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Routine PHQ-9 Depression Screening in Home Health Care: Depression Prevalence, Clinical and Treatment Characteristics and Screening Implementation

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Abstract

This study aimed to examine: the prevalence and correlates of depression among adults 65 and over on admission to diverse home health care programs; nurse compliance with routine screening using the PHQ-9; and concordance between the number of depressed individuals identified by the PHQ-9 and Medicare mandated nursing assessment following targeted nurse training in identifying depression among the elderly using a standard diagnostic screen. Data are drawn from routine screening of 9,178 patients (a 77% screening compliance rate). Of all patients screened, 782 (8.5%) met criteria for probable major depression and 148 (1.6%) for mild depression. Concordance between nurse identified depression via PHQ-9 vs OASIS depression assessment improved over that reported in previous studies. Findings suggest that the use of a routine screening tool for depression can be implemented with minimal in-house training and improves detection of depression among older adults with significant physical and functional impairment.

Keywords

depression screening; depression prevalence; home health care; older adults

INTRODUCTION

Depression is prevalent in medically ill elderly and is associated with greater morbidity and mortality, increased health service use, and medical costs (Charney, et al., 2003; Cronin-Stubbs, de Leon, Beckett, Field, Glynn & Evans, 2000; Katon, Lin, Russo & Unützer, 2003; Koenig & Kutchibhatla, 1999; Ranga, Krishnan, Delong, Kraemer, Carney, Spiegel et al., 2002; Unützer, Patrick, Marmon, Simon & Katon, 2002). Recognition of the burden of depression in this population has spurred research among older adults. An increasing number of studies have shown that guideline level antidepressant medication and structured psychotherapy, alone or combined with antidepressant treatment and relapse and maintenance follow-up, are effective for older adults with depression (Alexopoulos, Katz, Bruce, Heo, Have, Raue, et al., 2005; Areán, Hegel, & Reynolds, 2001; Areán & Cook, 2002; Areán, Perri, Nezu, Schein, Christopher, & Joseph, 1993; Bump, Mulsant, Pollock, Mazumdar, Begley, Dew & Reynolds, 2001; Callahan, Kroenke, Counsell, Hendrie, Perkins, Katon, et al., 2005; das Gupta,

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1998; Gum & Areán, 2004; Leibowitz, Pearson, Schneider, Reynolds, Alexopoulow, Bruce, et al, 1997; Salzman, Wong & Wright, 2002; Unützer, Katon, Callahan, Williams, Hunkeler, Harpole, et al., 2002). While studies have found patient, provider, and health care system barriers to the identification and optimal treatment of depressed elders, routine depression screening methods and effective intervention models are available to improve depression care for older adults (Ell, in press; Pignone, Gaynes, Rushton, Burchell, Orleans, Mulrow, et al., 2002; Unutzer, et al., 2002; Wei, Sambamoorthi, Olfson, Walkup, & Crstal, 2005).

The majority of studies of depression and medically ill elders have been conducted on hospitalized or primary care clinic patients; recently investigators have called attention to home health care patients and service systems (Bruce, McAvay, Raue, Brown, Meyers, Keohane, et al., 2002; Bruno & Ahrens, 2003; Raue, Brown & Bruce, 2002; Flaherty, McBride, Marzouk, Miller, Chien, Hanchett, et al., 1998). Depending on the method of assessment, rates of depression have been found to range from 13.5% to 26% elderly receiving home health care services (Bruce et al., 2002; Banerjee & Macdonald, 1996). The Outcomes and Assessment Information Set (OASIS) (DHHS, 2002), a nursing assessment and outcome measurement tool mandated for use in Medicare funded home health care includes assessment of depression (Sherlock, 2005). However, in two previous studies, investigators found that nurses using OASIS identified only about half of the patients who were found to be depressed on independent evaluation with a structured diagnostic interview. (Brown, McAvay, Raue, Moses & Bruce, 2003; Brown, Bruce, McAvay, Raue & Lachs et al., 2004). Several investigators have found that nurses may lack specific training in depression and may be uncomfortable with assessing depression (Brown, Meyers, Lee, Fyffe, Raue, Bruce, 2004; Larson, Chernoff & Sweet-Holp, 2004; McDonald, Passik, Dugan, Rosenfeld & Theobald et al., 1999; Williams & Payne, 2003). Thus, there is a need for research on ways to improve the recognition of depression, and the treatment of depression in older adult home care recipients. (Brown et al., 2004a; Sherlock, 2005).

This study examines identification of depressed elders by comparing the detection of depression among home health care patients using OASIS with detection based on the 9-item Patient Health Questionnaire (PHQ-9) a standardized screening and diagnostic instrument (Kroenke, Spitzer & Williams, 2001). In recent years, the PHQ-9 has emerged as a reliable depression screening tool in primary care with a demonstrated ability to identify clinically important depression, to make accurate diagnoses of major depression, to track severity of depression over time and to monitor patient response to therapy (Löwe, Unützer, Callahan, Perkins & Kroenke, 2004; Löwe, Gräfe, Zipfel, Witte, Loerch & Herzog, 2005; Kroenke & Spitzer, 2002). The instrument has specific diagnostic criteria and clinically significant cutoff scores (Löwe, Spitzer, Gräfe, Kroenke, Quenter, Zipfel, et al., 2004; Kroenke, et al., 2001), and has been used with older adults in the IMPACT primary care study where it was found to be sensitive to change in symptom severity when compared with a longer standardized depression severity measure (Löwe, et al., 2004c). The PHQ-9 can be administered in-person or via telephone (Simon, Ludman, Tutty, Operskalski & von Korff, 2004; Spitzer, Kroenke & Williams, 1999).

To our knowledge, this is the first study of routine depression screening - using a standard depression screening and diagnostic instrument - of older adults at admission to diverse home health care systems. Our study will compare the nurse-administered OASIS method of detecting depression with the PHQ-9 instrument to determine whether or not detection rates improved with the use of the PHQ-9 and if so, for whom. Specifically, the study will address the following questions regarding the screening process and the results of routine PHQ-9 depression assessment: a) What was the rate of compliance with routine formal screening in three diverse home health care systems? b) What was the prevalence of depression at admission to home health care? c) What are the demographic, clinical, treatment, and functional correlates

of depression among patients at admission into home health care programs? d) Are there differences in the number or characteristics of patients detected by the PHQ-9 versus those detected by nurses using OASIS? In addition, we discuss screening implementation problems that were identified by home care nurses during a brief educational session on depression in the elderly and depression screening.

METHODS

The study received full review and approval from the Institutional Review Board of the University of Southern California Health Sciences and an HMO internal review board.

Study Participants, Home Health Care Systems, and Screening Implementation

Study data are from routine home health care admitting depression screen and assessment, including a subsample of patients in an ongoing randomized clinical trial (RCT) of depression care for adults 65 and over referred for home health care conducted as part of an NIMH-funded study – Homecare to Overcome Problems of Elders with Depression (HOPE-D). Participants in this report include 9,178 geriatric patients screened for depression including 311 patients who met study criteria and consented to participation in the RCT. The study was conducted within a private Home Health Care agency (HHC), a Health Maintenance Organization home care program (HMO), and an Independent Practitioners Association (IPA) in which patients requiring home care services are referred to a community based home health care service. In all three home care programs, a referral and prescription for specified home care treatment and services was made by the patient's primary care physician. In all participating sites, a registered nurse (RN) conducted a standard 2-hour admitting home visit during which a medical, functional, and psychosocial assessment was completed.

Each study site administratively mandated and supervised routine PHQ-9 screening at admission to home health care or in the case of the IPA at point of referral to home health care. HHC nurses administered the study depression screen (PHQ-9) during the admitting RN home visit. HMO patients were screened during a routine home health care intake telephone call by the intake RN or if that failed, by the admitting RN during the admission home visit. The IPA site case manager (CM) conducted the screen via telephone as part of a routine referral process for home health care to a community based home health service. If a patient screened positive for probable major or minor depression, the patient’s primary care physician was informed of the result at all three study sites. Patients with a positive depression screen were invited to participate in the RCT. Following screening for cognitive impairment that precluded informed consent, written consent to RCT participation (including review of home health care clinical records) was obtained, and a telephone interview was conducted to obtain baseline data.

At the outset of the study, a 90 minute training session was provided by study investigators for groups of nurses to provide education about depression in the elderly, and to orient nurses to the study protocol, screening procedures, interviewing techniques, and PHQ-9 scoring. The session was repeated near the end of the first study year. Approximately 125 HHC and 50 HMO home health nurses and supervisory staff participated in the sessions. A total of four sessions used a didactic and interactive format including role plays and group discussions facilitated by the study investigators. Training sessions elicited and addressed screening implementation problems that were anticipated or encountered by home health care staff. Facilitators demonstrated ways to include the depression screen within the usual flow of questions without causing increased patient distress and drew analogies to familiar areas such as usual nursing assessment about physical functions (e.g., toileting, physical conditions). Problem-solving strategies were presented to address nurses’ expressed concerns about the role of family caregivers as gatekeepers in terms of their active role in either facilitating or inhibiting the screening process and about privacy when multiple human service providers and personal care

attendants were in the home. Nursing staff could elect to receive continuing education units for participating in the training. Screening training differed at the IPA site. The single IPA case manager received a one-hour introduction to depression in the elderly and in administering the PHQ-9. Home health care nurses in the community based home health programs used by the IPA received no training in depression care and no contact with the study investigators.

Data Analysis

Descriptive analyses were used to describe the study sample demographic and clinical characteristics. Chi-square tests were used to assess the relationship between demographic characteristics and prevalence of clinically significant depression (a PHQ-9 score of 8 or more plus one of two cardinal symptoms of depressed mood or anhedonia (little interest/pleasure in doing things). Analyses of variance (ANOVA) were conducted to identify the demographic, clinical and treatment correlates of depression in the RCT sample of patients for whom more detailed demographic and clinical information was available from the baseline interview and OASIS record. Finally, we assessed the agreement between OASIS diagnosis and PHQ-9 criteria in terms of sensitivity, i.e., the number of patients who nurses rated as depressed using OASIS criteria divided by the number of patients who met criteria for depression using the PHQ-9. Finally, odds ratios (ORs) and 95% confidence intervals (95% CI) were computed for characteristics related to receiving a diagnosis of depression using OASIS criteria.

Measures

Sociodemographic Characteristics—At admission, the following demographic data was collected on all screened patients: age, gender, race/ethnicity, marital status, living situation and annual household income.

Depression and Dysthymia—The nine-item PHQ-9, a subset of the Patient Health Questionnaire, a self-report version of the PRIME-MD, (Spitzer, Kroenke & Williams, 1999) assesses for the presence of major depressive disorder using modified Diagnostic and Statistical Manual, Fourth Edition (DSM-IV) criteria. For this study, we defined clinically significant depression as: one of the two cardinal symptoms and a PHQ-9 score of 10 or greater as probable major depression; a score of 15 or more as definite major depression; and a PHQ-9 score of 8-9 as minor depression.

Clinical and Treatment Characteristics—For the RCT sample, patient admission diagnoses, prescribed medications, and depression assessment data were collected from the OASIS, the Home Health Certification and Plan of Care form (CMS-485), and the Physician Orders/Plan of Care form used in the HMO. While OASIS does not provide specific questions or adequate guidelines for the assessment of emotional and behavioral symptoms, the series of items to be assessed using unstandardized nurse observation includes assessment of: depressed mood, sense of failure, hopelessness, recurrent thoughts of death, thoughts of suicide and suicide attempt, indecisiveness, diminished interest in activities, sleep disturbances, change in appetite, and agitation. The SF-20 was used to measure functional status (Ware & Sherbourne, 1992).

RESULTS

Admission Screening Compliance and Prevalence

Of 11,859 geriatric patients referred for home health care during the study period, 9,178 (77%) were screened with the PHQ-9. (Among those screened, 874 patients were screened more than once because they were readmitted to home health care over the study period.) Cited explanations for an uncompleted screen were: a) patients were too ill to be screened or had cognitive impairment (N=1,828, 15%); b) patient was unable to be located (N=434, 4%); c)

patient refusal (N=331, 3%); and d) language barriers (N=88, 1%). Screening compliance varied across study sites: HHC - 84%, IPA - 76%; and HMO - 72%. Of the 9,178 participants, the age of patients screened ranged between 65 and 107 years old, with a mean age of 78.1. Patients were predominantly over 75 years of age (65%); white (67%); female (63%); and without a partner (55%).

Based on the PHQ-9 criteria above, 10% of patients met criteria for clinically significant depression: 782 (8.5%) of patients met criteria for probable or definite major depression and an additional 148 (1.6%) met criteria for minor depression. Patients reporting suicidal ideation totaled 352 (4 %) of all patients screened: 96 (1%) patients reported suicidal thoughts nearly every day, 58 (0.6%) patients more than half the days, and 198 (2.2%) patients several days over the past two weeks. Among all patients screened, depression was associated with gender, race/ethnicity, and marital status (See Table 1). Female and Latino patients had significantly higher risk of PHQ-9 score of 8 or more (OR=1.36, p<.0001 and OR=1.26, p=.01, respectively), while married and African-American patients had lower risk of PHQ-9 score 8 or more (OR=0.63, p<.0001 and OR=0.73, p=.01, respectively). A subset of 97 patients were screened a second time within 2 weeks by a clinical social worker to assess the stability of the initial PHQ-9 screen. Of these patients, 32 (33%) no longer met criteria for depression (PHQ-9 score less than 8).

Prevalence and Correlates of Depression in the RCT Sub-sample of Screened Patients

After exclusion of 234 patients with significant cognitive impairment (SPMSQ scores of less than 5 (25%), 696 patients who screened positive for clinically significant depression were eligible to participate in the randomized clinical trial of depression homecare management. Of these, 272 (39%) study eligible patients refused to participate, 88 (13%) patients were discharged from home health care prior to the obtaining of informed consent, and another 25 (4%) patients were unable to consent to the study due to declining health status, lack of PMD agreement, or participation in another depression study. The remaining 311 patients (45% of eligible patients) were enrolled in the trial. Demographic comparisons between study-enrolled patients versus non-participants found no statistically significant differences in mean age, gender, race/ethnicity, or marital status.

Data on the demographic, clinical, and treatment characteristics correlates of depression were collected during a baseline telephone interview for the 311 RCT patients who met clinical trial study criteria and provided informed written consent to participate, and are reported in Tables 2 and 3. Several demographic and clinical characteristics were significantly associated with higher mean PHQ-9 scores: living with other(s) (F=4.39, df =1, p=.04); dysthymia (F=6.65, df=1, p=.02), suicidal ideation (F=50.37, df=1, p<.0001), and death within four months of the baseline assessment (F=8.09, df=1. p=.005). Older age was correlated with less severe depression (r = 0.14, p =.01). Poorer cognitive status was correlated with more severe depression (r = 0.13, p =.03). SF-20 subscales were correlated with PHQ-9 scores (physical functioning: r = −0.14, p=.03; mental health: r = −0.28, p<.0001; and current health perceptions r = −0.13, p = .03). A previous history of depression was self-reported by 163 (62%) of 262 patients who responded to this question, of whom 38 (23%) reported having taken antidepressant medication, 28 (17%), having received psychotherapy or counseling, and 36 (22%) reported having received both. Gender, race/ethnicity, marital status, income, history of depression and receipt of depression treatment were not associated with mean PHQ-9 scores.

A total of 104 (36 %) of the 291 patients, for whom a CMS-485 plan of care record was available, had been prescribed antidepressant medication at the time of study entry. All antidepressant medication dosages on the home health admitting care plan were consistent with guideline starting doses for older adults, although whether these were new or ongoing prescriptions was not routinely recorded. Prescription of antidepressants was significantly

correlated with history of depression (45% vs 16%; df=1, chi-sq=20.47, p<.0001), having suicidal ideation (47% vs 31%; df=1, chi-sq=6.77, p=.01), and not living alone (41% vs 25%; df=1, chi-sq=7.09, p=.01), but was not significantly correlated with gender, age, marital status, ethnicity, PHQ-9 score, anxiety, or number of comorbid physical illnesses.

Concordance between PHQ-9 and OASIS Depression Identification

To examine agreement between OASIS diagnoses of depression as recorded by admitting nurses and depression defined by PHQ-9 criteria, we computed the sensitivity using 3 different PHQ-9 cutoff scores: of 17 patients with minor depression (PHQ-9 scores of 8–9 plus at least one cardinal symptom) nurses rated 12 patients as depressed (sensitivity=71%); of 101 patients with probable major depression (PHQ-9 scores of 10-14), nurses using OASIS reported 59 patients as being depressed (sensitivity = 55%). Finally, nurses reported OASIS observation of depression for 103 of 161 patients with definite major depression (PHQ-9 score 15 or more), a sensitivity of 64%. There were significant differences in concordance of depression between OASIS identification and PHQ-9 scores of 15 or more and OASIS identification among the study sites: HHC, sensitivity 78%; HMO, sensitivity 60%, and IPA, sensitivity 38%.

For patients with PHQ scores of 15 or more, but not identified by OASIS assessment, nurses were less likely to identify depression among patients not on antidepressants (OR=2.67; p=.01) and patients without anxiety (OR=8.05; p<.0001). Of the African-American and Hispanics not identified via OASIS, 100% and 78% respectively, were not receiving antidepressants at admission.

DISCUSSION

The home health care patients in this study were generally older and more physically frail than patients in primary care studies. For example, twelve percent of patients in this study died within four months of admission to home care in contrast to the IMPACT primary care study in which a similar number died over a period of two years. Preliminary analyses from the RCT follow-up suggest that hospital readmissions were common in these home health care patients. The majority of RCT study patients had prior episodes of depression highlighting the chronic or recurrent nature of late-life depression, an important characteristic of depression among medically ill elderly with high rates of comorbidity and functional impairment (Unützer et al, 2002b; Koike, Unützer & Wells, 2002).

Our findings are encouraging insofar as they provide evidence that with relatively minimal investment in depression and screening education, PHQ-9 screening can be routinely administered by nursing staff in organizationally diverse home health care systems, and is likely to identify patients who are undetected by Medicare mandated OASIS assessment. Study findings of relatively high rates of antidepressant treatment (rates higher than reported in earlier home care studies) may reflect recent increases in the detection and treatment of depression in older adults (Blazer, Hybels, Fillenbaum, & Pieper, 2005; Crystal, Sambamoorthi, Walkup, & Akincigil, 2003). Compared with 10 years ago, the rates of antidepressant use in older adults have increased substantially. However, study patients who were receiving antidepressants continued to screen positive for major depression. In the IMPACT trial, the largest depression treatment trial in late life to date, almost half of the 1,801 depressed older adults identified in primary care settings were on antidepressant medications at study entry and still met DSM IV diagnostic criteria for current major depression or dysthymia (Unützer, et al., 2002a). Many older adults are on antidepressants that are not effective either because of inadequate doses, failure to increase the dose over recommended starting doses, or because they simply don't respond to a particular drug. Moreover, despite evidence that combining antidepressant and psychotherapy may be more effective for some older adults, only a minority of study patients reported that they had received psychotherapy, a finding consistent with other data (Wei,

Sambamoorthi, Olfson, Walkup, & Crystal, 2005). Consistent with recent analysis of Medicare and Medicaid data and data from older adults in primary care (Crystal et al 2003; Strothers, Rust, Minor, Fresh, Druss, & Satcher, 2005; Unützer et al, 2002b), ethnic minority patients in this study were less likely to have received antidepressant medication.

Routine PHQ-9 diagnostic screening across diverse home health care systems resulted in identifying 10% of patients with clinically significant depression, a prevalence rate higher than primary care rates for older adults, but somewhat lower than rates among hospitalized patients and earlier studies of home care patients (Bruce et al., 2002; Unützer et al., 2002a). Lower prevalence in this study may be attributable to the higher rate found when a diagnostic interview is conducted. It is also plausible that in some cases, nurse discomfort with the direct questioning required in administering the PHQ-9 may have resulted in variable administration of the screen or failure to adequately screen every patient.

The utility of nurse training in depression and screening among the elderly is supported by the greater concordance between OASIS and PHQ-9 found in this study over previous reports (DHHS, 2002; Brown et al., 2003) as well as by the poorer PHQ-9-OASIS concordance for IPA community based home health care nurses, who received no specific training from the study team. A trend in study findings similar to that previously reported suggests that nurses may be better at detecting suicidal symptoms of depression, and at detecting depression among women and patients living with others, perhaps being influenced by other informants (Brown et al., 2003; McAvay, Bruce, Raue & Brown, 2004).

During the training sessions, nurses identified potential barriers to implementing the screening protocol: fears about causing patient distress, discomfort with screening questions and with administering the screen in the presence of family members or caregivers, problems in communicating with patients' physician about a positive screen, and perceived paperwork burden required by screening. Asking mental health-related questions was regarded as an invasion of privacy, expressing particular concern about privacy in relation to culturally based patient and family norms and thus reluctance to engage the topic of depression with culturally diverse patients. Nurses were concerned about asking direct questions about depression, patient privacy, and about precipitating patient distress (e.g., suicidal ideation). Nurses also reported that they were uncomfortable with, avoided, or delayed addressing emotionally-charged discussions that may have arisen during the screen. Training emphasis on subgroups of patients who are at particular high risk for not being identified by nurses is suggested by these findings.

Training was provided in a brief time frame and providing CEUs for participation was positively received. The interactive training sessions provided a forum for nurses to express and discuss commonly held perceptions that older adults with chronic illnesses are naturally and expectedly depressed and treatment will not help. Nurse participant evaluations indicated that the training provided in this study reduced their discomfort and facilitated implementation. Compared to other health professions, nurses are more likely to be willing to participate in geriatric education workshops and have high interest in mental health and dementia training (Brown et al., 2004). Thus, educational strategies aimed at increasing nurses' comfort and skill in depression assessment and care management are likely to be successful (Mayall, Oathamshaw, Lovell, & Pusey, 2004). Modifications in OASIS depression assessment and online OASIS training are potential strategies to enhance the quality of the detection and monitoring of depression in home health (Fazzi & Wright, 2003; Sherlock, 2005).

The present study has several limitations. Information on depression history and treatment relied on self-report, although available evidence indicates that patient self-report of antidepressant use is reasonably accurate (Pasternak & Zimmerman, 2003). Screening was done at admission to home care, however, repeat screening at different home health visits might

improve the validity of the screening process as nearly a third of a subset of patients screening positive at admission experienced significant improvement at a subsequent screen - a finding consistent with evidence of remission among elderly patients 1 month post home care admission. (Raue, Meyers, McAvay, Brown, & Koehane et al., 2003). This suggests that unless patients meet clear criteria for major depression, identification of older home care patients for depression treatment should not rely on a one-time assessment of depression performed at the time of admission but ideally a repeat assessment within a month. A significant number of patients refused to participate in the RCT, primarily explained by the high rate of medical illness and disability of the population and to the influence of “protective” caregivers, who expressed concern that participation might be overtaxing for the patient.

Use of a screening and diagnostic instrument was found to be feasible in home health care. However, screening alone is probably not sufficient to influence depression or functional outcomes in this medically ill population. How to integrate routine screening with adequate diagnostic assessment and what steps are necessary in order to provide guideline-level depression care are important questions for further study. Proactive tracking of depression outcomes, systematic follow-up, and care management activities - intervention components that have been shown to improve depression outcomes in depressed older adults in a primary care setting (Unützer, et al., 2002a) - may also be needed to improve depression outcomes in this population with chronic or recurrent depression and significant comorbid medical illness. Results from the ongoing RCT study will enable us to examine depression care management in diverse home health care systems as well as the effects of home health care intervention on depression, functional, and service use outcomes.

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Table 1

Depression by Socio-demographic Characteristics for All Patients Screened at Admission*

Characteristic	All N=9,178	Clinically significant depression ** N=930 (10%) ***	No significant depression N=8,248 (90%)	Chi-square p-value
Age				0.28
65–74	3241 (35%)	312 (34%)	2929 (36%)	
75–84	3880 (42%)	416 (45%)	3464 (42%)	
85–107	2043 (22%)	202 (22%)	1841 (22%)	
Gender				**<.0001**
Male	3348 (37%)	282 (30%)	3066 (37%)	
Female	5818 (63%)	648 (70%)	5170 (63%)	
Race/Ethnicity				**0.003**
White	5711 (67%)	598 (68%)	5113 (67%)	
African- American	1003 (12%)	80 (9%)	923 (12%)	
Latino/Hispanic	1251 (15%)	153 (17%)	1098 (14%)	
Other	572 (7%)	46 (5%)	526 (7%)	
Marital status				**<.0001**
Single	633 (7%)	71 (8%)	562 (7%)	
Married	3920 (45%)	309 (35%)	3611 (46%)	
Widowed	3535 (40%)	421 (47%)	3114 (39%)	
Divorced	713 (8%)	92 (10%)	621 (8%)	

* 874 patients were screened more than once due to re-admission.

** PHQ-9 score 8+ & one of the two cardinal symptoms

*** 148 patients had PHQ-9 score 8 to 9 and one of the two cardinal symptoms.

Data did not add up to the total due to missing information.

Chi-square tests used to test differences between groups

Table 2

Demographic Characteristics and PHQ-9 Score for RCT Patients

RCT Patient Characteristic (N=311)	Frequency N (%)	PHQ-9 Score Mean (SD)	ANOVA df	ANOVA F	ANOVA p
Gender			1	1.79	0.18
Male	86 (28%)	15.9 (4.2)			
Female	225 (72%)	15.2 (4.2)			
Race/Ethnicity			3	2.43	0.07
White	222 (72%)	15.3 (4.1)			
African-American	29 (9%)	14.2 (3.9)			
Latino/Hispanic	46 (15%)	16.5 (4.5)			
Other	12 (4%)	17.0 (4.9)			
Marital status			3	2.41	0.07
Single	16 (5%)	16.8 (5.1)			
Married	110 (36%)	15.6 (4.3)			
Widowed	149 (49%)	14.9 (3.8)			
Divorced	32 (10%)	16.7 (4.6)			
Living Situation			**1**	**4.39**	**0.04**
Alone	90 (31%)	14.7 (3.8)			
With other(s)	200 (69%)	15.8 (4.4)			
Annual Income			2	1.86	0.16
Less then $10,000	33 (22%)	16.2 (4.7)			
$10,000–19,999	55 (37%)	16.1 (4.6)			
$20,000 or more	62 (41%)	14.8 (3.7)			

Note: Totals reflect missing data.

Analysis of Variance (ANOVA) used to assess differences between groups on PHQ-9 mean scores.

Table 3

Clinical and Treatment Characteristics and PHQ-9 Score for RCT Patients

RCT Patient Characteristic (N=311)	Frequency N (%)	PHQ-9 Score Mean (SD)	ANOVA df	ANOVA F	ANOVA p
Dysthymia			**1**	**6.65**	**0.01**
Yes	98 (47%)	16.0 (4.2)			
No	110 (53%)	14.5 (4.2)			
Suicidal Ideation (PHQ-9)			**1**	**50.37**	**<.0001**
Yes	97 (31%)	17.8 (4.2)			
No	212 (69%)	14.4 (3.8)			
History of Depression (self-report)			1	1.55	0.21
Yes	163 (62%)	15.7 (4.3)			
No	99 (38%)	15.0 (4.1)			
Previous Depression Treatment (self-report; N=163)			1	0.17	0.68
Yes	102 (63%)	15.8 (4.4)			
No	61 (37%)	15.5 (4.1)			
Antidepressants at Admission			1	0.51	0.48
Yes	104 (36%)	15.7 (4.4)			
No	187 (64%)	15.4 (4.2)			
RN Reported Depression			1	2.22	0.14
Yes	174 (61%)	15.8 (4.4)			
No	111 (39%)	15.0 (4.0)			
RN Identified Anxiety (OASIS M0580)			1	0.58	0.45
No	133 (47%)	15.3 (4.2)			
Yes	151 (54%)	15.6 (4.4)			
ICD9 Primary Diagnoses			5	1.05	0.39
Cardiovascular	61 (21%)	14.8 (4.3)			
Musculoskeletal	53 (18%)	15.4 (4.4)			
Depression	30 (10%)	17.0 (5.0)			
Cancer	13 (4%)	16.5 (4.2)			
Diabetes	11 (4%)	14.7 (4.4)			
Other	130 (43%)	15.6 (4.1)			
Patient Death Within 4 Months of Baseline			**1**	**8.09**	**0.005**
Yes	29 (12%)	17.6 (4.0)			
No	209 (88%)	15.2 (4.2)			

Note: Totals reflect missing data.

Analysis of Variance (ANOVA) used to assess differences between groups on PHQ-9 mean scores.