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CME OBJECTIVE

After studying this article, you should be able to:

- Screen for anxiety and depression in patients with cardiovascular disease because of the impact that these comorbidities have on quality of life and functional status

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The Impact of Anxiety, Depression, and Suicidality on Quality of Life and Functional Status of Patients With Congestive Heart Failure and Hypertension: An Observational Cross-Sectional Study

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Objective: Congestive heart failure (CHF) and hypertension are prevalent diseases with high mortality and morbidity rates. Depression and anxiety are frequently associated with cardiovascular diseases. This observational cross-sectional study assessed depression, anxiety, suicidality, and quality of life in 240 patients with CHF (with or without hypertension) or hypertension (without CHF).

Method: Subjects were evaluated between June 2005 and June 2007 using the Hamilton Anxiety Rating Scale (HARS), Hamilton Depression Rating Scale, Montgomery-Asberg Depression Rating Scale, Medical Outcomes Study 36-item Short-Form Health Survey (both physical component score and mental component score), and Satisfaction With Life Scale (SWLS). Patients with CHF were assigned a New York Heart Association functional classification.

Results: The CHF patients had higher scores on the depressive factor and the HARS and higher suicidality. Furthermore, they had lower scores on the physical component score, higher scores on the mental component score, and lower scores on the SWLS. Depressive symptom level was a significant predictor of lower physical health ($P = .012$), whereas anxiety was a significant predictor of satisfaction with life ($P = .002$). CHF compared to hypertension was a predictor of higher mental health as measured with the mental component score and lower satisfaction with life. Higher anxiety predicted lower satisfaction with life both in patients with CHF and with hypertension.

Conclusions: Anxiety and depressive symptoms and cardiovascular disease were frequently associated. Screening for anxiety and depression in cardiovascular patients may be crucial.

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Congestive heart failure (CHF), often punctuated by acute exacerbation, is the most common form of heart failure. Over 20 million people are affected by CHF worldwide,¹ almost 5 million in the United States² and 10 million in Europe.^{3,4} The incidence and prevalence increases with age,^{5,6} and in subjects over the age of 65 years, CHF is the main cause of hospitalization and disability.⁷ Mortality among patients with CHF is 6–7 times higher than in the general population.⁸ In past studies, sudden death was a greater

CLINICAL POINTS

- ◆ Adequate screening for anxiety, depression, and suicide risk in patients with cardiovascular diseases may be crucial.
- ◆ Patients with severe chronic pain may see suicide as the only way of escaping their suffering.
- ◆ Clinicians should teach patients how to recognize the cues for anxiety, depression, and suicidal behavior and encourage them to seek help.

problem in patients with New York Heart Association (NYHA) functional classification IV and in those with advanced CHF.^{9,10}

Hypertension is considered one of the leading causes of death and disability, and its prevalence is rapidly increasing in developing countries.¹¹ Hypertension is reported to be the fourth most common cause of premature death in developed countries and the seventh in developing countries.¹² Recent reports indicate that nearly 1 billion adults (roughly a quarter of the world's population) have hypertension, and this rate is predicted to increase to 1.56 billion by the year 2025.¹³ Hypertension is a major risk factor for cardiovascular morbidity, including CHF,¹⁴ although the association between high arterial and incident hypertension has not been well studied.¹⁵

Several studies have reported that approximately 1 in 4 patients treated in primary care settings shows psychological problems, predominantly anxiety and/or depression.^{16,17} Runkewitz et al¹⁸ reported that approximately 22.1% of nonpsychiatric patients show clinically relevant psychological symptoms. Depression and anxiety are common conditions in primary care settings, affecting at least 10% of primary care patients. Depression in primary care is associated with an increasing risk of cardiovascular disease, diabetes, hypertension, stroke, and several symptoms increasing health service costs.^{19,20} General practitioners are considered to be gatekeepers who have a specific responsibility for the assessment, recognition, and treatment of psychiatric disorders.²¹ However, the recognition and diagnosis of psychological problems by primary care physicians remain poor and inadequate.²² The identification rate of depressive or anxiety disorders is reported to be only 50%–60%,²³ and physicians do not take into account over 50% of psychiatric conditions.²⁴

Patients at higher risk for increased anxiety and depression are generally female, single or divorced, and complaining of fatigue and/or cardiovascular symptoms.¹⁸ Both anxiety and depression are associated with CHF and hypertension. There is evidence that links depression,²⁵ anxiety,^{25,26} and both anxiety and depression^{26,27} to CHF mortality and sudden cardiac death. Additionally, depression is associated with a

higher mortality in both outpatients^{28,29} and inpatients with CHF.³⁰ The presence of depression in patients with existing coronary artery disease confers a relative risk between 1.5 and 2.5 for cardiac morbidity and mortality.³¹ Several authors have suggested that patients with CHF, anxiety, and depression have a worse quality of life, greater disability, and an increased rate of hospitalization,^{30,32,33} but other studies have not replicated these findings.^{28,32}

Also, several studies have hypothesized that there is a link between CHF, hypertension, and suicide.^{34,35} This link, however, has typically been inferred from uncontrolled case series, and few rigorous studies have been published.^{25,36–38}

Suicidal ideation is associated with functional disability, anxiety, depression, increased health service use, and subjective distress in primary care patients^{39,40} but frequently remains undetected by primary care physicians. It is well known that major depressive and anxiety disorders have also been shown to play significant roles in the increased risk of suicidal ideation among primary care patients.^{41,42}

Although most guidelines recommend improving the quality of life and helping patients comply with the treatment for cardiovascular diseases, particularly among elderly individuals with severe disability and functional impairment,⁴³ the exact role of psychological factors has not been evaluated.⁴⁴ The present study was designed to evaluate the impact of anxiety, depression, and several risk factors for suicide on the quality of life and functional status of patients with CHF and hypertension.

METHOD

Study Design

This study involves the cross-sectional analysis of enrollment data for subjects with CHF and hypertension. The study protocol was reviewed and approved by the Rome Public Health Department Institutional Review Board, and all study participants signed an informed consent.

Subjects. Study entry criteria were determined through several stages. At the beginning of the study, 256 patients at least 18 years old with a diagnosis of CHF (with or without hypertension) or hypertension (without CHF)

were screened. Some CHF patients had hypertension, but none of the hypertension patients had CHF.

The diagnoses of hypertension and CHF were assigned by a cardiologist and confirmed by a second cardiologist blind to the first diagnosis. The NYHA functional classification¹² was used to assess the degree to which heart failure limited 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. We considered hypertension to be present when a person's blood pressure was consistently ≥ 140 mm Hg systolic or ≥ 90 mm Hg diastolic.⁴⁵

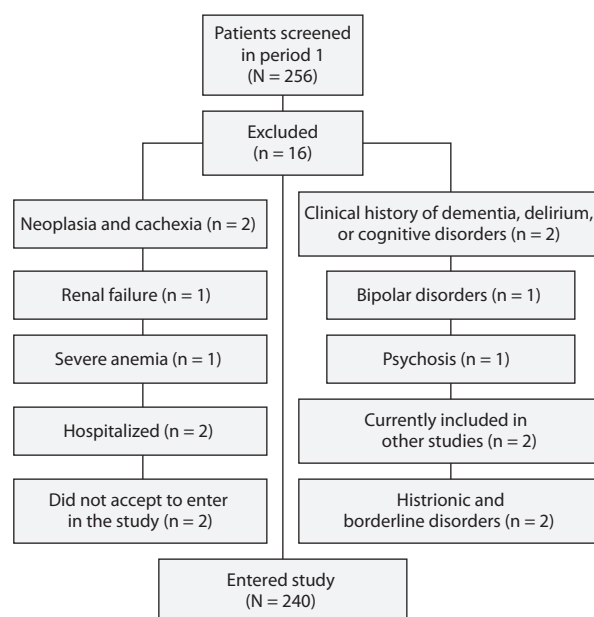
Sixteen subjects were excluded from the study for the following reasons. Four subjects with CHF were excluded because they were affected by severe medical conditions (2 with neoplasia and cachexia, 1 with renal failure, and 1 with severe anemia), 4 subjects with hypertension did not sign the informed consent, 2 subjects had been recently hospitalized, 2 reported over 6 hospitalizations in the last 2 years (and so had a greater functional impairment due to the severity of the illness), and 6 with CHF were excluded because they had a *DSM-IV* Axis I diagnosis (2 patients had a clinical history of dementia and delirium, 1 had a bipolar disorder type I, 1 had a psychosis, and 2 had a histrionic and a borderline personality disorder). We also excluded 2 individuals with hypertension because they were currently included in other studies (Figure 1).

Procedure. The final sample ($N = 240$) was enrolled in the study between June 2005 and June 2007 at the Department of Cardiology, Sant'Andrea Hospital (Rome, Italy) and "Riuniti" Hospital (Foggia, Apulia, Italy); those participants who completed all study measures were consecutively included as outpatients. All patients were approached by a research assistant after checking in for their appointment for CHF and hypertension and were asked to complete a brief questionnaire in which they were asked to indicate their age in years, gender, race, years of education, and marital status and whether or not they had been diagnosed with different health conditions, including asthma, cancer, coronary artery disease, diabetes, emphysema or chronic obstructive pulmonary disorder (COPD), heart attack, hearing loss, osteoarthritis, osteoporosis, rheumatoid arthritis, or stroke. Participation was voluntary.

Data

All participants were evaluated using the Semistructured Clinical Interview for *DSM-IV* Axis I and Axis II Disorders (SCID-I and SCID-II),⁴⁶ the 17-item Hamilton Depression Rating Scale (HDRS₁₇)⁴⁷ and the Montgomery-Asberg Depression Rating Scale (MADRS)⁴⁸ for the assessment of depressive symptoms, the Hamilton

Figure 1. Flowchart of Patient Disposition



Anxiety Rating Scale (HARS)⁴⁹ for the assessment of anxiety symptoms, the Satisfaction With Life Scale (SWLS),⁵⁰ and the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36)⁵¹ for the health-related quality-of-life measurements. Subjects were investigated only for anxiety and depressive symptoms, not using an interview, to classify individuals as meeting criteria for major depressive disorder or an anxiety disorder.

Assessment of Depression

HDRS₁₇. The HDRS₁₇,⁴⁷ a 17-item clinician-rated scale, was used to evaluate depressive symptom severity. It includes confounding items (eg, pain complaints with fatigue or irritability and anxiety), weights some items over others (eg, 0–3 vs 0–5 scored items), and possesses other psychometric flaws. However, Iannuzzo et al,⁵² using Cicchetti and Sparrow's⁵³ guidelines for evaluating reliability coefficients, obtained excellent total score reliability for the HDRS₁₇ (intraclass correlation coefficient = 0.98).

MADRS. The MADRS was developed in response to some of the limitations of the HDRS and other approaches to measuring depression.⁴⁸ Neither the HDRS₁₇ nor the MADRS cover all 9 symptom domains needed to diagnose a major depressive episode according to the *DMS-IV-TR*. The MADRS, designed to be sensitive to treatment changes, is briefer and more uniform than the HDRS. A limitation of the MADRS is the lack of a structured interview, which may affect its reliability. However, the internal consistency of the MADRS is satisfactory, with a Cronbach α of

0.84. The deletion of any of the 9 items would not increase the internal consistency of the total score.⁴⁸

SF-36. The SF-36 is a generic measure of health status and is widely used across the world. The SF-36 is a multi-item scale that assesses 8 health areas: physical functioning, role limitations due to physical problems, social functioning, bodily pain, general mental health, role limitations due to emotional problems, vitality, and general health perceptions. The SF-36 identifies functional problems coexisting with mood disorder symptoms and other common health problems in primary care patients. Its psychometric properties are well documented.⁵¹ Reliability estimates for physical and mental summary scores usually exceed 0.90.⁵⁴

SWLS. The SWLS⁵⁰ is a 5-item self-report measure of satisfaction with one's life (ie, a measure of global life satisfaction). It measures life satisfaction as a cognitive-judgmental process rather than focusing on affect. The Cronbach α reliability for the scale is 0.87, and the test-retest reliability for a 2-month period is 0.82. The advantage of the SWLS is that it is less correlated with affect than other life satisfaction measures, and the respondents are free to judge various domains (eg, health or material wealth) and several feeling states (eg, loneliness) according to their own preferences. The scale's Cronbach α is 0.75.⁵⁵

Assessment of Suicidality

Suicidality was measured using the 3 following dimensions: suicide attempts, suicidal ideation, and suicidal lethality. Suicide attempts were classified as self-injurious behaviors considered clinically significant or requiring emergency medical assessment. Violent suicidal acts were those involving grave bodily injury that may well have resulted in death but for timely medical or surgical interventions and included use of firearms, hanging, jumping, and automobile wrecks. Suicidal ideation was patient-reported thoughts of wishing to be dead, and not merely preoccupation with death or potential ill health.

Suicidal lethality was evaluated using 3 levels of severity (level 1: vague to moderate suicidal ideation, no organized plan, and no expressed intent; level 2: moderate to intense ideation, vague plan, some intent, and no specific time frame; and level 3: intense ideation, organized plan, particularly if lethal such as shooting or hanging, and strong intent). Lethality was considered higher if there was a past history of suicide attempts. Other factors considered as potentially increasing lethality were a drug/alcohol abuse history, a history of suicide by family members, recent significant losses, and the presence of numerous stressors.

Statistical Analysis

Depressive symptom measure. One item of the MADRS and 1 item of the HDRS measure suicidal risk

and ideation; these items were used to assess current suicidality. To avoid the strong correlation between measures of depression and suicide risk, we calculated the depression scores omitting the items measuring suicidal risk. The 1-tailed Pearson correlation coefficient between the HDRS and the MADRS scores was 0.76 ($P < .001$) (MADRS₉ and HDRS₁₆ Pearson $r = 0.70$, $P < .001$), indicating a strong convergence between these measures.

We performed 2 factor analyses (using a principal components extraction) on the measures of depression and suicidality to seek common factors explaining the variance. In the first factor analysis, only 1 factor had eigenvalues of 1 or higher (F1 initial eigenvalues = 1.70), explaining almost 85% of the variance. The factor loading was 0.833 for each measure. In the second factor analysis, only 1 factor had eigenvalues of 1 or higher (F1 initial eigenvalues = 1.82), explaining almost 91% of the variance of the suicidality measures. The factor loading was 0.907 for each measure. Depressive and suicidality factors are then used in all the bivariate and multivariate analyses.

Student t tests and Fisher exact tests were used to determine if there were mean differences between the groups. The Benjamin-Hochberg procedure was used to control for type 1 errors. Sequential regression analyses were used to test the impact of depressive symptoms, anxiety symptoms, suicidality, and other variables on the quality of life. To enter the suicidality factor in the sequential regression analysis, we dichotomized the variable: scores of 0 = lower suicidality and scores > 0 = higher suicidality.

RESULTS

Patient Characteristics

Two hundred forty patients with no history of psychopathology were consecutively admitted and included in the current study. Patients had not taken psychotropic drugs before recruitment into the present study and had no history of previous psychotropic medication. They were divided into 2 groups: 120 outpatients with CHF and 120 outpatients with hypertension. The CHF conditions included ischemic heart disease (57%), hypertension (19%), diabetes (12%), valvular heart disease (8%), and cardiomyopathy (4%). Subjects with CHF had a mean age of 59.7 years (range, 38–78 years; SD = 12.0); 79 (66%) were men, and 41 (34%) were women. Of the patients with CHF, 18 (15%) were in NYHA class I (no limitation of physical activity), 36 (30%) in NYHA class II (slight limitation of physical activity), 36 (30%) in NYHA class III (marked limitation of physical activity), and 30 (25%) in NYHA class IV (unable to carry out any physical activity without discomfort and symptoms of cardiac insufficiency at rest). Ninety-two (76.7%) CHF patients also had hypertension, 10 (12%) patients had

Table 1. Subject Characteristics and Differences Between Congestive Heart Failure (CHF) and Hypertension Groups

Variables	CHF Group (n = 120)	Hypertension Group (n = 120)	Test	<i>P</i> < ^a
Men, %	65.8	51.7		.05*
Age, mean ± SD, y	59.70 ± 12.04	60.77 ± 10.84	$t_{238} = -0.72$.47
Duration of illness, mean ± SD, y	6.47 ± 1.43	6.59 ± 1.53	$t_{238} = -0.62$.54
No. of previous hospitalizations, mean ± SD	6.34 ± 1.67	1.79 ± 1.12	$t_{208.04} = 24.75$.001**
HDRS ₁₇ score, mean ± SD	18.98 ± 3.63	9.90 ± 3.25		
MADRS ₁₀ score, mean ± SD	15.73 ± 2.53	6.43 ± 3.61		
HDRS ₁₆ score, mean ± SD	17.72 ± 3.55	9.90 ± 3.25		
MADRS ₉ score, mean ± SD	13.87 ± 2.46	6.42 ± 3.70		
Depression score, mean ± SD ^b	26.31 ± 3.98	13.59 ± 4.71	$t_{238} = 22.59$.001**
HARS score, mean ± SD	14.08 ± 2.61	8.15 ± 2.80	$t_{238} = 16.94$.001**
SF-36 (PCS) score, mean ± SD	41.06 ± 5.01	46.07 ± 7.23	$t_{211.82} = -6.24$.001**
SF-36 (MCS) score, mean ± SD	52.44 ± 5.70	45.74 ± 5.11	$t_{238} = 9.58$.001**
Satisfaction With Life Scale score, mean ± SD	18.86 ± 3.42	23.40 ± 2.36	$t_{211.10} = -11.97$.001**
Suicide attempts, n (%)	6 (5.0)	2 (1.7)		.14
High-lethality suicide attempts, n (%)	6 (100.0)	0 (0)		.05
Suicidality factor score > 0, % ^c	99.2	14.2		.001**
HDRS suicidality, %				
0		100.0		
1	4.2	0.0		
2	65.8	0.0		
MADRS suicidal ideation, %	30.0	0.0		
0		85.8		
1	0.8	14.2		
2	19.2	0.0		
3	72.5	0.0		
	7.5	0.0		

^aBenjamin-Hochberg correction for multiple testing (number of tests = 12).^bDepressive factor = (0.833 HDRS₁₆) + (0.833 MADRS₉).^cSuicidality factor = (0.907 HDRS item 3) + (0.907 MADRS item for suicidal ideation).*Significant at *P* < .05.**Significant at *P* < .01.

Abbreviations: HARS = Hamilton Anxiety Rating Scale, HDRS = Hamilton Depression Rating Scale, MADRS = Montgomery-Asberg Depression Rating Scale, MCS = mental component score, PCS = physical component score, SF-36 = Medical Outcomes Study 36-item Short-Form Health Survey.

diabetes, 6 (7.2%) had peripheral vascular disease, and 2 (2.4%) had COPD. The CHF patients had a mean duration of illness of 6.5 years (SD = 1), and a mean of 6.3 (SD = 2) previous hospitalizations because of hypertension (52%), paroxysmal nocturnal dyspnea and orthopnea (40%), and dizziness and confusion (8%).

Subjects with hypertension had a mean age of 60.8 years (range, 40 to 82 years; SD = 11); 62 (52%) were men and 58 (48%) were women. They had a mean duration of illness of 6.6 years (SD = 2) and a mean of 1.8 (SD = 1) previous hospitalizations. Ten (8.4%) patients were affected by secondary hypertension due to medical conditions (80% renal artery stenosis, 15% Cushing syndrome, and 5% hyperparathyroidism). None of the hypertension patients also had CHF. Five (6%) patients had diabetes, 1 (1.2%) had peripheral vascular disease, and 3 (3.6%) had COPD.

Differences between subjects with CHF and hypertension. The differences between patients with CHF (with or without hypertension) and hypertension (without CHF) are listed in Table 1. The 2 groups differed on several variables even after controlling for multiple testing. The CHF patients were more likely to be men (65.8% vs 51.7%; *P* < .02), had more

previous hospitalizations (6.34 ± 1.67 vs 1.79 ± 1.12; $t_{208.04} = 24.75$; *P* < .001), had higher scores on the depressive factor (26.31 ± 3.98 vs 13.59 ± 4.71; $t_{238} = 22.59$; *P* < .001) and the HARS (14.08 ± 2.61 vs 8.15 ± 2.80; $t_{238} = 16.94$; *P* < .001), and had scores higher than 0 on the suicidality factor and higher suicidality (99.2% vs 14.2%; *P* < .001) than patients with hypertension.

Furthermore, patients with CHF had lower scores on the physical component score (PCS) (41.06 ± 5.01 vs 46.07 ± 7.23; $t_{211.82} = -6.24$; *P* < .001), higher scores on the mental component score (MCS) (52.44 ± 5.70 vs 45.74 ± 5.11; $t_{238} = 9.58$; *P* < .001), and lower scores on the SWLS (18.86 ± 3.42 vs 23.40 ± 2.36; $t_{211.10} = -11.97$; *P* < .001) than patients with hypertension. The 2 groups did not significantly differ in the number of suicide attempts after the diagnosis of CHF or hypertension (5.0% vs 1.7%), but the suicide attempts in CHF patients were more likely to have high lethality than those in hypertension patients (100.0% vs 0%; *P* < .04).

Correlation of SF-36 and SWLS measures. The 1-tailed Pearson correlation between the PCS and MCS scores was -0.49 (*P* = .0008), between PCS and the SWLS scores was 0.10 (*P* = .06), and between MCS and SWLS scores was -0.21 (*P* = .001).

Table 2. Sequential Regression Analyses Assessing Multivariate Association Between Quality-of-Life Measures (SF-36 and SWLS) and Depressive and Anxiety Symptoms and Suicidality^a

Dependent variable: SF-36 physical component score							
Variables	1	2	3	4	5	6	Final
Diagnosis (CHF vs hypertension) ^b	.38	.38	.47	.26*	.22*	.21*	.15*
Sex (men vs women) ^b		-.05*	-.06*	-.05*	-.04*	-.04*	
Lifetime hospitalization			.10*	.13*	.12*	.12*	
Depression ^c				-.28	-.19*	-.19*	-.27
HARS score					-.14*	-.14*	
Suicidality factor ^d						.02*	
R ² change	0.14	0.003	0.003	0.02	0.01	0.000	0.16
Significant F change ^e	<.001	.40	.37	.01	.18	.90	<.001
Dependent variable: SF-36 mental component score							
Variables	1	2	3	4	5	6	Final
Diagnosis (CHF vs hypertension) ^b	-.53	-.54	-.58	-.54	-.59	-.59	-.59
Sex (men vs women) ^b		.11	.11	.11	.13	.13	.13
Lifetime hospitalization			-.05*	-.05*	-.05	-.05*	-.05*
Depression ^c				.05*	.15	.15*	.15*
HARS score					-.16	-.16*	-.16*
Suicidality factor ^d						.01*	
R ² change	0.28	0.01	0.001	0.001	0.01	0.000	0.30
Significant F change ^e	<.001	.05	.67	.60	.09	.93	<.001
Dependent variable: SWLS score							
Variables	1	2	3	4	5	6	Final
Diagnosis (CHF vs hypertension) ^b	.61	.60	.82	.73	.67	.64	.65
Sex (men vs women) ^b		.09*	.08*	.0*	.10	.10*	.10
Lifetime hospitalization			.26	.27	.26	.26	.26
Depression ^c				-.11*	.04*	.05*	
HARS score					-.25	-.25	-.23
Suicidality factor ^d						.04*	
R ² change	0.38	0.01	0.02	0.004	0.02	0.000	0.43
Significant F change ^e	<.001	.09	.008	.21	.005	.69	<.001

^aAll values are β indices with the exception of R² and F values. Indices are significant at $P < .05$ when not otherwise specified.

^bPositive β values mean that the latter category (hypertension or women) is associated with higher scores on the SF-36 or SWLS; negative scores mean that the first category (CHF or men) is associated with higher scores on the SF-36 or SWLS.

^cDepressive factor = (0.833 HDRS₁₆) + (0.833 MADRS₅).

^dSuicidality factor = (0.907 HDRS item 3) + (0.907 MADRS item for suicidal ideation).

^eP values associated with each step of the regression analysis.

*Not significant.

Abbreviations: CHF = congestive heart failure, HARS = Hamilton Anxiety Rating Scale, HDRS = Hamilton Depression Rating Scale, MADRS = Montgomery-Asberg Depression Rating Scale, SF-36 = Medical Outcomes Study 36-item Short-Form Health Survey, SWLS = Satisfaction With Life Scale.

Relationship between depressive and anxiety symptoms, suicidality, and quality of life. To test the association between depressive symptoms, anxiety symptoms, and suicidality with the quality of life of the patients, 3 sequential regression analyses were performed (Table 2). For the PCS, only the diagnosis (CHF vs hypertension) and the depressive factor were significant predictors and, when combined, only the depressive factor predicted higher scores on the PCS (standardized β coefficient = -0.27 ; $P = .012$). For the MCS, diagnosis (CHF vs hypertension), sex (men vs women), lifetime hospitalizations, depressive factor, and HARS score were significant correlates, and, in the final model, CHF (standardized β coefficient = -0.59 ; $P < .001$) and sex (women) (standardized β coefficient = 0.13 ; $P = .03$) were significant predictors of higher scores on the MCS. For SWLS, diagnosis (CHF vs hypertension), sex (men vs women), lifetime hospitalizations, and

HARS score were significant correlates and also significant predictors of the SWLS score in the final model. Hypertension (standardized β coefficient = 0.65 ; $P < .001$), sex (women) (standardized β coefficient = 0.10 ; $P = .05$), higher lifetime hospitalizations (standardized β coefficient = 0.26 ; $P = .005$), and higher HARS score (standardized β coefficient = -0.23 ; $P = .002$) were associated with higher scores on the SWLS.

DISCUSSION

Patients with CHF were more often hospitalized and showed more anxiety and higher suicidality than patients with hypertension. They were more physically ill and showed less satisfaction with life than patients with hypertension. Additionally, they had made more lethal suicide attempts than hypertension patients. In CHF patients, depressive symptom level

was the only significant predictor of physical health, while diagnosis and sex were significant predictors of mental health. Satisfaction with life was predicted by group, lifetime hospitalizations, and HARS score.

The findings of the present study indicate that anxiety and depressive symptoms represent relevant predictors of poor quality of life in patients with chronic illnesses such as cardiovascular diseases. Additionally, we found that anxiety and depression symptoms were rarely detected or correctly treated by physicians. Only 2 (0.01%) of the patients of the present sample had had previous contact with psychiatric services. This finding should encourage physicians and psychiatrists to work together to correctly approach and manage complex and chronic diseases such as CHF and hypertension.

In our sample, the CHF patients had a higher level of disability than the hypertension patients. They experienced a higher level of physical disability and reported a worse quality of life, with impairment in movement and conducting ordinary activities. The CHF patients were more likely to be men, to have more previous hospitalizations, and to have made more high-lethality suicide attempts, although they had the same duration of illness.

Those individuals making highly lethal suicide attempts and having a greater injury burden could have had a bipolar disorder. In another study,⁵⁶ high-lethality attempters reported greater suicidal intent and required inpatient medical treatment. Also, individuals with bipolar disorder who have made high-lethality attempts in the past more often make high-lethality attempts later and represent a subgroup of subjects at higher risk, so their identification and management are critical.⁵⁶ In the present sample, the CHF patients were more anxious than the hypertension patients, and a higher anxiety symptom level was associated with both more suicide attempts and more lethal suicide attempts. In accord with these findings, the severity of anxiety does not appear to protect against the likelihood of suicide attempts or the lethality of suicide attempts as reported by a recent study.⁵⁷ However, the sample size of suicide attempters did not allow definitive conclusions.

The role of anxiety in this subgroup appears to be critical. Anxiety was a significant predictor of lower satisfaction with life and was found to be associated with somatic phobias, death wishes, and somatic pain. CHF patients may view suicide as a reasonable solution for their somatic pain and disability. Only 2 (1.6%) subjects of both groups had had previous contact with psychiatric services. Most people who commit suicide have visited a physician in the month before the suicide, and these visits represent an opportunity to save people.⁵⁸ None of the patients in the study by Faris et al⁵⁸ committed suicide on the same day that they saw a psychiatrist. The 5 most common symptoms listed in

the week before the suicide were anxiety, unspecified gastrointestinal symptoms, depression, unspecified cardiac symptoms, and hypertension. These symptoms could be considered to be early warning signs of unrecognized psychiatric disorders such as affective or anxiety disorders, which may increase the risk of suicide.

Juurlink et al⁵⁹ observed a strong association between the cumulative number of illnesses and symptoms and the estimated risk of suicide. Compared with patients with no identified illness, for example, patients with 3 illnesses had about a 3-fold increase in the estimated risk of suicide, and patients with 5 illnesses had about a 5-fold increase in risk. Frierson⁶⁰ noted that attempted suicide in elderly individuals with several coexisting medical problems is a major psychiatric problem. In their study, major depression was the most common psychiatric diagnosis in the CHF patients and COPD the most frequently noted physical ailment. Klein-Schwartz and Oderda⁶¹ found that patients with preexisting cardiovascular disease and severe somatic pains are at particular risk of worsening ischemic heart disease, congestive heart failure, and suicide attempts.

Relevant psychosocial factors may be important in developing anxiety, depression, and cardiovascular diseases. For example, patients' beliefs about their illness should be adequately explored. Family stress, family coping, health stress, and the patient's personality should be evaluated in order to predict life satisfaction. These variables taken together may produce an "at risk mental state" in which individuals may not be able to mobilize resources and coping abilities. This state may increase the patients' suffering and lead them to perceive their illness as intolerable; therefore, suicide may appear as the only solution to their suffering and pain.

Similar to Juurlink et al,⁵⁹ in the present study, the CHF patients who experienced a more chronic condition were more likely to attempt suicide with lethal methods than the hypertension patients.⁵⁹ Physicians therefore should be aware of the risk of suicide among patients experiencing severe pain because patients may see suicide as the only way of escaping their suffering.

Study Limitations

The limitations of this study include its nonblinded design and lack of control groups. Also, the sample size was too small for a cross-sectional observational study. An additional limitation is the lack of follow-up. It would be interesting to monitor anxiety, depression, and risk of suicide in patients with cardiovascular diseases 12 or 24 months after baseline. However, the strength of the present study was that it was not based on spontaneous clinician reports about anxiety, depression, and quality of life but on reliable and valid psychometric assessments. As a result, the findings may be considered valid. Depressive symptoms were assessed using both the HDRS, designed

to assess the severity of depression, and the MADRS, developed in response to some of the limitations of the HDRS. The 1-tailed Pearson correlation index between the HDRS and the MADRS was 0.76 ($P < .001$) (MADRS-9 by HDRS₁₆, Pearson $r = 0.70$; $P < .001$), indicating a strong convergence among the measures of depression.

It was not possible to screen patients according to a classification of hypertension (grade 1 or mild hypertension ≥ 140 and/or ≥ 90 –99; grade 2 or moderate hypertension 160–179 and/or 100–109; and grade 3 or severe hypertension ≥ 180 and/or ≥ 110 ; isolated systolic hypertension ≥ 140 and 90),⁴⁵ and the distribution of CHF severity (NYHA classification) was heterogeneous.

Finally, in the present study, we could not investigate hopelessness and psychache as additional variables involved in increasing suicide risk. Furthermore, we did not assess suicide lethality.

CONCLUSION

Anxiety and depression frequently coexist with cardiovascular diseases and may have complex relationships. Our findings have important implications for prevention. Physicians, nurses, and other health care professionals should be alert to the quality of life related to patients with chronic illnesses who may have symptoms of depression and anxiety and a high risk for suicide. Our findings suggest the need for health professionals to screen patients with chronic illnesses in order to promote psychosocial rehabilitation and decrease the caregivers' and patients' stress.

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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