# Rates and Correlates of *DSM-IV* Diagnoses in Women Newly Diagnosed With Breast Cancer

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Although the presence of psychological distress has been documented in women with breast cancer, previous studies have not established rates of *DSM-IV* diagnoses in this population, nor have prior investigations compared the utility of diagnostic interviewing vs. symptom checklists to assess distress. *DSM-IV* diagnoses of anxiety disorders and major depression, symptoms of anxiety and depression, and quality of life were examined in 207 women with newly diagnosed breast cancer. Eighteen percent of breast cancer patients met criteria for a current *DSM-IV* anxiety or depressive disorder and 54% met criteria for a disorder at some point in their lifetime. These rates are comparable to those found in recent community epidemiological studies (e.g., R. C. Kessler, K. A. McGonagle, S. Zhao, C. B. Nelson, M. Hughes, S. Esheman, et al., 1994). Sensitivity, specificity, and positive predictive value for anxiety and depression symptoms as predictors of DSM disorders were relatively poor. However, after accounting for demographic, treatment, and cancer variables, self-reported anxiety symptoms were significantly related to the presence of an anxiety disorder and self-reported depressive symptoms were significantly related to a diagnosis of a depressive disorder. Symptoms of anxiety and depression contributed significantly and uniquely to physical, medical, and sexual quality of life; *DSM-IV* diagnoses were not significantly related to quality of life after controlling for symptoms of depression and anxiety. The importance of measuring both symptoms of distress and psychiatric diagnoses in cancer patients and the clinical practice implications of the results are discussed.

**KEY WORDS:** breast cancer; anxiety; depression; quality of life.

Breast cancer is the most common form of cancer among women, affecting approximately one in eight women in the United States during their lifetime (American Cancer Society, 1999; Feuer & Wun, 1999). The diagnosis and treatment of breast cancer are widely recognized as highly stressful for many women who are affected by the disease. The stress of breast cancer is associated with disruptions in quality of life and increased levels of psychological distress, especially symptoms of anxiety and depression (Compas & Luecken, 2002). In spite of the importance of understanding levels and correlates of psychological distress in breast cancer patients, several issues remain unresolved. First, the rates of mood and anxiety disorders based on diagnostic interviews in breast cancer patients are not been well established. Second, the degree of correspondence between scores on symptom checklists and psychiatric diagnoses in breast cancer patients is unclear. And third, the relative utility of symptoms versus diagnoses as predictors of quality of life is unclear. The present study addresses these three issues.

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The majority of prior studies have focused on documentation of negative affect and symptoms using self-report checklists. These studies have been important in establishing the presence, level, and course of emotional distress that characterize the experience of cancer patients (Ritterband & Spielberger, 2001). For example, up to 40% of women newly diagnosed with breast cancer experience elevated psychological distress following diagnosis and surgery (e.g., Andersen, Anderson, & deProsse, 1989; Epping-Jordon et al., 1999) and this distress persists for up to 2 years post surgery for as many as 30% of these patients (e.g., Glanz & Lerman, 1992; Irvine, Brown, Crooks, Roberts, & Browne, 1991). Checklists have several strengths, including their ease and efficiency of administration, appropriateness for use in nonpsychiatric populations, and the extensive knowledge base available on these tools.

Concerns have been raised, however, about the use of checklists. Self-report checklists may overestimate the level of distress, as several studies have shown the cut-offs on checklists typically produce high rates of false positives in the prediction of psychiatric diagnoses (e.g., Coyne & Schwenk, 1997). Most checklists have relatively poor correspondence with diagnostic criteria for disorders; for example, the depression and anxiety subscales on the widely used Symptom Checklist-90-R (Derogatis, 1983) do not adequately reflect the criteria for major depressive disorder or generalized anxiety disorder, respectively. Furthermore, symptom checklists are subject to response biases that are inherent in self-report measures (Stone et al., 2000). In light of these limitations, it has been argued that there is no substitute for the use of structured interviews to establish rates of psychiatric diagnoses. Therefore, it is important to establish the rates of psychiatric disorders as represented in the *Diagnostic and Statistical Manual for Mental Disorders-Fourth Edition* (*DSM-IV*) of the American Psychiatric Association (1994) in cancer patients and to determine their association with more commonly used checklists of mood and symptoms.

In spite of the importance of establishing rates of psychiatric diagnoses in cancer patients, the results of studies in this area are mixed and have been limited in several ways (McDaniel, Musselman, Porter, Reed, & Nemeroff, 1995). Sampling problems have included heterogeneity with regard to type and stage of cancer, time since diagnosis, and treatments (e.g., Derogatis et al., 1983). Measurement has been problematic in that several studies have used either nonspecific or nonstandardized methods to obtain data and derive diagnoses (e.g., Akechi, Okuyaama, Imoto, Yamawaki, & Uchitomi, 2001; Fallowfield, Hall, Maguire, & Baum, 1990; Kissane et al., 1998; Pinder et al., 1993; Ramirez, Richards, Jarrett, & Feniman, 1995). Furthermore, many studies have focused on one disorder, typically depression, rather than the full spectrum that are relevant to the stress of cancer (for reviews see Aapro & Cull, 1999; Massie, 1989; McDaniel et al., 1995).

As a consequence of these limitations, the findings on rates of psychiatric diagnoses in women with breast cancer have been quite mixed. In one of the earliest and most frequently cited studies of psychiatric morbidity in cancer patients, Derogatis et al. (1983) reported on 215 men and women with cancer, including inpatients and outpatients, a wide range of cancer types, and all stages of cancer. A nonspecified psychiatric interview was used to identify DSM-III disorders that included anxiety disorders, affective disorders, adjustment disorders, personality disorders, organic disorders, and alcohol abuse. Forty-seven percent of the sample met criteria for at least one of these disorders (44% met criteria for an Axis I disorder and 3% met criteria for an Axis II disorder). In a more recent review of the literature examining the rate of major depressive disorder in cancer patients, McDaniel et al. (1995) found extremely high variability with rates of major depression ranging from 1.5 to 50%. Furthermore, an important omission from these studies has been the assessment posttraumatic stress disorder (PTSD), a syndrome that may be highly relevant for breast cancer patients. Andrykowski, Cordova, Studts, and Miller (1998) recently found that 6% of women diagnosed with breast cancer (6–12 months after therapy for their cancer) met criteria for a diagnosis of PTSD. In light of the limitations of previous research, a high priority is to establish rates of *DSM-IV* disorders using a standardized diagnostic interview in a cancer patient sample that is homogeneous with regard to type of cancer, gender, and time since diagnosis.

A recent study by Coyne, Benazon, Gaba, Calzone, and Weber (2000) represents improvement on previous research in this area in several ways. These authors examined high-risk women who were enrolled in a cancer registry, half of whom had a past diagnosis of breast or ovarian cancer an average of 8 years earlier. Using a structured diagnostic interview to assess *DSM-IV* disorders, rates of psychiatric diagnoses did not differ for women with and without a history of a diagnosis of cancer. The rate of current (past 6 months) major depressive disorder among

women with a history of a cancer diagnosis was 1.9%, contrasting with the high rates of major depression reported in some previous studies of cancer patients (McDaniel et al., 1995) and from the 6-month prevalence rate of 8.2% found among a nationally representative sample from the community in the National Comorbidity Survey (NCS; Kessler et al., 1994). This low rate may be explained somewhat by characteristics of the Coyne et al. sample, which included relatively highly educated women enrolled in a cancer registry who were interviewed an average of 8 years after their cancer diagnosis. Nonetheless, the contrast between the low rates found in this study and much higher rates found in many earlier studies of cancer patients illustrates the need to use standardized measures, and to focus on a homogeneous cancer population in a particular treatment setting at a uniform time point during treatment.

Two additional problems have limited research on psychological distress and disorder in cancer patients. Although symptom checklists continue to be widely used, few studies have examined the relationship between diagnoses and more commonly used measures of psychological symptoms. This is an important issue to address, as most studies of cancer patients continue to rely on symptom checklists in spite of findings with other populations that the correspondence of checklists and diagnoses is relatively poor (e.g., Coyne & Schwenk, 1997). In the only study of this issue that included cancer patients, Coyne et al. (2000) examined the correspondence between a self-report measure of symptoms of depression and anxiety and diagnoses of major depressive disorder and generalized anxiety disorder in women at high risk for breast cancer that included women with and without a history of cancer. These authors found that self-reports had poor positive predictive value in relation to depression (4%) and anxiety disorder (3%) diagnoses. The correspondence of symptoms of distress and psychiatric diagnoses has not been examined in recently diagnosed cancer patients, however.

Finally, previous studies have also failed to establish the level of impairment in quality of life that is associated with psychiatric diagnoses as compared with symptoms of distress. Disruptions in quality of life for breast cancer patients as a result of surgery and adjuvant treatment are common (e.g., Rummans et al., 1998), and given that more women are living with, rather than dying from breast cancer, quality of life is highlighted as an important standard within psychosocial cancer research (Lamb, 1995; Syrjala et al., 2000). Thus, it is important to establish the utility of psy-chiatric diagnoses as compared with symptom checklists in accounting for differences in quality of life (Ganz et al., 1996; Gotay & Muraoka, 1998; Jacobsen et al., 1998; Shapiro et al., 2001). If mood and anxiety disorders are qualitatively distinct from elevated symptoms, then the presence of a disorder may be associated with greater impairment in quality of life, highlighting the utility of this methodology to identify women that may benefit from psychosocial services. Conversely, if even subclinical levels of symptoms of anxiety and depression affect quality of life, routine screening of these symptoms in patients may be warranted.

The goals of this study were to (a) establish rates of *DSM-IV* diagnoses of depression and anxiety disorders in women with recently diagnosed breast cancer, (b) examine the relation between interview-based diagnoses and symptoms of depression and anxiety as measured on symptom checklists, and (c) examine the relative association between diagnoses and symptoms with domains of quality of life. In order to address some of the limitations of previous research, a standardized interview was used to assess *DSM-IV* diagnoses in a relatively homogeneous cancer sample (women with breast cancer), in a particular setting (outpatient) at a uniform time point during treatment (near time of diagnosis). On the basis of recent findings reported by Coyne et al. (2000), we expected that rates of current and lifetime diagnoses of depression and anxiety disorders would be comparable to those reported in community studies (e.g., Kessler et al., 1994). We also hypothesized that the degree of correspondence between *DSM-IV* diagnoses and symptom levels of self-report checklists would be relatively low. Finally, because of the absence of previous data on the relation of psychiatric diagnoses and quality of life in breast cancer patients, no specific hypotheses were tested in these analyses.

## METHODS

### Participants

Participants were 207 women with recently diagnosed breast cancer who were part of a larger study comparing two psychological interventions to enhance coping and adjustment to breast cancer; all data reported here were obtained prior to participation in the intervention trial. Inclusion in the present study was based on availability of diagnostic interviews and questionnaires upon entry into the study.

Therefore, this sample consists of breast cancer patients who were motivated and able to seek psychological services near the time of their diagnosis. Patients had a mean age of 52.9 years ($SD = 10.6$) and a mean education of 14.6 years ($SD = 2.6$). Approximately 74% were either married or living with a partner, 8% were single, 11% were divorced, and 7% were widowed. Sixty-three percent were diagnosed with Stage 0 or I breast cancer, 32% with Stage II, and 5% with Stage III. Seventy-five percent of the sample underwent a lumpectomy, and 25% underwent a mastectomy. Surgery took place, on average, 8 weeks prior to psychiatric interviews ($SD = 8.5$ weeks) and 11 weeks prior to completion of symptoms checklists ($SD = 8.1$ weeks). Prior to the psychiatric interviews and completion of the BAI and BDI-II, 32.4% of the sample had started radiation therapy (between 4.3 and 6 weeks earlier) and 31.9% had started chemotherapy (between 4.8 and 8.3 weeks earlier). Ninety-eight percent of the sample was Caucasian, which is representative of northern New York State and northern Vermont from which the sample was drawn. Exclusionary criteria for the larger study were a history of organic and psychotic psychiatric disorders, and a diagnosis of metastatic (Stage IV) cancer. These criteria were assessed through medical chart review and patient interviews during participant recruitment.

Procedures

Participants were recruited from the Breast Care Center of Fletcher Allen Health Care (affiliated with the Vermont Cancer Center) in Burlington, VT, and the Glens Falls Cancer Center in Glens Falls, NY. Following a diagnosis of breast cancer, patients were invited to participate in a research study evaluating the effectiveness of two types of support groups. Women completed a structured diagnostic interview and self-report measures 3–6 weeks post breast cancer diagnosis (and prior to the start of the intervention arm of the study).

Measures

*Demographic and Medical Data*

Demographic data were obtained using a structured interview that asked participants their age, level of education, ethnicity, marital/partner status, and whether or not they had children. Breast cancer diagnosis, treatment status, and staging information were obtained through review of medical charts. Stage of cancer was determined by tumor size, lymph node involvement, and whether it had spread to other sites (American Joint Committee on Cancer, 1997).

*Diagnostic Interview*

The *DSM-IV* checklist (Helzer & Hudziak, 1996; Hudziak et al., 1993) is a structured psychiatric interview that follows symptoms and criteria directly from *DSM-IV* categories. In this study the interview was used to assess for both current and past (lifetime) disorders, and disorders were chosen from the anxiety–depression spectrum. Interviewers were first-, second-, or third-year female doctoral students in clinical psychology trained in diagnostic interviewing. The following disorders were included in the interview: major depressive disorder, dysthymic disorder, generalized anxiety disorder, panic disorder—with and without agoraphobia, posttraumatic stress disorder, acute stress disorder, specific phobia—blood, injection or injury, social phobia, and adjustment disorder. Interviews were audiotaped for reliability analysis and Cohen's kappa was used to assess interrater reliability as well as within-diagnosis reliability for a randomly selected 10% of the interviews. Interrater reliability for all current diagnoses was $\kappa = .96$ (range: .93 to 1.0), and for past diagnoses was $\kappa = .93$ (range: .88 to .98). Within-diagnosis reliability ranged from $\kappa = .83$ for major depressive disorder to $\kappa = 1.0$ for specific phobia and dysthymic disorder.

*Psychological Symptoms*

Symptoms of anxiety and depression were measured by the Beck Anxiety Inventory (BAI; Beck & Steer, 1990) and the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996). These self-report measures have well-established internal consistency, test-retest reliability, and discriminant validity. For this sample, internal consistency reliability for the BAI was $\alpha = .85$ and for the BDI-II was $\alpha = .92$. The BAI and BDI-II were selected because they have been shown to have the highest discriminant validity of self-report checklists of symptoms of anxiety and depression (Clark & Watson, 1991). Furthermore, the BDI-II yields adequately reliable and valid scores among medical populations (Arnau, Meagher, Norris, & Bramson, 2001).

## Quality of Life

Quality of life was measured by the Cancer Rehabilitation Evaluation System-Short Form (CARES-SF; Coscorelli Schag & Heinrich, 1988). This self-report measure yields five subscales of quality of life—physical, medical, psychosocial, sexual, and marital functioning. The psychosocial subscale was not included in analyses because a number of items are confounded with those on the BDI-II, BAI, or *DSM-IV* criteria (e.g., difficulty concentrating) and the marital subscale was not included since only a portion of this sample was married. This CARES-SF has well-established reliability, validity, and internal consistency (e.g., Schag, Ganz, & Heinrich, 1991). For this sample, internal consistency reliability for the physical subscale was $\alpha = .77$, the medical subscale was $\alpha = .78$, and the sexual subscale was $\alpha = .84$.

## RESULTS

### Descriptive Analyses

#### DSM-IV Diagnoses

Rates of current *DSM-IV* disorders for the breast cancer sample are displayed in Table I. Approximately one fifth (18%) of women newly diagnosed with breast cancer met criteria for at least one current psychiatric diagnosis, with a range from 2 to 11 women meeting criteria for each diagnosis. The most common current diagnosis was PTSD (5.3%) and when combined with patients meeting criteria for acute stress disorder (2.4%), the total represents 7.7% (16 women) of the sample. All of the women meeting criteria for acute stress disorder identified breast cancer as the source of trauma and 82% (9 of 11) meeting criteria for PTSD noted that their breast cancer diagnosis was the source of trauma. Only four women met criteria for a diagnosis of major depressive disorder (1.9%) and four women endorsed symptoms that correspond with dysthymic disorder (1.9%). Of the 37 women with any current diagnosis, 78% (29 women) had one current diagnosis, 13% (5 women) had two diagnoses, and 8% (3 women) had three or more current diagnoses. Fifty-nine percent (22 women) of those who met criteria for a current *DSM-IV* diagnosis had no prior history of psychiatric morbidity.

Rates of lifetime disorders for the breast cancer sample, defined as the presence of a current and/or past disorder, are displayed in Table II. Approximately 54% of the women had a present or past *DSM-IV* diagnosis in the anxious–depressed spectrum. The most common lifetime disorders were adjustment disorder (21.3%) and major depressive disorder (20.3%). Of the 111 women with a lifetime disorder, 54% (60 women) had one lifetime disorder, 22% (24 women) had two lifetime disorders, and 24% (27 women) had three or more lifetime disorders.

### Anxiety and Depressive Symptoms

Means and standard deviations for BAI and BDI-II scores are displayed in Table II. The mean level of anxiety symptoms on the BAI was 8.3 ($SD = 6.7$), falling in the mild range according to criteria based

Table I. Rates of Current and Lifetime *DSM-IV* Diagnoses in a Sample of Women Newly Diagnosed With Breast Cancer

| | % (n) | |
|---|---|---|
| Diagnosis | Current | Lifetime |
| Major depressive disorder | 1.9 (4) | 20.3 (42) |
| Dysthymic disorder | 1.9 (4) | 6.3 (13) |
| Generalized anxiety disorder | 2.4 (5) | 10.1 (21) |
| Panic disorder with agoraphobia | 0.9 (2) | 2.9 (6) |
| Panic disorder w/o agoraphobia | 1.9 (4) | 7.2 (15) |
| Posttraumatic stress disorder | 5.3 (11) | 16.4 (34) |
| Acute stress disorder | 2.4 (5) | — |
| Specific phobia (blood, injection, injury type) | 2.4 (5) | 2.9 (6) |
| Social phobia | 1.9 (4) | 6.8 (14) |
| Adjustment disorder | 2.4 (5) | 21.3 (44) |
| Any psychiatric disorder | 17.9 (37) | 53.6 (111) |
| One disorder | 14.0 (29) | 29.0 (60) |
| Two disorders | 2.4 (5) | 11.6 (24) |
| Three disorders | 1.4 (3) | 13.1 (27) |
| Any depressive disorder | 3.9 (8) | |
| Any anxiety disorder | 14.0 (29) | |

Table II. Means and Standard Deviations of Anxiety and Depressive Symptoms for the Breast Cancer Sample

| | Mean (*SD*) | Range |
|---|---|---|
| Symptoms of Anxiety (BAI) | 8.3 (6.7) | 0—36 |
| Percent in minimal range (0–7) | 55 | |
| Percent in mild range (8–15) | 31 | |
| Percent in moderate/severe range (16–63) | 14 | |
| Symptoms of Depression (BDI-II) | 9.9 (7.8) | 0—46 |
| Percent in minimal range (0–13) | 72 | |
| Percent in mild range (14–19) | 18 | |
| Percent in moderate/severe range (20–63) | 10 | |

on a clinically anxious outpatient sample (Beck & Steer, 1990). Approximately 45% of women newly diagnosed with breast cancer reported mild to severe symptoms of anxiety. The mean level of depressive symptoms on the BDI-II was 9.9 ($SD = 7.8$), falling in the minimal range when compared with a clinically depressed outpatient sample (Beck et al., 1996). Approximately 28% of women newly diagnosed with breast cancer reported mild to severe symptoms of depression. Patients who had started chemotherapy prior to completing the psychological measures ($n = 65$) had significantly higher BDI-II scores ($M = 11.9, SD = 8.0$) than women who had not begun chemotherapy ($M = 8.9$, $SD = 6.9$; Welch's $t = -2.8$, $p < .01$). Therefore, chemotherapy status was controlled for only in subsequent analyses involving the BDI-II (see also Ritterband & Spielberger, 2001). Scores on the BDI-II and BAI did not differ for women based on surgery, radiation, or cancer stage.

Correspondence Between DSM Diagnoses
and BAI and BDI-II Scores

Three approaches were used in order to test the correspondence between psychiatric symptoms and the presence of a *DSM-IV* disorder. First, to provide the simplest test of the relation between self-reports on the BDI-II and BAI with DSM diagnoses, Welch's $t$-tests and ANCOVAs were used to examine whether the presence of an anxiety or depressive disorder was associated with a significant difference in symptoms of anxiety or depression, respectively. Welch's $t$ was specifically used due to the large differences in sample size between women with and without psychiatric diagnoses. A second step involved calculating sensitivity, specificity, and positive predictive value of the BAI and BDI-II in predicting *DSM-IV* diagnoses. Sensitivity represents the ability of the BAI and BDI-II to correctly detect the presence of an anxiety or depression diagnosis (the proportion of women with psychiatric diagnosis above a cutpoint on the BAI or BDI-II). Specificity reflects the ability of the BAI and BDI-II to correctly rule out the presence of a diagnosis of anxiety or depression (the proportion of women without a psychiatric diagnosis who score below the cutpoint). Positive predictive value is the probability that an individual identified as anxious or depressed by one measure (the BDI-II or BAI) will have an anxiety or depressive disorder as determined by a second measure (the *DSM-IV* checklist) and depends on

the prevalence of the disorder and the sensitivity and specificity of the predictor (Coyne et al., 2000). Finally, logistic regression analyses were used to predict the presence of an anxiety or depressive disorder from symptoms of anxiety or depression while taking into account demographic and medical variables that were associated with psychological distress.

*Group Differences in Psychological Symptoms*

The mean level of anxious symptoms on the BAI for those with an anxiety disorder ($M = 15.8$, $SD = 9.7$) was significantly higher (Welch's $t = -4.8$, $p < .01$) than those without an anxiety disorder ($M = 7.0, SD = 5.2$). Similarly, the mean level of depressive symptoms on the BDI-II for those with an anxiety disorder ($M = 18.8$, $SD = 9.3$) was significantly higher [$F(3, 202) = 56.5$, $p < .01$] than for those without an anxiety disorder ($M = 8.4, SD = 6.5$). The mean level of depressive symptoms on the BDI-II for those with a depressive disorder ($M = 15.5$, $SD = 11.4$) was significantly higher [$F(3, 202) = 5.6$, $p = .02$] than those without a depressive disorder ($M = 9.6, SD = 7.6$) after controlling for chemotherapy status. Depressed and nondepressed patients did not differ on the BAI ($M = 10.9$, $SD = 9.4$, for depressed patients; $M = 8.2, SD = 6.6$, for nondepressed patients; Welch's $t = -0.81$, $p = .44$).

*Sensitivity, Specificity, and Positive Predictive Value*

Using a cutoff of 7 for the BAI (the distinction between minimal and mild anxiety) and a cutoff of 10 for the BDI-II (a standard used to discriminate depressed from nondepressed patients in prior studies, e.g., Frasure-Smith, Lesperance, Juneau, Tlarijic, & Bourassa, 1999), sensitivity, specificity, and positive predictive power were calculated for the BAI and the BDI-II. The BAI yielded a sensitivity of 83%, a specificity of 51%, and a positive predictive value of 30% in predicting the presence of any anxiety disorder. The BDI-II yielded a sensitivity of 75%, a specificity of 60%, and a positive predictive value of 7% in predicting the presence of any depressive disorder. These results indicate a moderate degree of accuracy for the BAI with anxiety symptoms performing nearly a third of the time to accurately indicate an anxiety disorder, but poor accuracy for the BDI-II in predicting a depressive disorder. However, the relatively low positive predictive power may be due to the small number of patients with anxiety disorders.

*Logistic Regression Analyses*

Logistic regression analyses were used to predict the presence of an anxiety or depressive disorder from symptoms of anxiety or depression while controlling for demographic and disease factors. Prior studies of women newly diagnosed with breast cancer indicate that demographic and disease variables that are often associated with psychological distress include age, years of formal education, and cancer stage (e.g., Compas et al., 1999). Welch's independent sample *t* tests indicated no differences on age, stage, type of surgery, and education for those with and without a depressive disorder; patients with an anxiety disorder were significantly younger ($M = 48.7$ vs. $M = 54.1$) and had a significantly lower stage of cancer ($M = 1.2$ vs. $M = 1.6$) than those without an anxiety disorder. Therefore, age and stage were controlled for in the logistic regression analysis for anxiety disorders. Furthermore, because women who were undergoing chemotherapy at the time of the study had higher levels of depressive symptoms than those who were not, chemotherapy status was controlled for in the logistic regression analysis for depressive disorders.

In the regression analysis for depressive disorders, only BDI-II depressive symptoms and chemotherapy status were used to predict the presence of a depressive disorder since none of the other demographic or disease variables had a reliable association with depressive disorders. The results indicated a significant association where symptoms of depression (BDI-II) predicted the presence of a current depressive disorder ($\beta = .07$, $\chi^2 = 4.0$, $p < .05$) and accounted for 3% of the variance. In the regression analysis for the presence of an anxiety disorder, after controlling for age and cancer stage, symptoms of anxiety (BAI) significantly predicted the presence of an anxiety disorder ($\beta = .17$, $\chi^2 = 30.4$, $p < .01$), and accounted for 19% of the variance.

*Quality of Life, Psychological Symptoms, and* *DSM-IV* Disorders

The relative association of both psychological symptoms and *DSM-IV* disorders were examined in relation to specific domains of quality of life. The three domains of the CARES used in these analyses include physical, medical, and sexual quality of life.

*Quality of Life and* DSM-IV *Disorders*

Welch's independent samples *t* tests were used to examine differences in quality of life between those with and without a depressive disorder (see Table III). There were no reliable differences between patients with and without depressive disorders across all three domains of quality of life. For those with and without an anxiety disorder, significant differences were found on the physical and sexual subscales (Welch's $t = -2.9$ and $-3.8$, $p < .01$) and approached significance for the medical subscale (Welch's $t = -1.8$, $p = .08$). Specifically, patients with an anxiety disorder reported significantly poorer quality of life than those without a disorder.

*Quality of Life and Anxiety and Depression Symptoms*

Correlations examining the association between psychological symptoms and the quality of life indices yielded significant moderate associations ranging from .33 to .38, $p < .01$, for anxiety symptoms and .34 to .70, $p < .01$, for depressive symptoms. Additionally, when using cutoffs to create a dichotomous variable representing the presence of depression or anxiety based on a symptom score higher than 10 for depression on the BDI-II, and 7 for anxiety on the BAI, Welch's independent samples *t* tests and ANCOVAs examining differences in mean scores on quality of life indicated significant differences. For the

Table III. Quality of Life of Breast Cancer Patients With *DSM-IV* Disorders and Elevated Psychological Symptoms

| Quality of life | *M (SD)* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Depressive disorder ($N = 8$) | No depressive disorder ($N = 199$) | Anxiety disorder ($N = 29$) | No anxiety disorder ($N = 178$) | >10 BDI-II ($N = 76$) | ≤10BDI-II ($N = 131$) | >7 BAI ($N = 114$) | ≤7BAI ($N = 93$) |
| Physical | 0.65 (0.51) | 0.74 (0.56) | 0.97 (0.46)* | 0.70 (0.56) | 1.00 (0.56)** | 0.55 (0.47) | 0.88 (0.56)** | 0.56 (0.48) |
| Medical | 0.59 (0.99) | 0.33 (0.56) | 0.56 (0.75)† | 0.29 (0.52) | 0.56 (0.75)** | 0.18 (0.32) | 0.49 (0.70)** | 0.17 (0.28) |
| Sexual | 1.20 (1.5) | 1.20 (1.1) | 2.00 (1.2)** | 1.10 (1.0) | 1.90 (1.2)** | 0.74 (0.74) | 1.50 (1.2)** | 0.86 (0.86) |

*$p < .05$. **$p < .01$. †$p < .10$.

BDI-II, significant differences between those with depressive symptoms above and below the cutpoint for all three domains were found [$F(3, 204)$ ranging from 20.2 to 43.5, $p < .01$]. For the BAI, significant differences were found between those with anxiety symptoms above and below the cutpoint were found across the three domains (Welch's $t$ ranging from $-4.0$ to $-4.6$, $p < .01$).

*Disorders, Symptoms, and Quality of Life*

Linear multiple regression analyses were used to account for quality of life based on both *DSM-IV* disorders and psychological symptoms. First, chemotherapy status (had started chemotherapy or not) was entered into the equation. Diagnoses of anxiety disorders and depressive disorders were entered as a second step in determining their relative association with physical, medical, and sexual quality of life; symptom scores on the BAI and the BDI-II were added in a third step in these regression equations.

Results for physical quality of life indicate that the model for anxiety and depressive disorders was significant, $F(3, 201) = 6.5$, $p < .01$, accounting for 8% of the variance. Chemotherapy status and anxiety disorders contributed ($\beta = .23$, $p < .01$; $\beta = .19$, $p < .01$) in this first step. When anxious and depressed symptoms were added to the equation, the model was significant, $F(5, 199) = 11.2$, $p < .01$, and 20% of the variance in physical quality of life was accounted for, and the change of 12% was significant ($p < .01$). After accounting for anxious and depressive symptoms, the contribution of anxiety and depressive disorders was no longer significant. Chemotherapy status ($\beta = .19$, $p < .01$), depressive symptoms on the BDI-II ($\beta = .25$, $p < .01$), and anxious symptoms on the BAI contributed ($\beta = .21$, $p < .05$) in this model.

For medical quality of life, the regression equation indicated a trend for anxiety and depressive disorders, $F(3, 201) = 2.0$, $p = .12$, accounting for 1% of the variance. Anxiety disorders contributed uniquely ($\beta = .15$, $p < .05$) in this first step. When anxious and depressed symptoms were added to the equation, the model was significant, $F(5, 199) = 6.1$, $p < .01$, accounting for 11% of the variance in medical quality of life, and the change of 10% was significant ($p < .01$). After accounting for anxious and depressive symptoms, the contribution of anxiety disorders dropped out, and anxiety (marginal; $\beta = .19$, $p < .06$) and depressive symptoms ($\beta = .22$, $p < .03$) each contributed to the model. Chemotherapy status was not significantly associated with medical quality of life at any step of these regression equations.

The regression equation for sexual quality of life indicated a significant association of anxiety and depressive disorders with sexual quality of life, $F(3, 197) = 14.3$, $p < .01$, accounting for 17% of the variance. Chemotherapy status ($\beta = .30$, $p < .01$) and anxiety disorders contributed ($\beta = .30$, $p < .01$) in this first step. When anxious and depressed symptoms were added to the equation, the model was significant, $F(5, 195) = 25.2$, $p < .01$, accounting for 38% of the variance in sexual quality of life, and the change of 21% was significant ($p < .01$). After adding anxious and depressive symptoms to the equation, anxiety disorders were no longer significant, and only chemotherapy status and depressive symptoms contributed ($\beta = .56$, $p < .01$; $\beta = .21$, $p < .01$).

DISCUSSION

Women with newly diagnosed breast cancer are challenged by the stress of a potentially life threatening disease, complex medical decisions about invasive procedures, and the reality of many months of difficult treatments. Prior research has established that a portion of women newly diagnosed with breast cancer experience elevated levels of psychological distress (e.g., Epping-Jordan et al., 1999). Estimates of the percentage of women who experience significant distress depend, however, on how distress is defined and measured (mood state, psychological symptom, psychiatric disorder). Although research has reported relatively consistent results on mood states and symptoms of emotional distress, data on rates of psychiatric diagnoses in this population have been much more varied (e.g., McDaniel et al., 1995).

Results of this study indicate that approximately one fifth (18%) of women newly diagnosed with breast cancer met criteria for a current *DSM-IV* mood, anxiety, or adjustment disorder, and slightly more than one half (54%) met criteria for a lifetime (current or past) diagnosis in the anxious–depressed spectrum. The most common current diagnosis was PTSD, and after combining this with acute stress disorder the current rate of these stress-response disorders was 7.7%. This compares favorably with the 6% rate of PTSD reported by Andrykowski et al. (1998) in a sample of women undergoing treatment for breast cancer. The rate of current major depressive disorder (1.9%) is identical to the rate reported by Coyne et al. (2000) in a recent study of women previously

diagnosed with breast cancer. The point prevalence rate in the current study is lower than the 8.2% rate found in the NCS (Kessler et al., 1994); however, this difference is most likely attributable to the use of a 6-month window in the NCS. Compared to the findings from the NCS, the rates for current anxiety disorders were all somewhat lower in the present study—generalized anxiety disorder (3.2% in the NCS vs. 2.7% in this study), panic disorder (4.1% vs. 3.4%), specific phobias (8.2% vs. 3.4%), and social phobia (5.2% vs. 2.0%). Again, the lower rates in this study are most likely the result of the different time frame used in deriving the diagnoses.

Lifetime rates of anxiety and depressive disorders in the current sample are quite similar to those found in the NCS, indicating that this sample of women with breast cancer had a psychiatric history that is similar to what would be expected in a community sample of women. For example, the lifetime rate of 20.3% for major depression found in this study is comparable to lifetime rates reported for adult women in the NCS (e.g., Kessler et al., 1994).

Thus, the present findings indicate that both current and lifetime *DSM-IV* mood and anxiety disorders in newly diagnosed breast cancer patients are similar to the rates found in the general population. This suggests that a diagnosis of breast cancer is not associated with a previous history of psychopathology. Similarly, the diagnosis of breast cancer does not appear to be associated with increased risk for a current mood or anxiety disorder. Current and past depression and anxiety disorders in newly diagnosed breast cancer patients appear to be relatively independent of the disease itself.

Overall, these rates suggest that a diagnosis of breast cancer is associated with a mood or anxiety disorder in only a small portion of women. However, on the basis of self-reports on the BAI and the BDI-II, nearly half of the breast cancer patients in this study reported at least minimally elevated levels of anxiety symptoms and over a quarter reported elevated levels of depressive symptoms. This suggests that the stress of receiving a diagnosis of breast cancer may manifest as psychological symptoms that do not reflect specific psychiatric disorders.

The correspondence between symptoms and disorders is important to understand when breast cancer patients report they experience elevated levels of anxiety and depressive symptoms but not an increased rate of disorders. Prior studies have reported poor correspondence between psychological symptoms and DSM disorders (e.g., Coyne et al., 2000), however,

research has not clarified if both approaches can be used in understanding distress among breast cancer patients. Correspondence between symptoms and disorders was examined using three different methods to optimize the understanding of this issue. First, we found that the presence versus absence of anxiety and depressive disorders was associated with significant differences in levels of anxiety and depressive symptoms. Second, we used a more rigorous method by determining cutoffs on the symptom checklists to identify the presence or absence of a disorder thus estimating sensitivity, specificity, and positive prediction for these checklists (BAI and BDI-II). This method indicated that the BAI performed adequately with positive prediction of anxiety disorders (30%), however, the BDI-II performed poorly and over predicted depressive disorders (7% positive predictive value). The positive predictive power for the BDI-II was similar to that found by Coyne et al. (2000) for depression (4%) but the rates for anxiety was much higher than that reported by Coyne et al. (3%). Finally, the third method involved the degree to which symptoms statistically accounted for the presence or absence of a disorder. While taking into account demographic and disease variables, these findings indicated that symptoms of anxiety moderately accounted for anxiety disorders, and depressive symptoms significantly accounted for depressive disorders. These three methods of measuring the correspondence between symptoms and disorders suggest that there is correspondence between symptoms and disorders; however, the correspondence is relatively poor. These data clearly caution against using symptom checklists as an indication of the presence or absence of a *DSM-IV* disorder, particularly the BDI-II for a depressive disorder. However, these findings need to be interpreted cautiously, as the relatively low base rate of current disorders led to low statistical power for these analyses and thus these results may reflect characteristics or size of the sample, rather than the psychometric properties of the BDI-II.

Finally, given the importance of issues related to quality of life among breast cancer patients, we examined the relationship of psychological symptoms and *DSM-IV* disorder with domains of quality of life. Symptoms of anxiety and depression were more strongly associated with physical, medical, and sexual quality of life than the presence of *DSM-IV* disorders. Therefore, women who did not meet the criteria for a *DSM-IV* disorder, yet who reported anxious or depressed symptoms were also experiencing lower quality of life. That is, psychiatric symptoms that do not

meet criteria for a *DSM-IV* disorder can still have a significant, negative impact on quality of life. These findings highlight the potential importance of routinely assessing psychological symptoms in medical and clinic settings, as women may benefit from psychological intervention to alleviate even subclinical levels of these symptoms and enhance their quality of life. However, the relatively stronger association of quality of life with symptoms of distress as compared with psychiatric diagnoses may be due in part to the use of self-report questionnaires to assess both quality of life and distress (i.e., assessment of quality of life and symptoms shared common variance attributable to the method used to assess both constructs), as well the presence of shared items on these self-report questionnaires (i.e., overlap of somatic symptoms in depression/anxiety and physical/sexual quality of life).

This study has several limitations that need to be addressed in subsequent research, including the narrow demographic make-up of this sample, the small number of women who met criteria for current psychiatric disorders in the sample versus those who did not, and biases inherent in recruiting for a larger study requiring participation in a support group. These characteristics of the sample may limit the generalizability of the findings. Future directions would involve collecting data on different populations of individuals facing cancer in order to establish a source of data for clinicians, researchers, and medical professionals to make decisions about services and treatments. Finally, in order to understand whether distress as measured by psychiatric diagnoses follow a similar pattern to distress as measured by dimensional measures, it would be important to continue to track rates of *DSM-IV* disorders over time. Because *DSM-IV* disorders are defined in part by a minimum time duration (e.g., generalized anxiety disorder has a duration criterion of 6 months), it would be important to track and take into account the onset of disorders as they occur in the timeline following a diagnosis of breast cancer. Presently, the provision of and reimbursement for clinical services depends upon meeting criteria for a *DSM-IV* diagnosis, and the integration of psychology within specific interdisciplinary behavioral medicine settings relies upon the comprehensive understanding of the mental health needs of this distinct health population.

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