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DEPRESSION, CORRELATES OF DEPRESSION, AND RECEIPT OF DEPRESSION CARE AMONG LOW-INCOME WOMEN WITH BREAST OR GYNECOLOGICAL CANCER

Kathleen Ell, DSW¹, Kathleen Sanchez, PhD¹, Betsy Vourlekis, PhD², Pey-Juan Lee, MS¹, Megan Dwight-Johnson, MD³, Isabel Lagomasino, MD⁴, Laila Muderspach, MD⁵, and Christy Russell, MD⁵

¹University of Southern California (USC) School of Social Work

²University of Maryland School of Social Work

³University of Washington Department of Psychiatry

⁴University of Southern California (USC) Keck School of Medicine, Department of Psychiatry

⁵University of Southern California (USC) Keck School of Medicine

Abstract

Purpose—To assess the prevalence of depression among low-income, ethnic minority women with breast or gynecological cancer, receipt of antidepressant medications or counseling services, and correlates of depression.

Patients and Methods—Study patients were 472 women receiving cancer care in an urban public medical center. Women had a primary diagnosis of breast (Stage 0-III) or gynecological cancer (FIGO 0-3B). A diagnostic depression screen and baseline questionnaire was administered prior to or during active treatment or during active follow-up. Self-report data was collected on receipt of depression treatment, use of supportive counseling, pain and receipt of pain medication, functional status and well-being, and perceived barriers to cancer care.

Results—Twenty-four percent of women reported moderate to severe levels of depressive disorder, 30% of breast cancer patients and 17% of gynecological cancer patients. Only 12% of women meeting criteria for major depression reported currently receiving medications for depression and only 5% of women reported seeing a counselor or participating in a cancer support group. Neither cancer stage or treatment status was correlated with depression. Primary diagnosis of breast cancer, younger age, greater functional impairment, poorer social/family well-being, anxiety, comorbid arthritis, and fears about treatment side effects were correlated with depression.

Conclusion—Findings indicate that depressive disorder among ethnic minority, low-income women with breast or gynecological cancer is prevalent and is correlated with pain, anxiety and health-related quality of life (HRQL). Because these women are unlikely to receive depression treatment or supportive counseling, there is a need for routine screening, evaluation and treatment in this population.

Keywords

cancer; depression screening; low-income; Hispanic; minority; quality of life

Address correspondence to: Kathleen Ell, DSW School of Social Work-0411 University of Southern California University Park Los Angeles, CA 90089 Email: ell@usc.edu Telephone: 213-740-0298.

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Introduction

Major depressive disorder and depressive symptoms are prevalent in patients with cancer [1-2], with significant differences in prevalence by site [3]. Variable and relatively high rates (up to 48%, depending on the criteria used in assessments) are found among women with breast or gynecological cancer [4-7], with some evidence that depression can worsen over the course of cancer treatment, and persist long after cancer therapy [8]. However, the majority of the patients in these studies have been non-Hispanic White and middle to upper income. Less is known about the prevalence of depression among low-income, ethnic minority women with cancer.

Correlates of depression among cancer patients include pain, anxiety, poorer functional status, fatigue, quality of life and survival [9-15]. Low-income, ethnic minority patients with cancer also encounter economic and other barriers to cancer care [16-19] and an association between economic stress and depressive symptoms has been found for cancer [20] and non-cancer patients [21].

Oncologists and nurses are found to correctly detect mild to moderate depressive symptoms in only one third of patients with depressive symptoms, to underestimate the level of depressive symptoms among patients who are more severely depressed, and to be most influenced by overt symptoms [22-25]. And studies find that the majority of depressed patients with cancer, who meet diagnostic criteria, have not been prescribed antidepressants or are not receiving adequate dosage [26-28]. There is also evidence that low-income patients with cancer are less likely to receive mental health services [29], evidence that is consistent with numerous primary care studies where low-income, underinsured, and ethnic minority primary care patients are found to have relatively high rates of depression, but to be less likely to receive care for depression or to be prescribed antidepressants [30-36].

Using baseline data from an ongoing randomized trial of a structured case management intervention to improve adherence to cancer treatment and reduce potential barriers to treatment of which depression is one probable barrier, we describe: 1) the prevalence of depressive disorders - based on results of a valid and reliable diagnostic screen - among low-income, ethnic minority women with breast or gynecological cancer; 2) correlates of depression, such as pain, anxiety, perceived social support, functional status, and potential barriers to cancer care; and 3) patients' self-reported receipt of antidepressant medications or supportive counseling.

Patients and Methods

Participants

Data on 472 women are drawn from the baseline survey of the NCI-funded study, Improving Patient Access and Adherence to Cancer Treatment (IMPAACT), an ongoing randomized trial of a structured case management intervention to improve adherence to cancer treatment among 500 women with breast or gynecological cancer. Patients were approached for study participation in outpatient oncology clinics at a large urban public sector medical center. Participants were enrolled in the study if they were 1) 18 years or older; 2) had a primary diagnosis of breast (Stage 0-III) or gynecological cancer (FIGO 0-4B); and 3) were undergoing active treatment or in active follow-up. Patients were excluded if they were receiving only palliative care or were cognitively impaired to the extent of being unable to participate. Of 621 potentially eligible IMPAACT patients, 500 (80.5%) women were enrolled in the clinical trial. There were no statistically significant differences between enrolled and non-enrolled by age, ethnicity, or cancer stage. Of the 500 women who were enrolled, 250 (50%) were diagnosed with breast cancer and 250 (50%) were diagnosed with a gynecological cancer. Of the 250 gynecological cancer patients, 28 women diagnosed with FIGO 4 cancer were excluded from

this report to reduce sample stage differences between the two cancer sites. Of the 222 gynecological patients, 120 (54%) women had cervical cancer, 53 (24%) uterine cancer, 42 (19%) ovarian cancer and 7 (3%) other gynecological cancer.

Procedures

Informed written consent was obtained for all study patients using a consent form approved by the University of Southern California-Health Sciences Institutional Review Board. Baseline interviews were conducted in-person or via telephone in either Spanish or English based on patient preference by trained bilingual interviewers. For patients who were not comfortable in speaking English or Spanish, an in-person interview was conducted with the help of translation by a family member or friend.

Measures

Depression Status—The PHQ-9, a diagnostic screen, was administered in-person or via telephone by trained study recruiters. The PHQ-9 is a subset of questions from the Patient Health Questionnaire (PHQ), a self-report version of the PRIME-MD [33]. The PHQ-9 assesses for the presence of depressive disorder [37-39] using modified Diagnostic and Statistical Manual, Fourth Edition (DSM-IV) [40] criteria [41] that is reflected in a threshold score. For major depressive disorder (MDD), the threshold score for the PHQ-9 is 10 or greater. Among those with major depression, a PHQ-9 score of 10 to 14 indicates moderate depression and score of 15 to 27 indicates severe depression. The instrument is valid and reliable [42], accurately diagnoses major depression [37-39,43], can be administered in-person or via telephone [44] and has been used with cancer patients [45]. The Spanish version of the PHQ-9 was used for monolingual patients. Two additional questions from the PRIME-MD were used to assess dysthymia [41]. Anxiety was assessed using a 6-item anxiety module from the Brief Symptom Inventory (BSI) [46] found to be a reliable measure among monolingual speaking Hispanics [47]. A BSI score of 14 to 24 indicated clinically significant anxiety.

Demographic and clinical variables—Age, marital status, education, birthplace, primary language, employment and health insurance status were assessed. Data on personal or household income was not collected given that the study site population is consistent with national and state poverty guidelines. Cancer site, stage, and oncology treatment status at study enrollment were abstracted from medical records. Among women reporting pain, further assessment was made using the Brief Pain Inventory (BPI) Short Form [48-49]. A clinically significant cutoff score of 7 or greater indicates severe pain. The reliability and validity of the BPI have been examined for the Spanish version and it has been used with similar patients at the reported study site [50]. The alpha reliability coefficient in this study was 0.84.

Functional status—Functional status was assessed by self-report at baseline using the Karnofsky Performance Status Scale (KPSS), an 11-point rating scale which ranges from normal functioning (100) to death (0) [51]. The Functional Assessment of Cancer Therapy Scale – General (FACT-G) [52], a valid and reliable 27-item Health Related Quality of Life (HRLQ) questionnaire assessed physical, functional, social/family, and emotional well-being. The Spanish version (FACT-S) [53] was used with monolingual patients. The alpha reliability coefficients for the subscales in this study were 0.85 for physical well-being; 0.81 for functional wellbeing; 0.79 for social/family well-being and 0.78 for emotional well being. Mean subscale scores are presented and cutpoints of each subscale based on a median score were created for analytic purposes. The presence of six co-morbid health conditions (i.e., hypertension, heart disease, diabetes, stroke, arthritis, and kidney disease) was obtained from patient self-report.

Treatment adherence and perceived barriers to cancer care—Patients were asked a series of questions about a) completion of treatment to date; b) number of missed

appointments; c) the reason for missed appointments, d) whether they were currently taking medication for depression, anxiety, or pain, and e) whether they had missed taking prescribed medications along with a reason for failure. Following a lead statement “There are different reasons that women may have for not being able to keep scheduled appointments or to follow treatment recommendations. I'm going to name some of these and I'd like you to tell me if any of these problems may be true for you”, a battery of 18 perceived barriers to cancer care were presented. Patients were allowed to choose multiple barriers that included lack of comprehension about treatment recommendations; worries about treatment side effects; economic concerns about cost of care or lost wages and problems related to personal/family issues or co-morbid illness.

Analysis Plan

Descriptive statistics were conducted to present the overall characteristics of the study sample. Chi-square tests were used for categorical variables and t-tests were used for continuous variables to assess associations between demographic, clinical, functional characteristics and the dependent variable, depression. Odds ratios and confidence intervals were calculated for each variable found to be statistically significant ($p \leq .05$). Confidence intervals that do not contain 1.0 are considered to indicate statistical significance. Each independent factor found to be statistically significant at the univariate level was considered for entry into the final logistic regression model. A good fitting model would yield a high p-value ($P > .7$) in the Hosmer and Lemeshow [54] “goodness of fit” chi-square test [55].

Results

Demographic, Clinical, and Functional Status

Study participants have a mean age of 50.0 ($SD=11.8$); are primarily Latina (79%), Spanish-speaking (75%), foreign-born (88%), without a partner (59%), and had completed less than 9 years of education (56%). The majority (72%) of women reported receiving Medi-Cal or state and local government financed short-term, episodic assistance in paying for specific types of care, e.g. state cancer treatment funds. Of the 472 women, 213 (45%) were employed in the past 12 months; however, the baseline rate of unemployment was high (81%) (See Table 1).

At enrollment, 38% ($n=178$) were newly diagnosed with cancer ($n=35$, 7% were recurrent cancers), 51% ($n=242$) were in active cancer treatment, and 11% ($n=52$) were receiving active follow-up. Co-morbid conditions most frequently cited were hypertension (31%), diabetes (19%), and arthritis (15%). The Brief Pain Inventory (BPI) was completed by 187 women who reported having pain during the past seven days; 146 (78%) of these women reported taking pain medication. On the BPI scale of 0 to 10, 14% rated having pain at baseline score of 7 to 10. Baseline functional and quality of life assessment FACT-G mean subscale scores were 20.9 for physical well-being; 17.9 for social/family well-being; 15.7 for emotional well being; and 14.3 for functional wellbeing (See Table 1).

Prevalence of Depression

Of the 472 study subjects, 114 (24%) women met criteria for a major depression disorder (MDD). Of the women with MDD, 71 (62%) scored in the moderate range (PHQ-9, 10-14) and 43 (38%) were scored as severe (PHQ-9, 15-27) and 23 (20%) endorsed suicidal ideation. In addition, 24 (21%) of depressed women screened positive for anxiety (BSI score 14 or more). Of the 472 study participants, seventy (15%) women screened positive for dysthymia without major depression (See Figure 1).

Adherence and Perceived Barriers to Cancer Treatment

Of the 472 study participants, 36 (8%) reported having missed a previous appointment and 22 (5%) reported having missed taking prescribed medications. Thirty-three women (7%) reported their intention to seek treatment other than that recommended by their physician. And 152 (32%) women reported using complementary and alternative medicine therapies such as teas, herbs, and spiritual healers.

Self-reports of perceived barriers to cancer treatment were common among all women, with the majority (70%) reporting 4 or more. The most commonly cited were concerns about side effects (n=318, 69%); treatment process (n=292, 62%); and lack of understanding of what to expect when getting treatment (n=177, 39%). Economic concerns were also frequent: Patients cited the inability to get all medications (n=125, 30%); lost wages due to sick time (n=127, 46% of 274 women who responded to questions regarding wage) and/or keeping medical appointments (n=117, 43%). Personal/family problems were reported as interfering with keeping appointments (n=132, 28%); as was medical co-morbidity (n=95, 20%). Women reported that they relied primarily on family/friends (52%) and public transportation (31%) to attend their medical appointments.

Correlates of Depression

Demographic, Clinical and Functional Characteristics—Age was significantly correlated with depression, with younger women (< 50 years old) more likely to report depression (p=.015). Ethnicity, education, marital status, birthplace, primary language, health insurance or employment status were not correlated with depression. Cancer site (p=.001), report of pain (p<.001), suicidal ideation (p<.001), anxiety (p<.001) and arthritis (p=.006) were significantly correlated with depression. Depressed women were significantly more likely to report poorer physical and functional status and social/family and emotional well-being (p<.001, respectively). (See Table 2)

Barriers to Cancer Care—Overall, depressed women report significantly more barriers (t=4.95, df=470, p<.001), including lack of understanding of treatment recommendations and worries about treatment, side effects, costs, and lost wages. Seven out of 18 cancer treatment barriers were significantly related to depression in this sample: understanding treatment recommendations (p=.002); fears about receiving treatment (p=.020) and side effects (p=.008); inability to get for all prescribed medication (p=.021); concerns about lost wages due to illness (p=.002) and to attend medical appointments (p=.010) and forgetting medical appointments (p=.013). (See Table 2)

Receipt of Depression Care

Fourteen (12%) of the women with major depression and eleven (16%) of the women with dysthymia alone, reported currently receiving medications for depression. Five additional women who did not meet criteria for major depression or dysthymia reported antidepressant medication use at baseline. Women who reported receiving antidepressants were less likely to have major depression (47% vs 87%) and pain symptoms (47% vs 67%) and more likely to report anti-anxiety medication use (27% vs 2%) compared to depressed women not receiving antidepressants. Of the depressed women, four (4%) reported currently seeing a social worker or mental health counselor; 2 (2%) had participated in a cancer support group; 17 (15%) reported talking with a priest or religious counselor or participating in religious activities and 7 (6%) reported receiving emotional support from family or friends.

Logistic Regression Model.

The logistic regression analysis was conducted using a backward stepwise selection ($p < .05$) with twelve main effects: cancer site, age, physical functioning (KPSS), social/family well being, anxiety, arthritis, pain and five barriers - difficulties understanding recommendations, fears about receiving treatment, fears about treatment side effects, inability to get for all prescribed medication and forgetting medical appointment. The final model consisted of seven main effects which explained 40% of the variance in depression and resulted in a chi-square of 5.23, $p = .73$, an indication of a good fit. (See Table 3)

Discussion

Findings indicate that depressive disorder is highly prevalent among the study low-income, ethnic minority women, and that a majority of women were not receiving antidepressant medication or other supportive counseling services. The prevalence of major depressive disorder is higher than that reported in a recent study where 10% of women with breast cancer population met diagnostic criteria [56]. And the percentage of women receiving antidepressant medications is somewhat lower than the 19.2% found by Asbury and colleagues among breast cancer patients in community oncology practices [28] and is in striking contrast to a recent study of predominantly non-Hispanic White, college educated, middle to upper income women with breast cancer where it was found that of the 10% of women who met diagnostic criteria for major depression, 80% were receiving antidepressant medication [56]. Undertreatment in this study is also consistent with primary care studies, where Hispanics are found to be less likely than whites to receive depression treatment according to evidence-based guidelines [57], and less than half as likely as non-Hispanic whites to receive a diagnosis of depression or antidepressant medication [58].

While this report does not address patient or provider explanations for receipt of care, it is likely that data reflect provider failure to routinely assess and treat depressive disorder that is common across oncology practice [28] as well as known barriers to receipt of depression care among low-income populations. In either case, study findings present evidence supporting the utility of routine depression screening [59-62] among low-income cancer patients. At the same time, active screening for depression within already burdened and under-resourced public care systems raises additional considerations, including the potential high prevalence of depression symptoms frequently found in low-income and medically underserved populations [63-64], the needs and preferences of culturally diverse patients [65-66], and lack of availability of low cost depression care in the community [26,67]. Despite these considerations, screening can be effective for indigent patients [68].

Fortunately, there is also evidence that quality improvement depression interventions are effective among low-income and ethnic minority primary care patients [69-71]. Ethnic minority patients' preference for receiving depression care within the general health sector [66] suggests a need to integrate depression care within the oncology care system. Nurses and social workers might be trained to provide depression care for cancer patients [72-73]. In a pilot randomized study of 55 depressed, low-income, Latina breast or cervical cancer patients in public sector oncology clinics, onsite depression care management by a medical social worker that included Problem Solving Treatment and medication follow-up and psychiatric consultation significantly reduced depression symptoms over usual care [74].

An additional note, while the majority of depressed women reporting significant levels of pain were receiving pain medication, a significant number reported limited pain relief. This finding raises questions that are consistent with a previous study of ethnic minority cancer patients in which inadequate pain assessment by physicians, particularly among women, patient reluctance to report pain, and lack of staff time were perceived as barriers to optimal pain

management for ethnic minority cancer patients [44]. Additional correlates of depression – economic worries, less satisfaction with support, lack of cancer support participation – may be specific to low-income patients with cancer. Lack of participation in cancer support groups may result from both of lack of access and barriers to participation [74]. The identification of economic concerns, social support needs, and potential barriers to supportive cancer services suggest the need for supplementary case management services similar to those reported to be effective among impoverished primary care and cancer patients from ethnic minority groups [70].

Study limitations include that specific diagnostic evaluation of patients' depression was unavailable, the data does not provide conclusive evidence about the causal relationship between identified correlates and depression, and the findings are limited to low-income minority women with cancer receiving care in an urban, public sector setting. In addition, information obtained on functional status, pain, use of medications, social support resources and barriers to cancer care relied on self-report, although patient self-report of antidepressant use is reasonably accurate [75]. However, the collection of longitudinal and medical record data on this cohort of women with cancer is underway. Results from the ongoing randomized intervention study will enable us to examine actual cancer treatment adherence and the effects of the intervention which includes systems navigation and supportive case management as well as algorithm guided depression care.

Despite limitations, we believe that the study contributes to the existing literature on depression among low-income, minority women with cancer and that taken together, evidence encourages oncology care providers to consider ways to improve depression care practices and interventions designed for low-income patients. Use of a diagnostic depression screen for these women is likely to identify relatively high rates of clinically significant and undertreated depression. The screen might be used by cancer care providers to aid in targeting women who are likely to benefit from further evaluation, treatment with antidepressant medications, and/or efforts to link these women to mental health specialists and supportive psychosocial care providers within and outside of the oncology care system.

REFERENCES

1. Honda K, Goodwin RD. Cancer and mental disorders in a national community sample: Findings from the National Comorbidity Survey. *Psychother & Psychosom* 2004;73:235–242.
2. Pirl WF. Evidence report on the occurrence, assessment, and treatment of depression in cancer patients. *J Natl Cancer Inst Monogr* 2004;32:32–39. [PubMed: 15263039]
3. Massie MS. Prevalence of depression in patients with cancer. *J Natl Cancer Inst Monogr* 2004;32:57–71. [PubMed: 15263042]
4. Bodurka-Bevers D, Basen-Engquist K, Carmack CL, et al. Depression, anxiety, and quality of life in patients with epithelial ovarian cancer. *Gyn Onc* 2000;78:302–308.
5. Kissane DW, Clarke DM, Ikin J, et al. Psychological morbidity and quality of life in Australian women with early-stage breast cancer: a cross sectional survey. *MJA* 1998;169:192–196. [PubMed: 9734576]
6. Norton TR, Manne SL, Rubin S, et al. Prevalence and predictors of psychological distress among women with ovarian cancer. *J Clin Oncol* 2004;22:919–926. [PubMed: 14990648]
7. Rijken M, deKruif A, Komprou IH, et al. Depressive symptomatology of post-menopausal breast cancer patients: a comparison of women recently treated by mastectomy or by breast conserving therapy. *Eur J Surg Oncol* 1995;21:498. [PubMed: 7589593]
8. Thompson DS, Shear MK. Psychiatric disorders and gynecological oncology: a review of the literature. *General Hospital Psychiatry* 1998;20:241–247. [PubMed: 9719904]
9. Stark D, Kiely M, Smith A, et al. Anxiety disorders in cancer patients: their nature, associations, and relation to quality of life. *J Clin Oncol* 2002;20:3137–3148. [PubMed: 12118028]

10. Ahlberg K, Ekman T, Wallgren, et al. Fatigue, psychological distress, coping and quality of life in patients with uterine cancer. *J Advanced Nursing* 2004;45:205–213.
11. Bair M, Robinson RL, Katon W, et al. Depression and pain comorbidity: a literature review. *Arch Intern Med* 2003;163:2433–2455. [PubMed: 14609780]
12. Brown KW, Levy AR, Rosberger Z, et al. Psychological distress and cancer survival: a follow-up 10 years after diagnosis. *Psychosomatic Med* 2003;65:636–643.
13. Goodwin JS, Zhang DD, Ostir GV. Effect of depression on diagnosis, treatment, and survival of older women with breast cancer. *J Am Geriatr Soc* 2004;52:106–111. [PubMed: 14687323]
14. Hjerl K, Anderses EW, Keiding N, et al. Depression as a prognostic factor for breast cancer mortality. *Psychosomatics* 2003;44:24–30. [PubMed: 12515834]
15. Ciaramella A, Poli P. Assessment of depression among cancer patients: the role of pain, cancer type and treatment. *Psycho-Onc* 2001;10:156–165.
16. Golden-Kreutz DM, Anderson BL. Depressive symptoms after breast cancer surgery: Relationships with global, cancer-related, and life event stress. *Psycho-Onc* 2004;13:211–220.
17. Guidry JJ, Adav LA, Zhang D, Winn RJ. Transportation as a barrier to cancer treatment. *Cancer Practice* 1997;5:461–466.
18. Guidry JJ, Adav LA, Zhang D, Winn RJ. Cost considerations as potential barriers to cancer treatment. *Cancer Practice* 1998;6:182–7. [PubMed: 9652250]
19. Kasper AS. Experiences of low-income women with breast cancer. Final Report to the Agency for Health Care Policy and Research. 1999
20. Heilman MV, Lee KA, Dury FS. Strengths and vulnerabilities of women of Mexican descent in relation to depressive symptoms. *Nursing Res* 2002;51:175–182.
21. Ennis NE, Hobfoll SE, Schroder KE. Money doesn't talk, it swears: how economic stress and resistance resources impact inner-city women's depressive mood. *Am J Comm Psych* 2000;28:149–173.
22. Keller MB, McCullough JP, Klein DN, et al. A comparison of nefazodone, the cognitive behavioral-analysis system of psychotherapy, and their combination for the treatment of chronic depression. *New Engl J Med* 2000;342(20):1462–1470. [PubMed: 10816183]
23. McDonald M, Passik S, Dugan W, et al. Nurses' recognition of depression their patients with cancer. *Oncology Nursing Forum* 1999;26:593–599. [PubMed: 10214600]
24. Newell S, Sanson-Fisher RW, Girgis A, et al. A. How well do medical oncologists' perceptions reflect their patients reported physical and psychological problems? Data from a survey of five oncologists. *Cancer* 1998;83(8):1640–51. [PubMed: 9781960]
25. Passik SD, Digan W, McDonald MV, et al. Oncologists' recognition of depression in their patients with cancer. *J Clin Oncol* 1998;16:1594–1600. [PubMed: 9552071]
26. Ashbury FD, Madlensky L, Raich P, et al. Antidepressant prescribing in community cancer care. *Supportive Care Cancer* 2003;11:278–285.
27. Fallowfield L, Ratcliffe D, Jenkins V, et al. Psychiatric morbidity and its recognition by doctors in patients with cancer. *British J Cancer* 2001;84:1011–5.
28. Sharpe M, Allen K, Strong V, et al. Major depression in outpatients attending a regional cancer centre: screening, prevalence and unmet treatment needs. *British J Cancer* 2004;90:314–320.
29. Hewitt M, Rowland JH. Mental health service use among adult cancer survivors: analyses of the National Health Interview Survey. *J Clin Oncol* 2002;20:4581–4590. [PubMed: 12454116]
30. Young AS, Lap R, Sherbourne CD, et al. The quality of care for depressive and anxiety disorders in the United States. *Arch Gen Psychiatry* 2001;58:55–61. [PubMed: 11146758]
31. Katz SJ, Kessler RC, Lin E, et al. Medication management of depression in the United States and Ontario. *J Genl Int Med* 1998;13(2):77–85.
32. Melfi CA, Croghan TW, Hanna MP. Access to treatment for depression in a Medicaid population. *J Health Care for the Poor and Underserved* 1999;10(2):201–219.
33. Miranda J, Cooper LA. Disparities in care for depression among primary care patients. *J Gen intern Med* 2004;19:120–126. [PubMed: 15009791]
34. Olfson M, Marcus SC, Druss B, et al. National trends in the outpatient treatment of depression. *JAMA* 2002;287:203–209. [PubMed: 11779262]

35. Sleath B, Shih YT. Sociological influences on antidepressant prescribing. *Soc Sci Med* 2003;56:1335–1344. [PubMed: 12600369]
36. Virnig B, Huang Z, Lurie N, et al. Does Medicare managed care provide equal treatment for mental illness across races. *Arch Gen Psychiatry* 2004;61:201–205. [PubMed: 14757597]
37. Rizzo R, Piccinelli M, Mazzi MA, et al. The Personal Health Questionnaire: a new screening instrument for detection of ICD-10 depressive disorders in primary care. *Psychological Medicine* 2000;304:831–40. [PubMed: 11037091]
38. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J General Internal Medicine* 2001;169:606–13.
39. Spitzer RL, Kroenke K, Williams JB. Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. *Primary Care Evaluation of Mental Disorders. Patient Health Questionnaire. JAMA* 1999;282:1737–44. [PubMed: 10568646]
40. Diagnostic and Statistical Manual of Mental Disorders. Fourth. American Psychiatric Association; Washington, DC: 1994.
41. Spitzer RL, Kroenke K, Linzer M, et al. Health-related quality of life in primary care patients with mental disorders. Results from the PRIME-MD 1000 Study. *JAMA* 1995;274:1511–7. [PubMed: 7474219]
42. Spitzer RL, Williams JB, Kroenke K, et al. Validity and utility of the PRIME-MD patient health questionnaire in assessment of 3000 obstetric-gynecologic patients: the PRIME-MD Patient Health Questionnaire Obstetrics-Gynecology Study. *Am J Obstetrics and Gynecology* 2000;1833:759–69.
43. Kroenke K, Spitzer RL. The PHQ-9: A new depression diagnostic and severity measure. *Psychiatric Annals* 2002;32:509–515.
44. Simon GE, Ludman EJ, Tutty S, et al. Telephone psychotherapy and telephone care management for primary care patients starting antidepressant treatment: a randomized controlled trial. *JAMA* 2004;292:935–42. [PubMed: 15328325]
45. Leopold K, Ahles TA, Walch S, et al. Prevalence of mood disorders and utility of the Prime-MD in patients undergoing radiation therapy. *Int. J Radiation Oncology Biol. Phys* 1998;42:1105–1112.
46. Derogatis L, et al. The Hopkins symptom checklist (HSCL): A measure of primary symptom dimensions. *Modern Problems in Pharmacopsychiatry* 1974;7:43–45.
47. Acosta FX, Nguyen LH, Yamamoto J. Using the brief symptom inventory to profile monolingual Spanish-speaking psychiatric outpatients. *J Clin Psychology* 1994;50:723–726.
48. Cleeland, CS. Measurement of pain by subjective report. In: Chapman, CR.; Loeser, JD., editors. *Advances in Pain Research and Therapy*. 12. Raven Press; New York: 1989. p. 391-403. Issues in Pain Mean Measurement
49. Cleeland, CS. Pain assessment in cancer. In: Osaba, D., editor. *Effect of Cancer on Quality of Life*. CRC Press; Boca Raton, FL: 1991. p. 293-305.
50. Anderson K, Mendoza T, Valero V, et al. Minority cancer patients and their providers: Pain management attitudes and practice. *Cancer* 2000;88:1929–1938. [PubMed: 10760771]
51. Mor V, Laliberte L, Morris JN, Wiemann M. The Karnofsky Performance Status Scale. An examination of its reliability and validity in a research setting. *Cancer* 1984;53:2002–2007. [PubMed: 6704925]
52. Cella DF, Tulsky G, Sarafian B, et al. The functional assessment of cancer therapy scale: development and validation of the general measure. *J Clin Oncol* 1993;113:570–579. [PubMed: 8445433]
53. Cella D, Hernandez L, Corona M, et al. Spanish language translation and initial validation of the functional assessment of cancer therapy quality-of-life instrument. *Medical Care* 1998;369:1407–1417. [PubMed: 9749663]
54. Hosmer, DW.; Lemeshow, S. *Applied Logistic Regression*, Wiley-Interscience. 2nd. 2000. p. 1-392.
55. SAS Institute Inc.. *Logistic regression examples using the SAS system*. First. SAS Institute Inc.; Cary, NC: 1995. p. 72-80. Version 6
56. Coyne JC, Palmer SC, Shapiro PJ, et al. Distress, psychiatric morbidity, and prescriptions for psychotropic medication in a breast cancer waiting room sample. *Gen Hosp Psych* 2004;26:121–128.
57. Wells K, Klap R, Koike A, et al. Ethnic Disparities in unmet need for alcoholism, drug abuse, and mental health care. *Am J Psychiatry* 2001;158:2027–2032. [PubMed: 11729020]

58. Sclar DA, Robison LM, Skaer TL, et al. Ethnicity and the prescribing of antidepressant pharmacotherapy: 1992-1995. *Harvard Rev Psychiatry* 1999;7:29–36.
59. Carlson LE, Bultz BD. Cancer distress screening, Needs, models, and methods. *J Psychosomatic Res* 2003;55:403–409.
60. Strong V, Sharpe M, Cull A, et al. A: Can oncology nurses treat depression? A pilot project. *J Advanced Nursing* 2004;46:542–548.
61. Greenberg DB. Barriers to the treatment of depression in cancer patients. *J Natl Cancer Inst Monogr* 2004;32:127–135. [PubMed: 15263054]
62. Trask PC. Assessment of depression in cancer patients. *J Natl Cancer Inst Monogr* 2004;32:80–92. [PubMed: 15263046]
63. Mauksch LB, Tucker SM, Kanton WJ, et al. Mental illness, functional impairment, and patient preferences for collaborative care in an uninsured, primary care population. *J Fam Prac* 2001;50:41–47.
64. Miranda J, Azocar F, Komaromy M, et al. Unmet mental health needs of women in public-sector gynecologic clinics. *Am J Obstetrics and Gynecology* 1998;1782:212–7.
65. Mezzich JE, Ruiz P, Muñiz RA. Mental health care for Hispanic Americans: A current perspective. *Cultural Diversity and Ethnic Minority Psychol* 1999;5(2):91–102.
66. Dwight-Johnson M, Sherbourne CD, Liao D, et al. Treatment preferences among depressed primary care patients. *J Gen Intern Med* 2000;15:527–34. [PubMed: 10940143]
67. Freiman MP, Cunningham PJ. Use of health care for the treatment of mental problems among racial/ethnic subpopulations. *Med Res & Review* 1997;54:80–100.
68. Jarjoura D, Polen A, Baum E, et al. Effectiveness of screening and treatment for depression in ambulatory indigent patients. *J Gen Int Med* 2004;19:78–84.
69. Miranda J, Azocar F, Organista KC, et al. Treatment of depression among impoverished primary care patients from ethnic minority groups. *Psychiatr Serv* 2003;542:219–25. [PubMed: 12556604]
70. Miranda J, Chung JY, Green BL, et al. Treating depression in predominantly low-income young minority women: a randomized controlled trial. *JAMA* 2003;2901:57–65. [PubMed: 12837712]
71. Miranda J, Duan N, Sherbourne C, et al. Improving care for minorities: can quality improvement interventions improve care and outcomes for depressed minorities? Results of a randomized, controlled trial. *Health Serv Res* 2003;382:613–30. [PubMed: 12785564]
72. Sharpe M, Strong V, Allen K, et al. Management of major depression in outpatients attending a cancer centre: a preliminary evaluation of a multicomponent cancer nurse-delivered intervention. *Br J Cancer* 2004;90:310–313. [PubMed: 14735169]
73. Dwight-Johnson M, Ell K, Lee PJ. Can Collaborative Care Address the Needs of Low-income Latinas with Comorbid Depression and Cancer? Results from a Randomized Pilot Study *Psychosomatics*. in press
74. Guidry JJ, Adav LA, Zhang D, et al. The role of informal and formal social support networks for patients with cancer. *Cancer Practice* 1997;5:241–246. [PubMed: 9250081]
75. Posternak MA, Zimmerman M. How accurate are patients in reporting their antidepressant treatment history? *J Affective Dis* 2003;75:115–124.

Table 1
Patient Clinical, Demographic and Functional Characteristics

Characteristic	All N=472	MDD N=114 (24%)	Non-MDD N=358 (76%)	Analysis		
				χ^2	df	p
<u>Cancer Site</u> Breast	250 (53%)	76 (67%)	174 (49%)	11.32	1	0.001
GYN	222 (47%)	38 (33%)	184 (51%)			
<u>Cancer Stage</u> *	73 (21%)	22 (27%)	51 (20%)	4.12	3	0.25
1	91 (27%)	18 (22%)	73 (28%)			
2	96 (28%)	26 (32%)	70 (27%)			
3	80 (24%)	15 (19%)	65 (25%)			
Cancer Treatment Status				3.79	2	0.15
Prior to treatment	178 (38%)	47 (41%)	131 (37%)			
Active treatment	242 (51%)	60 (53%)	182 (51%)			
Follow up care	52 (11%)	7 (6%)	45 (13%)			
<u>Ethnicity</u> Hispanic	371 (79%)	89 (78%)	282 (79%)	3.03	4	0.55
Asian	24 (5%)	4 (4%)	20 (6%)			
African American	17 (4%)	6 (5%)	11 (3%)			
White	51 (11%)	14 (12%)	37 (10%)			
Other	9 (2%)	1 (1%)	8 (2%)			
US Born	59 (12.5%)	15 (13%)	44 (12%)	0.06	1	0.81
<u>Primary Language</u> *	111 (25%)	24 (23%)	87 (26%)	0.30	1	0.58
English						
Spanish	335 (75%)	81 (77%)	254 (74%)			
<u>Marital Status</u> Married	193 (41%)	48 (42%)	145 (41%)	3.88	4	0.42
Divorced	50 (11%)	11 (10%)	39 (11%)			
Separated	63 (13%)	11 (10%)	52 (15%)			
Widowed	50 (11%)	10 (9%)	40 (11%)			
Never Married	116 (25%)	34 (30%)	82 (23%)			
<u>Education level</u> *	260 (56%)	63 (56%)	197 (55%)	0.21	2	0.90
0-8	119 (25%)	30 (27%)	89 (25%)			
9-12	89 (19%)	20 (18%)	69 (19%)			
13+						
Currently employed	90 (19%)	21 (18%)	69 (19%)	0.04	1	0.84
Health Insurance/Benefits				3.70	3	0.30
Medical/Medicare	187 (40%)	41 (36%)	146 (41%)			
County care program	151 (32%)	34 (30%)	117 (33%)			
Other	18 (4%)	7 (6%)	11 (3%)			
No	115 (24%)	32 (28%)	83 (23%)			
<u>BSI Anxiety</u> 14-24	28 (6%)	24 (21%)	4 (1%)	61.58	1	<.0001
<u>KPSS</u> *	194 (42%)	71 (64%)	123 (35%)	28.48	1	<.0001
0 to 6						
7 to 10	266 (58%)	40 (36%)	226 (65%)			

	N	Mean	SD	N	Mean	SD	N	Mean	SD	Analysis		
										t	df	p
Age	472	50.0	11.8	114	48.3	10.6	358	50.5	12.1	-1.76	470	0.08
<u>Brief Pain Inventory</u> *	187	18.0	7.8	60	19.8	7.8	127	17.1	7.7	2.22	185	0.03
Physical Well-Being	472	20.9	6.0	114	16.9	6.1	358	22.1	5.4	-8.66	470	<.0001
<u>Social/Family Well-Being</u> *	468	17.9	6.0	114	15.2	6.1	354	18.8	5.8	-5.72	466	<.0001

	N	Mean	SD	N	Mean	SD	N	Mean	SD	Analysis		
										t	df	p
<u>Emotional Well-Being</u> *	471	15.7	5.1	114	11.5	5.0	357	17.1	4.4	-11.53	469	<.0001
<u>Functional Well-Being</u> *	471	14.3	5.6	114	9.5	5.3	357	15.9	4.7	-12.18	469	<.0001

Abbreviations: MDD=Major Depressive Disorder

* Totals do not add up due to missing data.

Table 2

Significant Correlates of Depression

Significant Predictors of Depression	Univariate Logistic Regression		
	OR	95%CI	p
Age (<50 yrs vs 50+ yrs)	1.70	1.11 - 2.61	0.015
Clinic			
Cancer Site (Breast vs GYN)	2.11	1.36 - 3.29	0.001
Suicidal Ideation	12.85	5.34 - 30.90	<.001
Anxiety (BSI score 14+ vs <14)	23.60	7.99 - 69.74	<.001
Pain	2.89	1.86 - 4.50	<.001
Arthritis	2.10	1.24 - 3.58	0.006
Functional Status			
KPSS (0 to 6 vs 7 to 10)	3.26	2.09 - 5.09	<.001
FACT Physical well-being *	4.44	2.70 - 7.28	<.001
FACT Social/family well-being *	2.33	1.49 - 3.66	<.001
FACT Emotional well-being *	7.28	4.22 - 12.55	<.001
FACT Functional well-being *	6.64	3.85 - 11.45	<.001
Medication			
Taking antidepressants	3.03	1.43 - 6.43	0.004
Taking pain medication	2.37	1.52 - 3.68	<.001
Barriers to cancer treatment			
Difficulties understanding recommendations	2.17	1.32 - 3.56	0.002
Fears about receiving treatment	1.73	1.09 - 2.74	0.020
Fears about side effects	1.98	1.20 - 3.26	0.008
Inability to get for all prescribed medication	1.75	1.09 - 2.80	0.021
Worries wages lost due to illness	2.37	1.38 - 4.08	0.002
Worries wages lost to attend medical appointment	2.01	1.18 - 3.42	0.010
Forgetting medical appointment	2.34	1.19 - 4.58	0.013

Abbreviations: OR=Odds Ratios; 95% CI=95% Confidence Intervals

* Scale less or equal to the median.

Table 3

Multiple Logistic Regression Model

Predictors for Depression	Multiple Logistic Regression Model [†]		
	OR	95%CI	p
Cancer site (Breast vs GYN)	2.15	1.24 - 3.73	0.007
Age	0.98	0.95 - 1.00	0.057
KPSS * (10 the worst to 0 the best)	1.54	1.34 - 1.77	<.001
Social/Family well-being * (28 the worst to 0 the best)	1.10	1.05 - 1.15	<.001
Anxiety (yes vs no)	16.06	4.23 - 60.89	<.001
Arthritis (yes vs no)	2.56	1.26 - 5.21	0.010
Fears about treatment side effect (yes vs no)	2.16	1.15 - 4.04	0.016

24 subjects were deleted due to missing value for the explanatory variable, observations used in this model N=448

Abbreviations: OR=Odds Ratios; 95% CI= 95% Confidence Intervals

[†]R²=27%; Adjusted R²=40%; Goodness-of-fit test, chi-sq=5.23, df=8, p=.73

* Scores were reversed so that a high value indicated poor functioning.