

Analysis of the Status and Factors Influencing Anxiety and Depression in Patients with Chronic Heart Failure and Their Primary Caregivers: Empirical Quantitative Research

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Abstract

Objective: This study examined the associations between anxiety, depression, and quality of life among hospitalized patients with chronic heart failure and their primary caregivers. **Patients and Methods:** Between May and September 2018, the data were collected from 61 patients and their caregivers. Demographic information of CHF patients was collected by questionnaires; the Hospital Anxiety and Depression Scale (HADS) and the Minnesota Living with Heart Failure Questionnaire (MLHFQ) were used to assess CHF patient's anxiety, depression and quality of life (QOL); the HADS, the Family Caregiver Quality of Life (FAMQOL) were used to assess primary caregivers' anxiety, depression and QOL. Descriptive statistics, correlation analysis, independent-sample t-test, one-way analysis of variance and multiple stepwise regression were used in the statistical analysis. SPSS 17.0 was used to manage and perform statistical analyses. **Results:** Quality of life, anxiety, and depression of the patients and caregivers had significant positive correlations. Gender, quality of life, number of hospitalizations, duration of patients' heart failure, and the quality of life of caregivers influenced patients' anxiety. Gender, quality of life, relationship with the patient, and depression of caregivers influenced their anxiety. The quality of life and anxiety of patients influenced their depression. Daily caregiving time, anxiety, relationship with patients, and the patients' heart function influenced caregivers' depression. **Conclusion:** The patients and caregivers experienced anxiety and depression, which interacts and decreases their quality of life. It is important to regularly assess anxiety, depression, and quality of life in patients with chronic heart failure and their primary caregivers.

Keywords

Chronic Heart Failure, Primary Caregiver, Anxiety, Depression, Quality of Life

1. Introduction

The prevalence of chronic heart failure (CHF) increases dramatically with age owing to underlying cardiac diseases [1]. Heart failure is a global public health problem whose prevalence is annually increasing at an epidemic rate, imposing a major burden on nurses. A primary caregiver provides the majority of care to a patient. In China, owing to traditional cultural influences, the primary caregivers of patients with chronic CHF are usually the patient's family members, such as partners or children. Primary caregivers provide services, assistance, and support to patients over time, forming an invisible workforce in health care. In the United States in 2015, family caregivers of patients with heart failure provided approximately \$7 billion worth of unpaid care services, which is expected to increase to \$13.5 billion by 2035 [2].

Anxiety and depression are common in patients with CHF and their primary caregivers. Previous studies have shown that psychiatric disorders in patients with CHF lead to poor prognoses, such as recurrent hospitalization, high mortality, and poor quality of life, with depression and anxiety being the most common psychiatric disorders. These mood comorbidities complicate the treatment of patients with CHF and increase hospitalization and mortality rates [3] [4] [5]. Yohannes *et al.* [6] found a high prevalence of anxiety and depression in patients with CHF, at 11% - 45% and 10% - 60%, respectively. Anxiety and depression are also common among the primary caregivers of patients with CHF and have significantly more common in this group than within the general population [7] [8]. In addition, isolation, depression, and poorer quality of life of primary caregivers are strongly associated with poorer patient outcomes (e.g., increased mortality and readmission rates) and affect the caregivers' ability and willingness to care for patients [9] [10].

1.1. Background

Previous studies have found that the quality of life of patients with CHF is generally lower than that of their healthy peers [11] [12], especially in China, where patients with CHF have a low-to-moderate quality of life [13] [14] [15]. The primary caregivers of the patients have been found to have a generally low quality of life [16], and depression significantly reduces the quality of their caregiving [17]. A limited number of studies in China have shown that family caregivers of patients with heart failure have varying degrees of reduced quality of life owing to caregiving tasks [18].

In summary, patients with CHF and their primary caregivers suffer from se-

vere anxiety, depression, and poor quality of life; the anxiety, depression, and quality of life of both patients and their primary caregivers interact with each other. In China, especially in economically and medically disadvantaged areas, few studies have simultaneously assessed the anxiety, depression, and quality of life of patients with CHF and their primary caregivers.

1.2. The Study's Aims and Objectives

This study aimed to measure the anxiety, depression, and quality of life of patients with CHF and their primary caregivers, analyze the correlation between anxiety and depression, and investigate their respective influencing factors.

2. Patients and Methods

2.1. Design

A cross-sectional study was conducted with a convenience sampling method. The potential participants were from the Department of Geriatrics at REDACTED. Written informed consent was obtained from each participant.

2.2. Instrument with Validity and Reliability

This study used standardized scales with high reliability and validity that have been validated for the Chinese population. The respondents were surveyed using a structured questionnaire.

2.2.1. Anxiety and Depression Assessment

Anxiety and depression of patients with CHF and their primary caregivers were assessed using the Hospital Anxiety and Depression Scale (HADS), a widely used instrument developed in 1983 by Zigmond and Snaith to measure anxiety and depression in non-psychiatric and general hospitals [19]. The HADS has good reliability and validity in China [20]. It consists of anxiety and depression subscales, with 14 items and item scores ranging from 0 to 3. The total scores of the anxiety and depression subscales range from 0 to 21, with ≥ 8 indicating the presence of anxiety or depression symptoms [20] [21]. In this study, Cronbach's α measuring the internal consistency of the overall scale, anxiety subscale, and depression subscale were 0.879, 0.845, and 0.804, respectively.

2.2.2. Quality of Life Measures

The quality of life of patients with CHF was assessed using the Chinese version of the Minnesota Living with Heart Failure Questionnaire (MLHFQ), developed by Cohn at the University of Minnesota [18], which comprises 21 items including physical, emotional, and other dimensions. The total score ranges from 0 - 105, with higher scores indicating worse quality of life for patients. This study used reverse scoring with the MLHFQ to score each dimension and obtain the total score. The maximum score was 100, and higher converted scores indicated a better quality of life. The Chinese version of the MLHFQ was developed by Sun *et al.* [22] and has demonstrated good reliability and validity for the Chinese

population. In this study, Cronbach's α of the overall MLHFQ scale and the physical, emotional, and other dimensions were 0.896, 0.865, 0.803, and 0.604, respectively.

We used the Family Caregiver Quality of Life (FAMQOL) scale for patients with heart failure developed by Nauser *et al.* [23] to measure the quality of life of family caregivers of the patients on four dimensions: physical, psychological, social, and spiritual. The scale has 16 items, and the total score ranges from 16 - 80, with higher scores indicating a higher quality of life. The Chinese version of the scale was developed by Qian [18] and has shown good reliability and validity for the Chinese population. In this study, the Chinese version of the FAMQOL was used, and Cronbach's α for the total scale and physical, psychological, social, and spiritual dimensions were 0.826, 0.728, 0.853, 0.584, and 0.681, respectively.

2.3. Sampling and Recruitment

A non-probability sampling method was used to select a cohort of 61 patients with CHF who were admitted to a hospital's geriatric unit and their primary caregivers.

2.4. Sample Size and Power

Multiple linear stepwise regression was used to explore the influencing factors of anxiety and depression of patients with CHF and their primary caregivers, and it was expected that there would be approximately five influencing factors. For the multivariate analysis, the sample size is generally considered 10 to 20 times the number of independent variables, and the preliminary estimate was that the minimum sample size would be $5 \times 10 = 50$ cases and the maximum sample size would be $5 \times 20 = 100$ cases. Sixty-one sets of patients with CHF and their primary caregivers participated in the study.

2.5. Quality Appraisal

Participants were screened based on the inclusion and exclusion criteria, and the scales' answering methods and specific requirements were explained to them. Participants were instructed to separately complete the questionnaire items that were not clear, according to the actual situation, and the investigators explained the questionnaire items on the spot. At the end of the survey, 5% of the sample was randomly selected from the included participants and reviewed by a psychiatrist for scale assessment.

2.6. Data Abstraction

We independently performed data abstraction from medical records using a pre-designed data abstraction form.

2.7. Inclusion Criteria

Inclusion criteria for patients were: 1) confirmed diagnosis of CHF and New

York Heart Association (NYHA) functional class II–IV according to the Chinese diagnostic criteria for CHF; 2) duration of CHF > 3 months; 3) voluntary participation; and 4) not taking anxiolytic or antidepressant medication. Inclusion criteria for the primary caregiver were: 1) primary caregiver of the patient; 2) voluntary participation; and 3) not taking anxiolytic or antidepressant medication.

2.8. Data Collection

Patient information included gender, age, marital status, educational attainment, duration of heart failure, number of hospitalizations, underlying etiology of heart failure, and NYHA functional class. Primary caregiver information included gender, age, marital status, educational attainment, relationship to the patient, daily caregiving time, and whether they lived with the patient.

2.9. Data Analysis

SPSS 17.0 was used to construct the database and perform the statistical analyses. The significance level of all statistical tests was $\alpha = 0.05$. Measurement data were expressed as mean \pm standard deviation and compared using the independent samples t-test, one-way analysis of variance (ANOVA), and Student-Newman-Keuls (SNK-q) test. Count data were expressed as proportions and compared using the χ^2 -test, Pearson correlation analysis, or Spearman rank correlation analysis. The factors influencing anxiety and depression scores in the patients and caregivers were analyzed by multiple linear stepwise regression analyses.

2.10. Ethical Considerations

The Ethics Committee of Dali University approved the study protocol. The study was conducted following the Declaration of Helsinki (1964) and all subsequent revisions. All participants signed informed consent forms. Permission was obtained to use the Chinese version of the scales.

3. Results

3.1. General Characteristics of the Participants

The mean age of patients with CHF was 61.8 years, and that of their primary caregivers was 48.6 years. Other data are shown in **Table 1**.

3.2. Anxiety, Depression, and Quality of Life Levels and Correlations of the Patients and Caregivers

The anxiety and depression scores of the patients and caregivers are shown in **Table 2**. Scores of 0 - 7 were defined as having no symptoms of anxiety or depression, and 8 - 21 as the presence of anxiety or depression.

The raw MLHFQ score of the patients was (65.4 ± 15.6), and the standardized score after reversion of the raw score to a percentage scale was (37.6 ± 14.8). The FAMQOL score of the caregivers was (46.2 ± 9.6).

Pearson correlation analysis showed a significant positive correlation between

the anxiety and depression of each patient and primary caregiver and a negative correlation with the quality of life. Anxiety and depression in the patients and primary caregivers affected their respective quality of life and influenced others'

Table 1. General characteristics of patients with chronic heart failure (CHF) and their primary caregivers (n = 61).

Variable	Patient	Primary caregiver	Variable	Patient	Primary caregiver
	Number (proportion)	Number (proportion)		Number (proportion)	Number (proportion)
Gender			1	5 (8.2)	-
Male	31 (50.8)	29 (47.5)	2	15 (24.6)	-
Female	30 (49.2)	32 (52.5)	3	16 (26.2)	-
Marital status			4 or more	25 (41.0)	
Married	57 (93.4)	59 (96.7)	NYHA		-
Not married*	4 (6.6)	2 (3.3)	II	14 (23.0)	-
Educational attainment			III	30 (49.2)	-
Elementary school or below	35 (57.4)	13 (21.3)	IV	17 (27.8)	-
Middle school	18 (29.5)	24 (39.3)	Relationship to patient		
High school	6 (9.8)	15 (24.6)	Spouse	-	34 (55.7)
Bachelor's or above	2 (3.3)	9 (14.8)	Child	-	25 (41.0)
Duration of heart failure			Other		2 (3.3)
<1 year	22 (36.1)	-	Daily caregiving time		
1 - 2 years	14 (23.0)	-	< 6 h	-	24 (39.3)
2 - 3 years	7 (11.5)	-	6-12 h	-	26 (42.6)
3 - 4 years	4 (6.6)	-	> 12 h	-	11 (18.0)
4 - 5 years	2 (3.3)	-	Lives with patients		
>5 years	12 (19.7)	-	Yes	-	55 (90.2)
Number of hospitalizations		-	No	-	6 (9.8)

Note: *Not married: unmarried, divorced, or widowed; NYHA, New York Heart Association functional classification.

Table 2. Anxiety and depression levels in patients with chronic heart failure (CHF) and their primary caregivers.

Variable	Patient	Primary caregiver
Anxiety score	11.2 ± 4.3	9.7 ± 4.8
No anxiety	12 (19.7)	25 (41.0)
Anxiety	49 (80.3)	36 (59.0)
Depression score	10.8 ± 3.7	6.3 ± 3.6
No depression	10 (16.4)	38 (62.3)
Depression	51 (83.6)	23 (37.7)
Comorbid anxiety/depression	43 (70.5)	22 (36.1)

Values are mean ± standard deviation or n (%).

anxiety, depression, and quality of life. A dependency relationship was present, and the quality of life of the two groups was significantly positively correlated (Table 3).

Pearson or Spearman correlation analysis showed that some demographic information and clinical characteristics of the patients and some demographic information of the caregivers were associated with anxiety and depression scores of the patients (Table 4).

3.3. Multiple Linear Regression Analysis of Anxiety and Depression in the Patients and Primary Caregivers

We performed a multiple stepwise linear regression of the factors influencing anxiety and depression in the patients and primary caregivers by combining the results of the univariate correlation analysis of the factors influencing anxiety and depression in the participants. In the multivariate analysis of anxiety in patients, dummy variables were set for gender, number of hospitalizations, duration

Table 3. Correlation between anxiety, depression, and quality-of-life between patients with CHF and their primary caregivers

Variable	1	2	3	4	5
1 Patient anxiety	—				
2 Primary caregiver anxiety	0.328**	—			
3 Patient depression	0.704**	0.220	—		
4 Primary caregiver depression	0.325*	0.768**	0.265*	—	
5 Patient QOL	-0.597**	-0.365**	-0.589**	-0.335**	—
6 Primary caregiver QOL	-0.473**	-0.749**	-0.222	-0.582**	0.393**

Note: *P < 0.05, **P < 0.01, “—” indicates the same variable/no correlation. QOL, quality of life.

Table 4. Correlation between anxiety and depression of patients with chronic heart failure (CHF) and their primary caregivers, and their demographic characteristics and patient characteristics (n = 61).

	Female patient	Patient			Primary caregiver		
		Duration of heart failure	Number of hospitalizations	NYHA	Lives separately from the patient	Female caregiver	Daily caregiving time
Patient							
Anxiety	0.284*	0.255*	0.356**	0.370**	-0.384**	—	—
Depression	—	—	0.280*	0.418**	-0.309**	—	—
Primary caregiver							
Anxiety	0.381**	—	0.287*	0.333**	-0.348**	0.470**	0.609**
Depression	-0.361**	—	0.367**	0.431**	-0.391*	0.302*	0.742**

Note: *P < 0.05, **P < 0.01, “—” indicates the same variable/no correlation. NYHA, New York Heart Association functional classification.

of heart failure, whether the patient lived alone, and presence of depression. In the multivariate stepwise regression analysis of depression, dummy variables were set for whether the patient lived alone and had anxiety. The gender of the patients was found to be the primary influencing factor for anxiety, and comorbid anxiety was found to be the main influencing factor for depression (**Table 5**). In the multiple stepwise regression analysis of anxiety in primary caregivers, dummy variables were set for the gender of the primary caregiver and the relationship to the patient. In the multiple stepwise regression analysis of depression, dummy variables were set for the relationship to the patient. Depression or anxiety in the primary caregiver was the main influencing factor of anxiety or depression (**Table 6**).

4. Discussion

The major findings of this study included that both patients with CHF and their primary caregivers experienced high levels of anxiety and depression, with a high prevalence of comorbid anxiety and depression, and both had varying degrees of impaired quality of life. Furthermore, anxiety and depression in the patients and primary caregivers were not independent; important dependencies were observed. It was also found that sociodemographic and clinical characteristics of patients influenced anxiety and depression in the patients and primary caregivers.

Table 5. Multiple regression analysis of factors influencing anxiety and depression in patients with chronic heart failure (CHF) (n = 61).

Dependent variable	Independent variable	Regression coefficient β	Standardized regression coefficient β	t	Coefficient of determination R^2	Adjusted R^2	F
Anxiety score	Constant	20.611	—	7.630**	0.721	0.636	8.478**
	Patient QOL	-0.083	-0.301	-3.153**			
	Caregiver QOL	-0.135	-0.298	-2.813**			
	Patient gender						
	Female	3.677	0.4320	4.657**			
	Number of hospitalizations						
	2	-3.657	-0.370	-2.499*			
	3	-2.479	-0.256	-2.065*			
	Duration of heart failure						
>5 years	-3.733	-0.349	-2.609*				
Depression score	Constant	10.520	—	5.077**	0.606	0.585	18.034**
	Patient QOL	-0.099	-0.357	-3.670**			
	Anxiety in patient						
	Anxiety score 8 - 21	6.004	0.561	5.862**			

Note: *P < 0.05, **P < 0.01. QOL, quality of life.

Table 6. Multiple regression analysis of factors influencing anxiety and depression in primary caregivers (n = 61).

Dependent variable	Independent variable	Regression coefficient β	Standardized regression coefficient β	t	Coefficient of determination R^2	Adjusted R^2	F
Anxiety score	Constant	13.384	—	5.758**	0.784	0.769	50.865**
	Caregiver depression	0.706	0.542	6.118**			
	Caregiver QOL	-0.213	-0.423	5.470**			
	Caregiver gender						
	Female	1.875	0.199	2.975**			
	Relationship to patient						
Depression score	Child	1.460	0.152	2.034*			
	Constant	-2.804	—	-2.444*	0.756	0.738	43.275**
	Caregiver anxiety	0.361	0.470	5.551**			
	Daily caregiving time	1.088	0.219	2.286*			
	Patient NYHA	0.914	0.180	2.554*			
	Relationship to patient						
Spouse	1.976	0.271	3.272**				

Note: * $P < 0.05$, ** $P < 0.01$. “—” indicates the same variable/no correlation. QOL, quality of life. NYHA, New York Heart Association functional classification.

In this study, the prevalence of anxiety and depression in patients with CHF was 80.4% and 83.6%, respectively. Chialà *et al.* [24] found that anxiety was present in 48% of patients with heart failure, while depressive symptoms were present in 49% of the patients, and the patients were two to three times more likely to be depressed than the general population [25]. However, because of the overlap of symptoms of heart failure and depressive disorders, depression is often overlooked [26]. From a pathophysiological perspective, the body initiates neurohumoral mechanisms to compensate for heart failure, increasing sympathetic excitability and norepinephrine levels in the blood and cerebrospinal fluid, which may lead to increased symptoms of anxiety [27]. In turn, increased anxiety leads to increased sympathetic excitability, excessive release of catecholamines, sodium, and water retention, and increased anterior and posterior cardiac load, further exacerbating heart failure and forming a vicious cycle over the long term. Depression and CHF share common physiological and pathological mechanisms, such as high catecholamines, cortisol, and inflammatory cytokines (IL-6, IL-1 β , TNF- α), suggesting a relationship between depression and the clinical symptoms and prognosis of CHF [28]. The significance of this finding is that treating anxiety and depression may provide new avenues to inhibit ventricular remodeling.

Furthermore, we noted that the high incidence of anxiety and depression in patients with CHF in the present study compared with the results in China and abroad might be because the patients sampled in the present study were hospita-

lized. The sudden exacerbation of disease symptoms and signs and the experience of this threat to life and safety may constitute a “trigger” for acute anxiety attacks [29] and contribute to their development. Moreover, the type of scale affects the detection of anxiety and depression in assessing comorbid anxiety and depression in patients with heart failure [30] [31].

Additionally, we found a high incidence of anxiety and depression in primary caregivers, at 59.0% and 37.7%, respectively, which was similar to previous studies [8] [32] [33]. The primary caregivers of patients with CHF have been described as the “invisible victims” of the disease [8], as they face demanding care tasks and enormous psychological stress and, in many cases, provide care for several years [34]. In China, primary caregivers are usually family members or close relatives of patients with CHF, and based on this close relationship, they empathize with the poor disease prognosis and may experience anticipatory grief [35]. Caregivers usually have to juggle different social roles along with their caregiving role and may even have to share some of the patient’s family roles, causing great distress in the caregiver [36].

A major finding of the correlational analysis was that the anxiety and depression of patients and caregivers affect each other and impair quality of life. This anxiety and depression do not exist independently but have a major inter-dependency, consistent with other studies [37] [38]. This can be explained by the “emotional contagion” theory, which states that emotional states can be spread to others, causing people to experience the same emotions unconsciously [39], particularly when two people are in a close interpersonal relationship where emotions are easily transferred [40]. This suggests that two-way interventions for adverse emotional states should be attempted in managing patients with heart failure.

Another major finding was the presence of significant comorbid anxiety and depression in patients with CHF, with a prevalence of 70.5%. Based on a multivariate analysis of factors influencing depression in the patients, the presence of anxiety was associated with significantly higher depression scores. Comorbid anxiety and depression is an independent predictor of mortality and readmission rates in patients with heart failure [41], and there is a dose-response relationship between depressive and anxiety symptoms [42]. However, comorbid anxiety and depression are commonly under- and misdiagnosed, often stemming from the fact that depressive symptoms may mask comorbid anxiety and vice versa, and anxiety may present as depressive symptoms and vice versa [43].

In addition, the incidence of comorbid anxiety and depression in primary caregivers was high, at 36.1%. In the multivariate analysis of factors affecting anxiety and depression in primary caregivers, depression or anxiety was the most influencing factor. Numerous studies have demonstrated a high incidence of comorbid anxiety and depression in the general population [44] [45], but few studies have focused on comorbid anxiety and depression in primary caregivers of patients with CHF. Comorbid anxiety and depression is a common psychological problems, and depression may be associated with a lack of positive affec-

tivity (e.g., anhedonia). In contrast, increased psychological hyperarousal may be associated with anxiety and higher negative affectivity when anxiety and depression coexist [46]. A nationwide epidemiological study in 24 countries found higher rates of severe role impairment and suicidal ideation among respondents with a >1-year duration of comorbid anxiety and depression [47]. The high incidence of comorbid anxiety and depression in primary caregivers is a serious hazard and warrants more attention.

In this study, multiple regression analysis of the factors influencing anxiety in patients with CHF revealed that the patient's gender was the most influencing factor for their anxiety. Female patients had significantly higher anxiety scores than their male counterparts; the difference was statistically significant, and the results of the present study are similar to those of previous studies [37] [48]. Similarly, in the multiple regression analysis of factors influencing primary caregiver anxiety, a gender difference was found, with results similar to those of previous studies [49] [50]. The reasons for this difference include reports of worry in adult women [51]—that worry is a cognitive component of anxiety, and that those who worry tend to have negative problem orientation [52]. In addition, from the perspective of changes in female hormone levels, estrogen has been shown to positively regulate the expression of the human corticotropin-releasing factor (CRF) gene [53], which is present in the anxiety-related brain circuits [54] that promote anxiety-like behaviors and persistent anxiety states.

We found that patients with one or four or more hospitalizations had significantly higher anxiety scores than those with two or three hospitalizations. The DSM-5 classifies anxiety into three categories: anxiety disorders, obsessive-compulsive disorders, and trauma and stressor-related disorders [55]. In the present study, all patients with CHF hospitalized for the first time had a disease duration of ≤ 2 years. This may have resulted in acute anxiety attacks in patients owing to being hospitalized for the first time, short exposure to disease scenarios, and misinterpretation and catastrophizing of associated somatic symptoms. In contrast, patients who have been hospitalized ≥ 4 times have been repeatedly exposed to disease scenarios; hence, they were often overwhelmed by negative traumatic memories caused by the exacerbation of the disease, generalizing anxiety to multiple domains of life, work, and school [56], and developing a generalized anxiety disorder. This suggests that patients with CHF and anxiety may experience different classifications of anxiety disorders and require different interventions.

Using multiple regression analysis, we found that anxiety scores were significantly higher when the primary caregivers were the patient's child, and depression scores were significantly higher when they were the patient's spouse or other close relatives. Most previous studies have focused on the emotional responses of the patients' spouses and reached the same conclusions as the present study [57], but less attention has been paid to the patients' children. Our findings suggest the need to pay attention to the mental health status of the children of patients with CHF, which may be explained by the "intergenerational trauma"

perspective, where parents and children have an intergenerational relationship with “attachment” characteristics. Intergenerational trauma is a discrete process and form of psychological trauma that is transmitted within the family and can be transmitted through attachment [58]; hence, the trauma suffered by parents may affect their children.

5. Strengths and Limitations

We evaluated the current status and the correlation between anxiety and depression in patients with CHF and their primary caregivers in medically and economically under-resourced areas of China. We found that anxiety and depression affected each other, and the prevalence of anxiety combined with depression was common, which is currently overlooked in remote areas of China. At the same time, our findings contribute to understanding the importance of dual assessment and intervention of adverse emotions in patients with CHF and their primary caregivers and provide a reference for relevant healthcare policy-making and people-oriented interventions. Considering the time limitations and other constraints, this study had a cross-sectional design, and a longitudinal study could not be carried out. Moreover, a non-probability sampling method was used instead of random sampling, which is another limitation of the study.

6. Recommendations for Further Research

Our study found that anxiety combined with depression was prevalent in patients with CHF and primary caregivers. Most previous studies have only focused on the adverse effects of either anxiety or depression and rarely focused on the impairment (such as physiological function, psychological stress, social function, and clinical outcomes) of patients with CHF and their primary caregivers with comorbid anxiety and depression. As assessing the quality of life and social functioning status of patients with CHF and primary caregivers with comorbid anxiety and depression and treating them with binary interventions have been tried, timely evaluation of intervention effects is a future research direction with great potential.

7. Conclusion

This study evaluated the current status of anxiety, depression, and quality of life in patients with CHF and their primary caregivers. It found that anxiety, depression, and comorbid anxiety and depression are highly prevalent in this sample, commonly misdiagnosed and underdiagnosed, and influenced by sociodemographic and clinical characteristics. We found that anxiety and depression are significantly interdependent and impair the quality of life of both patients and their primary caregivers. Underdiagnosis of anxiety, depression, and comorbid anxiety and depression lead to poorer mental and physical function in patients with CHF and diminish the ability of primary caregivers to care for them. Moreover, comorbid psychiatric disorders of physical illness lead to poorer clin-

ical outcomes in patients with CHF, which rarely receive clinicians' attention. Clinicians are recommended to routinely incorporate baseline anxiety, depression, and quality of life measures for patients with CHF and their primary caregivers into community health care management to improve comprehensive heart failure management, reduce the burden on the health care system, and conserve limited health care resources.

Ethical Approval

The study protocol was approved by the Ethics Committee of the First Affiliated Hospital of Dali University. All patients read and signed the informed consent statement before inclusion in the study and agreed to participate. The study followed the ethical principles for research from the Declaration of Helsinki.

Authors' Contributions

Yu Zhang: Conceptualization; Formal analysis, Writing, original draft preparation; Writing, reviewing and editing. Lihua Li: Conceptualization; Writing, original draft preparation; Writing, reviewing and editing.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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