

Recognition and Treatment of Depression and Anxiety Symptoms in Heart Failure

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Objective: The aim of this prospective study was to examine the prevalence, recognition, and treatment of depression and anxiety in ambulatory patients with heart failure.

Method: A total of 158 heart failure participants were enrolled between November 2006 and April 2007. Each patient completed a telephone screening interview that included an assessment of heart-failure severity (New York Heart Association criteria) as well as measures for depression (Geriatric Depression Scale [GDS]) and anxiety (Geriatric Anxiety Inventory [GAI]). Following study recruitment, each patient's electronic medical record was comprehensively reviewed for the 12 months prestudy and 6 months poststudy assessments to determine whether patients had been recognized as having and/or treated for depression or anxiety.

Results: Prevalence of depression (GDS score ≥ 6) was 41.8%, and prevalence of anxiety (GAI score ≥ 9) was 25.3%. Of patients with a positive GDS or GAI result, 57.5% had a diagnosis or medical-record notation for depression and/or anxiety, and 60.3% received mental health treatment during the 18-month period of the EMR review. Of patients with a documented diagnosis of depression or anxiety, 92.3% received mental health treatment. Results showed that higher GDS scores were associated with recognition of depression/anxiety in the medical record, and a positive primary care depression screening predicted documented mental health treatment.

Conclusion: These data suggest that symptomatic depression and anxiety are underrecognized in heart failure patients and that mental health screening may be important for receipt of care. Notably, once depression and/or anxiety was documented in the medical record, patients were highly likely to receive mental health treatment.

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Chronic illnesses, especially illnesses that severely affect functional abilities, such as heart failure (HF), are associated with significant physical, psychological, and lifestyle changes that often lead to increased mental health difficulties.^{1,2} The prevalence of depression and anxiety is far greater among chronically ill persons than among the general primary care population,³ with prevalence ranging from 30% to 50% in persons with HF.⁴⁻⁸

The impact of anxiety and depression is pervasive and can reduce patients' ability to cope with physical symptoms and adhere to medical treatment.^{4,8,9} The combination of depression and/or anxiety with a chronic medical illness also leads to increased risk of mortality, worsening of quality of life, functional disability, and increased health care utilization and cost.^{3,5,10-13}

Unfortunately, the rates for detecting and treating depression and anxiety among those with medical illnesses are quite low.¹⁴⁻¹⁷ Poor recognition and treatment of

FOR CLINICAL USE

- ◆ Depression and anxiety are highly prevalent in heart failure patients. Unfortunately, a large percentage of heart failure patients with significant depression or anxiety symptoms go unrecognized and undertreated for mental health difficulties.
- ◆ Once recognized as having depression and/or anxiety, patients are more likely to receive mental health treatments.
- ◆ Clinicians are encouraged to routinely screen for depression and anxiety in patients with heart failure and other chronic illness.

depression and anxiety may complicate and exacerbate HF symptoms, precipitate functional decline, disrupt social and occupational functioning, and lead to an increased risk of mortality.^{8,12,18–20}

A host of barriers, including patient, provider, and systems factors, likely affect poor recognition and limited treatment for depression and anxiety, especially in medical care settings.²¹ As examples, barriers include negative patient expectations about mental health conditions and/or treatment, physician competing demands and/or limited mental health knowledge, and restricted availability of mental health resources.^{21–23}

Although there is increasing information on the prevalence and impact of depression (and, to a lesser extent, anxiety) in the medically ill, few studies have examined rates of identified and treated mental health conditions, and no known studies have examined mental health recognition and treatment for outpatients with HF. The current study focused on ambulatory HF patients to (1) examine patient self-reported prevalence for depression and anxiety, (2) review electronic medical records (EMRs) to examine rates of system-level recognition and treatment of depression and anxiety over an 18-month extraction period, and (3) predict system-level recognition and treatment using patient demographic and clinical factors.

METHOD

Participants

This study was conducted as part of a larger investigation examining depression and anxiety in HF patients. Potential participants were identified from a large Veterans Affairs (VA) hospital through the Outpatient Care File and Patient Treatment File databases of the Veterans Health Administration (October 2004 through September 2006) using *International Classification of Diseases, Ninth Edition, Clinician Modification* (ICD-9-CM) codes (398.91, 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428, 428.0, 428.10, 428.9). Inclusion criteria were determined through several stages. First, medical records of veterans 60 years or older who had a documented diagnosis of HF (N = 4129) were extracted through a database search. Review of medical records by a

research assistant led to the exclusion of veterans who did not have contact information, lived outside the study site area, were deceased, or did not have sufficient medical record documentation of HF (N = 2834). The remaining 1295 participants received a letter via postal service indicating that a study coordinator would contact them by phone unless they opted out of the study. Of those mailed a letter, 443 patients were not interested in participating, 361 were unable to be contacted by phone, and 187 were deceased or too frail to participate. For the larger study, 304 telephone screens were conducted. The final participant sample for this study (N = 158) was enrolled between November 2006 and April 2007 and included all consecutive participants who underwent a telephone screen and completed all study measures during the first 6 months of the larger study. This project was approved by the Houston VA Research & Development Committee at the Michael E. DeBakey VA Medical Center and the Institutional Review Board at Baylor College of Medicine, and informed consent was obtained from all patients.

Procedures

Telephone assessment. The telephone assessment measures included (1) a brief demographic survey; (2) a semi-structured interview to determine New York Heart Association (NYHA) criteria (only patients with symptoms of class II or greater were included for further study); and (3) a short, 6-item cognitive screening instrument²⁴ to exclude participants with significant cognitive impairment (participants with 3 or more errors were excluded). All participants remaining eligible were administered the Geriatric Depression Scale (GDS) and the Geriatric Anxiety Inventory (GAI).

Medical-record review. Each patient's EMR was reviewed by a trained research assistant using a structured extraction form. Reviews of EMRs were conducted for the 12 months of care provided prior to each patient's telephone screening, as well as the 6-month period of care following the assessment. This before-and-after medical-record-review approach was deemed necessary to accurately assess the potential of the health care system to detect the presence of depressive or anxiety symptoms that may have been long-standing or recent in onset.

Data extracted from patient medical records included number of outpatient encounters (separately assessed for 12 months prestudy and 6 months poststudy assessments), screening information related to depression (conducted by the health care system via routine primary care/preventive medicine screenings using a 2-item instrument), diagnosis of depression or anxiety (outpatient or inpatient) in the medical record, documentation of antidepressant or anti-anxiety medications, and presence or absence of mental health clinic visit(s).

Structured reviews of the medical records were completed by 2 raters, using a structured format to increase reliability of ratings. A random 10% of medical records were reviewed by a third rater and compared for accuracy with results of the primary reviewers. Raters had a 95% agreement and a κ coefficient of 0.90.

Measures and Study Variables

Geriatric Depression Scale. The 15-item GDS²⁵ was used to determine participant self-reported symptoms of depression. The GDS is a widely used, reliable, and valid measure for assessing symptoms of depression among older adult populations.^{26,27} This measure is particularly useful with medically ill patient populations because of its lack of inclusion of somatic-based symptoms of depression (for review, see Stiles and McGarrahan²⁸) and has been used specifically in HF populations.²⁹ The present study administered the GDS via telephone based on prior work showing reliability and validity of the GDS by telephone.³⁰ As suggested by the original authors, a traditional cutoff of 6 or greater was used to determine clinically significant symptoms of depression.^{25,28}

Geriatric Anxiety Inventory. The GAI³¹ is a self-report measure of anxiety with 20 items to which the participant answers yes or no for how he or she has felt for the last week. The GAI was also administered via telephone. It was developed to assess the symptoms of anxiety specifically among older adults.³¹ The GAI has demonstrated good reliability and convergent validity^{31,32} but lower divergent validity, as it correlates higher with measures of depression than with other measures of anxiety.³² For the current study, a cutoff score of 9 or greater, as suggested by the original authors, was used to determine the presence of clinically significant anxiety.^{31,32}

Medical-record review.

Recognition of depression or anxiety. For the purposes of this study, recognition of depression or anxiety was defined as documentation in the medical record of any of the following: (1) an outpatient diagnosis of depression or anxiety, (2) an inpatient diagnosis of depression or anxiety, or (3) any documentation or references to anxiety or depression within the outpatient progress notes.

Provision of mental health treatment. Mental health treatment was considered to have been provided if 1 or both of the following were present in the medical record:

(1) any mental health encounters/clinic visits (visits included those by any mental health practitioner, including psychiatrists, psychologists, nurses, social workers, and physician assistants) and (2) documentation of a psychotropic medication for depression or anxiety. Medications included all antidepressant and anxiety medication classes except trazodone and amitriptyline. The medical-record documentation of these medications was examined in detail to ensure that the medication(s) were prescribed for depression or anxiety rather than for another clinical condition, such as sleep or pain. If the medications were documented as prescribed for another health issue, treatment was not noted. If the medications were not documented, the default was to consider the presence of these medications as evidence of mental health treatment.

Notably, the concept of mental health treatment, for the purposes of this study, did not assume recognition. Although it is conceivable that practitioners who prescribe a psychotropic medication likely recognized a mental health condition, it was believed that the concept of recognition was best described as a specific action taken by a provider to notate the medical record and, potentially, to alert other practitioners of the identified condition or symptoms.

Other variables.

Illness burden (relative-risk score). The illness burden, or relative-risk score, was assessed using a diagnosis-based, risk-adjustment methodology (DxCG Company, Boston, Mass.)³³ validated in the VA population.³⁴ An individual's relative-risk score is calculated using database information to identify his or her total predicted health care costs, which are then divided by the average predicted cost of the population. A score of 1.0 reflects an average risk; scores below 1.0 represent less illness burden, and scores above 1.0 reflect increased burden.^{33,34}

NYHA functional classification. The NYHA functional classification³⁵ was used to assess the degree to which heart failure limits physical activities corresponding to disease severity. As functional abilities decrease, NYHA classification increases from class I to class IV. In the current study, NYHA classification was determined using a semistructured clinical interview completed by trained research assistants.

Analyses

Descriptive statistics were used to provide information on the prevalence of depression and anxiety symptoms in HF patients and to describe the percentage of patients with mental health recognition and treatment, as determined by EMR review. Independent sample *t* tests and χ^2 tests were used to examine differences between HF patients classified as depressed or anxious versus those not depressed and not anxious, using the GDS and GAI clinical cutoff scores. Classification tables were used to examine the percentage of patients identified by self-report versus that recognized in the EMR, as well as those with a documented

Table 1. Sample Characteristics and Group Comparisons Based on Self-Reported Depression/Anxiety

Characteristic	GDS or GAI Positive ^a (N = 73)	GDS/GAI Negative (N = 85)	Group Difference p Value
Age, mean (SD), y	70.03 (7.82)	72.44 (7.69)	.45 ^b
Male gender, N (%)	72 (98.6)	84 (98.8)	.91 ^c
Ethnicity, N (%)			
White	46 (63.0)	50 (58.8)	.59 ^c
Other ethnicity	27 (37.0)	35 (41.2)	
NYHA classification, N (%)			
Class II	5 (6.8)	19 (22.4)	.00 ^c
Class III	26 (35.6)	37 (43.5)	
Class IV	42 (57.5)	29 (34.1)	
Relative risk score, mean (SD)	2.95 (3.24)	2.95 (3.09)	.81 ^b
Geriatric Depression Scale score, mean (SD)	7.78 (2.81)	2.31 (1.52)	.00 ^b
No. with positive GDS, N (%)	66 (90.4)	...	
Geriatric Anxiety Inventory score, mean (SD)	9.26 (6.31)	1.31 (1.98)	.00 ^b
No. with positive GAI, N (%)	40 (54.8)	...	
VHA chart code, N (%)			
Depression or anxiety recognized (a–c)	42 (57.5)	24 (28.2)	.00 ^c
a—Outpatient depression or anxiety diagnosis	31 (42.5)	8 (9.4)	.00 ^c
b—Outpatient progress note with notation for depression or anxiety	42 (57.5)	24 (28.2)	.00 ^c
c—Inpatient depression or anxiety diagnosis	8 (11.0)	1 (1.2)	.01 ^c
Depression or anxiety treatment (d and e)	44 (60.3)	21 (24.7)	.00 ^c
d—Depression or anxiety medication listed	43 (58.9)	18 (21.2)	.00 ^c
e—Mental health services used	25 (34.2)	7 (8.2)	.00 ^c
No. of outpatient encounters in the 12 mo preevaluation, N (%)			
0–25	25 (33.3)	35 (41.2)	.31 ^c
26 or more	48 (66.7)	50 (58.8)	
No. of outpatient encounters in the 6 mo postevaluation, N (%)			
0–10	23 (31.5)	43 (50.6)	.02 ^c
11 or more	50 (68.5)	42 (49.4)	

^aPresence of clinically significant depression was indicated by a GDS score of ≥ 6 ; presence of clinically significant anxiety was indicated by a GAI score of ≥ 9 .

^bIndependent-sample t test.

^cChi-square test.

Abbreviations: GAI = Geriatric Anxiety Inventory, GDS = Geriatric Depression Scale, NYHA = New York Heart Association, VHA = Veterans Health Administration.

recognition of depression or anxiety versus those receiving documented depression or anxiety treatment.

Logistic regression procedures were used to determine patient-level factors associated with recognition of depression or anxiety in the medical record. Predictors included demographic variables (age, ethnicity), health-service-use variables (categorical number of outpatient encounters pre- and post-assessment), and clinical indicators (GDS total score, GAI total score, NYHA classification, and relative-risk score). A second logistic regression was used to explore predictors of notation in the medical record of treatment for depression and/or anxiety, using the same variables as above, with the addition of a dichotomous variable representing the presence or absence of a positive primary care depression screen.

RESULTS

The study sample consisted almost exclusively of men (98.7%), the mean age was 71.3 years, and participant ages ranged from 60 to 92 years. A considerable number of individuals in this sample identified themselves as belonging to an ethnic minority (39.2%). As defined by

NYHA and relative-risk score criteria, the sample included a large number of patients with significant physical limitations and medical-illness burden. The prevalence of self-reported depression, according to the GDS, was 41.8%, and the prevalence of self-reported anxiety, according to the GAI, was 25.3%. Notably, of those identified as having either depression- or anxiety-related symptoms (N = 73), 90.4% had symptoms of depression.

Table 1 lists descriptive information and comparative analyses for depressed or anxious and nondepressed, nonanxious patients (using GDS and GAI cutoff scores). Comparative analyses between GDS/GAI-positive and GDS/GAI-negative patients found that significantly more severe NYHA status and increased number of outpatient encounters (6 months poststudy assessment) were associated with the depressed and/or anxious group. Age, gender, ethnicity, relative-risk score, and number of outpatient encounters (12 months prior to study assessment) were not significantly different between the 2 groups.

Of those screening positive for depression or anxiety on the GDS or GAI, 57.5% were recognized as having depression, and 60.3% had received some form of mental health treatment during the 18-month period of the EMR

Table 2. Prediction of Recognition of Depression and/or Anxiety (diagnosis and/or medical-record notation) (N = 158)

Characteristic	B	SE	Odds Ratio	95% CI
Age	-0.03	0.03	0.97	0.93 to 1.02
Ethnicity				
White				Referent
Other ethnicity	-0.35	0.39	0.70	0.33 to 1.52
Relative risk score	0.11	0.07	1.11	0.98 to 1.27
NYHA classification				
Class II				Referent
Class III	0.20	0.56	1.22	0.41 to 3.63
Class IV	-0.12	0.57	0.88	0.29 to 2.68
GDS total score	0.17*	0.08	1.18	1.02 to 1.38
GAI total score	0.04	0.05	1.04	0.96 to 1.14
No. of outpatient encounters in the 12 mo preassessment				
0-25				Referent
26 or more	0.17	0.45	1.18	0.49 to 2.83
No. of outpatient encounters in the 6 mo postassessment				
0-10				Referent
11 or more	0.16	0.41	1.17	0.52 to 2.63

*p < .05.

Abbreviations: GAI = Geriatric Anxiety Inventory, GDS = Geriatric Depression Scale, NYHA = New York Heart Association, SE = standard error.

review. Of the 73 patients screening positive for depression and/or anxiety on the GDS and/or GAI, 42.5% had a diagnosis of depression or anxiety documented in the medical record, 57.5% had at least 1 progress note with a notation for depression or anxiety, 58.9% had received an antidepressant or anti-anxiety medication, and 34.2% had obtained specialty mental health care. For patients who screened negative on both the GDS and GAI (N = 85), 9.4% had a diagnosis of depression or anxiety documented in the medical record, 28.2% had at least 1 progress note with a notation for depression or anxiety, 21.2% had documentation of receiving an antidepressant or anti-anxiety medication, and 8.2% had documentation that they had received specialty mental health care.

A follow-up examination was conducted to explore the number and percentage of patients with recognition of depression or anxiety (diagnosis or progress notation) in the medical record that also had a documented mental health treatment (psychotropic medication or specialty mental health visit). Of those with a depression or anxiety diagnosis, 92.3% had received treatment for depression or anxiety. For patients without a documented diagnosis of depression or anxiety, 24.4% had received mental health treatment.

Logistic regression procedures were used to predict documentation of recognized depression and/or anxiety in the medical record (Table 2). Recognition, dichotomized as either present or absent, represented whether or not patients were diagnosed with or had a specific notation for depression and/or anxiety in the medical record during the 12 months prestudy and 6 months post-

study assessment. Higher GDS total scores (odds ratio [OR] = 1.18, 95% confidence interval [CI] = 1.02 to 1.38) were significantly related to increased recognition in the medical record. Notably, age, ethnicity, relative-risk score, HF severity, GAI total score, and number of outpatient encounters (pre- and post-assessment) were not significantly related to documentation of recognition in the medical record.

A follow-up logistic regression predicting documentation of treatment for depression and/or anxiety in the medical record revealed that the presence of a positive primary care depression screen was significantly associated with increased odds of receiving mental health treatment (p < .05, OR = 3.37, 95% CI = 1.14 to 9.90). The GDS total score (OR = 1.14, 95% CI = 0.97 to 1.33) and GAI total score (OR = 1.09, 95% CI = 0.99 to 1.20) approached, but did not reach, clinical significance in the model (p values of .11 and .07, respectively).

DISCUSSION

Symptoms of anxiety and, especially, depression are highly prevalent in ambulatory HF patients, with over 45% of our sample reporting clinically significant symptoms on the GDS and/or GAI. Although these conditions have significant overlap in symptomatology, research indicates that both conditions offer unique contributions and warrant investigation, especially among chronically ill patients.¹⁰ In the present study, the prevalence of depression and anxiety was notable but largely fell under the depression spectrum. Specifically, over 90% of the depressed or anxious subgroup was accounted for by clinical cutoff scores obtained from the GDS.

This study represents the first known prospective investigation to examine rates of recognized and treated depression and anxiety in ambulatory HF patients. Our findings are consistent with known rates of poor recognition in chronically ill patients and in HF inpatients.³⁶ These results are somewhat consistent with a recent, large-scale Veterans Health Administration (VHA) study that found limited recognition but diverged from this larger study, which found poor follow-up care using standardized depression screenings.¹⁴ Despite the high-quality EMR system and formalized requirements for annual depression screening provided by the VHA, we found that many HF patients with significant symptoms of depression and/or anxiety went unrecognized. On a positive note, the use of primary care-based depression screening measures was significantly related to the attainment of mental health treatment. Specifically, patients with a positive depression screen (during the 18-month medical-record-review period) were over 3 times more likely to either obtain psychotropic medications or use mental health services. Results also indicated that patients with higher scores on the GDS were more likely to be recognized, suggesting that

providers are able to more easily identify higher levels of depression severity.

As depression (and anxiety to a lesser extent) screening is becoming more widely accepted and used in health care settings, it is becoming increasingly clear that additional efforts are needed to improve the sensitivity of routine mental health screening. Our findings suggest that positive depression screens are important for subsequent receipt of care. However, despite the known high sensitivity of the VHA 2-item depression screening measure,³⁷ the practical application of this method may not effectively identify patients willing to self-report depressive symptoms. For example, most mental health screenings identified in this study occurred during a preventive medicine note provided by a nurse, who was also charged with completing other physical health screenings. It is likely that many patients who received the depression screen may not have accurately reported their mental health state or may have been overlooked by providers who are charged with meeting multiple, competing demands.²²

Improvements in the recognition of depression (and, especially, anxiety) are needed and might best be addressed through formal mental health training of frontline practitioners to improve education about and skills in detecting mental health issues in the medically ill. Targeted efforts aimed at practitioners might include (1) education on the high prevalence of depression and anxiety in the medically ill and known effective treatments for these conditions to increase practitioners' ability to address patient concerns and comfort in openly discussing depression and anxiety in a medical, rather than mental health care, setting; (2) provider training and education about differential diagnoses, especially related to depressive and anxiety symptoms and their overlap with the physical symptoms common to HF (e.g., fatigue, decreased physical activities); and (3) system-level changes to increase the real-world effectiveness of depression screening practices. For example, changes might include increased numbers of mental health specialists available for assessment and triage, more focused mental health screening appointments (rather than embedding a 2-item screening questionnaire within a larger battery of medical screening questions), and increased time for providers to address mental health concerns during routine office visits, thereby decreasing competing demands.²²

Study Limitations and Need for Additional Research

Two methodological decisions should be further discussed. First, the current study focused on symptoms of depression and anxiety rather than a diagnosis as obtained from a semistructured clinical interview. As such, results must be interpreted with this methodological decision in mind. The decision to assess symptoms rather than diagnoses was based on literature that suggests the importance

of treating elevated mental health symptoms,³⁸ as well as the current assessment and care practices in the primary care setting, which often focus on symptom-based patient concerns. Second, the decision to separate recognition and treatment of depression and/or anxiety in the medical record has both strengths and limitations. As a strength, it offers an objectified classification strategy for analyses and clearly separates treatment from diagnosed or noted depression/anxiety. As a limitation, this classification strategy minimizes the role of recognition, which is likely inherent in many of the medical records reviewed for this study.

Results from this study are also limited by our reliance on documentation of depression and anxiety in the VA and the potential for biased participation favoring non-depressed/nonanxious HF patients. Our reliance on VA data, which did not include any information from outside providers, may underestimate recognition and treatment of depression and anxiety. Data also suggest that some patients may have been diagnosed by their provider without documentation (patients with treatment who did not have documentation of a condition). However, the VHA's use of EMR for provider communication and workload documentation, and the need to record clinical findings for accurate patient records, suggests that many providers routinely document their work. Study results may have also been affected by limited participation of depressed and anxious HF patients. However, the study attempted to address this concern using recruitment methods including unsolicited recruitment letters and telephone calls, as well as telephone-based screening, to increase the recruitment of depressed and/or anxious HF patients.

With the recent, targeted efforts to embed mental health services within VHA primary care practices, future work might assess potential improvements in recognition and treatment as these programs become established. The VHA's use of a comprehensive EMR will likely afford many opportunities to assess mental health practices in the primary care setting and the resulting impact of this large initiative on patient health factors. Other work is needed that focuses on the role of mental health treatments for the medically ill and on increasing the number of medically ill patients who receive evidence-based mental health treatments.

Disclosure of off-label usage: The authors have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents that is outside US Food and Drug Administration–approved labeling has been presented in this article.

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