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Predictors of Depressive Symptoms in Caregivers of Patients with Heart Failure

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Abstract

Background—Millions of family members deliver informal care and support to patients with heart failure (HF). Caregivers of patients with HF suffer from depressive symptoms, but factors associated with depressive symptoms are unknown. The purposes of this study were (1) to examine differences between caregivers with and without depressive symptoms in patients' characteristics and caregivers' functional status, caregiving burden (time devoted to caregiving, difficulty of caregiving tasks, and overall perceived caregiving distress), and perceived control; and (2) to determine predictors of depressive symptoms of caregivers.

Method—A total of 109 caregivers (mean age of 57 years; spousal caregiver 79%) and patients with HF participated in this study. Depressive symptoms, perceived control, and functional status of both patients and caregivers were assessed using the Beck Depression Inventory-II (BDI-II), the Control Attitudes Scale-Revised, and the Duke Activity Status Index, respectively. Caregivers' burden (time and difficulty of caregiving tasks and burden) were assessed using the Oberst Caregiving Burden Scale, and the Zarit Burden Interview.

Results—The 27.5% of HF caregivers with depressive symptoms (BDI-II ≥ 14) had poorer functional status, lower perceived control, higher perceived caregiving distress, experienced more caregiving difficulty and spent more time in caregiving tasks than caregivers without depressive symptoms. Controlling for age and gender in a multiple regression, caregivers' own functional disability ($s\beta = -.307, P < .001$), perceived control ($s\beta = -.304, P < .001$), and caregiver burden ($s\beta = .316, P = .002$) explained 45% of the variance in caregivers' depressive symptoms. Patients' NYHA class and functional status did not predict caregivers' depressive symptoms.

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Conclusion—Caregivers' poor functional status, overall perception of caregiving distress, and perceived control were associated with depressive symptoms. Depressed caregivers of patients with HF may benefit from interventions that improve caregivers' perceived control, address the caregiving burden and improve or assist with caregivers' functional status.

Keywords

Depressive symptoms; Family caregivers; Heart failure; Psychological stress

Introduction

Currently one in 100 people over the age of 65 have been diagnosed with heart failure (HF) and more than 5.3 million individuals have been diagnosed with HF in the United States.¹ Millions of family members deliver informal care and support to ill family members with HF. According to a nationwide cohort study of older adults with HF (aged 65 or older),² 42% received informal home care and 13% received formal care. Older adults with HF needed 3 times more informal or formal care than those who had coronary heart disease without HF.² Less than half of patients with HF had a spouse as a primary caregiver² and many patients may seek support from other family members including adult children.

Positive and highly supportive care from family caregivers may improve outcomes of patients with coronary heart disease including adjustment to and recovery from acute cardiac events.^{3, 4} Poor or absent spousal support has been associated with poor outcomes in patients with HF.^{5, 6} Vinson and colleagues found that 21% of readmissions were caused by inadequate social support.⁶ Patients who were single or non-married had a 2.1 times higher risk of readmission than married patients.⁵ However, provision of support by family caregivers may come at considerable cost to family caregivers.

Family caregivers can suffer significant psychological distress related to their caregiving and support roles. Depressive symptoms are a common source of psychological distress in caregivers.⁷⁻⁹ It is known that 23% to 47% of spousal caregivers of patients with HF experienced at least mild to moderate depressive symptoms^{7, 8} and 45% of family caregivers who took care of end-stage HF patients had depressive symptoms.⁹

There has been substantial research on the caregiving experience in family caregivers for patients with dementia or Alzheimer's disease.¹⁰⁻¹² In the prior research available among those with dementia or other chronic diseases, it is clear that caregiver burden is associated strongly with caregiver's level of depression.¹³ Patients' physical functioning has been shown to be related to caregivers' depressive symptoms or emotional distress,¹² but few investigators have studied the relationship of caregivers' functional status with emotional stress among caregivers.¹⁴ Although caregivers' physical capacity or performance ability may be a key factor in fulfilling the caregiver role, caregivers' physical health often declines as a result of their caregiving role.^{15, 16} Another factor strongly related to depression is sense of perceived control,^{17, 18} a variable that is effectively increased with simple intervention.¹⁹ However, there is little research focused on psychosocial distress and burden among family caregivers of patients with HF. As a result, whether caregivers' burden, physical function, and their perceived control are predictors of depressive symptoms in this population are unknown. As these factors are amenable to change, it is important to include them any consideration of predictors of depressive symptoms in this population. Identification of factors that are associated with caregivers' depressive symptoms could provide important targets for intervention.

Therefore, the specific aims of this study were (1) to examine differences between caregivers with and without depressive symptoms in patients' characteristics and caregivers' functional status, caregiving burden (time devoted to caregiving, difficulty of caregiver tasks, and overall perceived caregiving distress), and perceived control; and (2) to determine factors that predicted depressive symptoms of caregivers controlling for age and gender. Measured predictors of depressive symptoms included both patient variables (i.e., functional status) and caregiver variables (i.e., functional status, caregiving burden, and perceived control).

Method

Design and sample

This study is a cross-sectional, descriptive, and correlational study in which patients with HF and their primary caregivers completed self-report questionnaires. Family caregivers in this study were identified by patients with HF as the primary caregiver, and were excluded from the study if they had cognitive impairment or major co-morbidities such as HF, cancer, or other terminal illnesses. Cognitive impairment was assessed by trained research nurse during the initial contact. Those with difficulty during the general conversation and those who had difficulty understanding the study were considered to have cognitive impairment as were those who were noted to have dementia or a history of Alzheimer's disease during the eligibility screening process. Patients who were receiving active treatment for cancer were excluded. Because the focus of this study was on caregivers who took care of stable, community dwelling patients with HF, we also screened eligibility of patients before we recruited caregivers. Patients who had a confirmed diagnosis of chronic heart failure, no history of acute myocardial infarction or admission within 3 months, and were on stable doses of HF medications were included in this study. We excluded patients who were referred for heart transplantation or had terminal illness or end-stage HF.

Procedures

After institutional review board approval, research nurses screened both patients and caregivers referred by nurses and physicians from outpatient clinics from two community hospitals and an academic medical center in Central Kentucky. We approached eligible caregivers and patients by face to face contact in the outpatient clinics or by phone. When both caregiver and patient agreed to participate in the study, we mailed questionnaires to dyads and asked them to complete their own questionnaires without communicating with each other and return completed questionnaires using a stamped addressed envelope that was provided by the investigators. Primary caregivers completed self-reported questionnaires including their functional status, caregiving burden, perceived control, and depressive symptoms. Patients were also asked to complete a subjective physical functioning questionnaire (i.e. Duke Activity Status Index) and to report demographic information. Patients' severity of HF was assessed using the New York Heart Association class (NYHA class) during face to face interviews by trained research nurses. Research nurses obtained clinical information for patients using a structured questionnaire, by reviewing medical charts and through a brief interview.

Measures

Depressive symptoms were assessed using the Beck Depression Inventory-II (BDI-II).²⁰ The BDI-II is a 21-item scale. Each item is rated by the participant from 0 to 3. The total score is the sum of the 21 items and can range from 0 to 63. Higher scores indicate higher levels of depressive symptoms. Caregivers who received a score of 14 or above were considered to have at least mild depressive symptoms. The reliability of the BDI-II in this study was high with Cronbach's alpha of .93.

Functional status was assessed using the 12-items of the Duke Activity Status Index (DASI).²¹ The DASI focuses on an individual's ability to perform 12 common activities of daily living which are weighted based on the difficulty of each activity. The total score is a sum of weighted scores for the 12 items, and ranges from 0 to 58.2. Higher scores reflect better functional status. The reliability of the DASI in this study was high as evidenced by a Cronbach's alpha of .89.

Caregivers' perceived control was assessed using the Control Attitudes Scale-Revised (CAS-R)²² family version which focuses on family members' perception of control with regard to their family members' heart disease. The CAS-R is the 8 item revision of the Control Attitudes Scale that has undergone extensive psychometric testing²³ and that measures degree of perceived control in the context of patients' management of cardiac disease. Because we were interested in assessing family caregiver's beliefs or perception of their ability to control their family member's HF symptoms, we modified it from the patients' view to the family caregivers' view. For example, the original statement of the CAS-R which states 'regarding my heart problems, I feel lots of control' was modified to 'regarding my family's heart problems, I feel lots of control'. The reliability, construct, and convergent validity of the CAS-R were reported.²² The reliability of CAS-R was reported high with Cronbach's alpha ranging from .72 to .80.^{22, 24} Each item was rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) and summed to create a total score after two negative items were reverse coded. The possible total score ranges from 8 to 40 with a higher score indicating higher perceived controllability. Cronbach's alpha coefficient was .59 in this study.

The Oberst Caregiving Burden Scale (OCBS)²⁵ was used to assess caregiver perceptions of the difficulty of caregiving tasks and time required in caring for their ill family member. Such caring tasks included providing personal care and medical care, assisting with activities of daily living, monitoring symptoms, managing patient's emotions and behaviors, dealing with finances, and coordinating and seeking health services. The difficulty of caregiving task factor was rated on a 5-point Likert scale from 1 (not difficult) to 5 (extremely difficult). Time spent on caregiving tasks was rated on a 5-point Likert scale from 1 (none) to 5 (a great amount of time). A total score is used and is the sum of 15 items. Higher scores indicate great task difficulty and more time spent on the task.²⁶ Content and construct validity of this instrument has been reported in cancer and stroke caregivers.^{25, 27-29} Internal consistency reliability using Cronbach's alpha was reported as .92 in HF caregivers²⁶ and stroke family caregivers.²⁷ Cronbach's alpha was .94 for difficulty and .86 for time in this study.

Caregivers' overall perceived caregiving distress was assessed using the Zarit Burden Interview (ZBI).³⁰ The ZBI has 22-items and each item is rated on a 5-point Likert scale from 0 (never) to 4 (nearly always). A total score is the sum of 22 items and ranges from 0 to 88. A cutoff total score of 17 or higher is considered to represent severe burden. Although this measure was initially developed and used to assess caregiver burden for patients with dementia, there is no problem with the use of this measure for caregivers of patients with HF or coronary heart disease.^{31, 32} Cronbach's alpha of this measure was .93 in this study.

We also collected caregivers' age, gender, ethnicity, marital status, education, relationship to the patient, their co-morbidities, and use of medications as well as the patient's demographic (i.e., age and gender) and clinical characteristics (NYHA class, etiology, and left ventricular ejection fraction) using a structured questionnaire. When the ejection fraction was indicated as a range, the mean value was used.

Analysis

Descriptive statistics including frequency, percentile, mean, and standard deviation were used to describe variables used in this study. For analysis, caregivers were grouped into two groups, either with or without depressive symptoms, using the standard cutoff point of 14 on the BDI-II score. Independent sample t-test, paired t-tests, or Chi-square were used to compare the characteristics between the two groups. The Pearson correlation was used to examine multicollinearity among predictors. A series of multiple regression models were used to examine predictors of depressive symptoms while controlling for potential confounding factors such as age and gender. In the first multiple regression, only patient's severity of HF and functional status (i.e., DASI) were entered as predictors while controlling for patient age, gender, and left ventricular ejection fraction. In the second multiple regression, only caregiver variables were entered as predictors while controlling for caregiver's age and gender.

Results

Caregiver Characteristics

A total of 109 caregivers participated in this study (Table 1). The mean age of caregivers was 57.3 years (SD = 13.3), and they were an average of 4 years younger than patients ($P = .027$). The majority of caregivers were female (76%), white (94%), were spouses (82%), and lived with patients in the same home (95.7%). Half of the caregivers were healthy without chronic illness, and the other half had at least one to three co-morbidities. The most common comorbidities were hypertension (45%) and diabetes (20%). One third of caregivers (27%) reported that they had taken antidepressants in the past and 7% were taking antidepressants at the time of the assessment. One third of caregivers (31%) worked full or part time, and 10% reported that they quit a job or retired early to take care of patients.

The mean BDI-II score for caregivers was 9.35 (SD = 9.6), and 28% of caregivers had at least mild depressive symptoms (BDI-II ≥ 14). The mean ZBI score was 15.9 (SD = 13.1), and 33% caregivers had severe distress related to caregiving burden (the ZBI ≥ 17). There were no differences in perceived caregiving distress (12.5 ± 10.4 vs. 16.9 ± 13.7 , $P = .12$), caregiving time (30.7 ± 8.6 vs. 33.3 ± 12.0 , $P = .30$), caregiving difficulty (21.3 ± 4.2 vs. 22.7 ± 6.7 , $P = .41$), perceived control (24.2 ± 3.9 vs. 24.4 ± 4.5 , $P = .78$), functional status (34.2 ± 21.8 vs. 30.3 ± 21.8 , $P = .41$), or depressive symptoms (8.8 ± 8.1 vs. 9.5 ± 10.1 , $P = .74$) between male and female caregivers in this study.

Patients with HF

Patients with HF were community dwelling outpatients who had no acute admission episodes within the previous 3 months. Their mean age was 61 years (SD = 12), and 60% were male. They had either preserved or non-preserved left ventricular function with a mean ejection fraction of 35.5%, and 36.7% had an ischemic etiology underlying their HF. Sixty four percents of patients were in NYHA class III or IV. The mean of the DASI was 12.1 (SD = 11.8) and was lower than caregivers' functional status ($M = 22.1$, SD = 20.2, $P < .001$) when compared using a paired t-test.

Comparison between caregivers with and without depressive symptoms

Caregivers who had depressive symptoms were an average of 6 years younger than caregivers without depressive symptoms ($P = .027$) but gender and living status were similar between groups (Table 2). Caregivers with depressive symptoms had poorer functional status ($P = .004$), and lower perceived control ($P = .002$) than caregivers without depressive symptoms (Table 2). Caregivers with depressive symptoms reported higher levels of perceived overall caregiving burden ($P < .001$), spent more time in caregiving tasks ($P = .$

001), and felt greater difficulty related to caregiving ($P = .002$) than caregivers without depressive symptoms (Table 2). There were no differences in patient characteristics (i.e., age, functional status, and NYHA class) between caregivers with and without depressive symptoms.

Predictors of depressive symptoms in caregivers

There were no multicollinearity issues found ($r > .7$) when assessed bivariate correlations among patients' predictors. Patient functional status as assessed by the DASI was correlated with patient age ($r = -.250$, $P = .010$) but was not correlated with caregivers' depressive symptoms ($r = -.137$, $P = .16$). Patient's NYHA class was also not correlated with depressive symptoms of caregivers ($r = .17$, $P = .12$). When we entered patient variables as predictors of caregivers' depressive symptoms in the first regression while controlling for patient age and gender, patients' physical functional status ($S\beta = -.101$, $P = .382$) and NYHA class ($S\beta = -.162$, $P = .148$) did not predict caregiver depressive symptoms.

There were no multicollinearity issues detected when assessed using bivariate correlations among caregivers' predictors (Table 3). There were moderate correlations between depressive symptoms and caregivers' predictors ($r = -.203 \sim r = .471$). When we included only caregivers' variables as predictors controlling for caregivers' age and gender, only caregivers' functional status ($S\beta = -.307$, $P < .001$), perceived control ($S\beta = -.304$, $P < .001$), and overall perceived caregiving distress ($S\beta = .316$, $P = .002$) predicted their depressive symptoms (Table 4). Caregivers who had poor functional status, lower levels of perceived control and severe caregiving distress experienced severe depressive symptoms. The three variables explained 42.7 % of variance in depressive symptoms, and have similar predictability as shown by the similar values of standard beta.

Because depressive symptoms were predicted by overall perceived caregiving distress not by difficulty or time spent on caregiving; and overall perceived caregiving distress was highly correlated with caregiving difficulty ($r = .643$) and time ($r = .509$), we ran another multiple regression to examine whether caregiving difficulty or time may predict depressive symptoms when overall perceived caregiving distress variable was eliminated. We found that depressive symptoms were not predicted by either difficulty or time spent on caregiving but rather that caregivers' functional status and perceived control were the strongest predictors (Table 5).

Discussion

In this study, we focused on depressive symptoms among the primary family caregivers who supported community dwelling, stable HF outpatients who had not been hospitalized within 3 months of baseline. We found that slightly more than a quarter of caregivers (28%) experienced at least mild depressive symptoms. The prevalence of depressive symptoms among caregivers in this study was consistent with previous reports of caregivers of patients with HF.^{7, 8, 33} Considering the relatively stable condition of patients engaged in self-management in the home settings in this study, the prevalence of depressive symptoms in primary family caregivers was significant. Our results indicate that it is important to identify and screen depressive symptoms of caregivers before they reach "burnout" in order to provide optimal quality of care to patients with HF, and to prevent poor health outcomes of family members.

Family caregivers commonly are expected to assume the role of caregiving in spite of their own physical disability or emotional distress or burden. Family caregivers often do not seek needed medical attention due to their focus on HF patients. As a result, they often become overwhelmed and neglect their own health, thus further adding to the potential for

“burnout”. Pressler and her colleagues³³ found that caregivers who were primary caregiver of adults with HF and reported depressive symptoms at baseline were more likely to report that their life was changed negatively and their mental quality of life was poor at 8-month follow up. Health care providers must be trained to observe and recognize the depressive symptoms and burden of caregivers who are, in essence, ‘hidden patients’; regular assessment of depressive symptoms or burden distress related to their caregiving role is essential to prevent negative health outcomes for both patients and caregivers.

Researchers have begun to focus on depressive symptoms or burden distress of spousal or family caregivers of patients with HF^{7, 8, 34} It has been reported that both patients with HF and caregivers experienced substantial depressive symptoms; and depressive symptoms of caregivers were similar to or worse than those of patients.^{7, 8, 35, 36} Furthermore, depressive symptoms in caregivers of HF patients were not only related to their own health outcomes^{26, 37} but also to patients’ quality of life.^{8, 26, 37} Further research is needed to examine whether depressive symptoms of family caregivers influence patient self-management or long term outcomes including mortality and rehospitalization.

In this study, caregivers who had depressive symptoms had worse functional status, lower perceived control, more severe burden, more difficulty in caregiving and spent more time on caregiving tasks than caregivers without depressive symptoms. Caregivers’ depressive symptoms were predicted by their own lower functional status, lower perceived control and severe perceived burden. These findings suggest that depressed caregivers of patients with HF may benefit from interventions that improve perceived control, address caregiving burden as well as attend to caregivers’ functional status. It has been reported that caregivers’ perceived control over managing heart problems is associated with their depressive symptoms and mental health.^{38, 39} According to Moser,²² perceived control can be increased by specific education and skills training directed at their major concerns. Caregivers assume a large responsibility in the management of patients with HF, including symptom monitoring, providing emotional support, and the daily management of medications, sodium restricted diet, and exercise. Considering the result that perceived control was correlated with caregivers’ perceptions of the difficulty of caregiving tasks in this study, interventions that are designed specifically to influence the degree of perceived control related to their caregiving tasks or caregiving burden may improve caregivers’ depressive symptoms. Future studies are needed to examine the effectiveness of this intervention in randomized control trials. Two recent meta analysis studies of intervention programs for caregivers of Alzheimer or dementia patients indicated that nonpharmacological interventions, including individual or group counseling or support programs are effective in improving depressive symptoms of caregivers.^{40, 41} However, the effectiveness of these interventions has not been studied in caregivers of patients with HF. Further research is needed to investigate whether improving caregivers’ depressive symptoms will have a positive influence on the outcomes of caregivers as well as patients.

A significant finding in this study was that caregivers’ depressive symptoms were not predicted by patient characteristics, including patient NYHA class or self-reported functional status. This result was consistent with Martensson's report that patient NYHA class and functional status (ability to finish a 6-minute walk) did not predict caregivers’ depressive symptoms, although patients’ NYHA class was correlated with spousal caregivers’ depressive symptoms.⁷ It may be that caregivers’ depressive symptoms are related to individual personality characteristics as they assume the caregiving role regardless of levels of patient disease severity or functional disability. Furthermore, the amount of time spent in caregiving or the difficulty of the caregiving tasks did not predict depressive symptoms in this study, although these were moderately correlated with caregivers’ burden distress. Karmilovich³⁴ found that burden and distress in caregivers with HF patients were

associated with caregiving tasks as well as their perceived difficulty in performing caregiving activities. Halm and Bakas³⁸ found that the difficulty of caregiving tasks was not a significant predictor of depressive symptoms in caregivers of patients with coronary artery bypass surgery. One of the possible reasons for this result may be that caregivers' perceptions or appraisals of the caregiving experience as burdensome may vary even though they may experience similar levels of difficulty or time consumption to caregivers without depressive symptoms. This perceived caregiving distress may be caused by various factors that were not assessed in this study including the range of coping strategies used and personal mastery of caregiving tasks.^{26, 38}

Another noteworthy finding in this study was that caregivers' functional status was a predictor of their depressive symptoms. Although caregivers were on average 4 years younger than patients, they were older adults with a mean age of 57. Of the participants in this study, 79% were spousal caregivers. As patients with HF age, these spousal caregivers may suffer from their own illnesses but remain obligated to take care of a patient with HF. It has been reported that the caregiving role is associated with an increased risk of coronary heart disease or mortality.^{15, 16, 42} This cross-sectional study, however, was limited in the ability to identify causal relationships between poor functional status and the caregiving role. Further investigation is needed in this area. Interestingly, in contrast to previous findings that female caregivers tend to perceive more caregiving burden or depressive symptoms,^{38, 43} we did not find gender differences in caregiving difficulty or time spent, perceived caregiving burden, functional status, perceived control or depressive symptoms. Because the majority of caregivers who participated in this study were women, additional research including more males is needed before definitive conclusions can be drawn regarding gender differences.

This study had limitations. First, the internal consistency reliability score of the perceived control measure, the CAS-R instrument, was just below that level considered acceptable. Modification of original patients' version of the CAD-R to a caregivers' version may have resulted in this lower level of reliability. Nevertheless, this instrument demonstrated validity in that caregivers' perceived control was a significant predictor of caregivers' depressive symptoms. Second, we did not assess participants' reading ability before we administered the questionnaires. Third, we cannot say for certainty that patients and caregivers completed the questionnaires independently. Nonetheless, the strength of our findings suggests that each member of the dyad did indeed complete the instruments with consultation. It is also unknown whether caregivers had a history of depression comorbidity before their caregiving role began. This study may have limited generalizability to the total population of caregivers of patients with HF because participants volunteered and were not randomly selected.

Conclusion

We found that caregivers of community dwelling, stable patients with HF experienced significant depressive symptoms and burden distress related to their caregiving roles. Caregivers who had poor functional status, lower levels of perceived control, and severe burden distress were the most likely to have depressive symptoms in this study. These findings suggest that depressed caregivers of patients with HF may benefit from interventions that improve perceived control, address the caregiving burden distress and improve functional status. This study has also contributed to the growing body of knowledge about depressive symptoms of caregivers of patients with HF with a larger sample size than previous studies in caregivers of patients with HF.^{7, 8, 26, 34}

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References

1. Rosamond W, Flegal K, Furie K, et al. Heart disease and stroke statistics--2008 update: a report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation* 2008;117(4):e25–146. [PubMed: 18086926]
2. Gure TR, Kabeto MU, Blaum CS, Langa KM. Degree of disability and patterns of caregiving among older Americans with congestive heart failure. *J Gen Intern Med* 2008;23(1):70–76. [PubMed: 18030537]
3. Farmer IP, Meyer PS, Ramsey DJ, et al. Higher levels of social support predict greater survival following acute myocardial infarction: the Corpus Christi Heart Project. *Behav Med* 1996;22(2):59–66. [PubMed: 8879457]
4. Friedman MM. Social support sources and psychological well-being in older women with heart disease. *Res Nurs Health* 1993;16(6):405–413. [PubMed: 8248567]
5. Chin MH, Goldman L. Correlates of early hospital readmission or death in patients with congestive heart failure. *Am J Cardiol* 1997;79(12):1640–1644. [PubMed: 9202355]
6. Vinson JM, Rich MW, Sperry JC, Shah AS, McNamara T. Early readmission of elderly patients with congestive heart failure. *J Am Geriatr Soc* 1990;38(12):1290–1295. [PubMed: 2254567]
7. Martensson J, Dracup K, Canary C, Fridlund B. Living with heart failure: depression and quality of life in patients and spouses. *J Heart Lung Transplant* 2003;22(4):460–467. [PubMed: 12681424]
8. Pihl E, Jacobsson A, Fridlund B, Stromberg A, Martensson J. Depression and health-related quality of life in elderly patients suffering from heart failure and their spouses: a comparative study. *Eur J Heart Fail* 2005;7(4):583–589. [PubMed: 15921798]
9. Scott LD. Caregiving and care receiving among a technologically dependent heart failure population. *ANS Adv Nurs Sci* 2000;23(2):82–97. [PubMed: 11104326]
10. Garand L, Dew MA, Eazor LR, DeKosky ST, Reynolds CF 3rd. Caregiving burden and psychiatric morbidity in spouses of persons with mild cognitive impairment. *Int J Geriatr Psychiatry* 2005;20(6):512–522. [PubMed: 15920711]
11. Schulz R, Martire LM. Family caregiving of persons with dementia: prevalence, health effects, and support strategies. *Am J Geriatr Psychiatry* 2004;12(3):240–249. [PubMed: 15126224]
12. Pinquart M, Sorensen S. Associations of stressors and uplifts of caregiving with caregiver burden and depressive mood: a meta-analysis. *J Gerontol B Psychol Sci Soc Sci* 2003;58(2):P112–128. [PubMed: 12646594]
13. Pirraglia PA, Bishop D, Herman DS, et al. Caregiver Burden and Depression Among Informal Caregivers of HIV-infected Individuals. *Journal of General Internal Medicine* 2005;20(6):510–514. [PubMed: 15987325]
14. Mui AC. Perceived health and functional status among spouse caregivers of frail older persons. *J Aging Health* 1995;7(2):283–300. [PubMed: 10165957]
15. Lee S, Colditz GA, Berkman LF, Kawachi I. Caregiving and risk of coronary heart disease in U.S. women: a prospective study. *Am J Prev Med* 2003;24(2):113–119. [PubMed: 12568816]
16. Schulz R, Beach SR. Caregiving as a risk factor for mortality: the Caregiver Health Effects Study. *Jama* 1999;282(23):2215–2219. [PubMed: 10605972]

17. Moser DK, Dracup K. Psychosocial recovery from a cardiac event: the influence of perceived control. *Heart Lung* 1995;24(4):273–280. [PubMed: 7591794]
18. Dracup K, Westlake C, Erickson VS, Moser DK, Caldwell ML, Hamilton MA. Perceived control reduces emotional stress in patients with heart failure. *J Heart Lung Transplant* 2003;22(1):90–93. [PubMed: 12531418]
19. McKinley S, Dracup K, Moser DK, et al. The effect of a short one-on-one nursing intervention on knowledge, attitudes and beliefs related to response to acute coronary syndrome in people with coronary heart disease: a randomized controlled trial. *Int J Nurs Stud* 2009;46(8):1037–1046. [PubMed: 19243778]
20. Beck, AT.; Brown, G.; Steer, RA. Beck Depression Inventory II Manual. The Psychological Corporation; San Antonio, TX: 1996.
21. Hlatky MA, Boineau RE, Higginbotham MB, et al. A brief self-administered questionnaire to determine functional capacity (the Duke Activity Status Index). *Am J Cardiol* 1989;64(10):651–654. [PubMed: 2782256]
22. Moser DK, Riegel B, McKinley S, et al. The control attitudes scale-revised: psychometric evaluation in three groups of patients with cardiac illness. *Nurs Res* 2009;58(1):42–51. [PubMed: 19092554]
23. Moser DK, Riegel B, McKinley S, Doering LV, An K, Sheahan S. Impact of anxiety and perceived control on in-hospital complications after acute myocardial infarction. *Psychosom Med* 2007;69(1):10–16. [PubMed: 17244843]
24. Heo S, Moser DK, Lennie TA, Riegel B, Chung ML. Gender differences in and factors related to self-care behaviors: A cross-sectional, correlational study of patients with heart failure. *Int J Nurs Stud* 2008;45(12):1807–1815. [PubMed: 18674762]
25. Carey PJ, Oberst MT, McCubbin MA, Hughes SH. Appraisal and caregiving burden in family members caring for patients receiving chemotherapy. *Oncol Nurs Forum* 1991;18(8):1341–1348. [PubMed: 1762974]
26. Bakas T, Pressler SJ, Johnson EA, Nauser JA, Shaneyfelt T. Family caregiving in heart failure. *Nurs Res* 2006;55(3):180–188. [PubMed: 16708042]
27. Bakas T, Austin JK, Jessup SL, Williams LS, Oberst MT. Time and difficulty of tasks provided by family caregivers of stroke survivors. *J Neurosci Nurs* 2004;36(2):95–106. [PubMed: 15115364]
28. Bakas T, Burgener SC. Predictors of emotional distress, general health, and caregiving outcomes in family caregivers of stroke survivors. *Top Stroke Rehabil* 2002;9(1):34–45. [PubMed: 14523721]
29. Bakas T, Champion V. Development and psychometric testing of the Bakas Caregiving Outcomes Scale. *Nurs Res* 1999;48(5):250–259. [PubMed: 10494909]
30. Bedard M, Molloy DW, Squire L, Dubois S, Lever JA, O'Donnell M. The Zarit Burden Interview: a new short version and screening version. *Gerontologist* 2001;41(5):652–657. [PubMed: 11574710]
31. Fried TR, Bradley EH, O'Leary JR, Byers AL. Unmet desire for caregiver-patient communication and increased caregiver burden. *J Am Geriatr Soc* 2005;53(1):59–65. [PubMed: 15667377]
32. Hooley PJ, Butler G, Howlett JG. The relationship of quality of life, depression, and caregiver burden in outpatients with congestive heart failure. *Congest Heart Fail* 2005;11(6):303–310. [PubMed: 16330905]
33. Pressler SJ, Gradus-Pizlo I, Chubinski SD, et al. Family caregiver outcomes in heart failure. *Am J Crit Care* 2009;18(2):149–159. [PubMed: 19255105]
34. Karmilovich SE. Burden and stress associated with spousal caregiving for individuals with heart failure. *Prog Cardiovasc Nurs* 1994;9(1):33–38. [PubMed: 8058692]
35. Chung ML, Moser DK, Lennie TA. Similarity of depressive symptoms between heart failure patients and their spousal caregivers. *Prog Cardiovasc Nurs* 2007;22(2):120–121.
36. Chung ML, Moser DK, Rayens MK. The effects of depressive symptoms and anxiety on quality of life: Testing dyadic dynamic using actor partner interdependence model. *Journal of Cardiac Failure* 2007;13(6)(Supplement 2):S160.
37. Chung ML, Moser DK, Lennie TA, Rayens MK. The effects of depressive symptoms and anxiety on quality of life in patients with heart failure and their spouses: testing dyadic dynamics using Actor-Partner Interdependence Model. *J Psychosom Res* 2009;67(1):29–35. [PubMed: 19539816]

38. Halm MA, Bakas T. Factors associated with caregiver depressive symptoms, outcomes, and perceived physical health after coronary artery bypass surgery. *J Cardiovasc Nurs* 2007;22(6):508–515. [PubMed: 18090193]
39. Moser DK, Dracup K. Impact of cardiopulmonary resuscitation training on perceived control in spouses of recovering cardiac patients. *Res Nurs Health* 2000;23(4):270–278. [PubMed: 10940952]
40. Thompson CA, Spilsbury K, Hall J, Birks Y, Barnes C, Adamson J. Systematic review of information and support interventions for caregivers of people with dementia. *BMC Geriatr* 2007;7:18. [PubMed: 17662119]
41. Selwood A, Johnston K, Katona C, Lyketsos C, Livingston G. Systematic review of the effect of psychological interventions on family caregivers of people with dementia. *J Affect Disord* 2007;101(1-3):75–89. [PubMed: 17173977]
42. Pinquart M, Sorensen S. Differences between caregivers and noncaregivers in psychological health and physical health: a meta-analysis. *Psychol Aging* 2003;18(2):250–267. [PubMed: 12825775]
43. Yee JL, Schulz R. Gender differences in psychiatric morbidity among family caregivers: a review and analysis. *Gerontologist* 2000;40(2):147–164. [PubMed: 10820918]

Table 1

Characteristics of caregivers in HF (N=109)

Characteristics	Mean ($\pm$ SD) or n (%)
Gender, female	82 (75.2%)
Age, years	57.3 ($\pm$ 13.3)
Married	89 (81.7%)
Ethnicity, White	102 (93.6%)
Education, $\leq$ High school diploma	62 (57.9%)
Relationship with patients - Spouse	86 (78.9%)
Son or daughter	10 (9.2%)
Son or daughter-in law	5 (4.6%)
Other relative	3 (2.8%)
Friend	5 (4.6%)
Living with patient in the same home	104 (95.4%)
Employment- Full or part time outside home	34 (31.2%)
Quitting a job or taking early retirement because of patients with HF	11 (10.1%)
Comorbidity: none	54 (49.5%)
1 -3	47 (43.1%)
4 or more	6 (5.4%)
missing	2 (1.8%)
Comorbidity –Hypertension	49 (45.0%)
Comorbidity – Diabetes	22 (20.2%)
Ever taken antidepressants	29 (26.6%)
Currently taking antidepressants	8 (7.3%)

Table 2Comparison between caregivers with depressive symptoms (BDI-II ≥ 14) and without depressive symptoms

	With depressive symptoms (n = 30)	Without depressive symptoms (n = 79)	p-value
Caregiver's characteristics	% or Mean $\pm$ SD		
Age	52.7 $\pm$ 13.7	59.0 $\pm$ 12.8	.027
Gender, female	80.0%	73.4%	.644
Living with patients	93.3%	96.2%	.899
Quit a job or take early retirement due to patients with HF	20%	6.3%	.078
Have other family living at home also need caregiver's help	13.8%	28.6%	.186
Taking antidepressants	12.5%	8.2%	.842
Functional status (DASI)	22.2 $\pm$ 20.4	34.8 $\pm$ 19.4	.004
Perceived controllability (CAS-R)	22.3 $\pm$ 4.4	25.2 $\pm$ 4.1	.002
Caregiving- time spent (OCBS)	39.0 $\pm$ 12.4	30.2 $\pm$ 9.8	.001
Caregiving- difficulty (OCBS)	26.3 $\pm$ 8.5	20.9 $\pm$ 4.3	.002
Overall perceived caregiving distress (ZBI)	24.6 $\pm$ 15.2	12.5 $\pm$ 10.6	< .001

DASI= The Duke Activity Status Index; CAS-R=The Control Attitudes Scale-Revised; OCBS=The Oberst Caregiving Burden Scale; ZBI= The Zarit Burden Interview

Table 3

Correlations among caregivers' variables (N = 109)

	Depressive symptoms	Age	Functional status	Perceived control	Caregiving-time	Caregiving-difficulty	Overall perceived caregiving distress
Age	-.203 *						
Functional status	-.344 ***	-.278 **					
Perceived control	-.444 ***	-.004	.222 *				
Caregiving-time	.313 ***	-.163	-.032	-.086			
Caregiving-difficulty	.403 ***	-.055	-.202 *	-.229 **	.588 ***		
Overall perceived caregiving distress	.471 ***	-.074	-.119 *	-.193 *	.509 ***	.643 ***	
Mean ± SD	9.4 ± 9.7	57.3 ± 13.3	31.3 ± 20.4	24.4 ± 4.3	32.6 ± 11.2	22.6 ± 6.2	15.9 ± 13.1

*
p < .05

**
p < .01

p < .001

Table 4

Predictors (caregiver's variables) of depressive symptoms in caregivers (N =109)

step	Predictor	Standard β	p-value	R ² change	R ² for full model	p-value
1	Age	-.203	.035	.042		.101
	Gender	.030	.754			
2	Age	-.255	.001	.427	.469	<.001
	Gender	-.043	.561			
	Functional status	-.307	<.001			
	Perceived control	-.304	<.001			
	Caregiving -Time	.067	.474			
	Caregiving- Difficulty	.019	.859			
	Overall perceived caregiving distress	.316	.002			

Table 5

Predictors of depressive symptoms in caregivers (N = 109)

step	Predictor	Standard β	p-value	R ² change	R ² for full model	p-value
1	Age	-.203	.035	.042		.101
	Gender	.030	.754			
2	Age	-.259	.002	.371	.414	<.001
	Gender	-.018	.814			
	Functional status	-.305	<.001			
	Perceived control	-.324	<.001			
	Caregiving -Time	.130	.177			
	Caregiving- Difficulty	.179	.071			