EFFECTS OF A BRIEF INTERVENTION ON
SOCIAL SUPPORT AND PSYCHIATRIC
MORBIDITY IN BREAST CANCER PATIENTS

J. STEVEN A. SIMPSONa,b,c, LINDA E. CARLSONc, CYNTHIA A. BECKa,b and SCOTT PATTENa,b,d

SUMMARY

(1) To cross-sectionally and longitudinally investigate relationships between the availability and adequacy of both close personal attachment and interactional support, and psychiatric morbidity in a sample of early stage breast cancer patients participating in a 6-week psychoeducational intervention. (2) To address the question of directionality in these longitudinal relationships. (3) To investigate the effects of the intervention on levels of social support.

Eighty-nine women were enrolled in the study, and randomly assigned to either the treatment or control condition. They were evaluated with the Interview Schedule for Social Interaction (ISSI), the Beck Depression Inventory (BDI), the Global Severity Index (GSI) of the Symptom Checklist (SCL) –90-R, and the Structured Clinical Interview for DSM-III-R (SCID) at three time periods: baseline (pre-intervention), 1 year post-intervention and 2 years post-intervention. Relationships between social support and the psychiatric measures were evaluated both cross-sectionally and longitudinally.

Cross-sectionally, there were strong associations at each time period between being diagnosed with a DSM-III-R Axis I disorder and having less adequate perceived social support from both close relationships and more distant social ties. Initial levels of psychiatric symptoms on the BDI and GSI were better predictors of later social support than initial social support variables were of later psychiatric symptoms. Participation in the group intervention did not result in changes in social support at 1 or 2 years post-intervention.

Cross-sectionally, there was a strong relationship between social support and psychiatric morbidity in these patients with early-stage breast cancer. Longitudinally, it appeared that although social support influenced psychiatric symptomatology somewhat, the influence of psychiatric symptoms on social support was greater. This illustrates the importance of both working to bolster social support and dealing with psychiatric symptomatology in this population. Copyright © 2002 John Wiley & Sons, Ltd.

INTRODUCTION

Research in psycho-oncology has repeatedly revealed a high prevalence of psychiatric illness in a variety of populations of cancer patients (reviewed in Sellick and Crooks, 1999; Massie and Popkin, 1998; Noyes et al., 1998; Strain, 1998). In one widely-cited study assessing the point prevalence of DSM-III diagnoses, over one-third of a randomly selected sample of cancer patients from three centers met diagnostic criteria for adjustment disorder with depressed or anxious mood, and an additional 7% were diagnosed with a current major depressive disorder (Derogatis et al., 1983). Overall, 47% of the patients were diagnosed with a DSM-III Axis I disorder (Derogatis et al., 1983). Reported rates of depression in patients with cancer have ranged from 1 to 53%, depending on the population of patients and the diagnostic criteria used (DeFlorio and Masie, 1995). The

*Correspondence to: Department of Psychiatry, Foothills Medical Centre, 1403, 29 St. N.W., Calgary, Alberta, Canada T2N 2T9. Tel.: 403-670-1272; fax: 403-670-2525; e-mail: steve.simpson@crha-health.ab.ca
most commonly reported point prevalence rates of major depression are in the 20–25% range, increasing with higher levels of physical disability, advanced illness, and pain (Sellick and Crooks, 1999). Adjustment disorder is also very common (Massie and Popkin, 1998), with an average point prevalence across studies of about 25–30% (Sellick and Crooks, 1999).

In breast cancer populations specifically, large studies conducting clinical interviews of postmastectomy patients have reported major depression rates of 22% (Morris et al., 1997; Grandi et al., 1987) and anxiety rates of 22% (Grandi et al., 1987). Rates of combined anxiety and depression have been reported as 30–45% (Meyer and Aspergren, 1989; Hopwood et al., 1991; Jenkins et al., 1991). Depression rates in studies of ambulatory patients have varied from 1.5–32% (Jenkins et al., 1991; Maguire et al., 1978; Cathcart et al., 1993; Sneeuw et al., 1993; Maraste et al., 1992). Those studies citing lower rates have been in patients with early stage breast cancer (Cathcart et al., 1993; Sneeuw et al., 1993; Maraste et al., 1992).

Social support has been identified as an important factor in preventing and alleviating depression and anxiety in cancer patients (Ord-Lawson and Fitch, 1997; Bloom and Spiegel, 1984), and has also been suggested as a potential source of survival benefit (Spiegel et al., 1989; Maunsell et al., 1995). Social support as a construct has been defined in many ways, and is generally accepted as being multidimensional in nature (Winemiller et al., 1993). Despite large discrepancies in defining social support, three aspects seem to be common to most characterizations: (a) structural aspects of the support network (number and composition), (b) functional types of assistance available or received (emotional, instrumental, informational, appraisal), and (c) the nature of the support (satisfaction, reciprocity) (Winemiller et al., 1993; Vrabec, 1997; Cohen and Wills, 1985).

A relationship between social support and depressive symptoms has been found in studies of non-cancer medical populations, including patients with rheumatoid arthritis (Fitzpatrick et al., 1991) and cardiac patients (Keller, 1998; Pattison, 1997; Tessaro, 1997; Rendle, 1997; Helgeson and Cohen, 1996; Muszbek and Ruzsa, 1996; Ofman, 1995). Looking specifically at cancer patients, available support as assessed by the self-report Social Provisions Scale was associated with less depressive symptoms on the Centre for Epidemiological Studies – Depression scale (CES-D) in a group of head and neck cancer patients at 6 months post-diagnosis (De Leeuw et al., 2000). Mood disorder rates diagnosed using the international classification of disease system, version 10 (ICD-10) of 31.8% were found in a group of outpatients with mixed cancer diagnoses 1 yr after the cancer diagnosis, and those patients who were depressed also reported lower levels of both close and distant social support on the Social Support Index (Grassi et al., 1997). A longitudinal study of recovery after breast cancer surgery found that anxiety and depression 3 months post-surgery were related to satisfaction with support from both family members and surgeons (Neuling and Winefield, 1988). The ‘active ingredient’ in the alleviation of distress by support groups and psychosocial interventions has been described as the provision of social support through professionals and peers (Broadhead and Kaplan, 1991; McLean, 1995; Helgeson and Cohen, 1996; Bottomley and Jones, 1997).

Not all studies have found relationships between social support and depression. No significant relationships were found between social interactions on the short version of the Interview Schedule for Social Interaction (ISSI, described below) and depression scores on the Beck Depression Inventory (BDI) in a group of cervical and endometrial cancer patients (Lalos and Eisemann, 1999), or between scores on the Medical Outcomes Survey Social Support Survey and mood on the Profile of Mood States in testicular cancer patients (Ord-Lawson and Fitch, 1997). As well, social support from a partner or oncologist did not predict changes in psychological adjustment 6 months later in a sample of women with recurrent breast cancer, although it did predict physical problems (Brady and Helgeson, 1991).

The Interview Schedule for Social Interaction (ISSI), the instrument used in the current study, was developed by Henderson et al. (1980, 1981) based on attachment models as explicated by Bowlby (1980), and Weiss (1980), and encompasses all three aspects of social support mentioned above. Social relationships are conceptualized as satisfying needs for personal attachment and social integration. Attachment is considered to provide a sense of security and place, and can be found in close affectional relationships. Social integration is provided by membership in a network of persons having shared interests and
values. Each of these categories of support is assessed on two distinct dimensions by the ISSI: the extent to which they are available and the extent to which they are seen as adequate, reflecting both the objective and subjective nature of social support, respectively. Individuals can then be classified into four groups based on their levels of availability and adequacy of each type of support. Those who score highly on both dimensions are well off and content, their needs being met. Those with low availability and high perceived adequacy are content with little, while those with high availability and low adequacy have the perception of their needs not being met by those around them. Finally, those low in both dimensions are lacking in social support provisions and are aware of that lack.

The question of whether psychosocial interventions can help to improve the social support available to breast cancer patients was addressed in a recent study that examined the effect on social support of a self-help intervention program provided within the first 2 months after diagnosis (Badger et al., 1999). Women who participated in the program showed significantly more improvement over time than control patients in the self-rated quality of their interpersonal relationships, as measured on the Interpersonal Relationship Scale, developed for that study. They did not, however, indicate any change in the structure of their social support network compared to those women who did not get the intervention. Women with more depressive symptoms at baseline tended to use and need more social support resources, but reported worse quality of their interpersonal interactions over the next 4 months, than did those women with lower initial levels of depression, regardless of whether they received the intervention (Badger et al., 1999). Similarly, in another study, psychological distress in women with recurrent breast cancer predicted a decrease in partner emotional support over a 6-month period (Brady and Helgeson, 1991). General findings in the area credit social support with reduction of distress in many populations of cancer patients, including breast cancer (Carlsson and Hamrin, 1994). Social support may also be related to survival in breast cancer, as hypothesized by several researchers (Waxler-Morrison et al., 1991; Spiegel and Kato, 1996).

These findings illustrate the bidirectional relationship between social support and depression, as not only is it evident that the loss of social support may lead to depression, but that depression may also lead to the loss of social support resources, thus confounding cause and effect. This could happen through several mechanisms: the woman may withdraw from her network as psychological distress and depression increases; her needs for emotional support may increase to a point at which they cannot be met; her partner may distance as she becomes more distressed; and the woman’s needs may remain the same, but her perception of the emotional support may be influenced by the negative thinking that is characteristic of psychological distress (Brady and Helgeson, 1991). It thus becomes important to assess the multidirectionality of the relationship between distress and social support in populations of cancer patients using longitudinal methodology.

The purpose of this study was to evaluate, within a larger study of health care utilization, the relationships between psychiatric morbidity and the availability and adequacy of both close personal attachment and interactional support, in a group of early stage breast cancer patients. We also wished to address the question of directionality in these relationships. Finally, we wanted to know if it was possible to enhance social support in early stage breast cancer patients through the provision of a 6-week psychosocial intervention. All measures were assessed at baseline, and 1 and 2-yr later, allowing for longitudinal analysis of the relationships between support and psychopathology.

METHODS

Participants

Baseline: Inclusion criteria included being female, diagnosis of stage 0–II breast cancer, active treatment completed, disease in clinical remission. Exclusion criteria included age over 70 yr at the time of study entry, main residence greater than 40 km from the Centre, diagnosis date earlier than January 1992, tumor stage III or IV disease, more than one diagnosis of cancer or another concurrent physical active chronic illness (defined as requiring more than one visit to a doctor per year), psychotic illness or active substance abuse (i.e. substance abuse or dependence followed by abstinence for less than 2 yr). Women diagnosed with mood or anxiety disorders were not excluded.
Three hundred and fifteen patients were identified by chart review as potentially eligible and were contacted personally. Eighty-one refused further contact, and 111 made no further effort to participate and were not approached again. One hundred and twenty-three agreed to participate and were assigned study numbers. Eighteen of these withdrew prior to assessment by a psychiatrist. Of those 105 assessed, 16 did not meet medical inclusion criteria (15%). A total of 89 were found to meet all inclusion and no exclusion criteria, and agreed to continue in the study. Initial data was available for all 89 subjects, or 28.2% of those initially considered eligible (89/315). Subsequently, 46 were randomly assigned to the treatment group, and 43 to the control condition.

One-year follow-up: At 1 year post-intervention, data was collected for 39 of the 46 women in the treatment group (84.8%), and 35 of the 43 in the control group (81.4%). At this time point two subjects in the treatment group had died. Reasons for not providing data included not returning questionnaires in the mail, moving out of the province, and not responding to reminder phone calls.

Two-year follow-up: At the final data collection point, 2 years post-intervention, questionnaire data was available for 35 women in the treatment group (76.1%) and 27 women in the control group (62.8%). The reasons that data were not collected on all the women were similar to the 1-year point: several women had moved, some had withdrawn from the study, others did not return our phone calls, and four women had died.

Study design and procedure

The study used a prospective, randomized, controlled design and included an intervention component (described below). Patients were recruited with the co-operation of oncologists at the Tom Baker Cancer Centre, who gave approval for the names of all eligible patients seen in follow-up clinics to be forwarded to the research team. Patients who met eligibility criteria and agreed to participate were given a structured psychiatric assessment by the first author. The study questionnaires were completed by all subjects in a standardized setting within the Foothills Medical Centre, Calgary.

Following the initial assessment but prior to randomization, all subjects were assigned a diagnostic category, if appropriate, using the SCID. All subjects who were given a DSM-III-R diagnosis were told that the intervention program was not a treatment for psychiatric disorders, and offered a referral to a psychiatrist who was blind to the study condition of the subject. All eligible subjects were given the book and tape set “Helping Yourself: A Workbook for People Living With Cancer” (Canadian Cancer Society, 1999), and told that the program would be either 6 weekly, 1.5 h group sessions or would be done on their own as self-initiated study.

Randomization: After the completion of the initial screening, the patients were randomly assigned to either the treatment or control group, and informed of this assignment by mail. The patients receiving the information package only acted as controls. These patients were requested not to seek out professionally led group psychological treatment, but all other forms of therapy were open to them.

Treatment group: The professionally-led groups were carried out in ‘waves’ as soon as 8–10 patients were recruited. Patients who did not attend each group were contacted by telephone.

Assessment and follow-up: Patients in both groups were assessed at three time periods: baseline (pre-intervention), 1 year post-intervention and 2 years post-intervention. Any patient who raised a psychological, psychiatric or medical problem at any time was given support and referred to an independent physician who was blind to the experimental status of the patient.

Intervention

The group psychotherapy program consisted of 6 weekly, 90 min sessions led by the first author, a psychiatrist with training in group psychotherapy and psychosocial oncology. A female lay counselor from the community who had breast cancer, was employed as co-leader. Two different women filled this role over the course of the study. The group size was limited to 7–10 participants. The program
was as described by Cunningham and Tocco (1989), and had 6 weekly themes: (1) progressive muscle relaxation; (2) inner relaxation (self-hypnosis); (3) stress management techniques; (4) mental imagery; (5) goal setting; and (6) planning and achieving change. See Simpson et al., (2001) for details of other outcomes.

Measures

**Baseline: Demographics:** Basic demographic data were collected on each subject. This included details of marital status, living arrangements, education, religion and past medical history. These have been shown to correlate highly with mood disturbance (Cunningham et al., 1991).

**Interview schedule for social integration (ISSI)** (40): This 52 item semi-structured interview assesses the person’s perception of his or her social support network. It takes approximately 45 min to administer. Results are reported as scores on four measures: availability of close relationships (ADAT); adequacy of close relationships (AVAT); availability of more distant supports (AVSI); and adequacy of more distant supports (ADSI). Its development was based on classical attachment theory, as described in the introduction.

**Symptom checklist (SCL)–90-R** (Derogatis, 1983): A general mental health measure of which one global score was used in this report: the global severity index (GSI).

**Beck depression inventory (BDI)** (Beck et al., 1961): This 21-item self-report questionnaire gives a global score on depressive symptoms.

**Structured clinical interview for DSM-III-R (SCID)** (Spitzer et al., 1992). This psychiatric interview allows for psychiatric diagnoses to be assigned, and was administered to all subjects by a psychiatrist who was unaware of the scores on the self-report questionnaires. This interview provides current diagnoses for depressive and anxiety disorders, and screens for somatoform, eating, substance abuse, and psychotic disorders. The global assessment of functioning scale (GAF), which is Axis V of the DSM-III-R, was used to assess overall severity of psychological, social and occupational function (Goldman et al., 1992).

**One- and two-year follow-up:** At 1 yr and 2 yr following the intervention, all the measures were re-administered to all available participants by an experienced research nurse who was supervised by the principal investigator for 10% of the assessments.

**Statistical analyses:** In order to investigate the effects of the intervention on social support, between group analysis comparing the control and treatment groups on ISSI scores at each time period were conducted using independent samples t-tests.

In order to analyze the cross-sectional relationships between psychiatric morbidity and social support at each time, patients were classified as either ‘cases’ or ‘non-cases’. This classification was based on the presence of a currently active DSM-III-R Axis I diagnosis of a disorder. For example, if a patient was diagnosed with major depressive disorder (MDD), in full remission, she would not be classified as a ‘case’, but if the diagnosis was MDD, current or in partial remission, she would be classified as a ‘case’. Those women in the two categories were then compared at each time point on ISSI scores using independent samples t-tests. Another way to assess degree of impairment was to divide the patients into ‘low-functioning’ and ‘high-functioning’ groups, based on GAF scores, using a GAF of 70 as the cut-off score. Scores lower than 70 represent greater than mild levels of functional impairment. High- and low-functioning groups could then be compared on ISSI scores cross-sectionally at each time point, again using independent samples t-tests. T-tests were conducted only after the underlying statistical assumptions of normality of the distributions and equality of variances were verified.

To assess the longitudinal relationships between social support and psychiatric morbidity, several regression analyses were conducted. The effect of social support on later ‘caseness’ was evaluated using logistic regression, with 1-yr ‘caseness’ as the dependent variable, entering first age, group membership (treatment/control), baseline ‘caseness’ (yes/no), and finally baseline social support variables. This procedure effectively controlled for the initial level of psychiatric morbidity by first factoring out the influence of baseline ‘caseness’ before addressing the influence of social support. This could not be done for the 2-yr data due to the low number of ‘cases’. Similar logistic regression procedures were used with GAF level of functioning (‘High’ vs ‘Low’) as the dependent variable, controlling for age, group membership and initial GAF before entering social support variables. This
was done for both 1-yr and 2-yr GAF scores, with both baseline and 1-yr actual scores entered for the 2-yr equation.

A similar procedure was followed using multiple linear regression to predict BDI and GSI scores as the dependent variables, entering stepwise the predictor variables of age, group membership, baseline BDI (or GSI) scores, and finally social support variables. Four equations were calculated in this manner: BDI 1-yr, BDI 2-yr, GSI 1-yr, and GSI 2-yr. For the 2-yr equations, both baseline and 1-yr BDI (or GSI) scores were entered into the equations before entering baseline and 1-yr social support variables.

Then, to assess the relationships in the other direction (i.e. whether the indicators of psychiatric morbidity, namely ‘caseness’, GAF, BDI and GSI scores, predicted later social support), AVAT, ADAT, AVSI and ADSI scores were used as the dependent variables in separate multiple regression equations. Baseline age, group membership, ‘caseness’, GAF, BDI and GSI scores were regressed as predictor variables onto the 1-yr social support dependent variables, first controlling for the relevant baseline social support measure. For the 2-yr equations, both baseline and 1-yr social support were entered prior to the baseline and 1-yr ‘psychiatric morbidity’ variables. Therefore, eight separate equations were calculated assessing the impact of distress on subsequent social support, one for each of the four social support subscales at 1 yr and at 2 yr.

RESULTS

Participants

Demographics of the participants are presented in Table 1. The women in the treatment group were not different from those in the control condition on any of the variables measured. Type of treatment (surgery, chemotherapy, radiation therapy, hormone therapy) was also compared and found to be not different between the two groups. DSM-III-R diagnoses of the initial and final groups are presented in Table 2. Overall, the

<table>
<thead>
<tr>
<th>Table 1. Demographic characteristics at baseline</th>
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<tbody>
<tr>
<td>Treatment (n = 46)</td>
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<tr>
<td>(Mean)</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td><strong>Age</strong></td>
</tr>
<tr>
<td><strong>Education</strong></td>
</tr>
<tr>
<td>Less than high school</td>
</tr>
<tr>
<td>High school</td>
</tr>
<tr>
<td>University</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
</tr>
<tr>
<td>Single/divorced/widowed</td>
</tr>
<tr>
<td>Married/common-law</td>
</tr>
<tr>
<td><strong>Living arrangement</strong></td>
</tr>
<tr>
<td>Alone</td>
</tr>
<tr>
<td>Spouse/common-law</td>
</tr>
<tr>
<td>Parents/relatives</td>
</tr>
<tr>
<td><strong>Occupational status</strong></td>
</tr>
<tr>
<td>Full-time</td>
</tr>
<tr>
<td>Part-time</td>
</tr>
<tr>
<td>Homemaker/unemployed/retired</td>
</tr>
<tr>
<td><strong>Religious practice</strong></td>
</tr>
<tr>
<td>No practice</td>
</tr>
<tr>
<td>&lt;1/month</td>
</tr>
<tr>
<td>1–4/month</td>
</tr>
<tr>
<td>&gt;4/month</td>
</tr>
<tr>
<td><strong>GAF score</strong></td>
</tr>
</tbody>
</table>
women were about 50 yr of age, one-third were university educated, three quarters were married and living with a spouse, about 40% worked full-time outside the home with an additional 28% working part-time, and about 40% did not adhere to any religious practice.

Psychiatric morbidity

Baseline: The GAF scores at baseline were not significantly different between the treatment and control groups (see Table 1). The overall mean score was 78.3, indicating transient and expectable reactions to psychosocial stressors with only slight impairment in social or occupational functioning. Overall, 23 subjects were diagnosed with a DSM-III-R illness, 11 in the control group and 12 in the intervention group, a total of 26% of the entire sample (Table 2). The women with DSM-III-R diagnoses and the types of diagnoses were evenly distributed between the control and treatment groups.

Relationship with living arrangement: Women were grouped based on living arrangement and civil status at baseline and compared on ‘caseness’. Those who were living alone were significantly more likely to be given a DSM-III-R diagnosis than were those living with someone ($\chi^2 = 5.94, p<0.05$). Similarly, women who were unmarried/divorced/widowed were more likely to be ‘cases’ than those who were married/common-law ($\chi^2 = 7.86, p<0.01$).

One year: One year later, the GAF scores for the treatment and control groups were 85.7 and 82.3, respectively, which were not significantly different from each other. These high scores indicate good overall functioning and minimal symptoms. There were seven ‘cases’ in the control condition, six of current MDD, and one social phobia. There was also one woman with MDD in full remission who was not counted as a ‘case’ in the analysis. There were three ‘cases’ in the treatment condition, two of current MDD, and one of MDD in partial remission. The three women in the treatment group with MDD in full remission, again, were not considered to be ‘cases’ in subsequent analyses. Overall, there was a 3.57% incidence rate, calculated by dividing the new cases (there were two) by the person years at risk.

Two years: At the 2-yr point, the GAF scores in the treatment and control groups were 85.9 and 80.3, respectively. These scores were significantly different ($t = 2.3, p<0.05$), indicating higher global functioning in the treatment group, although both were in the range indicating good functioning in all areas with little symptomatology. Only one woman in the treatment group

Table 2. DSM-III-R psychiatric diagnoses

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Baseline</th>
<th>One-year follow-up</th>
<th>Two-year follow-up</th>
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<tbody>
<tr>
<td></td>
<td>Treatment</td>
<td>Control</td>
<td>Treatment</td>
</tr>
<tr>
<td>Major depressive disorder—current or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>partial remission</td>
<td>4 33.3</td>
<td>5 45.5</td>
<td>3 50.0</td>
</tr>
<tr>
<td>Major depressive disorder—full remission</td>
<td></td>
<td></td>
<td>3 50.5</td>
</tr>
<tr>
<td>Adjustment disorder with depressed mood</td>
<td>2 16.7</td>
<td>2 18.0</td>
<td></td>
</tr>
<tr>
<td>Dysthymia</td>
<td>1 8.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depressive disorder NOS</td>
<td>1 8.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generalized anxiety disorder</td>
<td>1 8.3</td>
<td>2 18.2</td>
<td></td>
</tr>
<tr>
<td>Panic disorder</td>
<td>1 8.3</td>
<td>1 9.1</td>
<td></td>
</tr>
<tr>
<td>Agoraphobia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insomnia</td>
<td>1 8.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social phobia</td>
<td>1 8.3</td>
<td>1 12.5</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>12 100</td>
<td>11 100</td>
<td>6 100</td>
</tr>
</tbody>
</table>

received a diagnosis of MDD in full remission, while five women in the control condition received diagnoses, two of current MDD, two of MDD in full remission, and one social phobia. The women in complete remission were not included as ‘cases’ in subsequent analyses. Overall, the incidence rate of new ‘cases’ between years one and two was 1.92% (one new ‘case’).

Social support

Relationship with living arrangement: When women were grouped based on living arrangements, those who were living alone reported lower scores on AVAT \((t = -4.83, p < 0.001)\) and ADAT \((t = -3.28, p < 0.001)\) compared to those living with someone else. Similarly, those who were unmarried/divorced/widowed had lower AVAT scores \((t = -5.94, p < 0.001)\) and ADAT scores \((t = -3.91, p < 0.001)\) compared to the married/common-law group, as well as lower scores on the ADSI subscale \((t = -3.29, p < 0.001)\).

Effect of group membership: Scores on the ISSI subscales are reported in Table 3. At the baseline assessment, the women in the treatment group, on average, had higher ADAT scores than those in the control condition \((t = -2.2, p < 0.05)\) as assessed by independent samples \(t\)-tests. As well, they had marginally higher ADSI scores \((t = -1.7, p < 0.10)\). At the 1-yr follow-up, there were no between-group differences in any subscale scores. At the 2-yr follow-up, the ADAT scores for the women in the treatment condition were marginally higher than that of those in the control group \((t = -1.9, p < 0.10)\).

Cross-sectional social support and psychiatric morbidity: To investigate the association between levels of social support and diagnosis with a DSM-III-R ‘case’, the ISSI subscale scores of the women designated as ‘cases’ at baseline and at the two follow-up periods were compared to those of women designated as ‘non-cases’ at each time using independent samples \(t\)-tests. The results are presented in Table 4. Women who were ‘cases’ had

| Table 3. ISSI scores in treatment and control groups\(^a\) |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                                | Baseline        | One-year follow-up | Two-year follow-up |
|                                | Treatment \((n = 46)\) | Control \((n = 43)\) | Treatment \((n = 39)\) | Control \((n = 35)\) | Treatment \((n = 35)\) | Control \((n = 27)\) |
|                                | \(X\) | S.D. | \(X\) | S.D. | \(X\) | S.D. | \(X\) | S.D. | \(X\) | S.D. |
| AVAT                            | 6.7 | 1.3 | 6.5 | 1.6 | 6.9 | 1.3 | 6.5 | 1.7 |
| ADAT                            | 7.7*** | 2.8 | 9.1 | 2.8 | 9.4* | 2.8 | 7.9 | 3.7 |
| AVSI                            | 8.8 | 2.6 | 8.7 | 2.6 | 8.9 | 2.8 | 8.0 | 2.8 |
| ADSI                            | 14.3* | 2.8 | 14.7 | 3.1 | 14.5 | 2.7 | 14.5 | 3.6 |

\(^{a}\) Treatment greater than control (indicating more social support).

\(\ast p < 0.10, \ast\ast p < 0.05.\)

| Table 4. ISSI Scores for DSM-III-R ‘cases’ and ‘non-cases’\(^a\) |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                                | Baseline        | One-year follow-up | Two-year follow-up |
|                                | Non-cases \((n = 66)\) | Cases \((n = 23)\) | Non-cases \((n = 64)\) | Cases \((n = 10)\) | Non-cases \((n = 57)\) | Cases \((n = 5)\) |
|                                | \(X\) | S.D. | \(X\) | S.D. | \(X\) | S.D. | \(X\) | S.D. |
| AVAT                            | 6.8*** | 1.4 | 6.7** | 1.4 | 6.8 | 1.3 | 5.2 | 2.6 |
| ADAT                            | 7.5** | 2.8 | 9.2*** | 2.8 | 8.9 | 3.1 | 6.8 | 5.0 |
| AVSI                            | 8.7 | 2.7 | 8.4 | 2.7 | 8.8** | 2.6 | 5.2 | 3.0 |
| ADSI                            | 14.6*** | 2.7 | 14.9*** | 2.8 | 14.6 | 3.0 | 13.6 | 4.0 |

\(^{a}\) Non-cases higher scores (indicating more social support) than cases.

\(\ast p < 0.05, \ast\ast p < 0.01, \ast\ast\ast p < 0.001.\)
lower scores, indicating less social support, at baseline on the AVAT (t = 4.0, p < 0.001), ADAT (t = 2.7, p < 0.01) and ADSI (t = 4.2, p < 0.001) subscales. Similarly, at 1-yr follow-up, women who were ‘cases’ scored lower than the others on AVAT (t = 3.3, p < 0.01), ADAT (t = 4.4, p < 0.001), and ADSI (t = 4.6, p < 0.001), and at the 2-year follow-up, the numbers of ‘cases’ were very low, and the only significant difference was found on AVSI (t = 2.6, p < 0.05).

Social support as a predictor of psychiatric morbidity: Logistic regression analysis demonstrated that the only significant predictors of ‘caseness’ at one year was baseline ‘caseness’ (β = 2.6, R² = 0.20, p < 0.001). None of the social support variables predicted later ‘caseness’.

Similar statistics predicting membership in either the low or high functioning group based on GAF scores demonstrated that only the baseline GAF score predicted level of functioning at year one (β = 0.15, R² = 0.21, p < 0.01). Year two predictors were 1-yr GAF scores (β = 0.10, R² = 0.18, p < 0.01), and 1-yr AVSI scores (β = 0.37, R² = 0.07, p < 0.05).

Using stepwise linear regression to predict BDI scores with social support measures, at 1-yr the best predictors of BDI scores were baseline BDI (β = 0.65, R² = 0.49, p < 0.001) and baseline ADAT (β = -0.23, R² = 0.05, p < 0.01) scores. At 2-yr, the best model included only 1-yr BDI scores (β = 0.73, R² = 0.54, p < 0.001). For the models predicting GSI scores at 1-yr, the best predictors were baseline GSI (β = 0.52, R² = 0.50, p < 0.001) and baseline ADSI (β = -0.36, R² = 0.09, p < 0.001) scores. At 2-yr, only 1-yr GSI scores predicted 2-yr GSI scores (β = 0.79, R² = 0.63, p < 0.001).

Psychiatric morbidity as a predictor of social support: AVAT, ADAT, AVSI and ADSI scores were used as the dependent variables in separate multiple regression equations. Baseline age, group membership, GAF, BDI and GSI scores as well as initial ‘caseness’ were regressed as predictor variables onto the social support dependent variables, first entering the relevant baseline social support measure. For the 2-yr equations, both baseline and 1-yr social support were entered prior to the baseline and 1-yr ‘psychiatric’ variables (i.e. GAF, BDI, GSI and ‘caseness’).

AVAT at 1-yr was best predicted by baseline AVAT (β = 0.71, R² = 0.59, p < 0.001) and baseline BDI (β = -0.18, R² = 0.03, p < 0.05) scores. At 2-yr, AVAT was predicted by 1-yr AVAT (β = 0.46, R² = 0.40, p < 0.001) and 1-yr GSI (β = -0.44, R² = 0.16, p < 0.001) scores. ADAT at 1 yr was predicted by baseline ADAT (β = 0.55, R² = 0.39, p < 0.001) and BDI (β = -0.31, R² = 0.18, p < 0.01) scores, while 2-yr ADAT was best predicted by 1-yr ADAT (β = 0.56, R² = 0.59, p < 0.001), baseline ADAT (β = 0.25, R² = 0.06, p < 0.01) and baseline GSI (β = -0.21, R² = 0.03, p < 0.05) scores. AVSI at 1 yr was predicted only by baseline AVSI (β = 0.60, R² = 0.36, p < 0.001), and at 2 yr was predicted by 1-yr AVSI (β = 0.49, R² = 0.36, p < 0.001) and 1-yr GSI (β = -0.37, R² = 0.10, p < 0.01) scores. Finally, the best model for 1-yr ADSI included only baseline ADSI (β = 0.81, R² = 0.66, p < 0.001), and for 2-yr ADSI included 1-yr ADSI (β = 0.59, R² = 0.43, p < 0.001), 1-yr GSI (β = -0.28, R² = 0.06, p < 0.01) and group membership (β = -0.20, R² = 0.04, p < 0.05).

DISCUSSION

We set out to investigate three major questions in this study. First, what is the relationship between social support and psychiatric morbidity in this sample of early stage breast cancer patients? There was clear evidence of a cross-sectional relationship between social support and psychiatric morbidity at each time point, as those women with DSM-III-R diagnoses had significantly less social support. This relationship was particularly strong in terms of the perceived adequacy of both close relationships and more distant social ties. This is consistent with other reports in the literature relating social support to depression in breast (Brady and Helgeson, 1991; Neuling and Winefield, 1988), head and neck (Leeuw et al., 2000) and mixed diagnosis (Grassi et al., 1997) cancer patients. Marital status and living arrangements were also related to scores on the ISSI and to psychiatric morbidity. Specifically, those women who were living alone or were unmarried were more likely to be diagnosed with a DSM-III-R disorder at baseline, and also reported less adequate and available close attachments and less adequate social interactions.

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The second issue, concerning whether baseline social support predicted later psychiatric morbidity or if earlier psychiatric morbidity predicted later social support, was investigated with a series of multiple regression analyses. The strongest predictors of psychiatric morbidity, as measured by each of ‘caseness’, functional level on the GAF, and BDI and GSI scores, were previous scores on the same measure. These measures at earlier time-points accounted for between 18 and 63% of the variance in future scores of distress and diagnosis. Some baseline social support measures did account for a small amount of the variance in future scores, with the availability of distant supports predicting 7% of the variance in GAF, the adequacy of close supports predicting 5% of the variance in future BDI scores, and the adequacy of distant supports predicting 9% of future GSI scores at certain time-points.

In the other direction, future social support scores were best predicted, again, by past scores on the same measures, but the inclusion of BDI and GSI scores in the model added to the predictive value for some variables. Both BDI and GSI scores improved the model for AVAT scores, where the baseline BDI accounted for 3% of the variance at 1 yr and GSI scores at 1 yr explained 16% of the variance at 2 yr. For the adequacy of close relationships, the baseline BDI scores explained 18% of the variance in 1-yr ADAT scores, and baseline GSI scores added 3% to the variance accounted for at 2-yr. One-year GSI scores further explained 10% of the variance in 2-yr AVSI scores, and 6% of the variance in 2-yr ADSI values.

To summarize, although it seemed that both causal directions of relationships between social support and psychiatric morbidity would be possible, earlier levels of depression and psychopathology (as assessed on the BDI and GSI) seemed to better predict future social support than the reverse. The only predictor of a future DSM-III-R diagnosis was the past presence of a diagnosis. This illustrates that, although both constructs were highly correlated with each other, psychiatric symptomatology better predicted the future adequacy and availability of support than baseline social support predicted future psychiatric morbidity. This is consistent with Brady and Helgeson, 1991 who found that psychosocial distress in women with breast cancer predicted a decrease in partner emotional support over a 6-month period.

The levels of social support reported in the ‘non-cases’, as compared to those of other groups published in the literature, were similar to those in the normal standardization sample from Canberra (Henderson et al., 1981), a sample of healthy middle aged Swedish men (Unden and Orth-Gomer, 1989), and to high-functioning patients with rheumatoid arthritis (Fitzpatrick et al., 1991). The non-cases also scored higher than patients with schizoaffective disorder (which has a significant mood component) on all measures of support (Nettelbladt et al., 1995), and much higher than a group of psychiatric inpatients who had recently attempted suicide (Magne-Ingvar et al., 1992). Those women who were diagnosed as DSM-III-R ‘cases’ at baseline has scores similar to the normal groups on the adequacy of more diffuse social relationships (Henderson et al., 1981), but lower on the adequacy of closer social ties. The most striking difference between our ‘cases’ and the suicidal patients was not in the lack of close ties, but in the extremely low availability and adequacy of more distant social relations in the patients who had attempted suicide (Magne-Ingvar et al., 1992).

Regarding the third question, whether participation in a brief psychoeducational group would improve social support, it appears that the intervention did not improve either the availability or adequacy of social support as rated by these women on the ISSI. Social support may be a modifiable risk factor for psychiatric morbidity (Badger et al., 1999), but we were not able to modify it with the intervention in this particular study. It may be that to enhance social support a more intensive intervention is warranted. Moreover, we measured the effect of the program on social support 1 yr after the intervention, and it may be unrealistic to predict that a 6-week group would have such long lasting effects. This does not preclude possible benefits that are more transitory. Of note, the ISSI measure is not designed to assess professional support, which may have improved as a result of the intervention.

Social support is a multi-determined variable. The perception of support is affected by cognitive attributions which are themselves related to mental states, such as depression and anxiety, and also by life events (Henderson et al., 1981). One explanation for the predictive value of depressive symptoms on future perceptions of social support could be through these negative cognitive schemas. Although we did not directly measure life events or utilization of psychiatric or psychotherapeutic
services external to the study during the 2-yr follow-up period, randomization of participants prior to the intervention is a legitimate methodological approach to deal with these potential confounding variables. Randomization also powerfully controls for other, unforeseen, variables that might possibly affect measures of outcome.

The issue of generalizability of these findings to other breast cancer patients is important to address. The rate of accrual to this study of 28% may seem to put the generalizability of our findings at question, but this rate is consistent with accrual rates into medical clinical trials (Gotay, 1991), and other psychosocial intervention studies (Winn, 1994). Regardless, these relationships may only apply to women who choose to participate in psychosocial interventions, and caution should be applied before generalizing to the greater population. The issue of low uptake rates in studies of this type may be a valuable subject to address in future research.

This study demonstrates the cross-sectional relationship between the presence of a psychiatric diagnosis and poor quality of perceived social support in women with early stage breast cancer. It also shows that our 6-week psychosocial intervention did not improve the availability or adequacy of social ties at 1- or 2-yr follow-up in this population of women. The implications of these findings on the way in which psychosocial interventions are structured and delivered should be considered by investigators of future studies.

REFERENCES


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