Psychological Distress Among Female Cardiac Patients Presenting to a Women's Heart Health Clinic

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Female cardiac patients are at greater risk for mental health disorders than their male counterparts, and these mental health disorders have been associated with increased cardiac morbidity and mortality. However, few studies have closely examined the mental health disorders found among the female cardiac population. The primary aim of this study was to examine the prevalence of psychological distress in a sample of female cardiac outpatients at an academic medical center. A secondary aim was to determine whether different demographic variables, cardiac risk factors, or cardiac diagnoses were associated with different levels of emotional distress. A survey, including demographic information, medical status, and standardized symptom measures was completed by 117 female patients scheduled for medical visits at an outpatient women's heart health clinic over a 4-month period. Using standardized self-report questionnaires, 38% scored in the moderate-to-severe range for at least 1 mental disorder and 50% endorsed current insomnia. Symptoms of clinical depression (20%) and anxiety (42)% were endorsed at higher rates than predominantly male or mixed comparison samples. Although there was no apparent relation between the severity of cardiac problems and the degree of psychological distress, women with diagnoses of hyperlipidemia, prediabetes, and diabetes reported greater psychological distress than those without these problems. Women with lower income also reported more psychological distress. In conclusion, our findings suggest an unmet need for integrated mental health services for female cardiac patients. **(Am J Cardiol 2019;123:2026−2030)**

Coronary heart disease (CHD) is the leading cause of death among women in the United States, accounting for 22.3% of annual female deaths nationwide.[1] Female cardiac patients have higher rates of psychiatric co-morbidity, which has been associated with worse outcomes.[2−5] For example, women with CHD are 2 to 3 times as likely to experience current anxiety or depression as their male counterparts[6,7] and younger (≤age 60) women with CHD are at the highest risk for depression compared with older women and men of any age.[3,8] Female cardiac patients with depression or anxiety also have higher CHD event recurrence rates[4] and depression contributes to higher rates of postevent rehospitalization compared with men.[9]

The primary aim of the present study was to examine the prevalence of psychological distress in a sample of female cardiac patients presenting to a women's heart health clinic. A secondary aim was to determine whether different demographic variables, cardiac risk factors, and cardiac diagnoses were associated with different levels of emotional distress. Based on the literature, we expected participants to report moderate-to-high levels of psychological distress and that women with a serious coronary issue would report more distress than those with only risk factors or a less severe diagnosis.

Methods

This study included female patients who visited an outpatient women's heart health clinic over a 4-month period. Approximately, 150 patients were approached about taking the survey. Patients were either approached during clinic appointments or sent an email, to which they had previously consented during a clinic visit, and were asked to participate in a 1-time survey. The survey was designed to gather information about female cardiology patients' mental health issues and included questions about mental health, behavioral health, coping, current mental health treatment status, and preference for different behavioral health treatment options.

Inclusion criteria were being female and a patient of the women's heart health clinic. Willing participants were asked to complete a paper and pencil survey while waiting for their medical provider or click on an email link to a secure web-based version of the survey. Those who elected to complete the paper and pencil survey were asked to return the survey to their medical provider before leaving the clinic that day. Participants were offered the chance to

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receive a follow-up call about their responses and/or to receive a treatment referral for current mental health concerns.

The validated measures used included the Insomnia Severity Index, the Perceived Stress Scale (PSS), the Patient Health Questionnaire, the Beck Anxiety Inventory (BAI), and the Alcohol Use Disorders Identification Test (AUDIT-C). The Insomnia Severity Index is a self-report questionnaire that assesses the severity of insomnia and its perceived impact. It has good reliability (Cronbach's $\alpha = 0.90$) and convergent validity with measures of fatigue, quality of life, and anxiety and depression ($r = 0.80$, $p < 0.05$).[10] The PSS is a 14-item questionnaire that measures the degree to which situations are perceived as stressful. Items are rated on a 5-point scale from 0 to 4, and the total score is the sum of the 14 items. It has shown good reliability (Cronbach's $\alpha = 0.85$). Evaluation of concurrent validity demonstrates moderate correlations with a number of stressful life events, and significantly increased correlations with self-rated impact of life events.[11] Furthermore, the PSS shows good predictive validity with respect to depressive and physical symptomology. The Patient Health Questionnaire is a brief measure for screening, diagnosing, and monitoring the severity of depression. It has solid internal reliability (Cronbach's $\alpha = 0.85$) and clinical validity in studies involving medical patients. Cut-off scores recommended by the authors were used to assess potential clinical levels of depression in this sample. Use of the measure in cardiac patients has demonstrated high specificity and predictive value for future cardiac events.[12] The BAI is a 21-item self-report inventory for measuring anxiety severity. It shows high internal consistency ($\alpha = 0.92$) and good test-retest reliability over 1 week ($r = 0.75$), as well as discriminant validity between patients with anxiety disorders and those with depressive symptomology (primary or secondary) or controls without anxiety or depression. Although depression and anxiety are known to overlap, factor analytic studies have demonstrated that BAI items load on a single distinct factor compared with items measuring depression.[13] The BAI is a widely used measure of general and panic-related anxiety, with a cut-off score of ≥ 20 for maximum clinical utility in screening for panic disorder among primary care populations. Finally, the AUDIT-C is a brief alcohol screen that reliably identifies patients who are hazardous drinkers or have active alcohol use disorders. It contains 3 Likert-style items, each on a 5-point scale, asking about alcohol consumption. The total score ranges from 0 to 12 with a higher score indicating more hazardous drinking behavior. The AUDIT-C has shown good sensitivity and specificity in both women and men for identifying both unsafe drinking and active alcohol abuse or dependence.[14] In a dichotomous approach to screening, participants in this study screened positive for exceeding recommended guidelines if they reported either drinking above weekly recommended limits on AUDIT-C questions 1 and 2 (7 drinks per week for women) or drinking more than 6 drinks on any occasion in the past year on question 3.

All analyses were conducted using IBM SPSS statistics software, version 22. Frequency and descriptive analyses were run on demographic data, medical diagnostic data, mental health questionnaires, and responses about receiving past or present mental health treatment. One-way ANOVAs and correlational analyses were conducted to examine relations between demographic variables and level of distress, and between risk and diagnostic variables and level of distress.

Results

This all-female sample had a mean age of 58.8 years (range: 20 to 84) and 77% self-identified as white. More than half (68.1%) completed college or graduate school, 72.7% were married, and 44.4% reported an income above $150,000. Within the sample, 17.1% had confirmed CHD and another 17.9% reported chest pain. Women reported the diagnoses for which they were being treated in the clinic (Table 1).

We assessed prevalence of symptoms indicating depression, anxiety, insomnia, and alcohol abuse using established clinical cut-off scores on validated measures (Figure 1).

Table 1
Demographic characteristics of the sample (n = 117)*

Variables	
Age (n = 108)	58.8 (12.4)
Race (n = 61)	
White	77.0%
Hispanic	13.3%
Asian	9.8%
Black/African-American	4.9%
Other	4.9%
American Indian/Alaskan	1.6%
Native Hawaiian/other Pacific Islander	1.6%
Education (n = 66)	
High school	12.1%
Some college	19.7%
Completed college	33.3%
Graduate degree	34.8%
Relationship status (n = 66)	
Single	13.6%
Co-habiting	3.0%
Married	72.7%
Divorced	10.6%
Income (n = 66)(k)	
Less than $20,000	9.3%
20 - 49.9	9.3%
50 - 99.9	22.3%
100 - 149.9	14.9%
Above $150,000	44.4%
Cardiac or related condition (n = 117)	
Hypertension	38.5%
Hyperlipidemia	27.4%
Chest Pain	17.9%
Coronary heart disease	17.1%
Other	15.4%
Endothelial or Microvascular dysfunction	12.0%
Diabetes or prediabetes	9.4%
Palpitations or arrhythmia	6.8%
Coronary spasm or Prinzmetal's angina	5.1%
Diastolic dysfunction	4.3%
Myocardial infarction	2.6%
Carotid disease	2.6%

* Not every patient answered every demographic question.

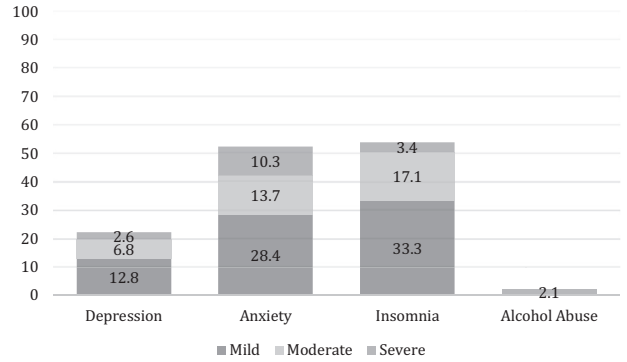

Figure 1. Prevalence of mental health problems in a Women's Heart Health Clinic (n = 117).

Cut-off scores were used to represent mild, moderate, and severe diagnostic categories and possible alcohol abuse. Sample means and standard deviations of scores on psychological questionnaires can be found in Table 2.

Twenty-two patients (19%) disclosed that they were currently receiving treatment for a mental health problem. Of those patients who said yes, 6 patients (30%) reported that they were taking medication(s) only, 3 patients reported receiving therapy only (10%), and 13 patients (60%) reported receiving both medication(s) and therapy. Patients reported being treated for current diagnoses of depression, anxiety, adjustment disorder, post-traumatic stress disorder, domestic violence, and panic disorder.

A series of analyses were conducted to determine whether demographic or diagnostic variables were associated with different levels of psychological distress. ANOVA and correlational analyses revealed that patients who reported less income reported greater levels of perceived stress ($r = -0.45$, $p = 0.001$), depression ($r = -0.29$, $p = 0.041$), and anxiety ($r = -0.43$, $p = 0.002$) compared with their higher income counterparts. No other demographic variables were significantly related to measures of psychological distress.

Women who reported having a serious coronary issue (n = 47) reported the same levels of distress as women with other diagnoses served in our clinic (Table 2). Diagnoses categorized as a serious coronary issue included chest pain, coronary artery disease, coronary spasm/Prinzmetal's angina, endothelial/microvascular dysfunction, and myocardial infarction. Other diagnostic variables associated with psychological distress included diabetes/prediabetes and hyperlipidemia. Patients with diabetes/prediabetes scored higher on depression and anxiety than those without diabetes (Table 3), and patients with hyperlipidemia reported higher stress than those without hyperlipidemia (Table 4).

Discussion

Our study had 2 important findings. First, that female cardiac patients presenting to a women's heart health clinic are at high risk for comorbid mental health problems. Thirty-eight percent (38%) of patients in our sample endorsed symptoms consistent with at least 1 moderate-to-severe clinical disorder (depression, anxiety, insomnia, or alcohol abuse). Second, that only about half of these patients reported receiving treatment. Given the known association between emotional distress and increased cardiovascular risk,[2] and evidence for reduced risk through mental and behavioral health treatment,[15] we believe that our findings demonstrate an unmet need for mental and behavioral health services among female cardiac patients.

Table 2
Serious coronary issues and emotional distress

Outcomes	Full sample (n = 106) M (SD)	SCI (n = 47) M (SD)	no SCI (n = 59) M (SD)	ANOVA F statistic	ANOVA p value
PHQ-9	6.42 (5.50)	6.59 (4.73)	6.28 (6.09)	0.86	0.77
BAI	12.14 (11.29)	12.49 (10.94)	11.86 (11.65)	0.08	0.78
ISI	9.29 (6.52)	9.92 (6.42)	8.82 (6.61)	0.75	0.39
AUDIT-C	1.86 (1.58)	1.88 (1.62)	1.85 (1.56)	0.00	0.95
PSS	16.76 (6.05)	16.53 (5.88)	16.95 (6.21)	0.13	0.72

AUDIT-C = Alcohol Use Disorders Identification Test; BAI = Beck Anxiety Inventory; ISI = Insomnia Severity Index; M = mean; PHQ-9 = Patient Health Questionnaire 9-item depression scale; PSS = Perceived Stress Scale; SCI = serious coronary issue including diagnoses of chest pain, coronary artery disease, coronary spasm/Prinzmetal's, endothelial dysfunction/microvascular disease, and myocardial infarction; SD = standard deviation.

Table 3
Diabetes and emotional distress

Outcomes	DM + (n = 11) M (SD)	DM 0 (n = 95) M (SD)	ANOVA F statistic	ANOVA p value
PHQ-9	10.01 (6.88)	6.01 (5.21)	5.44	0.02*
BAI	19.22 (17.53)	11.32 (10.16)	5.01	0.03*
ISI	12.00 (6.54)	8.98 (6.48)	2.14	0.15
AUDIT-C	1.60 (1.84)	1.90 (1.55)	0.31	0.58
PSS	27.15 (8.30)	23.06 (7.53)	2.85	0.09

AUDIT-C = Alcohol Use Disorders Identification Test; BAI = Beck Anxiety Inventory; DM = diabetes mellitus; ISI = Insomnia Severity Index; M = mean; PHQ-9 = Patient Health Questionnaire 9-item depression scale; PSS = Perceived Stress Scale; SD = standard deviation.

* Indicates significance at $p \leq 0.05$ level.

Table 4
Hyperlipidemia and emotional distress

Outcomes	HLD + (n = 32) M (SD)	HLD 0 (n = 75) M (SD)	ANOVA F statistic	ANOVA p value
PHQ-9	7.60 (6.06)	5.91 (5.21)	2.13	0.15
BAI	10.68 (11.23)	12.77 (11.34)	0.77	0.39
ISI	9.06 (6.88)	9.39 (6.41)	0.53	0.82
AUDIT-C	2.19 (1.50)	1.73 (1.60)	1.61	0.21
PSS	25.74 (7.46)	22.52 (7.61)	4.06	0.05*

AUDIT-C = Alcohol Use Disorders Identification Test; BAI = Beck Anxiety Inventory; HLD = hyperlipidemia; ISI = Insomnia Severity Index; M = mean; PHQ-9 = Patient Health Questionnaire 9-item depression scale; PSS = Perceived Stress Scale; SD = standard deviation.
* Indicates significance at $p \leq 0.05$ level.

It was unexpected that women in our sample would report more symptoms of insomnia than anxiety or depression: 50% of women surveyed endorsed symptoms of clinical insomnia. The mean score in our sample was above the clinical threshold for insomnia and higher than the mean score in a comparable sample of cardiac patients (80% male) enrolled in cardiac rehab.[16] Current estimates are that 13% to 44% of patients with CHD report comorbid insomnia[17,18] and sleep disturbance has been suggested as the "10th modifiable cardiac risk factor."[19] In our sample, 42% of women surveyed endorsed symptoms of clinical anxiety and 20% endorsed symptoms of clinical depression. Point prevalence for anxiety disorders among stable cardiac outpatients (70% male) is estimated at 24% to 36%[4,16] whereas current major depression occurs in approximately 9.3% of CAD patients (mixed gender sample).[20] Our findings suggest that female cardiac patients may be experiencing symptoms of anxiety and depression at nearly double the rate of men. This is consistent with the literature on gender differences in prevalence rates among cardiac patients[6,7] and in the general population.

Contrary to our hypothesis that women with more severe diagnoses would report higher levels of psychological distress, women with diagnoses classified as a serious coronary issue reported the same levels of distress as women with less severe diagnoses or only cardiac risk factors. This could be due to our classification or a limited range of disease severity in this small sample. Another possible explanation for this finding is that the women in our sample were distressed about other things. Recent research suggests that women with CHD are more adversely affected by psychosocial stress than men[21] and may be more affected by combined factors of work and family/spousal stress than their male counterparts. Spousal stress, in particular, has been found to be a strong predictor of poor prognosis in women with CHD.[22] More research is needed on predictors of psychosocial distress in female cardiac patients.

Patients in our sample with diabetes and hyperlipidemia reported more psychological distress than patients without diabetes or hyperlipidemia. Specifically, patients with diabetes/prediabetes scored higher on depression and anxiety than those without diabetes and patients with hyperlipidemia reported higher stress than those without. These findings are consistent with existing evidence that prevalence rates of co-morbid depression and diabetes are high, estimated at 10% to 17%.[23] Our finding regarding stress and hyperlipidemia is consistent with known associations between acute and chronic stress and lipid disturbances.[24,25]

There is mounting evidence that integrated psychological and medical services can improve healthcare systems' ability to achieve the "Triple Aim" of enhancing medical outcomes, improving the patient experience, and reducing cost.[26] Integrated behavioral health models are increasingly common, particularly in primary care, in part because of changes in healthcare policy such as the Patient Protection and Affordable Care Act (2010),[27] emergence of the Patient-Centered Medical Home model and the Triple Aim. However, there is a relative paucity of data on integrated behavioral health models in the cardiology setting, despite evidence for specific behavioral risk factors − including anxiety, insomnia, depression, and anger/hostility − in the development and progression of CHD.[28] Data from the present study support the importance of creating models of integrated mental and behavioral health care for female cardiac patients.

Limitations of this study include a somewhat narrow sociodemographic sample that may not be generalizable to typical cardiac populations. Specifically, 44% of our sample reported an annual household income above $150,000 and 77% self-identified as white. However, our finding that women who reported lower income reported greater levels of psychological distress suggests that rates of distress may be even higher among women of lower socioeconomic status. Also, whereas our study was broadly representative of patients seen in a women's heart health clinic, only 17% reported having CHD. In addition, psychological diagnostic data were drawn from clinical cut-off scores on self-report measures rather than using clinician-administered interviews, which generally serve as the gold standard for data collection in psychological research. On self-report measures, patients may either over- or under-report symptoms. Finally, we did not assess for the full range of Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5) disorders and, notably, omitted an assessment for post-traumatic stress disorder, which occurs in about 4% of patients after acute coronary syndrome[29] and has been studied as a prospective risk factor for CHD morbidity and mortality in women.[30]

In conclusion, women presenting to a women's heart health clinic report high rates of co-morbid mental health problems, particularly insomnia and anxiety, which are associated with event recurrence and rehospitalization, and only about half of these women are receiving treatment. Our findings strongly support the need for an integrated behavioral health model within women's heart health clinics.

Disclosures

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