Published in final edited form as:
Heart Fail Clin. 2011 January ; 7(1): 127–141. doi:10.1016/j.hfc.2010.10.001.

Cognitive Therapy for Depression in Patients with Heart Failure: A Critical Review

Rebecca L. Dekker, PhD, ARNP

Synopsis

Depression is a significant problem in patients with heart failure (HF). The purpose of this review is to examine the evidence for the use of cognitive therapy (CT) in treating depression and depressive symptoms in patients with HF and cardiovascular-related illnesses. In 8 of the 14 studied reviewed, researchers found that CT reduced depressive symptoms; however, the limitations of the studies prevent wide generalization of the results. Evidence to support the use of CT for the treatment of depressive symptoms in patients with cardiovascular illness is insufficient at this time. Large randomized, controlled trials that demonstrate the efficacy of CT are needed before clinicians routinely refer patients with HF to CT for the purpose of improving depression or depressive symptoms.

Keywords

Heart Failure; Congestive; Depression; Cardiovascular Diseases; Cognitive Therapy; Stroke; Diabetes

Introduction

Depression is a significant problem in patients with heart failure (HF). One in five persons with HF has clinical depression,[1] and up to 48% have clinically significant depressive symptoms.[2] According to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV-TR), a major depressive episode, sometimes referred to as clinical depression, consists of five or more symptoms which are present for most of the day, almost daily, for at least two weeks. One of these symptoms must be either depressed mood or loss of interest or pleasure in usual activities, and the symptoms must cause significant distress in social, occupational, or other areas of functioning (Table 1).[3] However, patients can experience clinically significant depressive symptoms without the presence of major depressive disorder.[4] Depressive symptoms may include depressed mood, irritability, guilt, hopelessness, low self-esteem, fatigue, sleep disturbances, appetite change, and inability to concentrate.[5]

Corresponding author: Rebecca L. Dekker, PhD, ARNP, ACNS-BC, Assistant Professor, University of Kentucky College of Nursing, 760 Rose Street, Lexington, KY 40536-0232, rdekker@uky.edu, (859) 533-9610 (phone), (859) 323-1057 (fax).

Disclosure: The author has nothing to disclose.

A version of this article originally appeared in *Nursing Clinics of North America*, volume 43, number 1.

The adverse effects of clinical depression and depressive symptoms on mortality and hospitalizations in patients with HF have been well documented.[1, 2, 6-8] Results from a meta-analysis demonstrated that patients with HF who have depressive symptoms are more than twice as likely to die or experience a cardiac event compared to patients without depressive symptoms.[1] Moreover, the presence of depressive symptoms has a negative impact on every dimension of health-related quality of life in patients with HF, including physical functioning, social functioning, and mental health.[2]

The problems associated with depression and depressive symptoms in patients with HF are well described. It is time for researchers to test interventions. Importantly, there is a lack of research on non-pharmacological interventions for depressive symptoms in patients with HF.[9] Cognitive therapy (CT) has been used successfully to treat depression in multiple populations.[10, 11] Therefore, it may also be useful for treating depression in patients with cardiovascular illnesses, including HF. The purpose of this critical review was to examine the empirical support for the use of CT in treating depression and depressive symptoms in patients with cardiovascular-related illnesses.

Background

Beck, a psychiatrist, developed the Cognitive Model of depression in 1967 to explain the psychological processes that occur in depression. The underlying assumption behind the Cognitive Model was that human minds are biased and cannot interpret stimuli objectively. This bias leads to cognitive errors, or dysfunctional thinking.[10] The Cognitive Model holds that dysfunctional thinking influences the emotions, behaviors, and psychosomatic symptoms associated with depression. Thus, interventions aimed at changing dysfunctional thinking should improve the emotional, behavioral, and somatic symptoms of depression.[11]

Cognitive therapy, also referred to as cognitive behavioral therapy, is the psychotherapeutic intervention based on the Cognitive Model of depression. The primary goal of CT is to alter emotions and behavior by redirecting negative cognitive processes. CT is typically a short term therapy that consists of 4 to 14 sessions, depending on the individual's progress. The role of the therapist is to develop a collaborative, therapeutic relationship with the client and to teach the client to become his or her own therapist. The therapist teaches the client to identify, analyze, and question dysfunctional thinking. For example, the therapist may help the client to identify negative thoughts such as “I'm a burden to others.” Together, the therapist and the client explore the evidence behind this negative thought. After evaluating the rationale for the thought, the therapist then guides the client to challenge the thought, and eventually change the client's thinking. By creating changes in thinking, the client may modify negative emotions and behaviors.[11]

CT offers several potential advantages for the treatment of depression and depressive symptoms in patients with HF. First, CT is a non-pharmacological intervention. Non-pharmacological interventions may have several advantages over pharmacological treatments such as a lack of drug-drug interactions, immediate short-term relief of symptoms, and greater involvement of patients in their own self-care. Second, CT is an intervention that many health care professionals, including nurses, can be trained to administer. CT is compatible with common nursing interventions of teaching patients to accurately appraise stressors, determining the best coping method, and increasing perceived control. Despite the potential benefits of CT, its effectiveness in patients with cardiovascular illness including HF remains unknown. The following review provides a critical analysis of the existing research on the effectiveness of CT for treating depression or depressive symptoms in patients with cardiovascular illnesses.

Methods

The databases searched for relevant literature were PUBMED, PsychInfo, CINAHL, and MEDLINE. Keywords included depress* and cognitive therapy (or cognitive behavioral therapy) and cardiovascular (or heart failure, chronic illness, coronary artery disease, cardiac, stroke, or diabetes). The search was limited to English language papers published between 1980 and December 2009.

Studies were included in the review if they met the following criteria: randomized, controlled trial; a cognitive therapy intervention; depression or depressive symptoms measured as an outcome; sample consisted of patients with cardiovascular disease, non-hemorrhagic stroke, or diabetes. Diabetes mellitus commonly coexists with HF[12] and is an important risk factor for the development of HF,[13] Thus samples that contained patients with diabetes were also included.

The search resulted in 335 articles of which the titles or abstracts were screened for inclusion criteria. Reference lists of relevant articles were screened for additional studies. A total of fourteen papers met the inclusion criteria and were extracted for review.

Results

Cardiovascular disease

Eight studies were identified in which the impact of CT on depression in patients with cardiovascular illness was evaluated (Table 2).

In the largest randomized controlled trial on CT in cardiovascular disease to date, the ENRICHD (Enhancing Recovery in Coronary Heart Disease) investigators[14] compared the impact of CT with usual care on depressive symptoms and event-free survival in 2,481 patients with a recent myocardial infarction (MI). Patients were eligible to participate if they were defined as depressed on a diagnostic interview or if they had low perceived social support. Patients in the intervention group attended 6 to 19 individual or group CT sessions (median of 11 sessions) over six months in conjunction with selective serotonin reuptake inhibitor when indicated. The intervention group experienced a statistically significant decrease in depressive symptoms compared to the control group at six months. However, this difference was no longer present at 30 or 42 months of follow up. There was no difference in event-free survival between the intervention and control groups.

The lack of impact on event-free survival may have been due to several factors. The ENRICHD investigators assumed that CT should begin as soon as possible (within 28 days) after an MI. Thus, the study may have included patients in the control group who had transient rather than clinical depression and recovered without intervention. The investigators also assumed that the usual care group would not receive treatment for depression, but this was not the case. Antidepressant use was comparable in the control group (21%) and intervention group (28%).[14-16] It is not known why a decrease in depressive symptoms in the intervention group in this study did not translate into improved outcomes. It may be that the decrease in depressive symptoms was insufficient to affect clinical outcomes. This conclusion is supported by the observation that while depressive symptoms in the intervention group decreased by 49%, depressive symptoms in the control group also decreased by 33%.[14]

More recently, Freedland et al.[17] compared the effects of CT, supportive stress management, and usual care for the treatment of depression in 123 patients who were post coronary artery bypass graft surgery (CABG). Patients were included if they scored 10 or higher on the

Beck Depression Inventory (BDI) and met the DSM-IV criteria for depression based on a diagnostic interview. The investigators tested two separate interventions: 12 weeks of CT and 12 weeks of supportive stress management (progressive relaxation, controlled breathing, and imagery); both interventions were delivered in individual sessions by a trained clinical social worker or psychologist. Follow-up information on depression was collected at 3, 6, and 9 months using the BDI and the Hamilton Rating Scale for Depression.

The investigators found that patients in both intervention groups were more likely to experience remission from depression at all time points compared to patients in the usual care group. At nine months, 73% of the CT group and 57% of the stress management group experienced remission from depression, compared to 23% of patients in the usual care group ($p = .003$). This study was underpowered to detect differences between the CT and stress management arms of the study. Therefore, it is difficult to draw conclusions as to whether CT or stress management was superior for the treatment of depression in patients who are post-CABG. However, patients who received CT experienced greater improvement in secondary outcomes such as lower anxiety, hopelessness, and perceived stress; these results suggest that CT may offer more benefits to patients in comparison to stress management.

Twenty years ago, Burgess et al.[18] reported that an intervention combining CT, social support, and job return counseling failed to reduce depressive symptoms in patients who had recently experienced an acute MI. In this randomized, controlled trial, 180 patients were randomized to the intervention group or usual care. There were no differences in depression scores between groups at baseline, three months, or thirteen months of follow-up. The authors did not offer any explanations for the null effects on depression. Females were underrepresented in the study; thus, it is not known whether the intervention would have been effective for females.

CT may be effective in reducing depressive symptoms in survivors of sudden cardiac death. Cowan et al[19, 20] tested the impact of CT, biofeedback therapy, and health education on depressive symptoms and mortality in 133 survivors of sudden cardiac death. Only 11% of the sample had depressive symptoms at baseline and all of these were male. Approximately half of the sample had chronic heart failure (NYHA Functional Class II-IV). The treatment group experienced a significant decrease in depressive symptoms compared to the control group. Although the study was not originally powered to detect differences in mortality, the treatment group experienced an 86% reduction in the risk of cardiac death compared to the control group. Therefore, the results of this study suggest that CT and biofeedback may be beneficial for survivors of sudden cardiac death, whether or not they are experiencing depressive symptoms.

Limited evidence suggests that CT may be more effective than exercise at reducing depressive symptoms in patients with coronary artery disease. Black et al[21] randomized 60 patients who had recently been hospitalized for a coronary event and were psychologically distressed to one of two groups: a special intervention that consisted of stress management, relaxation training, and CT administered by a psychiatrist, or a cardiac rehabilitation group that included exercise and risk reduction counseling. At six months, the CT group experienced a significant reduction in depressive symptoms compared to the cardiac rehabilitation group. There was no difference between groups with regard to rehospitalizations. There were several limitations of the study such as low representation of women (12%), exclusion of elderly (>80 years old), and lack of a true control group. Most importantly, adherence to the intervention was low. Less than 50% of participants attended more than one intervention session. Crossover between groups was also a problem, as six participants in the usual care group were treated with antidepressants or psychological

counseling. Combined, these limitations severely weakened the internal and external validity of the study.

Results from three studies suggest that CT may be helpful for reducing depressive symptoms in patients with implanted cardioverter defibrillators (ICDs). Frizelle et al.[22] compared the impact of a cardiac rehabilitation and CT to a wait list control group on depressive symptoms in patients with ICDs. Despite the small sample size (N = 22), the intervention group experienced a significant reduction in depressive symptoms compared to the control group at three months. The intervention included exercise, which makes it impossible to ascertain whether the CT alone had an impact on depressive symptoms.

In another study, Kohn et al.[23] evaluated the effects of CT on depressive symptoms in 49 patients with ICDs. This study was limited by the lack of a comprehensive measure of depressive symptoms at baseline. Only three biological indicators of depression were measured at baseline: sexual functioning difficulties, changes in appetite, and sleep disturbance. At nine months follow-up, the CT group reported fewer sexual functioning difficulties than the control group; however, sexual difficulties increased in both groups over time. The BDI version II (BDI-II) was administered only at follow-up. Although the CT group had a lower BDI-II score than the control group at follow-up, the lack of depression score data at baseline limits the conclusions that can be drawn from findings.

Lewin et al.[24] tested the effects of a brief, self-help CT booklet for the treatment of depressive symptoms in patients who were undergoing ICD implantation. In this RCT, eight ICD implantation centers were randomized to intervention or control. The intervention consisted of several booklets that were given to the patient and family by healthcare providers who had received a half day of training in administering the intervention. One of the booklets consisted of a self-help cognitive behavioral rehabilitation program, but the intervention in this booklet was not described in further detail. Patients in the intervention arm also received three phone contacts after ICD implantation to discuss their progress and set goals. The authors defined depression as a HADS score of 8 or greater, and patients were followed for six months.

In a logistic regression, the investigators found that patients in the intervention group were less likely to experience depression at six months compared to patients from control centers, after adjusting for baseline depression score (OR -0.46, Confidence interval -1.93 to 1.00). Furthermore, the intervention group had a greater reduction in the proportion of patients with depression at six months compared to the control group (-13.2% vs. -2.1%, *p* value not specified). However, this study was limited by the lack of a thorough description of the CT intervention, which limits researchers' ability to replicate the results and translate the study findings to the clinical setting.

Finally, results from a small study suggest that an intense regimen of CT combined with exercise may reduce depressive symptoms in patients with heart failure (HF).[25] In this study, 20 patients with HF (NYHA Class II/III) were randomized to three groups: group-based CT plus exercise, Digoxin titrated to achieve drug levels between 0.8 – 2.0 ng/mL, or placebo. Despite the small sample size, the intervention group experienced a 52% reduction in depressive symptoms while the other groups experienced a 15% and 25% increase in depressive symptoms, respectively. As a result of the combination of exercise with CT, it is not known whether CT alone would have been effective in decreasing depressive symptoms. In addition, the follow up period was short, only 12 weeks, and therefore no conclusions can be drawn regarding the long-term effects of the intervention.

Stroke

There is less evidence regarding the effectiveness of CT on depression in patients with stroke. Lincoln and Flannaghan[26] conducted a randomized, controlled trial in which 123 patients who had recently experienced a stroke and depressive symptoms (scored > 10 on the BDI) were assigned to one of three groups: CT, an attention placebo group, or a control group. Surprisingly, depressive symptoms improved over time in all of the groups. There were no significant differences between the groups at baseline, three months, and six months of follow up.

The authors suggested that the intervention, which consisted of ten one-hour sessions, may not have been intense enough to improve depressive symptoms more than would occur naturally. However, other investigators have tested CT in chronic illness and found positive results using a similar number of CT sessions.[14, 27] It is possible that the improvement in depressive symptoms in all three groups over time may have reflected the natural improvement of depression that occurs over time after an acute stroke.[26]

Diabetes

The effectiveness of CT for the management of depression in patients with diabetes has been tested in four randomized, controlled trials. Lustman et al.[27] conducted a RCT in which 51 patients with type 2 diabetes and clinical depression were assigned to either ten weeks of CT and diabetes education or an education-only group. As a result of the intervention, the treatment group had a higher rate of remission from depression compared to the control group (58.3% vs. 25.9%).

In contrast, investigators from three studies have found that CT was not effective for treating depressive symptoms in adults with diabetes. Snoek et al.[28] compared the effects of two interventions on depressive symptoms in adults with type 2 diabetes. The two interventions that were compared were a six week group CT intervention and a blood glucose awareness training. The results showed no differences between groups at 6 and 12 months follow up. There was no true usual care group; by comparing two active interventions, the investigators may have been less likely to detect a difference in the improvement of depressive symptoms between groups.

Similarly, Henry et al.[29] also found that CT did not improve depressive symptoms in patients with type 2 diabetes. The investigators in this small RCT used a wait list control to evaluate the effects of CT plus progressive muscle relaxation on depressive symptoms in nineteen patients with type 2 diabetes and elevated levels of glycosylated hemoglobin. Although there was an overall decrease in depressive symptoms from pre-treatment to post-treatment in both the intervention and wait-list groups, there was no difference between groups. Because of the small sample size, the study likely was under-powered to detect changes in depressive symptoms between groups.

In a much larger study of 344 adults with type 1 diabetes, Ismail et al.[30] also found that CT did not improve depressive symptoms. In this RCT, the investigators compared CT plus motivational enhancement therapy and motivational enhancement therapy alone to usual care in the treatment of depressive symptoms. Despite the lengthy intervention (up to 12 sessions over 6 months), a large sample size, and a rigorous design, neither of the intervention groups experienced a greater reduction in depressive symptoms over time than the usual care group.

Discussion

Fourteen randomized, controlled trials were identified in which investigators tested the impact of CT on depression or depressive symptoms in patients with cardiovascular-related illnesses. Positive effects of CT on depression or depressive symptoms were reported in eight of the fourteen studies. This discussion section will report possible reasons for the mixed results, as well as limitations that prevent wide generalization of study findings.

The major factors that contributed to the mixed results were that: 1) more than one intervention was tested in most studies, 2) there was a lack of a true, no-intervention control group in most studies, 3) most had small sample sizes, and 4) follow-up periods were short. The consequences of each of these factors are described below.

The presence of more than one treatment intervention in several studies restricted the ability to determine the effect of CT on outcomes. In two studies which found positive outcomes, CT and antidepressant therapy were combined,[14, 21] making it impossible to determine the effect of CT alone on depressive symptoms. Similarly, in two other studies finding positive outcomes, the intervention consisted of CT plus exercise.[22, 25] Although combined interventions may be a valuable addition to the treatment options for depressive symptoms in patients with cardiovascular disease, it is difficult to assess the value of CT by itself when it is tested in combination with other interventions. For example, a growing body of evidence has demonstrated that exercise is an effective treatment for persons with major depressive disorders or with depressive symptoms.[31, 32] Thus exercise in combination with CT may have yielded a larger effect than CT alone or may obscure the effect of CT.

Six of the fourteen studies lacked a true, no-intervention group. These studies included a variety of comparison groups. For example, one group of investigators compared patients who received a CT intervention to patients who received a cardiac rehabilitation exercise intervention.[21] Although these investigators found positive results with the CT intervention, the comparison of CT to exercise may have yielded a smaller effect than would have been seen if the investigators compared CT to a third, true control group.

Seven of the fourteen studies had small sample sizes (total N ranging from 19 to 86), and eight studies had a follow-up period of six months or less. Interestingly, despite the ENRICHD trial's large sample size and long follow up period (30 months), the investigators found only modest clinically significant reductions in depressive symptoms. Moreover, this benefit was no longer present by 30 months of follow-up, as all groups improved over time.[14] In contrast, researchers of smaller studies found that CT reduced depressive symptoms at a relatively short follow-up time. It is possible that the improvements in depressive symptoms found in these studies did not persist. Short follow-up times limit the ability of researchers to determine whether CT is a potential long-term treatment for depression.

Researchers' ability to generalize the findings of several of the reviewed studies is compromised by several factors: 1) vaguely described interventions, 2) underrepresentation of women, 3) use of a wide variety of instruments to measure depressive symptoms, and 4) failure to adhere to the CONSORT guidelines for the reporting of clinical trials.

First, researchers often included vague descriptions of the intervention in articles; this limits the ability of future researchers to replicate results from these studies as well as translate the findings to clinical practice. It is also possible that the investigators tested different forms of CT, which could contribute to the mixed findings.

Second, only nine of the fourteen studies had samples that consisted of at least 30% women. Of these nine studies, investigators in four studies found that CT reduced depressive

symptoms. Previous researchers demonstrated that women may react differently to psychological interventions than men. In a post-hoc analysis, the ENRICHD investigators reported that white men who received the CT intervention had a reduced risk of experiencing cardiac mortality or recurrent MI. In contrast, there was no similar beneficial effect for women and minorities.[33] Frasure-Smith et al.[34] reported that women who received an intense psychosocial nursing intervention after a myocardial infarction experienced an increase in all-cause mortality when compared to the control group (10.3% vs. 5.4%). This adverse effect was not found in the male participants. The results of these two studies suggest that it is important to evaluate the impact of psychological interventions on both men and women. Overall, the studies in this review provide insufficient evidence to determine the impact of CT on depressive symptoms in women with cardiovascular disease.

Third, researchers used a variety of methods to measure clinical depression and depressive symptoms. Many of these measures, such as the Beck Depression Inventory, have established reliability and validity. In contrast, Kohn et al.[23] used an instrument that measured three biological indicators of depression. The reliability and validity of this instrument was not provided. Overall, there was a lack of consistency on the measurement of depression in the reviewed studies. This limitation may restrict researchers from conducting future meta-analyses to examine the overall effect of CT for the treatment of depression in patients with cardiovascular disease. For this reason, in 2006 a working group of the National Heart, Lung, and Blood Institute made recommendations as to which instruments researchers should use to measure depressive symptoms in clinical trials that include patients with cardiovascular disease.[35]

Finally, of the twelve studies that were published after 1996, only five followed all of the CONSORT guidelines.[14, 26] The CONSORT (Consolidated Standards of Reporting Trials) guidelines were originally published in 1996 and have since been revised.[36, 37] These guidelines provide a standardized framework for the reporting of clinical trials. The CONSORT guidelines allow the reader to understand the design, conduct, analysis, and interpretation of a randomized controlled trial, and to judge whether a trial has internal or external validity.[37] A lack of adherence to the CONSORT guidelines in several of the studies reduces the transparency of the reported clinical trials and could contribute to a bias in over-estimating the effects of interventions.

Implications for future research

The problems associated with depression and depressive symptoms in patients with HF have been adequately described. Interventions such as CT for the treatment of depression in patients with HF are now needed to move us forward. As only one small trial has studied the effects of CT in the treatment of depression in patients with HF, this article reviewed the empirical evidence for CT in the treatment of depression in patients with cardiovascular-related illnesses. Overall, the current evidence to support CT as a treatment for depression or depressive symptoms in patients with cardiovascular-related illnesses is inconclusive due to limitations of existing studies.

Based on this review, future clinical trials should include the following recommendations. Researchers should test the effect of a CT intervention alone as well as in combination with other treatments. The CT intervention should be replicable in a clinical setting. Careful consideration should be paid to the inclusion of an appropriate comparison group. Given that depression in patients with HF is associated with a high risk for morbidity and mortality, it may be unethical to withhold treatment for depression from patients who are severely depressed. Furthermore, CT alone may not be appropriate for severely depressed individuals. It is suggested that researchers should refer all patients with severe depression to their primary care providers for treatment.

Studies should be designed with sufficient sample sizes to be adequately powered to detect changes in depressive symptoms and related outcomes. Researchers should also make special efforts to include a representative sample of women. In addition, trials should include an adequate follow-up time of at least one year in order to provide information on the long-term effects of CT on both depression and other health outcomes, such as morbidity and mortality. It is also important that researchers use consistent methods for measuring depressive symptoms, such as issued in the National Heart, Lung, and Blood Institute's recommendations.[35] Finally, to improve transparency in the reporting of randomized, controlled trials, researchers should follow the CONSORT guidelines.[37].

Several gaps in understanding of CT as a treatment for depression in cardiovascular conditions, including HF, remain. It is not known if there is a dose-response relationship between CT and depression in patients with cardiovascular disease. For example, we do not know how many CT sessions are necessary to improve depression outcomes, or whether the effective dose varies among different cardiovascular populations. The best time to intervene for depressive symptoms in patients with cardiovascular disease is also unknown. The results of the ENRICHD trial showed that patients who had recently experienced a cardiac event and received a CT intervention only experienced a minimal improvement in depressive symptoms. This led researchers to question whether CT should be offered to patients who have recently experienced a cardiac event or if treatment should be delayed.[15] Likewise, it is not known whether CT should be offered to patients with HF who have been recently hospitalized or whether their depression may remit on its own. Next, it is not known whether CT interventions should be offered only to patients with cardiovascular disease or HF who are clinically depressed or to all patients, regardless of depression status. Finally, it is unknown whether CT can affect outcomes related to depression such as mortality, morbidity, or health-related quality of life in patients with cardiovascular disease or HF.

Implications for practice

Cognitive therapy has been used successfully to treat depression in medically-healthy populations. Because there is a scarcity of evidence for patients with HF, this review was broadened to include all patients with cardiovascular-related illnesses. Based on the findings of this review, the current evidence is insufficient to recommend CT as a treatment for depressive symptoms in patients with cardiovascular illness. Although the majority of the studies reviewed demonstrated that CT may be effective, the limitations in study design prevent wide generalization of the results. More evidence is needed before it can be recommended that clinicians routinely refer patients with cardiovascular disease to CT for the treatment of depression or depressive symptoms. It is important to also note that CT may not be appropriate for all patients with HF or cardiovascular disease, particularly for patients with cognitive impairment or those who may have difficulty adhering to the CT treatment protocol. These patients may benefit from alternative treatments for depression.

Conclusion

Depression is a significant clinical problem in patients with HF. The time has come for researchers to focus their efforts on designing and testing non-pharmacological interventions for depression in patients with HF. Cognitive therapy holds promise as an intervention that may decrease depressive symptoms in patients with cardiovascular illness including HF. Clinicians should continue to monitor the literature for new evidence regarding the effectiveness of CT for treating depression in patients with HF and other cardiovascular disease.

Acknowledgments

The author would like to acknowledge Susan K. Frazier, PhD, RN, Terry A. Lennie, PhD, RN, and Debra K. Moser, DNSc, RN, from the University of Kentucky College of Nursing for their mentorship during the writing of this review. The intellectual contributions of Dr. Frazier, Dr. Lennie, and Dr. Moser were sponsored by the University of Kentucky College of Nursing Center for Biobehavioral Research on Self-Management, NIH NINR, P20 NR010679. The content is solely the responsibility of the author and does not necessarily represent the official views of the National Institute of Nursing Research or the National Institutes of Health. This manuscript was written in partial fulfillment of the requirements for the PhD degree in Nursing at the University of Kentucky College of Nursing.

References

1. Rutledge T, Reis VA, Linke SE, et al. Depression in heart failure: A meta-analytic review of prevalence, intervention effects, and associations with clinical outcomes. J Am Coll Cardiol 2006;48(8):1527–1537. [PubMed: 17045884]
2. Gottlieb SS, Khatta M, Friedmann E, et al. The influence of age, gender, and race on the prevalence of depression in heart failure patients. J Am Coll Cardiol 2004;43(9):1542–1549. [PubMed: 15120809]
3. Diagnostic and statistical manual of mental disorders (DSM-IV-TR). 4th. Washington, D. C.: American Psychiatric Association; 2000.
4. Judd LL, Akiskal HS, Zeller PJ, et al. Psychosocial disability during the long-term course of unipolar major depressive disorder. Arch Gen Psychiatry 2000;57(4):375–380. [PubMed: 10768699]
5. Stuart, GW. Emotional responses and mood disorders. In: Stuart, GW.; Laraia, MT., editors. Principles and practice of psychiatric nursing. 7th. St. Louis: Mosby; 2001. p. 345-380.
6. Jiang W, Kuchibhatla M, Clary GL, et al. Relationship between depressive symptoms and long-term mortality in patients with heart failure. Am Heart J 2007;154(1):102–108. [PubMed: 17584561]
7. Faris R, Purcell H, Henein MY, et al. Clinical depression is common and significantly associated with reduced survival in patients with non-ischaemic heart failure. Eur J Heart Fail 2002;4(4):541–551. [PubMed: 12167395]
8. Jiang W, Alexander J, Christopher E, et al. Relationship of depression to increased risk of mortality and rehospitalization in patients with congestive heart failure. Arch Intern Med 2001;161(15):1849–1856. [PubMed: 11493126]
9. Lane DA, Chong AY, Lip GY. Psychological interventions for depression in heart failure. Cochrane Database Syst Rev 2005;(1):CD003329. [PubMed: 15674906]
10. Beck AT. The current state of cognitive therapy: A 40-year retrospective. Arch Gen Psychiatry 2005;62(9):953–959. [PubMed: 16143727]
11. Beck, JS. Cognitive therapy: Basics and beyond. New York: Guilford Press; 1995.
12. Masoudi FA, Inzucchi SE. Diabetes mellitus and heart failure: Epidemiology, mechanisms, and pharmacotherapy. Am J Cardiol 2007;99(4A):113B–132B. [PubMed: 17196473]
13. Levy D, Larson MG, Vasan RS, et al. The progression from hypertension to congestive heart failure. JAMA 1996;275(20):1557–1562. [PubMed: 8622246]
14. Berkman LF, Blumenthal J, Burg M, et al. Effects of treating depression and low perceived social support on clinical events after myocardial infarction: The Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD) Randomized Trial. JAMA 2003;289(23):3106–3116. [PubMed: 12813116]
15. Joynt KE, O'Connor CM. Lessons from SADHART, ENRICHD, and other trials. Psychosom Med 2005;67:S63–66. [PubMed: 15953805]
16. Frasure-Smith N, Lesperance F. Depression--a cardiac risk factor in search of a treatment. JAMA 2003;289(23):3171–3173. [PubMed: 12813125]
17. Freedland KE, Skala JA, Carney RM, et al. Treatment of depression after coronary artery bypass surgery: A randomized controlled trial. Arch Gen Psychiatry 2009;66(4):387–396. [PubMed: 19349308]

18. Burgess AW, Lerner DJ, D'Agostino RB, et al. A randomized control trial of cardiac rehabilitation. Soc Sci Med 1987;24(4):359–370. [PubMed: 3551088]
19. Cowan MJ, Pike KC, Budzynski HK. Psychosocial nursing therapy following sudden cardiac arrest: Impact on two-year survival. Nurs Res 2001;50(2):68–76. [PubMed: 11302295]
20. Cowan, MJ. Innovative approaches: A psychosocial therapy for sudden cardiac arrest survivors. In: Dunbar, SB.; Ellenbogen, KA.; Epstein, AE., editors. Sudden Cardiac Death: Past, Present, and Future. Armonk, NY: Futura Publishing Company, Inc; 1997. p. 371-386.
21. Black JL, Allison TG, Williams DE, et al. Effect of intervention for psychological distress on rehospitalization rates in cardiac rehabilitation patients. Psychosomatics 1998;39(2):134–143. [PubMed: 9584539]
22. Frizelle DJ, Lewin RJ, Kaye G, et al. Cognitive-behavioural rehabilitation programme for patients with an implanted cardioverter defibrillator: A pilot study. Br J Health Psychol 2004;9(3):381–392. [PubMed: 15296684]
23. Kohn CS, Petrucci RJ, Baessler C, et al. The effect of psychological intervention on patients' long-term adjustment to the ICD: A prospective study. Pacing Clin Electrophysiol 2000;23(4 Pt 1):450–456. [PubMed: 10793433]
24. Lewin RJ, Coulton S, Frizelle DJ, et al. A brief cognitive behavioural preimplantation and rehabilitation programme for patients receiving an implantable cardioverter-defibrillator improves physical health and reduces psychological morbidity and unplanned readmissions. Heart 2009;95(1):63–69. [PubMed: 18070951]
25. Kostis JB, Rosen RC, Cosgrove NM, et al. Nonpharmacologic therapy improves functional and emotional status in congestive heart failure. Chest 1994;106(4):996–1001. [PubMed: 7924541]
26. Lincoln NB, Flannaghan T. Cognitive behavioral psychotherapy for depression following stroke: A randomized controlled trial. Stroke 2003;34(1):111–115. [PubMed: 12511760]
27. Lustman PJ, Griffith LS, Freedland KE, et al. Cognitive behavior therapy for depression in type 2 diabetes mellitus. A randomized, controlled trial. Ann Intern Med 1998;129(8):613–621. [PubMed: 9786808]
28. Snoek FJ, van der Ven NC, Twisk JW, et al. Cognitive behavioural therapy (CBT) compared with blood glucose awareness training (BGAT) in poorly controlled Type 1 diabetic patients: Long-term effects on HbA moderated by depression. A randomized controlled trial. Diabet Med 2008;25(11):1337–1342. [PubMed: 19046225]
29. Henry JL, Wilson PH, Bruce DG, et al. Cognitive-behavioural stress management for patients with non-insulin dependent diabetes mellitus. Psychol Health Med 1997;2(2):109–118.
30. Ismail K, Thomas SM, Maissi E, et al. Motivational enhancement therapy with and without cognitive behavior therapy to treat type 1 diabetes: A randomized trial. Ann Intern Med 2008;149(10):708–719. [PubMed: 19017589]
31. Blumenthal JA, Babyak MA, Moore KA, et al. Effects of exercise training on older patients with major depression. Arch Intern Med 1999;159(19):2349–2356. [PubMed: 10547175]
32. Dunn AL, Trivedi MH, Kampert JB, et al. Exercise treatment for depression: efficacy and dose response. Am J Prev Med 2005;28(1):1–8. [PubMed: 15626549]
33. Schneiderman N, Saab PG, Catellier DJ, et al. Psychosocial treatment within sex by ethnicity subgroups in the Enhancing Recovery in Coronary Heart Disease clinical trial. Psychosom Med 2004;66(4):475–483. [PubMed: 15272091]
34. Frasure-Smith N, Lesperance F, Prince RH, et al. Randomised trial of home-based psychosocial nursing intervention for patients recovering from myocardial infarction. Lancet 1997;350(9076):473–479. [PubMed: 9274583]
35. Davidson KW, Kupfer DJ, Bigger JT, et al. Assessment and treatment of depression in patients with cardiovascular disease: National Heart, Lung, and Blood Institute working group report. Ann Behav Med 2006;32(2):121–126. [PubMed: 16972809]
36. Begg C, Cho M, Eastwood S, et al. Improving the quality of reporting of randomized controlled trials. The CONSORT statement. JAMA 1996;276(8):637–639. [PubMed: 8773637]
37. Moher D, Schulz KF, Altman D. The CONSORT statement: revised recommendations for improving the quality of reports of parallel-group randomized trials. JAMA 2001;285(15):1987–1991. [PubMed: 11308435]

Table 1
DSM-IV-TR criteria for a major depressive episode

At least 5 of the following symptoms have been present most of the day, nearly every day, during the same 2 week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure:

1	Depressed mood
2	Loss of interest or pleasure
3	Weight loss or changes in appetite
4	Insomnia or hypersomnia
5	Psychomotor agitation or retardation
6	Fatigue
7	Feelings of worthlessness or guilt
8	Decreased ability to concentrate
9	Thoughts of death, suicidal ideation, or suicide attempt.

- The symptoms must cause significant impairment in functioning (i.e., work, social)
- The symptoms must not be directly due to a medical condition (i.e., hypothyroidism) or a medication
- The episode is not better accounted for by a different diagnosis such as bereavement, bipolar disorder, or schizoaffective disorder

Data from Diagnostic and statistical manual of mental disorders (DSM-IV-TR). 4th ed. Washington, D.C.: American Psychiatric Association, 2000.

Heart Fail Clin. Author manuscript; available in PMC 2012 January 1.

Table 2

Study characteristics and findings

First author (year)	Design, follow-up time	Sample	Measurement of depression	Treatment	Control	Results
Cardiovascular Disease						
ENRICHD[14] (2003)	RCT 2 arms 30 months	N = 2481 28 days post-MI Eligible if classified as depressed or low perceived social support Females 44% Minorities 34%	DISH, BDI, HRSD	11 tailored CT sessions over 6 months, group therapy as needed, referral to psychiatry for antidepressants as needed	Usual care; physicians were notified if patients were depressed or had low perceived social support	The CT group had a lower BDI score compared to control (9.1 vs. 12.2, p <. 001), and a lower HRSD score (7.6 vs. 9.4, p <.001) at 6 months. This difference was not present at 30 or 42 months
Freedland (2009)[17]	RCT 3 arms 9 months	N = 123 CABG surgery within the past year Eligible if scored ≥ 10 on the BDI and met DSM-IV criteria for major or minor depression based on the DISH Females 50% Minorities 19%	HRSD score derived from the DISH; BDI	1. CT: 12 weekly, individual, 50-60 minute sessions with a therapist 2. Supportive stress management: 12 weekly, individual, 50-60 minute session. Training included progressive relaxation, imagery, and controlled breathing	Usual care	Patients in the CT and stress management group were more likely to experience remission from depression at 3, 6, and 9 months compared to patients in the usual care group
Burgess[18] (1987)	RCT 2 arms 13 months	N = 180 Post acute MI Females 14% Minorities not reported	ZDS	A mean of 6.32 CT visits per patient, social support, facilitation of job return	Usual care	There were no differences between groups on depression scores at baseline or follow-up
Cowan[19, 20] (2001)	RCT 2 arms 3 months	N = 133 Sudden cardiac death survivors Females 27% Minorities 10%	SCR-90: Depression subscale	11 sessions of combined CT, biofeedback, and health education, administered biweekly for six weeks	90 minute health education class	Depressive symptoms decreased in the treatment group when compared to the control group
Black[21] (1998)	RCT 2 arms 6 months	N = 60 Recently hospitalized for angina, MI, angioplasty, or CABG Eligible if scored as distressed Females 12% Minorities not reported	SCR-90: Depression subscale	1 to 7 weekly sessions with a psychologist including: relaxation training, stress management, reduction of risk factors, efforts to improve adherence, and CT intervention; antidepressants if necessary	Cardiac rehabilitation with monitored exercise 1-3 times per week, for 8 weeks, daily home exercise. Education on stress management, support group meeting with spouses, individual nutrition counseling	The CT group had significant reductions in depressive symptoms compared to the control group (-5.2 vs. -0.2, p < . 034)

First author (year)	Design, follow-up time	Sample	Measurement of depression	Treatment	Control	Results
Frizelle[22] (2004)	RCT 2 arms 3 months	N = 22 Patients with ICD's Females not reported Minorities not reported	HADS	Group-based therapy, six sessions, 1 hour each: home-based exercise, education, relaxation, behavioral goal setting, education on identifying and challenging negative thoughts	Wait list	The treatment group experienced decreases in depressive symptoms compared to the control group (-4.25 vs. -0.2, p = .001)
Kohn[23] (2000)	RCT 2 arms 9 months	N = 49 Post-ICD implantation Females 35% African American 8%	BDI version II; 4 biological measures of depression: sexual functioning, appetite, weight change, and sleep patterns	9 sessions ranging from 15-90 minutes, sessions included psycho-education on: anxieties about ICD, avoidance behavior, fear of shocks, stress management, work and social activities, distorted cognitions	Usual care	The CT group had lower levels of depressive symptoms at follow-up compared to the control group (6.9 vs. 15, p = .037), but depressive symptoms were not measured at baseline
Lewin[24] (2007)	Clustered RCT 2 arms 6 months	N = 192 Patients undergoing ICD implantation 8 implantation centers in the UK were randomized to intervention or control Females 20% Minorities 3%	HADS-Depression subscale	Intervention consisted of 2 booklets for patients, 1 booklet for family, a goal-setting diary and a relaxation tape. The first booklet targeted fears prior to ICD implantation. The second booklet consisted of a self-help CT program. The intervention was delivered by healthcare staff that underwent a half day of training.	Usual care and contact by a study facilitator to discuss postoperative progress	The intervention group experienced a greater reduction in the proportion of patients with depression at six months compared to the control group (-13.2% vs. -2.1%, *p* value not reported)
Kostis[25] (1994)	RCT 3 arms 3 months	N = 20 Patients with congestive heart failure Female 30% Minorities not reported	BDI	12 weeks of exercise training at a cardiac rehab facility for 1 hr 3 times per week; weekly meetings with a dietician; group-based CT intervention: twice weekly for 60-90 minutes (relaxation, positive imagery, appraisal of negative cognitions)	1. Lanoxin titrated to achieve levels between 0.8-2.0 ng/mL 2. Placebo	There was a 52% decrease in BDI scores in the intervention group compared to a 15% and 25% increase in the control groups at follow up (p = .04)
Stroke						
Lincoln[26] (2003)	RCT 3 arms 6 months	N = 123 1 to 6 months post-stroke Eligible if scored as depressed Female 49% Minorities not reported	BDI WDI	Ten 1-hour sessions over 3 months, tailored CT intervention: education, task assignment, activity scheduling, identification and modification of inaccurate thoughts	1. No intervention 2. Attention placebo: Ten 1 hr visits over 3 months	No significant differences between groups in depression scores
Diabetes						
Lustman[27] (1998)	RCT 2 arms 6 months	N = 51 Type II diabetes and major depression Females 60% Minorities 19%	DIS BDI	1 hour per week of individual CT for 10 weeks, strategies included: behavioral strategies, problem solving, and cognitive techniques to change cognitive errors	Attention placebo: 1 hour, biweekly, individual sessions with a diabetes educator	The CT group had a higher rate of remission from depression compared to the control group (58.3% vs. 25.9%, p = .03)

First author (year)	Design, follow-up time	Sample	Measurement of depression	Treatment	Control	Results
Snoek[28] (2008)	RCT 2 arms 12 months	N = 86 Adults with poorly controlled type I diabetes Females 58% Minorities: not reported	CES-D	6 weekly group sessions of CT delivered by a diabetes nurse educator and a psychologist. Sessions focused on cognitive restructuring, behavior change and stress management	Blood glucose awareness training focused on symptom management and diabetes education, delivered by a diabetes nurse educator and a psychologist	There were no differences between groups with regard to change in depressive symptoms over time
Henry[29] (1997)	RCT 2 arms 7 weeks	N = 19 Type II Diabetes Females 53% Minorities not reported	BDI	Six sessions of 1.5 hours: progressive muscle relaxation, cognitive coping training (such as identifying and modifying negative thoughts), problem-solving skills, homework assignments	Wait-list	Depressive symptoms decreased across time in both groups; there was no difference between groups
Ismail[30] (2008)	RCT 3 arms 12 months	N = 344 Adults with poorly controlled type I diabetes Females 60% Minorities 20%	PHQ-9	1. CT plus motivational enhancement: 4 individual sessions of motivational enhancement therapy (see below) and 8 sessions of CT delivered over 6 months by trained diabetes nurses 2. Motivational enhancement: 4 individual sessions delivered over 2 months by a diabetes nurse. Sessions focused on assessment of readiness to change, diabetes behavior modification, and problem solving	Usual care	Neither group experienced an improvement in depressive symptoms compared to usual care

BDI: Beck Depression Inventory version I; CABG: Coronary bypass graft surgery; CT: Cognitive Therapy; DIS: Diagnostic Interview Schedule; DISH: Depression Interview and Structured Hamilton; HADS: Hospital Anxiety & Depression Scale; HRSD: Hamilton Rating Scale for Depression; PHQ-9: Patient Health Questionnaire; SCR-90: Symptom Checklist 90 Revised; WDI: Wakefield Depression Inventory; ZDS: Zung Depression Scale