changes in social support and psychological functioning from 3-month to 13-month follow-up and predictors used in multiple regression analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Change in social support</td>
<td>−0.42</td>
<td>7.34</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Change in psychological distress</td>
<td>−0.07</td>
<td>0.21</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Available social support rated by partners (MOS SS)</td>
<td>84.58</td>
<td>10.14</td>
<td>−.23</td>
<td>.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Psychological distress (BSI)</td>
<td>0.32</td>
<td>0.34</td>
<td>−.19</td>
<td>−.51**</td>
<td>−.24</td>
<td></td>
</tr>
<tr>
<td>5. Physical functioning</td>
<td>83.98</td>
<td>15.01</td>
<td>−.24</td>
<td>.32*</td>
<td>.54***</td>
<td>−.54***</td>
</tr>
</tbody>
</table>

Note. N = 43. * At 3 months.
* p < .05, ** p < .01.

Table 5. Beta weights and uniqueness indices obtained in multiple regression analyses predicting change in social support from 3-month to 13-month follow-up

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Beta</th>
<th>t</th>
<th>Uniqueness index</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Social support (MOS)</td>
<td>−.10</td>
<td>0.65</td>
<td>.01</td>
<td>.42</td>
</tr>
<tr>
<td>2. Psychological distress (BSI)</td>
<td>−.45</td>
<td>3.10**</td>
<td>.17</td>
<td>9.60**</td>
</tr>
<tr>
<td>3. Physical functioning</td>
<td>−.36</td>
<td>2.11*</td>
<td>.08</td>
<td>4.46*</td>
</tr>
</tbody>
</table>

Note. N = 47. R² = .25, F(3, 43) = 4.77, p < .01, adjusted R² = .20. * At 3 months.
* p < .05, ** p < .01.
Table 6. Beta weights and uniqueness indices obtained in multiple regression analyses predicting change in psychological distress from 3-month to 13-month follow-up

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Beta weights</th>
<th></th>
<th>Uniqueness indices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta</td>
<td>t</td>
<td>Index</td>
</tr>
<tr>
<td>1. Social support (MOS)*</td>
<td>.00</td>
<td>0.00</td>
<td>.00</td>
</tr>
<tr>
<td>2. Psychological distress (BSI)*</td>
<td>-.55</td>
<td>3.73***</td>
<td>.23</td>
</tr>
<tr>
<td>3. Physical functioning*</td>
<td>.03</td>
<td>0.14</td>
<td>.00</td>
</tr>
</tbody>
</table>

Note. N = 45, R² = .31, F(3, 41) = 6.22, p < .005, adjusted R² = .26. *At 3 months.
** p < .01, *** p < .001.

Discussion

This investigation identified no differences in perceptions of social support, mood, or psychological functioning in women receiving breast-conserving surgical treatment versus mastectomy. For both groups, levels of mood disturbance and psychological distress decreased significantly from the time of surgical treatment to 13-months post-treatment. Perceived social support also decreased over time. In contrast, partners' ratings of the support available to recipients did not change over time and, accordingly, recipient/partner discrepancies in judgments of available support increased, perhaps indicating that the exchange of support became less harmonious over time. Furthermore, although low levels of physical functioning predicted relative increases in levels of social support, high levels of psychological distress predicted relative decreases in social support. Levels of social support judged by patients (but not partners) were a significant predictor of changes in psychological distress. The interaction between patient and partner judgments of social support did not predict changes in psychological distress.

The pattern of findings seen here regarding surgical treatment groups does not replicate Levy et al.'s (1989, 1992) findings of lower levels of social support and elevated psychological distress in women receiving lumpectomy versus mastectomy, but concurs with the results of other studies. This failure to replicate Levy et al.'s findings could be seen both with the measures of social support and mood disturbance used in Levy et al.'s investigation and with additional measures of social support and psychological status.

The present findings of no surgical treatment group differences in mood and psychological distress are consistent with a number of other studies comparing breast-conserving surgery versus mastectomy that have also used the POMS (Ganz et al., 1992; Pozo et al., 1992; Steinberg et al., 1985) and the BSI (Kemeny et al., 1988; Wellisch et al., 1989), although higher levels of vigor measured by the POMS in patients treated with breast-conserving surgery were reported in one investigation (Wolberg et al., 1989). In addition, several studies using other instruments have yielded results similar to these (e.g. Baider, Rizel, & Kaplan De-Nour, 1986; Fallowfield, Hall, Maguire, & Baum, 1990; Ganz et al., 1992; Meyer & Aspegren, 1989; Morris & Royle, 1988; Schain et al., 1983). A review of 40 investigations using meta-analytic techniques, which can detect subtle patterns across studies, found benefits for breast-conserving surgeries compared to mastectomy in terms of psychological functioning contrary to the paradoxical Levy et al. (1992) results (Moyer, 1997).

It is important to address the possible reasons why the findings of the current study and those of Levy et al. (1992) do not agree. Because the same measures were administered at similar points in time, it is unlikely that these aspects of the design are responsible. One difference is the method of participant recruitment. In Levy et al.'s (1992) study, a research nurse recruited subjects in person from surgeon's offices and fewer than 5 percent of the eligible patients refused to participate. In the present study, due to recruitment by mail, the refusal rate was higher, and this could have introduced a selection bias, perhaps for participants who were more physically well, optimistic, and psychologically healthy.
We also observed that patients' (but not partners') perceptions of available social support decreased over time. One means by which social support might decline in women with breast cancer is through limitations in social activities and opportunities for social exchange (Bloom & Kessler, 1994; Bloom & Spiegel, 1984). Alternatively, their need for support may decrease over the course of recovery. This notion is strengthened by the fact that psychological distress also diminished in our sample and the psychosocial disruption of breast cancer has been found to attenuate at about 1 year elsewhere (Schover et al., 1995).

Recipient/partner discrepancies increased over time, prompting the question of why this might have occurred. It is possible that supporters burn out, withdraw, or provide support that is increasingly unhelpful. Peters-Golden (1982) showed that a large proportion of women with breast cancer reported that support from others was inadequate and often inappropriate. In another investigation of cancer patients, withdrawal and problems with communication were found to be more prevalent with friends and acquaintances than close family members (Dakof & Taylor, 1990). As mentioned before, however, we have no indication which partner's perception is more accurate. There is some evidence that spouses of cancer patients handle the illness less well, feel more uncertain, worry more, and receive less support than patients themselves (Davis-Ali, Chesler, & Chesney, 1993; Northouse, Laten, & Reddy, 1995). Perhaps this burden means that attempts by partners to be supportive to them feel quite effortful, but they are perceived by recipients to be less so. Discovering the particular difficulties that supporters of individuals with cancer encounter could be a consideration for future research.

The present findings concur with Bolger et al.'s (1996) observations in that recipient distress predicted relative decreases in social support whereas physical limitations predicted relative increases. It has been observed elsewhere that partners of breast cancer patients may be more sensitive (and perhaps more receptive) to physical, rather than emotional cues of distress, but this could be a result simply of gender (Northouse, Dorris, & Charron-Moore, 1995). The effect of gender on responsiveness to physical versus psychological elicitation of social support could be a focus for further investigation. Despite the fact that patient/partner discrepancies increased over time, the interaction of these judgments was not found to predict changes in psychological distress. This suggests that, in addition to some of the more fine-grained approaches to the study of social support in cancer, such as considering the source of support and which behaviors are helpful versus unhelpful (e.g., Gurowka & Lightman, 1995; Martin, Davis, Baron, Suls, & Blanchard, 1994; Primono, Yates, & Woods, 1990; Rose, 1990), support recipient/provider discrepancies are also a valuable addition.

As screening technology allows earlier detection of cancer and as treatment improves, cancer will represent a chronic rather than a terminal disease, requiring assistance in living with the illness (Spiegel, 1993). A number of professionally and non-professionally led supportive interventions for cancer now exist (Glanz & Lerman, 1992; Willits, 1994) and they appear, in general, to be beneficial (Meyer & Mark, 1995). Reviewers have noted, however, that although correlational studies generally indicate that emotional support is beneficial for psychological adjustment, in contrast, interventions that provide peer emotional support from others with cancer seem to be no more helpful than those that provide information or education (Helgeson & Cohen, 1996; Meyer & Mark, 1995). In general, family and church communities appear to play a more important social support role for individuals with cancer than groups of cancer patients (Guidry, 1994). With limited resources for supportive intervention, and because currently small proportions of cancer patients participate in support groups (Ell, Nishimoto, Mediansky, Mantell, & Hamovitch, 1992; Taylor, Falke, Shoptaw, & Lichtman, 1986), it is important to consider viable alternatives. Thus, an important question to resolve would be the effectiveness of natural support from those already in an individual's social network versus supportive interventions (Nelles, McCaffrey, Blanchard, & Ruckdeschel, 1991). Future research might focus on support partners and how best to foster helpful behaviors from them. For instance, one investigation found that how helpful it was to disclose to a partner was more strongly associated with breast cancer patients' adjustment than their general relationship satisfaction, suggest-
ing that interventions focusing on communication, which is more amenable to change than relationship satisfaction, would be fruitful (Pistrang & Barker, 1995). Or, individuals could be coached how effectively to elicit support from their environment (Helgeson & Cohen, 1996).

Finally, a limitation of this investigation is that the 46 percent response rate can be considered low. However, comparable return rates for mailed questionnaires in women with breast cancer are common (Mock, 1993; Schover et al., 1995; Taylor et al., 1985; Wellisch et al., 1989). Clearly, encouraging participation is difficult at a time when women are anxious and have competing concerns. Another limitation is the homogeneity of the sample. Although respondents and non-responders were no different in terms of stage of disease, non-responders were older and more likely to be women of color. Inclusion of mostly White samples is a prevalent problem in studies considering psychosocial issues surrounding breast cancer. It is necessary to expand our understanding of the variety of responses to breast cancer in various ethnic, cultural, or religious groups (Mickley & Soeken, 1993; Ramirez, Bogdanovic, & Jasovic-Gasic, 1991). Discovering the reasons why women of color disproportionately decline to enter such studies would be instructive in fostering their participation. In addition, the findings of this study may not generalize beyond women with cancer, and beyond women with breast cancer in particular, as social support may have different effects in women and men and in various types of cancer (Ell et al., 1992).

Although this study and several others have revealed no overwhelming psychological advantages for women treated with breast-conserving surgical procedures, these findings should not discourage their use. The availability of such procedures encourages women to seek medical consultation earlier, which is relevant to survival (Aymé, Amalric, Kurtz, & Spitalier, 1993). We must continue to stress the value of adequate support for all women with breast cancer.

**Notes**

1. To determine to what extent generalizations could be made from this sample, characteristics of the 161 women who did not respond to the invitation to participate versus the 135 women who returned at least one questionnaire were compared. There were no significant group differences in stage of disease, but non-responders were significantly older than responders and White women were more likely to be responders than were non-White women. Because we had no information about spouses or partners we were unable to examine possible differences between spouses who participated and did not participate.

As an indication of participation bias, baseline characteristics of participants who completed all three assessments were compared to those who completed one or two. There were no differences in age, stage of disease, level of physical functioning, mood disturbance, or psychological distress. There were also no differences in the likelihood of having a partner, or being White versus non-White. Thus, to the extent that could be determined, considering only the data provided by respondents completing all three assessments is unlikely to bias the results.

2. To put levels of psychological distress in context, BSI scores were compared to the norms for non-patient adult females by converting to T-scores. A T-score of 50 represents the mean and 60 represents one standard deviation above the mean. The scores of both groups were in the mid-50s at each time point indicating moderately elevated psychological distress.

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