RELATIONSHIPS AMONG HEART FAILURE-RELATED PHYSICAL SYMPTOMS, SOCIAL SUPPORT, SOCIAL PROBLEM-SOLVING, DEPRESSIVE SYMPTOMATOLOGY, AND SELF-CARE BEHAVIORS IN INDIVIDUALS LIVING WITH HEART FAILURE

by

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A DISSERTATION
Submitted to the graduate faculty of The University of Alabama at Birmingham, in partial fulfillment of the requirements for the degree of Doctor of Philosophy

BIRMINGHAM, ALABAMA
2014
RELATIONSHIPS AMONG HEART FAILURE-RELATED PHYSICAL SYMPTOMS, SOCIAL SUPPORT, SOCIAL PROBLEM-SOLVING, DEPRESSIVE SYMPTOMATOLOGY, AND SELF-CARE BEHAVIORS IN INDIVIDUALS LIVING WITH HEART FAILURE

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ABSTRACT

Introduction: Heart failure (HF) is a chronic condition that progressively worsens over time. The condition is more common in individuals over the age of 65 and commonly causes dyspnea, fatigue, orthopnea, nocturnal dyspnea, edema, and activity intolerance. Prior studies suggest a relationship between HF-related physical symptoms and depressive symptomatology in individuals living with HF. Depressive symptomatology in individuals with HF are linked with a higher mortality rate, decreased quality of life, decreased functional status, and disturbed sleep. Additionally, HF-related physical symptoms impact self-care in individuals living with HF. Previous studies have found that symptom severity and the associated decrease in functional status negatively influence self-care among individuals with HF. Prior research has suggested that social support and social problem-solving may impact the relationship between HF-related physical symptoms and depressive symptomatology, yet research to date has failed to determine the nature of this relationship. Likewise, social support and social problem-solving may also influence the relationship between HF-related physical symptoms and self-care behaviors; however, previous findings are neither consistent nor conclusive.

Article Synthesis: Three published articles (Graven & Grant, 2013a, 2013b, 2014) are provided in this dissertation to describe background information on HF, as well as to illustrate and synthesize current empirical data related to the relationships among the
physical symptoms of HF, social support, coping (i.e., component of social problem-solving), depressive symptomatology, and self-care behaviors in individuals with HF. A fourth article, prepared for journal submission, reports pilot findings related to the relationships among HF symptoms, social support, social problem-solving, and depressive symptoms, as well as information regarding the reliability of study instruments. The final article, also prepared for journal submission, provides findings from the investigator’s dissertation study ($N = 201$) that examined relationships among the physical symptoms of HF, social support, social problem-solving, depressive symptoms, and self-care behaviors using structural equation modeling. Findings from this descriptive, correlational study contribute to the body of science related to HF and can potentially be used to develop interventions that promote coping, thus impacting psychological well-being and self-care in individuals with HF.

Keywords: heart failure, social support, coping, problem-solving, depression, self-care
DEDICATION

I dedicate this dissertation to my husband, James, for his unwavering love, support and encouragement and to my children, Donovan and Kimbrel, for always making me smile and realize that life is good. I hope that I have inspired you both to reach for the stars.
ACKNOWLEDGEMENTS

I would like to extend my deepest gratitude to my dissertation committee, Dr. David Vance, Dr. Erica Pryor, Dr. Laurie Grubbs, and Dr. Sally Karioth for sharing their expertise and guidance with me throughout the dissertation process. I would also like to extend a special thank you to Dr. Joan Grant, my Committee Chair, for always encouraging me and supporting my research interests. Her mentorship has helped me grow professionally and her expertise in manuscript development has been instrumental in my success as a student.

I would also like to acknowledge my family for providing me the opportunity to earn my PhD. To my husband, James, I appreciate your willingness to take over the “Mommy” duties while I spent time working on my research. To my children, Donovan and Kimbrel, I appreciate your willingness to share your Mommy with “college.” I can never repay the debt that you so lovingly paid to see me achieve my goal of earning a PhD. I love you today, tomorrow, and forever.

I would also like to thank my parents for providing emotional and financial support, as well as assisting with childcare when needed. To my Dad, I thank you for encouraging me to pursue this dream and for buying all of my books. A special thanks to my Mom, for proof reading papers and allowing me to cry when things got tough. I hope that I will be as good a parent as you both have been to me.

Lastly, I would like to acknowledge my colleagues at Florida State University for continual support. I appreciate all you have done to assist me with achieving this goal.
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INTRODUCTION

The incidence of heart failure continues to rise in the United States. According to the American Heart Association (AHA), approximately 660,000 new cases are diagnosed each year. Currently, there are an estimated 5.8 million individuals living with HF in the United States (AHA, 2013). The effect of this disorder is not only seen in symptomatology, but also in the enormous annual expenditures related to HF treatment. The AHA (2013) reported that the estimated direct and indirect cost of HF treatment each year is approximately 39 billion dollars. Heart failure is one of the most common reasons for hospitalization among individuals 65 and older (AHA, 2013). Medicare data reveal that individuals with HF are at high risk for hospital readmission, especially with the existence of co-morbidities, such as diabetes mellitus, myocardial infarction, peripheral vascular disease, and stroke (Aranda, Johnson, & Conti, 2009). Although hospital readmissions for HF are common, many of the individuals living with HF undergo treatment as outpatients (Liu, 2010). The AHA (2013) reports that there are about 26.8 million individuals living with HF in outpatient settings who make approximately 16 million visits to ambulatory care centers for HF-related issues each year.

Background and Significance

Physical symptoms of HF can have a devastating impact on individuals’ daily activities (Heo, Doering, Widener, & Moser, 2008). Common symptoms such as dyspnea and fatigue can make everyday activities such as walking and climbing stairs difficult
Increased symptoms of HF have been associated with decreases in quality of life, functional status, self-care, and psychosocial functioning (Carels et al., 2004; Heo et al.; Heo et al.; Riegel & Carlson, 2002; Song, Moser, & Lennie, 2009). In the latter case, evidence suggests that it is common for individuals with HF to experience depressive symptomatology (Dekker, Peden, Lennie, Schooler, & Moser, 2009; Gottlieb et al., 2004; Song et al.). Prior research has estimated that as many as 50 percent of those with HF experience some degree of depressive symptoms (Gottlieb et al.). Depressive symptoms are shown in this population to have a devastating impact on patient outcomes, such as influencing sleep quantity and quality, mortality, self-care behaviors, and quality of life (Dekker et al.; Friedmann, Thomas, Liu, Morton, Chapa, & Gottlieb, 2006; Heo et al., 2008; Jiang et al., 2001; Parker & Dunbar, 2002).

Similarly, HF-related symptoms have been shown to impact self-care behaviors in individuals with HF (Carlson et al., 2001; Riegel & Carlson, 2002; Riegel et al., 2009). Empirical evidence indicates that greater symptom severity and subsequent activity intolerance impacts functional ability, thereby adversely affecting one’s ability to perform and maintain adequate self-care behaviors (Carlson et al.; Moser, Doering, & Chung, 2005; Riegel & Carlson; Riegel et al.) Yet, good HF self-care is vital in preventing morbidity and mortality in this population and involves specific HF-related activities aimed at decreasing and controlling symptoms of HF, such as daily weights, fluid restriction, dietary restrictions, and symptom assessment and management (Riegel et al.).

One’s ability to cope with HF symptoms may play an important role in maintaining optimal psychological and physical well-being. Social support and social
problem-solving are coping resources (Lazarus & Folkman, 1984) that may influence how individuals with HF adapt to increased HF symptoms. Social support is a broad concept with multiple components, including emotional, instrumental, informational, and appraisal support and is commonly provided by one’s social network (i.e., available support system) (Langford, Bowsher, Maloney, & Lillis, 1997). Social problem-solving, on the other hand, involves a series of cognitive-behavioral processes that individuals undergo to make decisions or solve problems in everyday life (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). While the majority of research involving those with HF has examined the influence of social support and coping strategies on depressive symptoms and self-care behaviors (Graven & Grant, 2013a, 2013b, 2014), more attention to social problem-solving is needed.

While prior research has demonstrated a relationship between the presence of social support and the impact of physical symptoms in many populations (e.g., human immunodeficiency virus/acquired immune deficiency syndrome [HIV/AIDS], chronic obstructive pulmonary disease, and myocardial infarction; Ashton et al., 2005; Lee, Graydon, & Ross, 1991; Pedersen, Van Domburg, & Larsen, 2004), research is limited with regards to those with HF. Although prior studies suggest that potential benefits of social support include assistance with symptom assessment and management (Friedman & Quinn, 2008; Riegel & Carlson, 2002; Riegel et al., 2009), previous research is sparse regarding the impact of HF symptom severity on the availability and utilization of social support.

Additionally, no published studies have investigated the relationship between social problem-solving and symptoms of HF. However, in other chronic illness
populations, such as diabetes mellitus and HIV/AIDS (Ashton et al., 2005; Hunt, Wilder, Steele, Grant, Pryor, & Moneyham, 2012; Prachakul, Grant, & Keltner, 2007), social problem-solving has influenced how individuals cope with illness-related symptoms, thereby improving self-care and quality of life. While empirical studies have focused on specific coping related strategies that individuals with HF may use to adapt to or manage HF symptoms (Kristofferzon, Lindqvist, & Nilsson, 2010; Trivedi et al., 2009; Vollman, LaMontagne, & Hepworth, 2007), little is known regarding which coping style (i.e., adaptive vs. maladaptive) is commonly used as symptoms of HF increase in severity.

Several studies support the importance of social support in lessening depressive symptomatology in individuals with HF (Dekker et al., 2009; Graven & Grant, 2013a; Park, Fenster, Suresh, & Bliss, 2006; Vollman et al., 2007). Findings suggest that social support is a resource that facilitates coping when those with HF are confronted with disease-related challenges, such as maintaining dietary and treatment regimens and functional impairment (Dekker et al.; Murberg, Bru, & Stephens, 2002; Thornhill, Lyons, Nouwen, & Lip, 2008; Trivedi et al. 2009; Vollman et al.). However, findings among studies are inconsistent, suggesting that social support may not affect depressive symptoms in those with HF (Klein, Turvey, & Pies, 2007; Koenig, 2006).

Social problem-solving may also influence depressive symptomatology in those with HF; however, researchers have yet to investigate this relationship. Yet, empirical data suggests a relationship between maladaptive problem-solving style and increases in depressive symptoms in other chronic illnesses, such as HIV/AIDS (Prachakul et al., 2007). Furthermore, current HF research indicates that certain coping strategies (e.g., behavioral and mental disengagement, and denial) increased depressive symptoms
(Paukert, LeMaire, & Cully, 2009; Trivedi et al., 2009), while other coping strategies (e.g., planful problem-solving and seeking social support) decreased depressive symptoms (Trivedi et al; Vollman et al., 2007). While it appears that certain problem-solving efforts are likely to reduce or minimize depressive symptoms in those with HF, the influence of social problem-solving (i.e., problem-solving style [adaptive versus maladaptive]) has yet to be examined. Additionally, research suggests that maladaptive problem-solving may actually be a consequence of depressive symptomatology (Nezu, Wilkins, & Nezu, 2004); thus, more research is needed in this area.

The importance of social support, particularly family, in assisting with maintenance of self-care behaviors in individuals with HF is well documented. Family support has been found to influence self-care behaviors by assisting with symptom recognition and management (Dunbar, Clark, Quinn, Gary, & Kaslow, 2008; Friedman & Quinn, 2008; Quinn, Dunbar, & Higgins, 2010; Riegel & Carlson, 2002; Riegel et al., 2009), as well as by participating in the decision to seek treatment for HF symptoms (Friedman & Quinn, 2008). Likewise, individual peer support, through a trained mentor, has also shown promise in positively influencing self-care behaviors in individuals with HF (Riegel & Carlson, 2004). Nonetheless, other studies have failed to identify a relationship between social support and self-care behaviors (Chriss, Sheposh, Carlson, & Riegel, 2004; Heo, Moser, Lennie, Riegel, & Chung, 2008).

Empirical evidence suggests that problem-solving with family members and physicians influence symptom management and treatment seeking behaviors prior to hospital admission (Friedman & Quinn, 2008; Riegel, Dickson, Kuhn, Page, & Worrall-Carter, 2010). However, previous studies have not investigated which social problem-
solving style (i.e., adaptive versus maladaptive) is more beneficial in maintaining self-care behaviors in this population with HF. In those with diabetes mellitus, adaptive or constructive problem-solving style significantly influenced self-care management (Hunt et al., 2012); therefore, a similar association may exist in those with HF.

Cognitive appraisal of stressful situational demands has been indirectly associated with the response to those demands through social support and social problem-solving in other populations (D’Zurilla et al., 2004). Therefore, an indirect effect may also occur between HF-related physical symptoms, depressive symptomatology and self-care behaviors through social support and social problem-solving in individuals living with HF. Yet, researchers previously have not examined whether relationships between HF-related physical symptoms, depressive symptomatology, and self-care behaviors are indirectly affected by social support and social problem-solving. Determining the nature of these relationships can assist in the development of interventions and aid in patient-family education to reduce the incidence of depressive symptomatology and improve self-care behaviors in this population.

Guided by concepts from the theory of stress and coping (Lazarus & Folkman, 1984), this study will investigate the direct and indirect relationships among HF-related physical symptoms, social support, social problem-solving, depressive symptoms, and self-care behaviors in individuals with HF. In this study, HF-related physical symptoms are stressors that influence depressive symptomatology and self-care behaviors in those with HF (Figure 1). Individual antecedents (i.e., race, gender, age, income, and educational level) influence stressors (i.e. HF-related physical symptoms), as well as social support and social problem-solving. While both direct and indirect effects will be
examined, the framework for this study indicates that an indirect relationship between HF-related physical symptoms, depressive symptomatology, and self-care behaviors through social support and social problem-solving should exist.

Factors that Influence Study Variables

Antecedent variables, otherwise known as covariates, including race, gender, age, income and educational level were evaluated for their effect on the study variables. Findings from prior research that indicated variability among study participants based upon these factors led to the selection of these antecedents. Empirical research supports the presence of antecedents that affect depressive symptomatology, self-care behaviors, and social support in this population.

Depressive symptomatology has been shown to vary according to race, gender, and age, with females, whites, and younger individuals experiencing more depressive symptoms (Gottlieb et al., 2004). Likewise, depressive symptomatology has also been linked with decreased financial stability in this population (Dekker et al., 2009; Heo et al., 2009). Self-care behaviors are also impacted by antecedents, with previous research suggesting that men are better at interpreting and responding to HF symptoms (Riegel et al., 2010). Educational level also appears to influence self-care behaviors, specifically disease self-management (Hill-Briggs, Gary, Yeh, Batts-Turner, Powe, Saudek, & Brancati, 2006). Lastly, differences in gender may impact social support (Riegel et al.).
Article Synthesis

The first published article included in this dissertation titled, *The Impact of Social Support on Depressive Symptoms in Individuals with Heart Failure: Update and Review* (Graven & Grant, 2013a) provides a review of empirical data related to the influence of social support on depressive symptomatology in individuals with HF. Findings of this integrative review suggest that the availability and increased perception of social support
appears to positively influence depressive symptoms in those with HF. However, little is known regarding which type of support is more beneficial in reducing depressive symptoms in those with HF.

The second published article titled, *Coping and Health-Related Quality of Life in Individuals with Heart Failure: An Integrative Review* (Graven & Grant, 2013b) offers a synthesis of current knowledge related to emotion and problem-focused coping strategies and their effect on psychological and physical health-related quality of life in individuals with HF. While findings of this review indicate that emotion-focused coping strategies are negatively related to the physical and psychological domains of health-related quality of life, use of problem-focused coping strategies are positively related to these domains. However, no studies were found that investigated social problem-solving (i.e., problem-solving style) as a coping strategy. Therefore, in order to develop interventions aimed at enhancing health-related quality of life and improving one’s problem-solving style, more research is needed to examine whether a specific problem-solving style influences these domains.

*Social Support and Self-care Behaviors in Individuals with HF: An Integrative Review* (Graven & Grant, 2014), the third published article, provides a review of current empirical research related to the influence of social support specifically on HF self-care behaviors. This review revealed that four types of social support (emotional, instrumental, informational, and appraisal) are involved in the interactive process between an individual’s social network and the individual to enhance and maintain good self-care behaviors. However, research is sparse regarding which type of support is more beneficial. Similarly, although this review revealed that problem-solving is an important
component of appraisal support, no studies have investigated which type of problem-solving style is more beneficial in influencing self-care behaviors in those with HF.

Two articles, a pilot and a larger study, are also included in this dissertation. The first of these two articles titled, Relationships among Heart Failure Symptoms, Social Support, Social Problem-Solving, and Depressive Symptoms in Individuals Living with Heart Failure: A Pilot Study (Graven, Grant, Vance, Pryor, Grubbs, & Karioth, to be submitted a) provides a discussion of pilot study findings, including the consistency and reliability of the study instruments. Findings of this pilot study indicate that HF symptoms are positively related to depressive symptoms and maladaptive problem-solving, while depressive symptoms are negatively related to social support and social network. Results also indicated that depressive symptomatology was positively related to maladaptive problem-solving, yet negatively related to adaptive problem-solving. Also important to intervention development, and not examined in this study, is knowledge of any indirect relationships that may exist among study variables. Thus, more research is warranted.

The last article titled, Relationships among Heart Failure-Related Physical Symptoms, Social Support, Social Problem-Solving, Depressive Symptomatology, and Self-care Behaviors in Individuals Living with Heart Failure (Graven, Grant, Vance, Pryor, Grubbs, & Karioth, to be submitted b) describes findings from the investigator’s larger study that examined the direct and indirect relationships among physical symptoms of HF, social support, social problem-solving, depressive symptoms, and self-care behaviors, using structural equation modeling. Findings of this study suggest that increased HF symptoms were directly related to more depressive symptomatology and
worse self-care behaviors, with social support mediating this relationship. Increased symptoms of HF were also directly related to less social support and decreased social support was directly related to more depressive symptoms. Similarly, increased levels of support and an adaptive problem-solving style were directly related to better self-care behaviors. However, no indirect path involving social problem-solving was noted among the study variables. Although this study provided new information related to the influence of social problem-solving on self-care behaviors, it might be beneficial to investigate whether subcomponents of social problem-solving (i.e., adaptive versus maladaptive problem-solving) influence depressive symptoms, as this has been noted in other populations (Prachakul et al., 2007). In addition, examining which type of social support is more helpful in decreasing depressive symptoms and improving self-care behaviors also needs to be investigated to aid intervention development.
THE IMPACT OF SOCIAL SUPPORT ON DEPRESSIVE SYMPTOMS IN INDIVIDUALS WITH HEART FAILURE: UPDATE AND REVIEW

by

LUCINDA J. GRAVEN AND JOAN GRANT

Journal of Cardiovascular Nursing, 28(5), 429-443.
doi: 10.1097/JCN.0b013e3182578b9d

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Format adapted [and errata corrected] for dissertation
Abstract

**Background:** Approximately 50% of individuals living with heart failure (HF) experience depressive symptoms. Social support has been found to have a positive influence on depressive symptoms in individuals with HF.

**Objective:** The purpose of this review was to (1) examine recent literature regarding the impact of social support on depressive symptoms in individuals with HF, (2) synthesize findings across those studies, (3) assess potential areas of future research regarding social support, and (4) identify implications for nursing practice.

**Methods:** An integrative review of current empirical literature was conducted through a search of CINAHL and PsycARTICLES computerized databases for the period of January 2000 to December 2010. The keywords for the search were heart failure, social support, coping, depressive symptoms, and depression.

**Results:** Fifteen studies matched inclusion criteria. Eleven of these studies found social support to prevent or reduce depressive symptoms. Emotional and tangible support as coping resources or strategies, the perceived availability of or satisfaction with support, and assistance with problem-solving positively influenced depressive symptoms. Perceived emotional and tangible support and the presence and availability of social networks lessened depression in patients with HF. Findings from four studies on the impact of social support were not statistically significant. Different definitions of social support and a variety of measurement instruments utilized made it difficult to generalize study findings.
Conclusions: Social support appears to positively impact and influence the psychological well-being of those with HF. Additional research is needed to identify specific characteristics of support that is effective in influencing depressive symptoms in this population. Further, more research is needed regarding how factors such as ethnicity influence depressive symptoms and depression.

Keywords: coping skills, depression, heart failure, social support
Heart failure (HF) is quickly becoming an epidemic in the United States. According to the American Heart Association (AHA), approximately 660,000 new cases are diagnosed each year. Currently, there is an estimated 5.8 million individuals living with HF in the United States. Individuals with HF endure progressive symptoms that include dyspnea, fatigue, orthopnea, decreased urinary output, edema, and activity intolerance. Therefore, treatment of HF is complex and includes multi-drug therapy, lifestyle modifications, fluid intake restriction, and daily weight monitoring. The complexity of this treatment is often overwhelming for individuals with HF.

The complexity of HF-related treatment, decreases in physical functioning, and social isolation contribute to the development of depressive symptoms in HF. Previous research indicates that approximately 50% of individuals living with HF experience some degree of depressive symptoms. Furthermore, depressive symptoms negatively influence a number of outcomes in individuals with HF, including quality of life, mortality, physical functioning, and sleep quality and quantity.

Social support positively impacts coping behaviors and influences overall psychological well-being and quality of life. Although theoretical and empirical literature suggests a relationship between social support and depressive symptoms in individuals with HF, components or types of social support that are most beneficial are unclear. Furthermore, previous research that evaluated and synthesized empirical literature regarding social support and depressive symptoms are limited to a few studies. This study will build upon the previous body of knowledge by evaluating and
synthesizing research findings within the last ten years. Therefore, the purposes of this study were to (1) examine recent literature regarding the impact of social support on depressive symptoms in individuals with HF, (2) synthesize findings across those studies, (3) assess potential areas of future research regarding social support, and (4) identify implications for nursing practice.

**Definitions and Related Terms**

**Social Support**

The concept of social support is widely studied and there are various definitions of social support.\textsuperscript{18-20} For example, Cobb\textsuperscript{21(p300)} stated that social support is “information leading the subject to believe that he is cared for and loved, esteemed, and a member of a network of mutual obligations.” Heo, Moser, Chung, and Lennie\textsuperscript{22} described social support as individuals’ subjective perceptions about help from significant others or social relationships. Whereas Koenig\textsuperscript{23} defined social support as a potential coping resource that provides a buffer against potential stressors associated with chronic illnesses, Shumaker and Brownell\textsuperscript{24} defined social support as an exchange of support between two or more people, with a goal of enhancing the well-being of the recipient.

Langford et al.\textsuperscript{20} describes four types of support, including (1) emotional support, which refers to the provision of caring, empathy, love and trust; (2) instrumental support, which supplies tangible goods and services; (3) informational support, which gives information in order to problem-solve during a time of stress; and (4) appraisal support, which refers to the communication of information relevant to self-evaluation and includes
expressions of affirmation by others. Social support is most commonly provided through an interactive process between individuals and other persons known as social networks. For social support to be effective, individuals must have a certain degree of social embeddedness, or connectedness with those within their social network. In addition, their social climate must foster helpfulness and protection.

Support can be described as actual or perceived. Actual support is commonly provided by an individual’s social network and refers to the concrete provision of emotional, tangible, appraisal, and informational support. Perceived support, however, refers to the individual’s assessment of the availability and quality of support. Both actual and perceived support provides emotional support that impacts the severity of psychological stress.

**Depression and Depressive Symptoms**

The concepts of depression and depressive symptoms have been studied in HF research. However, the concepts are different. Depressive symptoms include subjective feelings such as guilt, hopelessness, low self-esteem, and low energy, in addition to depressed mood, sleep disturbances, fatigue, appetite change, and an inability to concentrate. Smith includes affective irritability, such as emotional instability, anger, and hypersensitivity as depressive symptoms.

In contrast, Beck describes depression as a specific alteration in mood that is associated with self-reproach and self-blame, regressive and self-punitive wishes, vegetative changes, and changes in activity level. However, Smith describes depression by including anxiety, chronic worrying, and hypochondriac problems, in addition to the
aforementioned definitions of depressive symptoms. Although individuals may have significant depressive symptoms without having a clinical diagnosis of depression, individuals who are depressed typically will have somatic symptoms.

Depressive symptoms are commonly assessed by self-report. In contrast, the majority of self-report instruments for depression are primarily meant to be used as screening tools by trained clinicians or therapists who are qualified to diagnose depression. Depression, on the other hand, is diagnosed via a structured clinician-guided diagnostic interview using self-report instruments, in addition to objectifying these subjective symptoms against a priori stated criteria, such as the Diagnostic and Statistical Manual for Mental Disorders coding. In addition, the evaluation of depressive symptoms and depression may be difficult because some symptoms of HF overlap with these psychological symptoms, such as fatigue and sleep disturbances. Therefore, in this integrative review, the term depressive symptoms is used unless referring to studies that specifically stated they were examining depression or that focused on individuals who are diagnosed by a trained clinician as experiencing depression.

Anxiety is a closely related concept to depression and depressive symptoms. Anxiety commonly co-exists with depression and can negatively affect psychological and physiological health. Patients who are depressed tend to be anxious and patients who are anxious tend to be depressed. Both anxiety and depression impact psychological coping and affect patient outcomes. Other related, but different terms to depressive symptoms and depression include cognitive slowing, somatic complaints, altered executive functioning, pessimism, and disrupted social connections.
Methods

A computerized search of the literature on the impact of social support on depressive symptoms in individuals with HF was conducted utilizing CINAHL and PsycARTICLES databases. Key words used in the searches included heart failure, social support, and coping. These keywords were combined with depression and depressive symptoms. In an effort to build upon previous work by Luttik\textsuperscript{17} and to obtain the most recent research on the topic, the search was limited to publications within the last ten years (January 2000 – December 2010). Reference lists from current and previous literature reviews and empirical studies were also investigated to identify any relevant articles not identified during the computerized search. Only those studies that met the following criteria were included in the review: (1) the study was published in English; (2) the study investigated both social support and either depressive symptoms or depression in HF patients and (3) the articles were published between January 2000 and December 2010.

The review included both qualitative and quantitative studies and was not restricted by study design. Articles that investigated patient-caregiver dyads were excluded from this review. Studies were initially reviewed and coded by one reviewer. A second reviewer independently reviewed and analyzed these articles, comparing their findings to that of the first reviewer. Areas of disagreement were discussed between both reviewers until consensus was reached.
Results

The following results represent data from 15 articles that met inclusion criteria (See Table 1). Of the 15 included articles, 11 found significant evidence that social support positively impacted either depressive symptoms or depression in HF patients. Of those 11 studies with significant findings, four investigated the impact of social support on depression and seven examined the effect of social support on depressive symptoms. Four of the 15 studies had non-significant findings, with two examining the influence of social support on depression and two investigating the impact of social support on depressive symptoms. Although the majority of studies utilized a cross-sectional, correlational design, this review did find three longitudinal studies investigating the effect of social support on depressive symptoms over time. Additionally, two qualitative studies were also included. The 15 studies included in this review measured a variety of different variables in addition to social support and depressive symptoms, such as disease severity, functional status, coping, quality of life, and anxiety. However, this review focused solely on investigating the impact of social support on depressive symptoms in individuals with HF.

Studies included in this review fell within three themes. Five studies focused on the use of social support as a resource or strategy to facilitate coping with the physiological and psychological effects of HF. Eight studies examined the impact of actual and/or perceived support on the development of depressive symptoms. Two of the included studies investigated factors that influenced depressive symptoms/depression, specifically ethnicity.
Social Support as a Resource to Facilitate Coping

Five studies included in this review focused on the utilization of social support as a coping resource in individuals with HF. Three of the studies found a clear relationship between the use of social support as a coping resource and the decrease in the development of depressive symptoms,\textsuperscript{15, 36-37} whereas, two studies investigating this coping strategy found no evidence that the use of social support, as a coping resource, influences depressive symptoms.\textsuperscript{23, 38}

In a study by Murberg, Bru, and Stephens,\textsuperscript{36} the use of emotional and instrumental support as a means of coping was examined in a convenience sample of 119 outpatients with HF. In this longitudinal, correlational study, self-report surveys were completed by participants at baseline and then two years later. Findings suggested that the use of emotional support as a coping mechanism was associated with depressive symptoms ($r = .20; p < 0.01$), indicating that the use of social support as a coping mechanism may prevent depressive symptoms.\textsuperscript{36}

Vollman et al.\textsuperscript{15} also utilized a convenience sample of 75 outpatients with HF in a descriptive-correlational study that examined how coping strategies such as seeking social support were related to depressive symptoms. Results indicated that those individuals who sought social support, as a problem-focused coping strategy, had less depressive symptoms ($r = -0.23, p = .04$). In addition, less use of problem-focused coping strategies, such as seeking social support, was found to be a predictor of depressive symptoms ($\beta = -.28; p < .01$).\textsuperscript{15}

Trivedi et al.\textsuperscript{37} also investigated the use of social support as a coping strategy to determine if support influenced depressive symptoms. This prospective, cross-sectional
study focused on identifying the impact of individual’s perceived emotional, structural, and instrumental supports on depressive symptoms. Similar to previous studies,\textsuperscript{15,36} Trivedi et al.\textsuperscript{37} examined a convenience sample of 222 outpatients with HF. Findings of this study also suggested that emotional support may be a useful resource for coping with depressive symptoms. Researchers found that less use of emotional support as a coping strategy was associated with an increase in depression scores ($\beta = -.14; p < .05$). In addition, results indicated that lower levels of perceived social support were associated with higher depressive symptoms ($F = 11.82; p < 0.001$).\textsuperscript{37}

Klein, Turvey, and Pies\textsuperscript{38} also conducted a cross-sectional, correlational study to determine the impact of social support as a coping resource on depressive symptoms. Self-report surveys were used to evaluate the impact of emotional and instrumental support on depressive symptoms in a convenience sample of 80 older adult outpatients with HF. In contrast to studies by Murberg et al.\textsuperscript{36}, Vollman et al.\textsuperscript{15} and Trivedi et al.,\textsuperscript{37} this study did not find the use of emotional and instrumental support as a coping strategy to significantly influence depressive symptoms.\textsuperscript{38}

Koenig et al.\textsuperscript{23} however, conducted a cross-sectional, correlational study to determine if the social support of hospitalized patients with and without heart failure and pulmonary disease influenced the degree of depression that the individual experienced. In contrast to previous studies,\textsuperscript{15,36-38} Koenig\textsuperscript{23} utilized a convenience sample of inpatients with either minor or major depression. Findings showed no significant difference in social support between the two groups in either those patients with minor or major depression.\textsuperscript{23}
Actual and Perceived Social Support

Eight studies examined in this review investigated the impact of actual and/or perceived social support on depressive symptoms. Four studies investigated both actual and perceived support;7-8, 14, 35 three studies focused only on perceived support;10, 39-40 and one study only examined actual support.4 Findings from six of these studies indicated that actual and perceived social support does influence depressive symptoms in individuals with HF;4, 8, 10, 14, 35, 40 whereas two studies revealed no significant relationship between these variables.7, 39

In a study by Yu, Lee, Woo, and Thompson,35 correlates of psychological distress in a convenience sample of 227 hospitalized elderly HF patients were examined. Findings showed that five constructs of perceived social support were related to the development of distress (i.e., anxiety and depression), including tangible support \( r = -0.34, p < 0.001 \), affectionate support \( r = -0.47, p < 0.001 \), positive social interaction \( r = -0.49, p < 0.001 \), emotional-informational support \( r = -0.48, p < 0.001 \). The size of the social network \( r = -0.43, p < 0.001 \) was also significant, suggesting that multiple components of social support should be considered important factors in the development of anxiety and depression, as components of distress.35

The impact of social support and social conflict on depression was investigated by Carels8 using a cross-sectional, correlational design. A convenience sample of outpatients (n = 58) with HF underwent a two-week monitoring period during which time they completed self-report surveys and a quality of life diary. Findings showed greater depression was related to greater social conflict \( t = 3.68, p \leq 0.01 \) and less perceived
social support \((t = 1.95, \ p \leq 0.05)\). These findings are consistent with those of Yu et al.,\(^{35}\) in which perceived social support was associated with the development of depression.

In a longitudinal, prospective, correlational study by Havranek et al.\(^4\) living status was investigated to determine whether it was associated with the development of depressive symptoms in a convenience sample comprised of 245 outpatients with HF. Participants were included if they did not have significant depressive symptoms at baseline, as defined by a score of lower than 0.06 on the Medical Outcomes Study-Depression Questionnaire.\(^{41}\) Standardized history and self-report questionnaires were completed at baseline and again one-year later. At the one-year follow-up, 52 (21.2\%) individuals had developed depressive symptoms. Those individuals who developed depressive symptoms were almost twice as likely to live alone (40.4\% vs. 22.9\%, \(p = 0.015\)). In addition, chi-square analysis revealed that living status was a significant predictor of depression at one year \((x^2 = 6.75; p < 0.05)\). Therefore, living status, as a means of support, influenced the development of depressive symptoms.\(^4\)

In a study by Park et al.\(^{14}\) satisfaction with social support as a predictor of depression was investigated using a prospective, correlational, longitudinal design. A convenience sample was used to evaluate participant’s availability of and satisfaction with social support at both entry into the study and again six months later. Findings showed that depression at six months was negatively related to satisfaction with social support \((r = -0.28, p < 0.01)\) and the number of social supports \((r = -0.25, p < 0.01)\). Satisfaction with social support prospectively predicted residual depression 6 months after enrollment, controlling for baseline depression \((r = -0.28; p < .001)\). These findings indicate that satisfaction with social support is an important predictor of depression.\(^{14}\)
The importance of family and friends, as a means of social support, was demonstrated in qualitative studies by Thornhill et al.\textsuperscript{40} and Dekker et al.\textsuperscript{10} Thornhill et al.\textsuperscript{40} conducted one-time semi-structured interviews with a purposive sample of hospitalized and non-hospitalized patients (n = 25) to examine the experience of living with heart failure. One of the main themes that emerged during analysis was the importance of the role of others in dealing with their HF. Participants described their reliance on family members for tangible and emotional support in dealing with the everyday challenges associated with HF.\textsuperscript{40}

In a similar study by Dekker et al.\textsuperscript{10}, a purposive sample consisting of ten outpatients with HF participated in semi-structured interviews following six weeks of both biofeedback training and cognitive therapy or six weeks of attention placebo, which included relaxation exercises. However, in this study, all participants had a history of past or current depression or were currently experiencing depression, as defined by a score of 14 or higher on the Beck Depression Inventory-II\textsuperscript{42} at enrollment. The use of social support as a strategy for managing depressive symptoms was one theme that emerged during data analysis. All participants reported that the provision of emotional, physical, and financial support provided by family and friends was vital in decreasing their depressive symptoms.\textsuperscript{10}

In contrast, Westlake et al.\textsuperscript{7} conducted a descriptive, correlational, cross-sectional study to identify correlates of depression and to examine the differences between those with minimal versus mild to severe depression using a convenience sample of 200 outpatients with HF. Although individuals with mild to severe depression had lower
levels of social support (78.81 vs. 80.30) and less social network (9.12 vs. 11.53) than those with minimal depression, these findings were not significant. \(^7\)

Using a cross-sectional, correlational design, Paukert, LeMaire, and Cully\(^{39}\) also examined living status as a predictor of depressive symptoms in a convenience sample of older veterans (\(n = 104\)) with HF. Potential participants were screened for depression and anxiety so that the sample would contain an equal number of participants with and without depressive symptoms. A total of 48 depressed and 56 non-depressed participants were included in the study. Investigators examined several possible predictors, including living status and perceived social support. In contrast to Havranek et al.,\(^4\) living status (\(\chi^2 = 2.30, p = 0.51\)) did not significantly differ between the depressed and non-depressed groups. In addition, correlational analyses did not reveal significant relationships between perceived social support and the development of depressive symptoms in this sample.\(^{39}\)

**Factors Influencing Depressive Symptoms/Depression**

Two studies examined ethnicity as a factor influencing psychological distress (anxiety and depression), one with significant findings\(^{43}\) and one with non-significant findings.\(^{34}\) The availability of someone to confide in was investigated by Evangelista et al.\(^{43}\) to examine whether this facet of social support would influence depression in individuals with HF. This cross-sectional, correlational study specifically examined ethnic minorities using a convenience sample of Non-Hispanic Blacks (\(n = 18\)), Hispanics (\(n = 55\)), and Non-Hispanics Whites (\(n = 168\)). Results indicated that Hispanics reported lower levels of depression (12.7\%) as compared to Non-Hispanic Blacks (33.3\%) and Non-Hispanic Whites (20.8\%). In addition, findings indicated that higher
perceived social support, as reported by Hispanics, was inversely related to the development of depression ($r = -0.163; p < .05$). Researchers concluded that having someone to confide in influenced coping mechanisms among this ethnic group. Furthermore race/ethnicity, perceived control, and social support contributed to 30% of the variance in anxiety while race/ethnicity, New York Heart Association (NYHA) Class, perceived control, and social support contributed to 41% of the variance in depression.\(^{43}\)

Similarly, Bean et al.\(^ {34}\) used a cross-sectional, correlational study to examine how psychosocial factors (i.e., social support, coping, spiritual wellbeing, and quality of life) were associated with psychological distress (i.e., anxiety and depression) in an ethnically diverse group of HF patients. The convenience sample consisted of African American ($n = 48$), Caucasian ($n = 46$), and Hispanic ($n = 3$) participants. Even though findings suggested that social support was related to depression in both correlational and regression analyses ($r = -0.66; p < .01$), with less social support associated with increased levels of depression, there were no statistically significant ethnic differences found.\(^ {34}\)

**Discussion**

The purpose of this study was to examine the recent literature related to the impact of social support on depressive symptoms in individuals with HF and to synthesis those findings across those studies. This review examined 15 studies that investigated the impact of social support on either depressive symptoms or depression. The ten-year review period allowed for an evaluation of the most recent literature surrounding the relationship between social support and depressive symptoms, in addition to building upon previous work conducted.\(^ {17}\)
Findings from this review indicate that social support may play an important role in the coping process for those with HF. When used as a coping resource, social support may positively influence depressive symptoms in individuals with HF. Both actual support, as well as the individual’s perception of support, may impact depressive symptoms. In addition, certain factors may affect social support, such as ethnicity, and should be considered when caring for individuals with HF. However, these findings must be evaluated within the context of the strengths and weaknesses of each individual study (See Table 1), as well as the overall findings from this review.

**Strengths and Weaknesses**

Studies included in this review used non-random sampling methods (e.g. convenience or purposive).\(^{4,7-8,10-15,23,34-40,43}\) Although this impacts generalizability of findings, it is common for these types of sampling methods to be utilized in health-related research in which a specific patient population is desired. In addition, most samples were limited to a small number of participants\(^{9,10,15,34,36,38-40}\) or failed to represent characteristics commonly found in individuals with HF (e.g. gender, race, age).\(^{7-8,15,35,37-40,43}\) Likewise, many studies had samples comprised of a large percentage of individuals with NYHA Class II HF.\(^{7,8,34-36}\) These individuals with NYHA Class II HF would not typically experience the more severe symptoms associated with HF, and therefore, may not experience as many depressive symptoms as compared to individuals with NYHA Class III or IV HF. These factors greatly limit the ability to draw conclusions and affect the ability to apply findings to characteristics typical of individuals with HF (See Table 1).
All but one\textsuperscript{23} of the studies included in this review utilized valid and reliable instruments for measuring depressive symptoms and depression. Four studies\textsuperscript{15,23,36,38} utilized instruments that had inadequate support for validity (e.g., demonstrated in populations other than individuals with HF) and reliability (e.g., inadequate Cronbach alphas) (See Table 1). Reliability coefficients for social support measures were either not reported or inadequate for some subscales in several studies. In addition, two studies\textsuperscript{4,43} used single-item social support measures (e.g., living status and presence of a confidant), and therefore, confidence in the impact of social support on outcomes would have been greater with more items.

Furthermore, the majority of these studies\textsuperscript{7-8,15,23,34-35,37-39,43} used cross-sectional, correlational designs that measured data at one time point. In dealing with depressive signs and symptoms that frequently change, longitudinal data that collects information over time with multiple measures to identify trends is valuable. Only three studies\textsuperscript{4,14,36} were longitudinal and two\textsuperscript{10,40} were qualitative designs. Additional methodologies that offered more control and compared depressive and non-depressive groups of individuals, such as quasi-experimental and experimental designs, would increase confidence in findings.

Several studies examined the impact of actual and/or perceived support,\textsuperscript{4,7-8,10,14,35,39-40} commonly focusing on emotional and informational support. Although these studies evaluated varying components of social support, various definitions of social support made it difficult to determine their value in improving depressive symptoms and depression. In addition, many of the studies\textsuperscript{8,14-15,23,34-40,43} failed to differentiate between depressive symptoms and depression. Although these studies used well-known measures
of depressive symptoms and depression with established validity and reliability, investigators often used these terms interchangeably or used instruments designed to measure depression to evaluate depressive symptoms. For example, only three tools were designed specifically to measure depressive symptoms; whereas, the remaining measures were designed to measure depression.

**Recommendations**

Considering the potential importance of a relationship between social support and depressive symptoms in individuals with HF, more research is needed to clarify the nature of this relationship. Several recommendations for future research can be made following this review of recent empirical literature regarding the impact of social support on depressive symptoms in individuals with HF.

First, the frequent use of cross-sectional designs indicates there is a need for more research involving longitudinal and qualitative studies in this area. As the severity of HF changes, one would anticipate that the need for social support would also change in addition to its impact on an individual’s psychological functioning. In addition, other areas of social support should be examined, including appraisal and belonging, as well as the impact of social networks. This review indicates that these social support constructs are not heavily researched regarding their impact on depressive symptoms in individuals with HF.

Second, researchers must be vigilant in utilizing valid and reliable instruments for the concept of social support in future studies, as this review found that several studies used inadequate measures for social support. Lastly, only one out of the seven studies.
examine the impact of social support on depression utilized a trained researcher or clinician to diagnose depression in participants versus utilizing a self-report questionnaire. Future research focusing on the impact of social support on depression that uses a trained researcher or clinician to evaluate study participants for depression would strengthen these studies.

Lastly, this review did not include studies that evaluated patient-caregiver dyads, even though evidence supports caregivers are beneficial in providing support. Likewise, evidence shows that caregivers of individuals with HF also experience depressive symptoms. Therefore, future research is needed to evaluate the impact of social support on depressive symptoms in caregivers of individuals with HF, as well.

This review found that social support is an important factor in preventing or reducing depressive symptoms in individuals with HF. However, a clear definition of social support must be established and adequately measured for conclusions to be drawn from the findings. Future studies should strive to utilize established measures for social support that are valid and reliable, as well as use samples that best represent individuals with HF to generalize findings.

In addition, future research should strive to identify from whom the social support is provided and determine the effectiveness of this support throughout the course of illness. Research has shown that individuals’ actual social support or social network can be instrumental in assisting with symptom assessment and management, as well as coping with symptoms. However, only one study included in this review specifically investigated the impact of social networks on depressive symptoms. Likewise, only three longitudinal studies were conducted, even though HF is known to be a progressive
and terminal illness. More research also is warranted regarding how factors such as ethnicity influence depressive symptoms and depression.

Although research concerning the relationship between social support and depressive symptoms/depression is promising, many questions are left unanswered and provide an avenue for future research. Specifically, what attributes of social support are more effective in preventing or decreasing depressive symptoms in individuals with HF? Is the effectiveness of social support consistent with reducing or preventing depressive symptoms over time? Does the effectiveness of social support on depressive symptoms differ according to gender or ethnic groups?

**Conclusion**

Overall, social support has the potential to significantly impact those suffering from HF and influence the psychological well-being of those with HF. Types of social support found to influence depressive symptoms included emotional and tangible support as coping resources or strategies, the perceived availability of or satisfaction with support, and assistance with problem-solving. In contrast to research examining depressive symptoms, types of social support effective in impacting depression included not only perceived emotional and tangible support, but also the presence and availability of a social network. More research needs to be completed in this area to adequately assess the impact of social support on depressive symptoms/depression and determine generalizability of those findings, as well as develop interventions related to social support for individuals with HF.
References


Clinical Pearls

- Nurses should assess social support in individuals with heart failure.
- Emotional and tangible support, the perceived availability of or satisfaction with support, as well as assistance with problem-solving lessen depressive symptoms.
- Perceived emotional and tangible support and the availability of a social network appear to lessen depression.
Table 1: Empirical Investigation of Social Support and Depressive Symptoms

<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Study Purpose and Definitions</th>
<th>Study Methods</th>
<th>Results and Implications</th>
<th>Strengths and Weaknesses</th>
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<tbody>
<tr>
<td>Murberg et al.</td>
<td>Purpose: To determine if coping styles were reflections of personality</td>
<td>Population: Outpatients with symptomatic HF (N = 119, mean age 66.0 years [SD = 9.1]; 34 females, 85 males)</td>
<td>Results: Emotional support was related to the development of depressive symptoms (r = .20; p &lt; 0.01).</td>
<td>Strengths: 1) 2 year longitudinal design</td>
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<td></td>
<td>Definitions: Coping styles are actions to manage stressful situations.</td>
<td>Sampling Method: Non-random, convenience sample; generalizability primarily to older outpatients with NYHA Classification II HF</td>
<td>Implications: Coping skills such as emotional support may play an important role in lessening depressive symptoms</td>
<td>Weaknesses: 1) COPE validated with students, with some low reliability coefficients; 2) sample mostly older individuals, not representing younger patients; 3) small sample size, primarily NYHA Classification II HF.</td>
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<tr>
<td></td>
<td>Social Support (inferred definition): coping style/strategy used to manage stressful situations</td>
<td>Design: Longitudinal, correlational design</td>
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<td></td>
<td>Depressive Symptoms – a measure of psychological functioning</td>
<td>Measures: Social Support – COPE Inventory (includes emotional and instrumental support)</td>
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<td>Depressive Symptoms: Zung Self-rating Depression Scale</td>
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<td></td>
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<td>Also measured: Personality and coping</td>
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<td>Vollman et al.</td>
<td>Purpose: To examine how coping strategies are related to depressive symptoms.</td>
<td>Population: Outpatients with HF (N = 75, mean age 54.6 years)</td>
<td>Results: Individuals who sought social support had less depressive symptoms (r = -0.23; p = 0.04)</td>
<td>Strengths: 1) excellent Cronbach’s alpha coefficient for BDI (.86); 2) all classes of HF (mostly NYHA Class II and III)</td>
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<td></td>
<td>Definitions: Social Support (inferred definition) – coping strategy in managing daily stressors associated with HF</td>
<td>Sampling Method: Non-random, convenience sample; generalizability to married, male Caucasians, primarily NYHA Classification II and III HF</td>
<td>Implications: Encourage patients to utilize social support in managing their chronic disease</td>
<td>Weaknesses: 1) small sample, primarily married, male Caucasians; 2) low Cronbach’s alpha coefficients for some WCQ subscales (.55); 3) cross-sectional design limits causal inferences; 4) recruitment from single health center limits generalizability; 5) symptom severity is</td>
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<tr>
<td>Author/Year</td>
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<td>Trivedi et al.</td>
<td>Purpose: To investigate the relationship between coping styles and depressive symptoms. Definitions: Social Support – no definition; instruments measured emotional, structural, and instrumental support Depressive Symptoms – no definition</td>
<td>Population: Stable outpatients with HF (N = 222); mean age 57.3 ± 12.5 years (range 27-88); 49.0% White, 45.4% non-Hispanic, 32.75% female Sampling Method: Non-random, convenience sample, generalizability to adult males Design: Prospective, cross-sectional design Measures: Social Support – Perceived Social Support Scale (PSSS), and ENRICHD Social Support Inventory (ESSI); the COPE measured seeking emotional and instrumental support Depressive Symptoms – Beck Depression Inventory (BDI), severity of depressive symptoms, e.g., fatigue, sadness, etc. Also measured: Coping styles</td>
<td>Results: Low levels of perceived social support were associated with increased depressive symptoms (F = 11.82; p &lt;0.001). Use of emotional support decreased depressive symptoms (β = -.14; p &lt;0.05). Implications: Should assess social support and encourage patients to develop relationships that provide emotional support.</td>
<td>Strengths: 1) racially diverse sample; 2) measures had established reliability and validity Weaknesses: 1) mostly male sample; 2) cross-sectional design limits causal inferences</td>
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<td>Klein et al.</td>
<td>Purpose: (1) To determine the relationship between coping style and health-related quality of life in older HF patients and (2) to determine if a relationship exists between coping style and depressive symptoms in older patients with HF.</td>
<td>Population: Outpatients with HF (N = 80; mean age 69 +/- 7 years) Sampling Method: Non-random convenience sample, generalizable to married or co-habiting (70%), white (99%) HF patients Design: Cross-sectional, correlational design Measures:</td>
<td>Results: Emotional and instrumental support was not related to depressive symptoms (Spearman rho coefficients for emotional and instrumental support = -0.01 and 0.10 respectively).</td>
<td>Strengths: 1) Cronbach’s alpha for the GDS acceptable (.80-.85 across multiple age groups, including elderly adults); 2) high number of Class III HF (59%), most likely experiencing significant HF physical symptoms Weaknesses: 1) no...</td>
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<tr>
<td>Author/Year</td>
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<td>Koenig(^2)</td>
<td>Purpose: To determine whether depressed inpatients with HF or chronic obstructive pulmonary disease differ from depressed inpatients with other medical disorders regarding psychological factors predisposing to depression, medical and psychological stressors, and availability of coping resources. Definitions: Social Support – a potential coping resource to buffer against stresses encountered with HF and chronic obstructive pulmonary disease Depression – no definition</td>
<td>Population: Hospitalized patients (n = 1000) with HF or chronic pulmonary disease with either major (n = 413; mean age 71.1 +/- 7.5 years) or minor (n = 587; mean age 72.9 +/- 8.0 years) depression were compared to patients with other diagnoses with major (n = 40; mean age 70.4 +/- 7.0 years) or minor (n = 23; mean age 68.3 +/- 6.8 years) depression.</td>
<td>Results: No difference between depressed patients with HF/pulmonary disease and patients with other medical diagnoses regarding social support and depression (major depression and support: M = 25.8 versus 26.1; minor depression and support: M = 27.7 versus 27.0 respectively).</td>
<td>Strengths: 1) patients screened for major and minor depression by a trained (every 6 months) psychiatric nurse using the Structured Clinical Interview for DSM-IV Weaknesses: 1) cross-sectional design prevents causal inferences; 2) combining HF and pulmonary disease into one group for analyses potentially biased findings; 3) several patients in comparison group had a history of cardiac disease, potentially contaminating comparison group; 4) sample characteristics typical of disorders, with limited generalizability to younger individuals; 5) no reported reliability coefficients for DSSI and HDRS; inadequate test-retest reliability for the DSSI (.50 to .77 in prior studies)(^49);</td>
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<td>Yu et al.53</td>
<td>Purpose: To identify the social, clinical, and demographic correlates of psychological distress. Definitions: Social Support – no definition; instruments measured perceived social support, including size of the social network; perceived adequacy of tangible, emotional, and informational support; positive social interaction and affective support Depression and anxiety were components of psychological distress but no other definition provided</td>
<td>Population: Hospitalized patients with HF (N = 227); mean age 77.1 +/- 7.9 years) Sampling Method: Non-random, convenience sample; generalizability to older adults with Class II (49.8%) or Class III (33.9%) HF. Design: Correlational, cross-sectional design Measures: Social Support – Medical Outcomes Social Support Survey (MOS-SSS – Chinese version) Distress – Hospital Anxiety and Depression Scale (HADS – Chinese version) measures both constructs collectively rather than separately Also measured: Anxiety, symptoms of HF, health perception, demographic and clinical characteristics</td>
<td>Results: Higher levels of distress (i.e., anxiety and depression) associated with reduced social network (r = -0.43; p &lt;0.001) and less perceived social support (tangible: r = -0.34, p &lt;0.001; affectionate: r = -0.47, p &lt;0.001; positive social interaction: r = -0.49, p &lt;0.001; emotional-informational: r = -0.48, p &lt; 0.001). Poorer emotional-informational support (along with higher fatigue levels, poorer health perception, and not living with a family member) contributed to the variance in distress (R2=.49, p&lt;.01).</td>
<td>Strengths: 1) measures had adequate reliability Weaknesses: 1) mostly Class II or Class III HF and women; 2) limited generalizability (other than Chinese and low socioeconomic level); 4) a collective measure of anxiety and depression used rather than separate instruments; 5) non-response rate of 31% limits representativeness; 6) questionable external validity regarding Framingham criteria used for validating medical HF diagnosis (i.e., 78% specific)</td>
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Actual and Perceived Social Support

6) Cronbach’s alpha coefficients for HDRS (.48 to .95) across multiple studies and populations, with lower alphas being inadequate.50-52
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<td>Carels (^8)</td>
<td>Purpose: To investigate the impact of disease severity, functional status, and level of depression on quality of life. Definitions: Social Support – indices of quality of life included emotional and physical quality of life, social support and conflict, positive and negative mood, and coping responses. Depression – no definition</td>
<td>Population: Outpatients with HF (N = 58); mean age 67.7 +/- 11.8 years (range 35-92) Sampling Method: Non-random, convenience sample; generalizability to older Caucasian adults with HF; history of heart disease, hypertension, diabetes, and smoking Design: Cross-sectional, correlational design Measures: Social Support – Social Conflict Scale and Perceived Social Support – Short Form (PSSS); daily assessment of quality of life diary (DAQL), including emotional support and social conflict; subscale of COPE measured instrumental [i.e., advice seeking] support, as a component of coping Depression: Beck Depression Inventory (BDI), a measure of depressive symptoms Also measured: Daily quality of life, coping</td>
<td>Results: Depression associated with greater social conflict ((t = 3.68; p \leq 0.01)) and lower perceived social support ((t = 1.95; p \leq 0.05)). Implications: Assess for the presence of depression in those with lower functional ability and decreased quality of life</td>
<td>Strengths: 1) measures had established reliability and validity Weaknesses: 1) small sample size, primarily Caucasians (n not given); 2) Higher percentage of males (57%) versus females (43%), which is not typical of national statistics; 3) Class II (52%) and Class III (40%) HF</td>
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<td>Havranek et al. (^4)</td>
<td>Purpose: To identify sociodemographic and clinical factors associated with the onset of depressive symptoms in outpatients with HF Definitions: Social Support – no</td>
<td>Population: Outpatients with HF (N = 245; mean age 60.5 years (\pm) 11.3 in depressed at 1 year; 63.1 years (\pm) 12.5 in those not depressed at 1 year) Sampling Method: Non-random, convenience sample; generalizability to older adults with HF</td>
<td>Results: Living status was a significant predictor of onset of depressive symptoms ((x^2 = 6.75; p &lt; 0.05)). Implications: Clinicians should assess</td>
<td>Strengths: 1) valid and reliable measure of depressive symptoms; 2) all classes of HF (primarily NYHA Class II and III); 3) participants served as own control – no depressive symptoms (based on their previous status)</td>
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<td>Park et al.</td>
<td>Purpose: To evaluate social support, appraisals, and coping as factors of depression. Definitions: Social Support – no definition; instrument measured both objective and subjective support; Depressive Symptoms – no definition</td>
<td>Population: Elderly outpatients with HF (Time 1: N = 202; mean age 65.6 years with range 44 – 85); (Time 2: n = 163; mean age 65.2 +/- 10 years)</td>
<td>Results: Satisfaction with social support prospectively predicted residual depression 6 months after enrollment, controlling for baseline depression (r = -0.28; p &lt;.001). Implications: Use interventions focused on depression symptoms and stressors; teach patients problem-focused strategies to manage impact of HF; investigate interventions to increase satisfaction with social support</td>
<td>Strengths: 1) measures had excellent reliability coefficients; 2) longitudinal study; 3) acceptable attrition (19% over 6 months) Weaknesses: 1) primarily older Caucasian males, limiting generalizability to younger individuals with HF of different gender and race; 2) significant differences in ejection fraction regarding those who remained in the study (30.7) versus those lost to follow-up (44.2)</td>
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<td>Thornhill et al.</td>
<td>Purpose: To explore</td>
<td>Population: Hospitalized and non-hospitalized</td>
<td>Results: Family members</td>
<td>Strengths: 1) design and method allows</td>
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<td>Dekker et al.</td>
<td>Purpose: To describe the experience of individuals with HF living with depressive symptoms</td>
<td>Patients with HF (N = 25; 35 and 85 years)</td>
<td>Provided emotional and tangible support that helped them cope with HF-related physiological and psychological challenges.</td>
<td>Strengths: 1) equal number males and females; 2) history of depression/depressive symptoms allowed evaluation of stressors associated with depressive symptoms and strategies used to manage these symptoms</td>
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<td>individuals with minimal versus mild to severe depression, and correlates of depression.</td>
<td>generalizability to males (84%) with either Class II or III HF (70%)</td>
<td>severe depression according to social network (M = 11.53 versus 9.12; t = 1.56; p = .120) and social support (M = 80.30 versus 78.81; t = 0.68; p = .500).</td>
<td>two HF groups allowed investigation of factors that may cause an increase in depression severity. Weaknesses: 1) Primarily males with Class II and III HF and high number of males (n = 168), limits generalizability.</td>
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<td>Paukert et al.</td>
<td>Purpose: To investigate the relationships between depressive symptoms and demographic factors, HF physical limitations, perception of HF intrusiveness, coping strategies, locus of control, self-efficacy, and social support.</td>
<td>Population: Outpatient Veterans with HF (N = 104; mean age 71.1 +/- 7.7 years)</td>
<td>Results: Living status did not differ between depressed and non-depressed groups (χ² = 2.30; p = 0.51). Social support was not significantly related to depressive symptoms (r = -0.09).</td>
<td>Strengths: 1) Adequate Cronbach’s alpha coefficients (.80-.85) for GDS in prior studies, across multiple age groups; 2) Cronbach’s alpha coefficient of 0.92 for Brief COPE, but individual coefficients for components not reported; 3) Adequate support for validity and reliability of Multidimensional Scale of Perceived Social Support. Weaknesses: 1) Small sample, primarily of white, male veterans; 2)</td>
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### Factors Influencing Depressive Symptoms/Depression

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<td>Evangelista et al.</td>
<td>Purpose: To investigate and compare the incidence of anxiety and depression among ethnic groups with advanced systolic HF. Hypothesized that low levels of perceived control, social support, and perceptions of financial stability were associated with the development of depression anxiety. Definitions: Social Support – no definition; measured by presence of a confidant Depression – no definition</td>
<td>Population: Non-Hispanic Black (n = 18), Hispanic (n = 55), and Non-Hispanic White (n = 168) Outpatients with HF (total N = 241; mean age 56.7 +/- 13 years) Sampling Method: Non-random, convenience sample; generalizable to married, retired, non-Hispanic white males Design: Correlational, cross-sectional design Measures: Social Support – Presence of a confidant Depression – Patient Health Questionnaire (PHQ) Also measured: Anxiety, perceived control, and demographic and clinical characteristics</td>
<td>Results: Hispanics reported lower levels of depression and higher amounts of social support (r = - 0.163; p &lt; 0.05) (compared to non-Hispanic blacks and non-Hispanic whites). Implications: Some racial/ethnic groups are at increased risk for developing depression</td>
<td>Strengths: 1) reliable measure of depression, with an acceptable Cronbach’s alpha coefficient (.89); 2) separate measures of anxiety and depression, closely related constructs Weaknesses: 1) cross-sectional design limits causal inferences; 2) primarily non-Hispanic whites limits generalizability; 3) social support measured by a single item</td>
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<p>| Bean et al. | Purpose: To investigate ethnic differences in social support, coping, spirituality, and health-related quality of life and their relationship to depression and anxiety. Definitions: Social Support – no definition | Population: Hospitalized and Non-hospitalized African American (n = 48), Caucasian (n = 46), and Hispanic (n = 3) HF patients (total N = 97; mean age 53, +/- 14 years, range 18-82) Sampling Method: Non-random, convenience sample, generalizable to African American and Caucasian males (67%) | Results: Less social support was associated with increased levels of depression (r = - 0.66; p &lt; 0.01; no ethnically related differences between the two variables. | Strengths: 1) 49.5% African Americans, enhancing generalizability; 2) measures had adequate reliability coefficients (.80 to .85) Weaknesses: 1) small sample size, mostly Class I and II HF (54.6%) versus Class III and IV |</p>
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<td>Depression – no definition</td>
<td>Design: Cross-sectional, correlational design</td>
<td>Implications: Assess psychosocial factors and their relationship to the presence of depression, anxiety, and quality of life. The effect of spiritual well-being on psychological health should be examined, particularly in African Americans.</td>
<td>IV HF (45.4%), potentially biasing findings; 2) few Hispanics, limiting generalizability; cross-sectional design limits causal inferences</td>
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Measures: Social Support – Interpersonal Support Evaluation List – Short form (ISEL-SF), includes esteem, belonging, tangible, and emotional support. The Brief COPE measured coping styles, including emotional and instrumental support.

Depression – Hospital Anxiety and Depression Scale (HADS)

Also Measured: Demographic and clinical characteristics, coping style, spiritual well-being, anxiety, and health-related quality of life.

Abbreviations: HF, heart failure; NYHA, New York Heart Association; MOS-D, Medical Outcomes Study-Depression; WCQ, Ways of Coping Questionnaire; BDI, Beck Depression Inventory; PSSS, Perceived Social Support Scale; ESSI, ENRICHD Social Support Inventory; DAQL, Daily Assessment of Quality of Life; MOS-SSS, Medical Outcomes Study-Social Support Survey; HADS, Hospital Anxiety and Depression Scale; CES-D, Center for Epidemiological Studies – Depression Scale; PHQ, Patient Health Questionnaire; ISEL-SF, Interpersonal Support Evaluation List – Short Form; GDS, Geriatric Depression Scale; DSM-IV, Diagnostic and Statistical Manual for Mental Disorders – IV; DSSI, Duke Social Support Index; HDRS, Hamilton Depression Rating Scale
Abstract

Objectives:
The purpose of this review is to examine and synthesize recent literature regarding the influence of coping on constructs contributing to health-related quality of life (HRQOL) in individuals with heart failure (HF).

Background:
Poor HRQOL is associated with HF-related outcomes, including increased mortality and poor self-care. Coping may influence HRQOL.

Methods:
An review of empirical literature was conducted utilizing CINAHL, PsycARTICLES, and PubMed computerized databases for a period of January 2000 to December 2011.

Results:
Only studies investigating coping and physical and psychological HRQOL were found that met the inclusion criteria (n = 16), with thirteen studies examining coping and psychological HRQOL, two studies examining coping and physical HRQOL, and one study investigating coping and physical and psychological HRQOL.

Conclusions:
Emotion-focused strategies are negatively associated with physical and psychological HRQOL, whereas, problem-focused strategies are positively associated with physical and psychological HRQOL in individuals with HF. Lack of experimental studies limits the inference of causality.
Keywords: heart failure, coping, health-related quality of life, depression, mortality
Introduction

The prevalence of heart failure (HF) remains high in the United States. The American Heart Association (AHA)\(^1\) reported there are an estimated 5.7 million individuals currently living with HF in the United States. Unfortunately, health outcomes continue to remain poor in individuals living with HF, with persistently high associated morbidity and mortality rates.\(^1\) The treatment of HF is complex and includes multi-drug therapy, lifestyle modifications, fluid intake restriction, as well as daily weight monitoring.\(^2\) The complexity of treatment, decrease in physical functioning, and social isolation often contribute to poor health-related quality of life (HRQOL) in those with HF.\(^3-4\) Poor HRQOL is associated with negative HF-related outcomes in individuals living with HF, including increased mortality rates\(^5\) and higher hospital readmission rates.\(^6\) Furthermore, poor HRQOL adversely affects event-free survival,\(^7\) as well as negatively impacts self-care\(^8\) in those with HF.

Living with the physical symptoms of HF and maintaining the treatment regimen is often stressful, requiring one to cope with these stressors.\(^9-11\) Increased stress has a negative impact on HRQOL in those with HF.\(^6,10\) However, prior research suggests that coping is related to concepts that contribute to HRQOL, specifically physical and psychological function in individuals with HF.\(^11-15\) For example, the way in which one copes has been associated with influencing self-care,\(^16\) which contributes to HRQOL and an individual’s ability to carry out activities of daily living.\(^17\) Likewise, research indicates that coping style is related to depressive symptoms and anxiety,\(^18-20\) both which influence
psychological functioning, specifically mental and emotional well-being.\textsuperscript{21} Since the majority of work in this area has been based upon cross-sectional research designs, one cannot assume causality. Rather, cross-sectional studies serve to illustrate the presence and degree of relationships between coping and physical and psychological HRQOL.\textsuperscript{22}

Although theoretical and empirical literature suggests a relationship between coping and concepts that contribute to the physical and psychological domains of HRQOL, there is little consensus regarding which coping style and related coping strategies are most beneficial in individuals with HF. Further, previous published research\textsuperscript{23} only investigated the influence of coping methods on depression and was limited to a few studies. Therefore, the purpose of this review was to: (1) examine recent literature regarding the influence of coping on constructs contributing to HRQOL domains; (2) synthesize findings across those studies; (3) assess potential areas of future research regarding HRQOL and coping; and (4) identify implications for nursing practice.

### Definitions and Concepts

**Coping**

The concept of coping has been examined extensively in both psychosocial and medical research.\textsuperscript{23-28} Coping is defined as a cognitive behavioral process that continually changes to manage external or internal stressors that are apprised as exceeding individuals’ resources. Individuals influence the quality and strength of stress through the use of two processes: cognitive appraisal and coping. While cognitive appraisal is used to
evaluate the significance of stressful situations, coping involves cognitive and behavioral activities, as well as resources used to manage these situations and emotions that accompany them.\textsuperscript{29}

Lazarus and Folkman\textsuperscript{29} describe two types of coping, including emotion-focused coping and problem-focused coping. Emotion-focused coping refers to efforts aimed at managing emotions that accompany stressful situations and includes strategies such as escape-avoidance (e.g. wishful thinking), distancing, minimization, behavioral disengagement, venting, and denial. Problem-focused coping, on the other hand, influences adaptation by defining the problem, generating alternative solutions, as well as enhancing positive coping skills. Problem-focused strategies can be aimed at the environment or directed at the self and includes strategies such as seeking social support, planful problem-solving, and having an active awareness of stressors. Strategies associated with emotion-focused coping are more likely to be utilized when an individual determines that nothing can be done to modify harmful, threatening effects of a stressful situation. Whereas, problem-focused coping strategies are more likely to be used when an individual believes that the stressful situation is more amendable to positive change.\textsuperscript{29}

**Health-Related Quality of Life**

The critical or defining attributes of HRQOL indicate it is a multi-dimensional concept that is dynamic in nature and includes the effects of the health-illness continuum on individuals’ sense of well-being. The term HRQOL also represents satisfaction in various areas of life likely to be impacted by health,\textsuperscript{17, 30} including treatment satisfaction and outcomes, as well as future prospects and the overall value a person attaches to
Additionally, health-related quality of life is an evaluation of individuals’ health and related circumstances within the context of the culture in which they live. Further, the dynamic nature of HRQOL is linked to achievement of goals and aspirations held by individuals and the associated constraints of the illness trajectory.

There are three domains that influence individuals’ perception of HRQOL, including physical, social, and psychological domains. These domains of HRQOL, although primarily subjective in nature, are defined by underlying concepts that contribute to HRQOL. For example, the physical domain includes individuals’ perceptions of their physical status, disease-related symptoms, and the ability to carry out activities of daily living (i.e., functional status). Therefore, the physical symptoms related to HF such as shortness of breath and fatigue influence functional status.

The social domain of HRQOL includes leisure, civic, and employment activities, as well as the ability to interact with family and friends and maintain social roles to the preferred level. However, the severity of HF-related physical symptoms often leads to social isolation in individuals with HF, thereby influencing this domain.

The psychological domain of HRQOL includes overall mental and emotional well-being, including both positive and negative mental states. Mental and emotional well-being refers to individuals’ perceptions of mood states, such as being depressed, anxious, joyful, unhappy, vigorous, or lethargic. The increased stress of living with HF is associated with depressive symptoms and anxiety, thereby influencing the psychological domain. Other constructs within this domain include communication, memory, and decision-making capabilities that require intellectual function. Therefore, self-care or the decision-making process individuals with HF use to determine behaviors...
that maintain stability of their health (i.e., symptom monitoring and responses to symptoms, treatment adherence)\(^{36-37}\) influences their disease-related symptoms and functional status and HRQOL.\(^{37}\)

Subjective evaluations of HRQOL are the most reliable.\(^{21,33-34}\) Therefore, perceived depressive symptoms, anxiety, satisfaction, happiness, symptom status, and self-care are commonly used in examining HRQOL.\(^{14,18,34-35,37-38}\) While depressive symptoms and anxiety are commonly associated with a variety of affective disorders,\(^{39}\) they have, as well, been negative attributes which have been seen to detract from HRQOL.\(^{40}\)

Thus, for individuals with HF, HRQOL is a subjective, multidimensional, and dynamic concept that is unique to each individual and incorporates physical, psychological, and social function. Further, HRQOL involves goal achievement within the context of aspirations and constraints imposed by the heart-related illness trajectory. Health-related quality of life commonly encompasses self-reported measures of physical and psychological health.\(^{34}\)

**Methods**

In contrast to a systematic review, an integrative review includes both non-experimental and experimental designs, potentially playing a significant role in evidence-based practice for nursing.\(^{41}\) This integrative review utilized a process described by Cooper\(^{42}\) and expanded upon by others\(^{41,43-44}\) for integrative reviews of quantitative and qualitative research.
First, a computerized search of the literature on coping and HRQOL was conducted using CINAHL, PsycARTICLES, and PubMed databases. Keywords used in the searches included “coping,” “emotion-focused coping,” “problem-focused coping,” and “heart failure.” These keywords were combined with “depression,” “anxiety,” “psychological functioning,” “physical functioning,” “physical symptoms,” “social,” “social isolation,” “social functioning,” “employment,” “family,” “quality of life,” and “health-related quality of life.” In an effort to build upon prior work and to obtain the most recent research, the search was limited to publications from January 2000 to December 2011. Next, the reference lists from current and previous literature reviews and empirical studies also were investigated to identify any relevant articles not identified during the computerized search. Titles and abstracts of each article were read to determine relevance to the study topic.

Studies that met the following criteria were included in the review: (1) the study was published in English, (2) the study investigated aspects of coping and HRQOL, and (3) the articles were published between January 2000 and December 2011. Studies written in languages other than English or those translated into English were excluded because of reviewers’ language limitations. Studies were excluded that did not mention (by name or description) elements of coping and HRQOL in the title, abstract, and text. Articles that included patient-caregiver dyads were excluded from this review. Unpublished manuscripts (i.e., abstracts), books, and duplicate studies were excluded.

The review was not limited by study design and included both qualitative and quantitative studies. The final sample for this integrative review included cross-sectional, longitudinal, and qualitative designs. A quality appraisal of individual studies was not
undertaken because the purpose was to synthesize all findings describing the impact of coping on HRQOL in studies conducted using diverse methodologies.

The initial review yielded 43 articles for consideration from the three computerized data bases and review of reference lists from previous literature reviews. After duplicate articles (n = 9) were discarded, 34 articles were screened. Those not meeting inclusion criteria (n = 18) were excluded. Articles that met the criteria for inclusion (n = 16) remained and were included in the review. Of these 16 studies, 4 were qualitative studies and 12 were quantitative. Definitions of coping and HRQOL were analyzed to fully understand the impact of coping on HRQOL. Categories extracted included dimensions and consequences of coping in relation to dimensions of HRQOL. Antecedents, facilitators, and barriers to HRQOL were also examined but findings were limited in this area.

Data display matrices were constructed that illustrated the coded data from each report by category and were iteratively compared. To reduce bias, studies were first analyzed and coded by one reviewer; however, a second reviewer then independently reviewed and analyzed these articles, comparing their findings to that of the first reviewer. Areas of disagreement were discussed between both reviewers until consensus was reached.

Papers meeting the inclusion criteria were divided into subgroups of quantitative and qualitative studies and analyzed sequentially. Sources were described according to the elements extracted from the articles: author and year, study purpose, type of sample, methods, findings and implications, and strengths and weaknesses (Tables 1-3). Findings related to the impact of coping on HRQOL were extracted from these studies.
Subsequently, data describing coping on HRQOL were assembled from the sources and arranged to identify themes and their relationships. During the analysis, the subgroups were kept separate. Because the same themes were identified from both subgroups, the subgroups were integrated at the end of the analysis and the results were presented according to the themes only.

Results

Study Characteristics

Out of an initial 43 studies, 16 met inclusion criteria. In examining the literature, all studies investigated coping and underlying concepts that contributed to physical and psychological HRQOL. No studies were found that examined coping and social HRQOL. Therefore, this review focused solely on the impact of coping on the physical and psychological components of HRQOL. All but three of the studies had similar sample characteristics. The mean age of participants ranged from 53 to 75 years and included primarily Caucasian men participants. However, Dekker et al. included an equal number of men and women, while Bean et al. used an ethnically diverse sample with an approximately equal numbers of African American and Caucasian participants and Bosworth et al. utilized a sample which consisted of males only.

Although, this review was not limited by study design, no experimental studies were found that investigated the effect of coping interventions on HRQOL in individuals with HF. Even though a wide variety of study designs were utilized to investigate the influence of coping on HRQOL, the majority of these studies were cross-sectional,
limiting the ability to make inferences about behavioral change related to these constructs. Likewise, the four qualitative studies\textsuperscript{10, 15-16, 47} only conducted one-time interviews with participants, further limiting the ability to make inferences on behavioral change. However, three longitudinal studies\textsuperscript{28, 50-51} were noted in this review, enhancing the confidence of findings related to behavioral change. Yet, causality cannot be inferred as the majority of studies were cross-sectional in nature.\textsuperscript{12, 18-20, 28, 38, 48-49, 50-51}

Few studies provided a definition of HRQOL, yet provided definitions for the specific concepts that contribute to HRQOL in which the studies were investigating, such as depressive symptoms, anxiety, and self-care.\textsuperscript{16, 19-20, 50} However, one study defined HRQOL as encompassing many aspects of an individual’s life, including the physical, emotional, and social components associated with a health condition;\textsuperscript{12} while, another study described it as a multidimensional concept that included physical, psychological, social, and existential dimensions and well-being.\textsuperscript{13}

The concept of coping was defined similarly across studies. For example, Murberg and Bru\textsuperscript{28} defined coping as cognitive and behavioral attempts to either avoid stressful situations or actively address and attempt to alter the stressful situation. Coping was defined in another study as a constantly changing cognitive and behavioral process utilized to address external and/or internal demands that are appraised as taxing to the individual.\textsuperscript{12} Likewise, Vollman et al.\textsuperscript{19} defined coping according to the Process Theory of Coping by Lazarus and Folkman,\textsuperscript{29} in which an individual used both emotion and problem-focused coping strategies to deal with stressful situations.

Emotion-focused coping strategies often are viewed as less adaptive; whereas, problem-focused strategies are considered more adaptive when dealing with stressful
situations. Various constructs of emotion-focused coping were assessed by researchers in these studies including denial, avoidance, venting, and mental and behavioral disengagement. Constructs of problem-focused coping frequently assessed were active coping and instrumental social support. The variety of coping strategies examined and congruence of findings between studies enhanced the validity of findings noted in this review. Although no studies examined antecedents to HRQOL, one study examined facilitators and barriers to self-care, which contributes to HRQOL.

**Coping and Psychological HRQOL**

Thirteen studies examined the impact of coping on psychological HRQOL, most commonly depressive symptoms and anxiety. While eight were cross-sectional studies, two were longitudinal in design, and three were qualitative studies. Problem-focused coping strategies were found to be associated with psychological HRQOL in a positive manner. The use of problem-focused coping strategies was related to the incidence of depressive symptoms and anxiety. Greater action/acceptance, when used as a coping strategy, was found in one study to positively influence depression ($t = 2.10; p \leq 0.05$), while seeking social support ($r = -0.23; p = .04$) and planful problem-solving ($r = -0.27; p = .02$) were found in another study to be negatively correlated to depressive symptoms. On the other hand, the decreased use of problem-focused strategies such as planning ($\beta = -0.15; p < .05$) and acceptance ($\beta = -0.14; p < .05$) were associated with increases in depressive symptoms.

In contrast, emotion-focused coping was associated with psychological HRQOL in a negative manner. The use of emotion-focused coping strategies, such as
escape-avoidance, behavioral disengagement, and denial were found in two studies to be related to depressive symptoms. In one study, escape-avoidance ($\beta = .38; p < .001$), when used as a coping strategy, was related to depressive symptoms, while another study indicated that higher scores on the Beck Depression Inventory (i.e. $\geq 10$) were associated with the use of emotion-focused strategies, such as behavioral disengagement (OR = 1.3; $p < .001$), mental disengagement (OR = 1.3; $p < .001$), denial (OR = 1.2; $p < .01$), and venting (OR = 1.2; $p < .01$). In a similar study, avoidance coping style was found to be significantly related to the development of anxiety ($F = 9.95; p < .001$), anger ($F = 23.3; p < .001$), and depression ($F = 28.2; p < .001$). Likewise, several emotion-focused strategies, including self-distraction ($t = -1.97; p < .05$), denial ($t = -3.21; p < .01$), and self-blame ($t = -3.09; p < .01$) were significantly related to HRQOL, while only denial ($t = 3.23; p < .01$) and self-blame ($t = 2.95; p < .01$) were significantly associated with depressive symptoms.

Three studies used specific samples to investigate the relationship between emotion-focused coping strategies and psychological HRQOL. One study utilized a sample of older veterans who were pre-screened for depression and anxiety so that the sample would contain an equal number of participants with and without depressive symptoms. Like prior studies, depression was significantly associated with the use of maladaptive (i.e. emotion-focused) coping strategies ($r = .31; p < .01$). In another study, using a mixed sample of patients with HF and end stage renal disease, emotion-focused coping was found in the overall sample to be negatively related to HRQOL ($r = -0.40; p < .01$). Lastly, another study used an ethnically diverse sample to investigate whether ethnic differences in coping styles were related to HRQOL. In the overall
sample, the use of more emotion-focused strategies, such as avoidant coping, was associated with depression and anxiety ($\beta = 0.32; \ p < 0.001$); however, no statistically significant ethnic differences in the relationship between coping and psychological HRQOL were found.\textsuperscript{38}

Two longitudinal studies examined the association of both problem and emotion-focused coping and psychological HRQOL. In one study,\textsuperscript{28} findings at Time 2 indicated that four constructs were positively associated with depressive symptoms, including emotional support ($r = 0.20; \ p < 0.01$), restraint coping ($r = 0.20; \ p < 0.01$), mental disengagement ($r = 0.22; \ p < 0.01$), and behavioral disengagement ($r = 0.51; \ p < 0.0001$). While these researchers\textsuperscript{28} defined these constructs as examples of emotion-focused coping, emotional support primarily is viewed by other investigators\textsuperscript{12,19-20,51} as an example of problem-focused coping. Acceptance ($r = -0.19; \ p < 0.01$), a problem-focused coping strategy, however, was negatively associated with depressive symptoms.\textsuperscript{28}

Likewise, in a second longitudinal study\textsuperscript{50} findings indicated that the percent of active coping, a problem-focused coping strategy, used by research participants was negatively related to depression at both Time 1 ($r = -0.39; \ p < 0.01$) and Time 2 ($r = -0.37; \ p < 0.01$). The percent of active coping ($p < 0.05$) used was also found to prospectively predict depression at Time 2, controlling for baseline depression.\textsuperscript{50}

One qualitative study investigated coping and concepts that contribute to psychological HRQOL, specifically depressive symptoms.\textsuperscript{10} All participants had a history of past or current depression or were currently experiencing depression, as defined by a score of 14 or higher on the Beck Depression Inventory-II upon enrollment into the study. Interviews were conducted following six weeks of both biofeedback training and
cognitive therapy or six weeks of attention placebo, which included relaxation exercises. Utilizing an inductive approach to content analysis, “strategies for managing depressive symptoms” emerged as a theme in which participants described both emotion and problem-focused coping strategies such as activities, distraction, and social support as effective ways to cope with their depressive symptoms,\(^\text{10}\) indicating that both types of coping may be beneficial depending upon the individual and the circumstance. In reviewing factors influencing participants’ depressive symptoms, some faced difficult issues, such as personal losses (e.g., death of a family member) and finances, supporting other literature that suggests individuals are more likely to use emotion-focused coping strategies to manage these challenging situations.\(^\text{29}\)

The use of problem-focused coping strategies were also related to self-care,\(^\text{16, 47}\) or the decision-making process that determines actions aimed at maintaining stability of health (i.e., symptom monitoring and responses to symptoms, treatment adherence).\(^\text{36-37}\) Findings from two qualitative studies\(^\text{16, 47}\) suggest that the use of problem-solving, as a problem-focused coping strategy was associated with the facilitation of self-care. Participants in one study described practical adaptations used to facilitate self-care, such as modifying their environment to meet energy limitations and utilizing both emotional and tangible social support as coping resources.\(^\text{16}\) Similarly, in another qualitative study, participants reported using problem-solving strategies, (e.g., coping strategies) to assist with self-care decision-making when the physical symptoms of HF were severe.\(^\text{47}\)

Findings of this review suggest that coping style (i.e., problem-focused and emotion-focused coping) is associated with concepts that contribute to psychological HRQOL, specifically depressive symptoms, anxiety, and self-care. Studies included in
this review indicate that problem-focused coping strategies are associated with decreases in depressive symptoms and anxiety. Conversely, emotion-focused strategies such as behavioral disengagement, denial, and avoidance are associated with increases in depressive symptoms and anxiety.

**Coping and physical HRQOL**

Two studies examined the association of coping and physical HRQOL, specifically physical symptoms and functional status. While one study was qualitative in design, the other was a descriptive, correlational study. Qualitative findings revealed that individuals reported receiving personal and material support (i.e. social support), known as coping resources, from significant others to assist in coping with physical symptoms and adapting to decreases in physical functioning associated with HF. Coping style was examined to determine its relationship to HF-related physical symptoms in a study utilizing a daily diary for two weeks composed of four well-known and reliable self-report surveys. Findings indicated that increases in physical symptoms were associated with symptom-focused coping ($\beta = .21; p < .05$) and distraction techniques (i.e., emotion-focused coping strategies) ($\beta = .10; p < .05$); whereas, active coping strategies (i.e. problem-focused coping strategies) were related to less symptoms of HF the next day ($\beta = -.09; p < .05$). Additional findings revealed that increases in emotional functioning (i.e, positive mood) were also associated with less HF symptoms ($\beta = -.09; p < .05$); whereas, social conflict was associated with an increase in physical symptoms ($\beta = .14; R^2 = .07$).
This review suggests that coping resources and coping style are associated with physical HRQOL, specifically disease-related symptoms and functional status. Findings suggest that problem-focused coping strategies (i.e., use of social support, active coping) were associated with less HF-related physical symptoms and assist with adapting to changes in functional status secondary to disease-related symptoms. On the other hand, emotion-focused coping strategies were related to increases in physical symptoms of HF.

Coping and physical and psychological HRQOL

Only one study examined the relationship between coping and psychological and physical HRQOL. In this longitudinal study, findings at Time 2 indicated that the use of disengagement ($r = -.25; p < .01$) as an emotion-focused coping strategy was related to poor physical and psychological HRQOL; however, emotion-focused coping was not found to be a predictor of physical and psychological HRQOL at Time 2 in this study. These findings are consistent with previous studies indicating a relationship between emotion-focused coping and poor physical and psychological HRQOL.

Discussion

The purpose of this review was to examine recent literature regarding the influence of coping on constructs contributing to HRQOL domains and to synthesize these findings across studies. Although no studies were identified that examined coping and social HRQOL, this review revealed 16 studies that investigated coping and concepts that contribute to physical and psychological HRQOL, including depressive symptoms, anxiety, self-care, HF-related physical symptoms, and functional status. The 11 year
review period allowed for an evaluation of the most recent literature surrounding the relationship between coping and HRQOL, in addition to building upon previous work.\textsuperscript{23, 45-46}

The findings of this review indicate that there is a relationship between emotion-focused coping strategies and poor physical and psychological HRQOL.\textsuperscript{14, 19-20, 28} Emotion-focused coping was associated with increases in depressive symptoms and anxiety, as well as increases in disease-related symptoms.\textsuperscript{14, 19-20, 28} Conversely, a positive relationship between problem-focused coping strategies and physical and psychological HRQOL was identified.\textsuperscript{14, 16, 18-19} Problem-focused coping strategies were associated with fewer depressive symptoms, better self-care, and diminished HF-related physical symptoms.\textsuperscript{14, 16, 18-19}

Although findings from this review indicate that coping style (i.e., problem-focused coping vs. emotion-focused coping) is related to concepts which contribute to physical and psychological HRQOL, there are other factors to consider that may impact whether an individual uses a specific coping style. For example, an individual’s illness knowledge may moderate the relationship between coping style and HRQOL. Knowledge of one’s illness has been associated with poor psychological HRQOL and the use of emotion-focused strategies, such as denial.\textsuperscript{52} Likewise, one’s perception about HF has also been associated with coping styles. Individuals, who have more negative beliefs about HF have reported utilizing more emotion-focused coping strategies and having poor psychological HRQOL.\textsuperscript{11} Also, an individual’s personality may be related to the specific coping strategies used. Personality traits such as extraversion and neuroticism have been significantly associated with specific emotion and problem-focused coping
strategies, suggesting that personality may influence the use of one specific coping strategy over another. Lastly, an individual’s quality of life may actually influence the style of coping utilized. Greater deterioration in quality of life has been reported in other chronic illness populations to be related to increased use of emotion-focused coping strategies.

**Strengths and Weaknesses**

Non-random sampling methods (i.e. convenience or purposive) were utilized in the majority of studies included in this review. Even though this impacts the generalizability of findings, it is common in health-related research when a specific patient population is desired. The majority of studies included in this review did contain adequate sample sizes but failed to utilize samples that represented characteristics commonly found in individuals with HF. For example, several studies utilized samples comprised mostly of male participants, while other samples included mostly Caucasians. Likewise, several studies had samples comprised of large percentages of individuals with NYHA Class II HF. This could have potentially biased study findings, as those with NYHA Class II HF may not experience as many HF-related symptoms as compared to those with NYHA Class III or IV HF. These factors limit the generalizability of findings to a larger population of individuals with HF.

Instrument selection and appropriateness was a significant limitation in this review. Six of the studies used instruments with low reliability coefficients for either the entire instrument or some subscales or did not report reliability. The use of instruments with low reliability coefficients greatly impacts the confidence of study
findings. Also, several of the studies failed to differentiate between depressive symptoms and depression. Although, well-known measures of depressive symptoms and depression with established validity and reliability were used, investigators often used instruments designed to measure depression to evaluate depressive symptoms.\textsuperscript{18-20, 28, 38, 49-50} Incorporating health professionals with clinical expertise in assessing depression face-to-face, in conjunction with valid and reliable instruments would be useful to diagnose/measure depression in future studies.

**Recommendations for Future Research**

Considering the potential impact of coping on HRQOL, more research is needed to expand upon that which already exists in the literature. Based upon this review, several recommendations for future research can be made regarding the impact of coping and HRQOL. First, future studies should be conducted on relationship between coping and physical HRQOL, as only three studies\textsuperscript{14-15, 51} investigated this aspect of HRQOL. Second, since many of the studies\textsuperscript{12-13, 19, 28, 51} utilized instruments with low reliability coefficients, more reliable instruments to measure coping should be used in future research. Additionally, the frequent use of cross-sectional designs indicates a need for more diversity, including longitudinal, qualitative, and experimental studies in this area. When investigating the long term impact of coping styles, behavioral change needs to be investigated and this cannot be achieved with one-time data collection. Experimental studies involving coping skills and problem-solving training have been effective in other chronic illness populations, such as diabetes mellitus\textsuperscript{54-55} and spinal cord injury.\textsuperscript{56} Therefore, in order to establish causality between coping style and HRQOL, research is
needed on the effectiveness of specific coping styles to determine whether a specific coping style demonstrates improvement in quality of life, as experimental research investigating this area was not found in the review.

Although research in this area appears to be increasing, the large focus on the influence of coping style on psychological HRQOL overshadows the other important constructs of HROQL, leaving unanswered questions regarding these constructs. Specifically, what factors influence one’s coping style? Are there socio-demographic or HF-related clinical characteristics that play a role in one’s coping style? What is the role of caregivers or support systems in influencing one’s coping style? Are there illness trajectories that may favor the use of emotion and problem-focused coping in improving the physical and psychological HRQOL in HF?

**Conclusion**

Findings of this review suggest that emotion-focused coping strategies are negatively associated with physical and psychological HROQL, whereas, problem-focused strategies are positively associated with physical and psychological HRQOL. Emotion-focused coping strategies were related to concepts that contribute to physical and psychological HRQOL, such as depressive symptoms and anxiety, as well as disease-related symptoms. However, findings suggested that problem-focused coping was associated with improvements in these areas. Yet, more research is needed, specifically experimental research, to determine the effect of emotion and problem-focused coping on HRQOL in individuals with HF, since this review only revealed correlational studies. Therefore, the ability to infer causality and make recommendations for practice related to coping and HRQOL is limited.
References


57. Emory Healthcare. Heart failure statistics. Available at:

### Table 1 Coping and Psychological Health-Related Quality of Life

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<tr>
<th>Author/Year</th>
<th>Study Purpose</th>
<th>Methods</th>
<th>Findings/Implications</th>
<th>Strengths and Weaknesses</th>
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<tr>
<td>Murberg et al. [28]</td>
<td>Purpose: To determine if coping styles were reflections of personality</td>
<td>Population: A 2-year follow-up analysis, using data from symptomatic outpatients with HF</td>
<td>Findings: Four constructs of coping were positively associated with depressive symptoms, including the use of emotional support ($r = 0.20; p &lt; 0.01$), restraint coping ($r = 0.20; p &lt; 0.01$), mental disengagement ($r = 0.22; p &lt; 0.01$), behavioral disengagement ($r = 0.51; p &lt; 0.0001$). Acceptance was negatively associated with depressive symptoms ($r = -0.19; p &lt; 0.01$). Coping styles accounted for 9.3% of the variance in depressive symptoms, when accounting for personality traits.</td>
<td>Strengths: 1) a 2-year longitudinal design. Weaknesses: 1) Sample consisted of primarily males (71.4%) with NYHA Class II HF (59.7%); 2) Cronbach’s alpha for the COPE ranged from 0.45 to 0.81 (active coping = 0.45).</td>
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<td>Riegel &amp; Carlson [16]</td>
<td>Purpose: To examine how HF influences patients’ lives, assess how they perform self-care, and investigate how their life situation facilitates or</td>
<td>Population: Outpatients with HF (n = 26); mean age 74.4 ± 10.05 years</td>
<td>Results: Participants described various means of problem-solving, such as modifying the environment to meet energy limitations and utilizing social support (i.e. emotional and tangible support) as coping resources in order to improve self-</td>
<td>Strengths: 1) Study design allowed for investigation of personal experiences. Weaknesses: 1) Sample consisted primarily of males (65.4%) with NYHA Class III HF.</td>
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</table>
impedes HF self-care.

**Measures:** One-time interviews conducted either individually or in small groups using standardized questions.

**Implications:** Health care professionals should provide education on problem-solving strategies in order to improve self-care in patients with HF, emphasizing a stepped educational approach that focuses on key behavioral changes with each visit (rather than providing a comprehensive list of behaviors that they easily forget).

(46.2%) who were elderly, retired, and poor, impacting generalizability; 2) Interviews were conducted only one time.

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**Doering et al.**

**Purpose:** To identify relationships between coping styles and emotional states.

**Population:** Outpatients with advanced HF (n = 84, mean age 54.1 [SD = 10.8]; 59 males; 59 Caucasians)

**Sampling Method:** Non-random, convenience sample

**Design:** Cross-sectional

**Measures:**
- **Coping:** Dealing with Illness-R Checklist, a measure of active behavioral coping, active cognitive coping, and avoidance coping.
- **Psychological well-being:** Profile of Mood States, a measure of primary mood states (i.e., confusion, vigor, fatigue, anger, depression, and anxiety)

**Results:** Avoidance coping style was found to be a predictor of anxiety (F = 9.95; p <0.001), anger (F = 23.3; p <0.001), and depression (F = 28.2; p <0.001).

**Implications:** The use of interventions that support active coping styles rather than maladaptive coping styles may improve the emotional well-being of patients with HF.

**Strengths:**
- 1) Reliability for both instruments in prior studies with individuals with HF was acceptable. In this study, the Dealing with Illness-R Checklist had Cronbach’s alpha scores for three subscales ranging from 0.64-0.80 (avoidance subscale = 0.64).
- The Profile of Mood States had Cronbach’s alpha coefficients for six subscales ranging from 0.66-0.88 (confusion subscale = .66).

**Weaknesses:**
- 1) The sample was primarily comprised of Caucasian males.
- 2) Cross-sectional design limits the ability to examine causality and longitudinal studies are warranted.
- 3) Majority of participants had NYHA Class II HF.
- 4) Coping is a
**Carels**

**Purpose:** To examine the impact of disease severity, functional status, and level of depression on daily quality of life.

**Population:** Outpatients with HF (N = 58); mean age 67.7 +/- 11.8 years (range 35-92)

**Sampling Method:** Non-random, convenience sample

**Design:** Cross-sectional, correlational design

**Measures:**
- Coping – Acceptance, active coping, mental disengagement, and instrumental support subscales of the Brief COPE; two other items assessed symptom-related coping
- Quality of life – Daily Assessment of Quality of Life Diary (DAQL), a measure of physical and emotional QOL, social support, positive and negative mood, and coping
- Depression: Beck Depression Inventory (BDI), a measure of depressive symptoms

**Results:** Depression associated with greater social conflict ($t = 3.68; p ≤0.01$) and lower perceived social support ($t = 1.95; p ≤0.05$). Greater action/acceptance coping was related to decreased depression ($t = 2.10; p ≤0.05$)

**Implications:** Assess for the presence of depression in those with lower functional ability and decreased quality of life.

**Strengths:**
1. Measures had established reliability and validity
2. Mean level and variability of QOL was measured over 2 weeks using a diary

**Weaknesses:**
1. Primarily Caucasian participants (n not given)
2. Higher percentage of males (57%) versus females (43%), which is not typical of national statistics
3. Class II (52%) and Class III (40%) HF

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**Bosworth et al.**

**Purpose:** To investigate congestive HF patients’ descriptions of components of quality of life.

**Population:** Male outpatients with HF (N = 15; age range 47 – 82 years; 83% Caucasian); each focus group (N = 5) stratified according

**Findings:** Participants described using problem-solving techniques as a coping strategy to assist with self-care decision-making as needed.

**Strengths:**
1. Qualitative design allows in-depth examination of individual perceptions of quality of life
2. Measuring QOL over time.
<table>
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<tr>
<th>Study</th>
<th>Purpose</th>
<th>Population</th>
<th>Sampling Method</th>
<th>Design</th>
<th>Measures</th>
<th>Findings</th>
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<td></td>
<td>to NYHA classification (Class I/II [N = 10]; Class III/IV [N = 5])</td>
<td></td>
<td>Non-random, purposive sample</td>
<td>Qualitative Design</td>
<td>One-time focus group discussions using a semi-structured, open-ended protocol</td>
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<td>Encourage the use of problem-solving techniques as coping strategies to enhance self-care decision-making.</td>
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<td>Park et al.</td>
<td>Purpose: To evaluate social support, appraisals, and coping as factors of depression.</td>
<td>Elderly outpatients with HF (Time 1: N = 202; mean age 65.6 years with range 44 – 85); (Time 2: N = 163; mean age 65.2 +/- 10 years)</td>
<td>Non-random, convenience sample</td>
<td>Longitudinal, prospective, correlational design, measuring baseline data and data 6 months later</td>
<td>Stress Appraisal Measure (threat and challenge appraisal subscales) and COPE</td>
<td>Active coping was related to depression at both Time 1 ($r = -0.39; p &lt; 0.01$) and Time 2 ($r = -0.37; p &lt; 0.01$). Threat appraisals were also related to depression at both Time 1 ($r = 0.51; p &lt; 0.01$) and Time 2 ($r = 0.53; p &lt; 0.01$). Both threat appraisals ($p &lt; 0.001$) and active coping ($p &lt; 0.05$) prospectively predicted depression at Time 2, controlling for baseline depression.</td>
<td>Interventions that focus on appraisals and coping may be beneficial in improving depressive symptoms in those living with HF.</td>
<td>Measures had excellent reliability coefficients; Longitudinal study; Acceptable attrition (19% over 6 months)</td>
<td>Primarily older Caucasian males, limiting generalizability to younger individuals with HF of different gender and race; Significant differences in ejection fraction regarding those who remained in the study (30.7) versus those lost to follow-up (44.2)</td>
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<td>Vollman, et al. 19</td>
<td><strong>Purpose:</strong> To examine how coping strategies are related to depressive symptoms.</td>
<td><strong>Population:</strong> Outpatients with HF (N = 75, mean age 54.6 years; range 27 to 82 years)</td>
<td><strong>Results:</strong> Problem-focused coping strategies such as seeking social support (r = -0.23; p = .04) and planful problem-solving (r = -0.27; p = .02) were related to decreases in depressive symptoms. The emotion-focused coping strategy of escape-avoidance (r = 0.45; p &lt; .001) was related to increases in depressive symptoms. Escape-avoidance (β = .38; p &lt;.001) and planful problem-solving (β = -.28; p &lt;.01) were found to be predictors of depressive symptoms. Implications: Health care professionals should assess coping skills and educate individuals on the use of problem-focused strategies.</td>
<td><strong>Strengths:</strong> 1) Excellent Cronbach’s alpha coefficient for BDI (.86); 2) All classes of HF (mostly NYHA Class II and III) Weaknesses: 1) Primarily married, male Caucasian participants; 2) low Cronbach’s alpha coefficients for some WCQ subscales (0.55); 3) cross-sectional design limits causal inferences; 4) convenience sampling and recruitment from a single health center limits generalizability</td>
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<td>Klein et al. 12</td>
<td><strong>Purpose:</strong> (1) To determine the relationship between coping styles and health-related quality of life in older HF patients and (2) to determine if a relationship exists between coping styles</td>
<td><strong>Population:</strong> Outpatients with HF (N = 80; mean age 69 +/- 7 years)</td>
<td><strong>Results:</strong> The use of emotion-focused coping strategies, including self-distraction (r = -.32; p &lt;.01), self-blame (r = -.49; p &lt;.001), denial (r = -.30; p &lt;.01), venting (r = -.48; p &lt;.001), and behavioral disengagement (r = -.23; p &lt;.05) was significantly related to overall quality of life. Self-distraction (t</td>
<td><strong>Strengths:</strong> 1) Cronbach’s alpha for the GDS acceptable (0.80-0.85 across multiple age groups, including elderly adults); 2) High number of Class III HF (59%), most likely experiencing significant HF physical symptoms</td>
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and depressive symptoms in older patients with HF.

| Measures: | Measures: Coping – Brief COPE  
| Depressive Symptoms – Geriatric Depression Scale (GDS)  
| Quality of Life – Kansas City Cardiomyopathy Questionnaire (KCCQ)  
| Also Measured: Demographic and clinical characteristics | = -1.97; p <.05), denial (t = -3.21; p <.01), and self-blame (t = -3.09; p <.01) were predictors of QOL, while denial (t = 3.23; p <.01) and self-blame (t = 2.95; p <.01) were predictors of depressive symptoms. Implications: Assessing coping skills and using interventions to lessen maladaptive coping strategies may improve quality of life and decrease depressive symptoms in individuals with HF. |
| Weaknesses: 1) No reported reliability coefficients for emotional and instrumental support of Brief COPE; 2) Sample consisted primarily of a Caucasian, rural population |

Trivedi et al. 20

| Purpose: To investigate the relationship between coping styles and depressive symptoms. | Population: Stable outpatients with HF (N = 222); mean age 57.3 ± 12.5 years (range 27-88); 49.0% White, 45.4% non-Hispanic, 32.75% female  
| Sampling Method: Non-random, convenience sample  
| Design: Prospective, cross-sectional design  
| Measures: Coping – COPE, measures 15 styles of coping (e.g., seeking emotional and instrumental support, planning; denial, venting)  
| Depressive Symptoms – Beck Depression Inventory (BDI), severity of depressive symptoms, e.g., fatigue, sadness, etc. | Results: Increases in depressive symptoms were associated with decreased use of problem-focused coping strategies, such as planning (β = -.15; p <.05), and acceptance (β = -.14; p <.05), was well as the increased use of emotion-focused coping strategies, such as behavioral disengagement (β = .41; p <.001), denial (β = .33; p <.001), and venting (β = .25; p <.001). Higher depression scores (i.e. ≥ 10) was associated with the use of emotion-focused coping skills, including behavioral disengagement (OR = 1.3; p <.001), mental disengagement (OR = 1.3; p <.001), denial (OR = 1.2; p <.01), and venting (OR = 1.2; p <.01). Implications: Health care professionals should emphasize the use of problem-focused adaptive coping |
| Strengths: 1) Racially diverse sample; 2) Measures had established reliability and validity  
<p>| Weaknesses: 1) Mostly male sample; 2) Cross-sectional design limits causal inferences |</p>
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<tr>
<th>Study</th>
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<th>Strengths</th>
<th>Weaknesses</th>
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<tr>
<td>Paukert et al.</td>
<td>To investigate relationships between depressive symptoms and demographic factors, HF physical limitations, perception of HF intrusiveness, coping strategies, locus of control, self-efficacy, and social support. Also purported to determine which of these factors independently predicted depressive symptoms in patients with HF.</td>
<td>Outpatient Veterans with HF (N = 104; mean age 71.1 +/- 7.7 years)</td>
<td>Coping – Brief COPE, which includes emotional and instrumental support. An exploratory principal-components factor analysis yielded three factors in this study: adaptive and maladaptive coping and religion and substance abuse.</td>
<td>Although maladaptive coping strategies were associated with depressive symptoms (r = .31; p &lt; .01), they were not significant predictors.</td>
<td>Adequate Cronbach’s alpha coefficients (0.80-0.85) for GDS in prior studies, across multiple age groups; Cronbach’s alpha coefficient of 0.92 for Brief COPE, but individual coefficients for components not reported; Adequate support for validity and reliability of Multidimensional Scale of Perceived Social Support.</td>
<td>Sample composed mostly of white, male veterans; Half of sample met symptom-level criteria for anxiety while half met criteria for depression, potentially impacting findings and generalizability.</td>
</tr>
<tr>
<td>Bean et al.</td>
<td>To investigate relationships between depressive symptoms and demographic factors, HF physical limitations, perception of HF intrusiveness, coping strategies, locus of control, self-efficacy, and social support. Also measured: Social support, dispositional optimism.</td>
<td>Outpatient Veterans with HF (N = 104; mean age 71.1 +/- 7.7 years)</td>
<td></td>
<td>In the sample,</td>
<td>49.5%</td>
<td>Sample composed mostly of white, male veterans; Half of sample met symptom-level criteria for anxiety while half met criteria for depression, potentially impacting findings and generalizability.</td>
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</table>
investigate ethnic differences in social support, coping, spirituality, and health-related quality of life and their relationship to depression and anxiety.

| Dekker et al.¹⁰ | Purpose: To describe the experience of individuals with HF living with depressive symptoms. | Hospitalized and non-hospitalized African American (n = 48), Caucasian (n = 46), and Hispanic (n = 3) HF patients (total N = 97; mean age 53, +/- 14 years; range 18-82) | 13.4% and 15.5% reported borderline or clinically significant depression levels, respectively. Similarly, 18.6% and 16.5% reported borderline or clinically significant anxiety levels, respectively. Of these, only 40.0% and 43.8% with clinically significant depression and anxiety, respectively, were prescribed medication for these disorders. The use of more avoidant coping strategies was related to increases in depression and anxiety ($\beta = 0.32; p < .001$). Implications: Use brief anxiety and depression measures and refer to mental health specialists, when appropriate. Assess coping strategies and their relationship to the presence of depression, anxiety, and quality of life. | African Americans, enhancing generalizability; 2) Measures had adequate reliability coefficients (.80 to .85)
Weaknesses: 1) sample comprised mostly of Class I and II HF (54.6%) versus Class III and IV HF (45.4%), potentially biasing findings; 2) Few Hispanics, limiting generalizability; 3) Cross-sectional design limits causal inferences |

<p>| | Sampling Method: Non-random, convenience sample | Measures: Coping – Brief COPE; principle component analysis yielded two factors: approach coping (e.g., planning, active coping) and avoidant coping (e.g., behavioral disengagement) | Results: Participants used activities, distraction, and social support as strategies for coping with depressive symptoms. Implications: Encourage positive coping strategies for dealing with depressive symptoms. |
| | Design: Cross-sectional, correlational design | Depression and Anxiety – Hospital Anxiety and Depression Scale (HADS) Also Measured: Demographic and clinical characteristics, social support, spiritual well-being, and health-related quality of life | Strengths: 1) Equal number males and females; 2) History of depression/depressive symptoms allowed evaluation of stressors associated with depressive symptoms and strategies used to |</p>
<table>
<thead>
<tr>
<th>Kristofferzon et al.\textsuperscript{13}</th>
<th>Purpose: 1) To evaluate differences between those with ESRD and CHF regarding coping, sense of coherence, self-efficacy, and QOL and to 2) investigate the relationships between demographic variables and QOL as well as between coping, sense of coherence, self-efficacy, and QOL for the combined sample of patients.</th>
<th>Population: Outpatients with ESRD (n = 41) or CHF (n = 59); mean age 68 years ± 9.05</th>
<th>Results: No significant differences in coping or QOL were noted between the ESRD and CHF groups. Emotion-focused coping was found to be negatively related to QOL ($r = -0.04$; $p &lt; 0.01$).</th>
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<tr>
<td></td>
<td>37-81) Sampling: Non-random, purposive sample</td>
<td>Design: Qualitative Design</td>
<td>Implications: Health care professionals should evaluate coping strategies used by individuals with chronic illnesses, as increased use of emotion-focused coping strategies may lower QOL in these patients.</td>
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<td></td>
<td>Design: Comparative, cross-sectional, correlational design</td>
<td>Measures: One-time, semi-structured interview</td>
<td>Strengths: 1) LSQ-SF had adequate Cronbach’s alpha values for the subscales (0.80 to 0.90) and total scale (0.88); 2) Sample of ESRD participants was comprised of approximately half ≤ 65 years old and half &gt; 65 years old, increasing the generalizability</td>
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<tr>
<td></td>
<td>Quality of Life – Life Satisfaction Questionnaire – Short Form (LSQ-SF), which measures health, personal relationships, and everyday living</td>
<td>Symptoms: manage these symptoms</td>
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<td>Weaknesses: 1) One interview for each participant, limiting insight into the relationship between social support and depressive symptoms over time; 2) Primarily Class III HF (60%), although all HF classes; 3) No discussion of recruiting participants until saturation was reached, which is desired to identify more complete themes/data</td>
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Weaknesses: 1) Cronbach’s alphas for the JCS-60 ranged from 0.61 to 0.89 for the subscales and 0.95 for the total scale, with lower alphas being inadequate; 2) The sample for each group was of more men than women (ESRD: 61%; CHF: 66%); 3) Only compared two groups of chronic illnesses; 4) Cross-
| also measured: sense of coherence and self-efficacy | sectional design |
Table 2 Coping and Physical Health-Related Quality of Life

<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Study Purpose</th>
<th>Methods</th>
<th>Findings/Implications</th>
<th>Strengths and Weaknesses</th>
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<tr>
<td>Carels et al.</td>
<td>Purpose: To investigate the relationship between psychosocial functioning and physical symptoms of HF.</td>
<td>Population: Outpatients with HF (N = 58; mean age 67.7 ± 11.8 years)</td>
<td>Findings: Symptom-focused coping ($\beta = .21; p &lt; .05$) and distraction ($\beta = .10; p &lt; .05$) (i.e., emotion-focused coping) and social conflict ($\beta = .14; R^2 = .07$) were associated with increases in physical symptoms of HF. Whereas, action/acceptance coping ($\beta = .09; p &lt; .05$) (i.e., problem-focused coping) and positive mood ($\beta = -.09; p &lt; .05$) were associated with less physical symptoms of HF.</td>
<td>Strengths: 1) Collection of data daily over a two week period; 2) Sample was diverse according to age and gender (race not reported)</td>
</tr>
<tr>
<td>Heo et al.</td>
<td>Purpose: To examine the perceptions of patients with HF about quality of life.</td>
<td>Population: Outpatients with HF (N = 20; mean age 58 ± 10 years)</td>
<td>Findings: Participants reported using social support as a coping resource to assist with adaptation to life with HF symptoms.</td>
<td>Strengths: 1) Sample was diverse with regards to HF severity (i.e., NYHA classification)</td>
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<td></td>
<td></td>
<td>Sampling method: Non-random, purposive sample</td>
<td>Implications: Encourage the use of social support resources to aid in coping with HF related physical symptoms.</td>
<td>Limitations: 1) Sample was comprised mostly of Caucasian participants (90%); 2) Sample included a large percentage of males (70%)</td>
</tr>
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</table>
### Table 3 Coping and Physical and Psychological Health-Related Quality of Life

| Purpose: (1) To examine whether particular coping strategies used to deal with HF are related to meaning in life across time and (2) whether meaning in life mediates the effect of coping on health-related quality of life. | Population: This study used previously collected data from outpatients with HF (Time 1: N = 202; mean age 65.6; Time 2: N = 163; mean age not provided) |
| Purpose: (1) To examine whether particular coping strategies used to deal with HF are related to meaning in life across time and (2) whether meaning in life mediates the effect of coping on health-related quality of life. | Sampling Method: Sampling method previously described<sup>50</sup> |
| Purpose: (1) To examine whether particular coping strategies used to deal with HF are related to meaning in life across time and (2) whether meaning in life mediates the effect of coping on health-related quality of life. | Design: Design described previously<sup>50</sup> |
| Purpose: (1) To examine whether particular coping strategies used to deal with HF are related to meaning in life across time and (2) whether meaning in life mediates the effect of coping on health-related quality of life. | Measures: Coping – COPE, which measured various coping styles |
| Purpose: (1) To examine whether particular coping strategies used to deal with HF are related to meaning in life across time and (2) whether meaning in life mediates the effect of coping on health-related quality of life. | Health-related quality of life – Medical Outcomes Study Short Form (SF-36), a measure of both mental and physical quality of life |
| Purpose: (1) To examine whether particular coping strategies used to deal with HF are related to meaning in life across time and (2) whether meaning in life mediates the effect of coping on health-related quality of life. | Also measured: Severity of HF and meaning in life |
| Purpose: (1) To examine whether particular coping strategies used to deal with HF are related to meaning in life across time and (2) whether meaning in life mediates the effect of coping on health-related quality of life. | Results: The use of disengagement, as a coping strategy, was related to poorer QOL (r = -.25; p <.01). |
| Purpose: (1) To examine whether particular coping strategies used to deal with HF are related to meaning in life across time and (2) whether meaning in life mediates the effect of coping on health-related quality of life. | Implications: Disengagement, as a coping strategy, may decrease individuals’ quality of life. Patients should be assessed for using maladaptive coping strategies to address QOL. |
| Purpose: (1) To examine whether particular coping strategies used to deal with HF are related to meaning in life across time and (2) whether meaning in life mediates the effect of coping on health-related quality of life. | Strengths: 1) Reliability coefficients for the SF-36 were acceptable (0.74 for the physical health component and 0.77 for the mental health component) |
| Purpose: (1) To examine whether particular coping strategies used to deal with HF are related to meaning in life across time and (2) whether meaning in life mediates the effect of coping on health-related quality of life. | Weaknesses: 1) Sample comprised mostly of white, males and of lower socioeconomic status (79%); 2) Reliability coefficients for the subscales of the COPE ranged from 0.66 to 0.91, with lower alphas being inadequate; 3) Individuals were assessed only at two points |
SOCIAL SUPPORT AND SELF-CARE BEHAVIORS IN INDIVIDUALS WITH HEART FAILURE: AN INTEGRATIVE REVIEW

by

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International Journal of Nursing Studies, 51(2), 320-333.
doi: 10.1016/j.ijnurstu.2013.06.013

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Format adapted for dissertation
Abstract

Objectives:
The purpose of this review is to examine and synthesize recent literature regarding the relationship between social support and self-care behaviors in individuals with heart failure (HF).

Background:
Self-care is an important factor in maintaining health and well-being for individuals with heart failure. Self-care behaviors are an integral component of self-care, and may be impacted by the disease process of heart failure. However, social support may positively influence an individual’s self-care behaviors by assisting with activities associated with symptom management and evaluation, as well as activities associated with maintaining heart failure-related treatment regimens. This review will synthesize the current knowledge related to the influence of social support on heart failure self-care behaviors.

Design and Data Sources:
Using an integrative review method, a review of current empirical literature was conducted utilizing CINAHL, PsycARTICLES, and PubMed computerized databases for a period of January 2000 to December 2012. Thirteen studies were identified that met the inclusion criteria for review and investigated aspects of social support and heart failure self-care behaviors.

Results:
Social support appears to have a positive relationship on heart failure self-care behaviors, with an individual’s family playing an important role in assisting individuals to maintain...
positive self-care behaviors. Social support appears to influence both heart failure self-care maintenance and management related behaviors by assisting with maintaining treatment regimens and by participating in the decision-making process related to the management of symptoms, as well as seeking treatment for symptoms of heart failure.

Conclusions:
All four types of social support (i.e., emotional support, instrumental/tangible support, informational support, and appraisal support) are involved in the interactive process between an individual’s social network (i.e., family and peers) and the individual with heart failure to maintain self-care behaviors that enhance health and well-being. However, more research is needed, specifically longitudinal and experimental designs, to determine the effectiveness of social support on self-care behaviors in individuals with heart failure, since this review revealed mostly cross-sectional, correlational studies which limits the ability to infer causality.

Keywords:
Social support, social network, family, self-care, self-care behaviors, heart failure
What is already known about the topic?

- Heart failure is one of the most common diagnoses associated with hospital admissions among individuals 65 years and older.
- Maintaining positive self-care behaviors are integral to the health and well-being of individuals with heart failure and are associated with positive disease-related outcomes.
- The disease process of heart failure impacts individuals’ ability to maintain positive self-care behaviors and thus, affects their health and well-being.

What this paper adds

- This review demonstrates that social support positively influences heart failure-related self-care behaviors in individuals by influencing both heart failure self-care maintenance and management related behaviors.
- All four types of social support (i.e., emotional support, instrumental/tangible support, informational support, and appraisal support) are involved in an interactive process between one’s social network and the individual with heart failure in maintaining self-care behaviors.
- An individual’s family appears to be the most influential in assisting with the maintenance of heart failure self-care related behaviors.
Introduction

Heart failure (HF) is one of the most common reasons for hospitalization among individuals 65 years and older (AHA, 2010), especially if co-morbidities exist (Aranda et al., 2009). Currently, the prevalence of HF continues to increase, with approximately 660,000 new cases diagnosed each year. Morbidity and mortality rates remain high, with one out of five people dying within a year of diagnosis (AHA, 2010). Although hospital readmissions are common, the majority of individuals living with HF seek treatment as outpatients (Liu, 2010). The AHA (2010) reports that about 26.8 million individuals living in outpatient settings make approximately 16 million visits to ambulatory care centers for HF-related treatment; thus, increasing healthcare costs for both direct and indirect treatment of HF. In 2010, the cost of HF-related treatment was estimated to be 39.2 billion dollars (AHA, 2010). Therefore, it is vital that individuals with HF participate in self-care behaviors that may positively influence morbidity and decrease the number of visits to ambulatory care centers and hospitals for HF-related treatment.

Self-care is an important factor in maintaining optimal health for individuals with heart failure (Riegel et al., 2009). Self-care behaviors are an integral component of self-care, which is defined as a process by which individuals perform daily behaviors that promote or restore health and well-being and assist in illness prevention and management (Moser & Watkins, 2008). The progressive nature of HF and associated physical symptoms often impact an individual’s ability to perform self-care behaviors (Carlson et al., 2001; Riegel & Carlson, 2002), predisposing one with HF to poor HF-related
outcomes, including decreased quality of life and increased mortality, in addition to increased healthcare-related expenditures (Riegel et al., 2009).

However, social support may positively influence an individual’s self-care behaviors. Support from one’s family and social network has been found to influence optimal self-care by assisting with activities associated with symptom management and evaluation (Friedman & Quinn, 2008; Quinn et al., 2010; Riegel & Carlson, 2002; Riegel & Carlson, 2004), in addition to assisting with activities related to maintaining HF-related treatment regimens, (i.e., dietary and medication adherence) (Gallagher et al., 2011; Sayers et al., 2008). Although support can come from anyone within an individual’s social network (Langford et al., 1997), an individual’s family appears to be the most influential in assisting with maintenance of self-care activities (Dunbar et al., 2008).

Previous integrative reviews have focused solely on interventions that promote self-care (Barnason et al., 2012) and on the experiences and perceptions of those living with HF (Westland et al., 2009). Additionally, a state of the science examined the promotion of self-care (Riegel et al., 2009); however, no prior studies to date have synthesized the data related to the influence of social support on self-care behaviors. Thus, little is known regarding the influence of social support on self-care behaviors in individuals with HF or which type of social support may be more beneficial in enhancing specific self-care behaviors in this population. Therefore the purpose of this review was to: (1) examine recent literature regarding the relationship between social support and self-care behaviors in individuals with HF; (2) synthesize findings across those studies; (3) assess potential areas of future research regarding social support and self-care; and (4) identify implications for nursing practice.
Definitions and Concepts

Social Support

Social support is a multi-faceted concept (Langford et al., 1997) that positively influences disease-related outcomes in multiple chronic illnesses (Elfstrom et al., 2005; Huang et al., 2010; Hunt et al., 2012), including HF (Gallagher et al., 2011; Park et al., 2006). Defined as the assistance and protection given to others (Langford et al., 1997), social support is thought to act as a buffer in stressful situations (House et al., 1988). Social support has also been described as the exchange of resources between two or more individuals (Shumaker & Bronwell, 1984).

Four types of social support have been found to influence disease-related outcomes in individuals with HF, including emotional support, instrumental/tangible support, informational support, and appraisal support (Dekker et al., 2009; Dunbar et al., 2008; Park et al., 2006; Riegel & Carlson, 2002). Emotional support involves conveying the perception of caring, love, and trust to others. Instrumental/tangible support refers to the provision of goods and services needed by the recipient. Informational support is the provision of information to individuals during a stressful situation. Lastly, appraisal support involves providing assistance with self-evaluation and involves affirming the appropriateness of actions or statements made by other individuals (Langford et al., 1997).

Social network is a related term and is considered to be an antecedent of social support (House et al., 1988; Langford et al., 1997). Social network is the channel through which social support is provided to others (Langford et al., 1997) and is commonly
comprised of one’s friends and family (House et al., 1988; Langford et al., 1997). Social network has also been defined as the size, structure, and frequency of contact with the group of people surrounding an individual (Rodriguez-Artalejo et al., 2006). An individual’s family appears to be the most influential members of one’s social network, as family support has been found to positively influence HF-related outcomes, including quality of life, psychosocial function, and self-care (Dekker et al., 2009; Heo et al., 2009; Riegel & Carlson, 2002).

**Self-care and Self-care Behaviors**

Self-care is a naturalistic decision-making process occurring in real-world settings that includes specific behaviors aimed at maintaining health and well-being (Riegel & Dickson, 2008; Riegel et al., 2009). Self-care involves behaviors undertaken by individuals and their social network in an effort to enhance health, limit illness-related complications, and restore well-being (World Health Organization, 1983). Self-care behaviors are defined as activities that individuals initiate and perform to maintain life, healthy functioning, and well-being (Orem, 1991). Self-care behaviors related to HF are very specific and involve activities aimed at decreasing morbidity and maintaining physiologic stability (Riegel & Dickson, 2008), including activities such as taking prescribed medications, monitoring symptoms, adhering to a specialized diet, maintaining fluid restrictions, and participating in regular exercise (Riegel et al., 2009).

Attributes of self-care include the ability to perform and actual involvement in self-care behaviors that promote, enhance, or maintain health. Antecedents that influence the performance of self-care behaviors include factors associated with five categories: 1)
cognitive factors, which include memory, problem-solving skills, organizational ability, and knowledge base; 2) psychosocial factors, which comprises personality traits, self-discipline, and motivation; 3) physical factors, such as psychomotor skills and functional status; 4) demographic factors, including age, gender, educational level, socioeconomic status, and living arrangements; and 5) sociocultural factors, such as support systems, availability of resources, cultural beliefs, and health values (Sidani, 2003). Prior research has indicated that several factors facilitate self-care behaviors in individuals with HF including perceived control, socioeconomic status, health literacy, and social support. However, the concept of social support is multi-faceted and research findings, thus far, have not been synthesized nor evaluated regarding how the various aspects of social support influence self-care. In addition to facilitators, several barriers have also been identified in previous research that influence self-care behaviors in those with HF, such as increased age, impaired cognition, decreases in functional status, sensory impairment, the presence of multiple comorbidities, social isolation, and decreases in psychological functioning (i.e., depression and anxiety) (Moser & Watkins, 2008).

Often viewed as an outcome of nursing care (Sidani, 2003), self-care is also a process that involves a combination of performing self-care behaviors, as well as participating in problem-solving activities (Moser & Watkins, 2008; Sidani, 2003). Self-care of HF involves two processes known as self-care maintenance and self-care management. Each process involves specific self-care behaviors aimed at maintaining health and well-being. Self-care maintenance involves behaviors used to maintain health and physiologic integrity. Activities associated with self-care maintenance include symptom monitoring and treatment regimen adherence (i.e. medication and dietary
adherence, fluid restriction, participating in regular exercise). Whereas, activities related to self-care management involve participation in the decision-making response to symptoms when they occur and include behaviors such as symptom recognition and evaluation, plus treatment implementation and evaluation (Riegel & Dickson, 2008).

Self-care confidence is thought to serve as a moderator or mediator in the relationship between self-care behaviors and HF-related outcomes. However, individual, situational, and environmental antecedents impact the decision-making process, thus influencing the decisions made regarding self-care (Riegel & Dickson, 2008). Antecedents thought to influence the self-care decision-making process of individuals with HF include age, gender, marital status, length of time since HF diagnosis, educational level, and availability of social support (Cameron et al., 2010; Dunbar et al., 2008; Moser & Watkins, 2008; Riegel & Carlson, 2002; Riegel et al., 2010; Sayers et al., 2008).

**Methods**

An integrative review of empirical literature was conducted using methodological processes described by Cooper (1982), in addition to that of others (Dixon-Woods et al., 2004; Lubbe et al., 2012; Whittemore & Knafl, 2005) for integrative reviews of quantitative and qualitative research. An integrative review includes both non-experimental and experimental designs, thus providing a synthesis of current knowledge that may potentially influence evidence-based nursing practice (Whittemore & Knafl, 2005).
Initially, a search of the literature was conducted using CINAHL, PsycARTICLES, and PubMed computerized databases. Keywords used in the searches included “social support,” “social network,” “family,” “caregivers,” and “heart failure.” These words were combined with “self-care,” “problem-solving,” “decision-making,” and “adherence,” “self-care maintenance,” and “self-management.” In order to obtain the most recent research, the search was limited to publications from January 2000 to December 2012. Next, the reference lists from current and previous literature reviews and research studies were examined to identify relevant articles not identified in the computerized database searches. The title and abstract of the relevant articles were read to determine consistency with the study purpose.

To determine inclusion in the review, the following criteria were established: (1) the study was published in English; (2) the study examined aspects of social support and self-care; and (3) the articles were published between January 2000 and December 2012. Studies written in other languages were excluded due to the reviewer’s language limitations. Studies not mentioning elements (by name or description) of social support and self-care in the title, abstract, or text were excluded. Articles which included patient-caregiver dyads were also excluded from this review, in addition to unpublished manuscripts (i.e., abstracts), books, and duplicate articles.

This review was not limited by study design and included qualitative, quantitative, experimental, and mixed method studies. The final sample for this integrative review was comprised of cross-sectional, longitudinal, and qualitative designs. Since the purpose of this study was to synthesize all findings describing the influence of
social support on self-care behaviors in studies utilizing diverse methodologies, a quality appraisal was not conducted.

The initial review yielded 146 articles for consideration from the three computerized data bases and articles from the review of reference lists from previous literature reviews (See Figure 1). Following the removal of duplicate articles (n = 34), the abstracts of 112 articles were screened. Articles not meeting the inclusion criteria (i.e., studies not written in English, dyad studies, and unpublished manuscripts) were then discarded (n = 64). Full text of the remaining articles (n = 48) were then assessed for eligibility, with an additional 35 articles discarded for failure to meet the inclusion criteria (i.e., studies did not examine both social support and self-care). Of the remaining 13 studies, two were qualitative, nine were quantitative, one was experimental, and one was a mixed methods study. Definitions of social support and self-care were analyzed to fully comprehend the influence of social support on self-care behaviors. Antecedents, facilitators, and barriers to self-care were also examined; however, there were limited findings in this area.

Data matrices were developed to illustrate the coded data from each report by category and were compared iteratively. In an effort to reduce bias, studies were first analyzed and coded by one reviewer, then independently reviewed and analyzed by a second reviewer. Findings were compared and areas of disagreement were discussed between both reviewers until consensus was reached.

Articles meeting the inclusion criteria were divided into subgroups according to study design and analyzed sequentially (Whittemore & Knafl, 2005). Sources were described according to elements extracted from the articles: author and year, study
purpose, type of sample, methods, findings, and strengths and weaknesses (See Table 1). Findings related to social support and self-care behaviors were obtained from these studies. Next, data describing social support and self-care behaviors were assembled from the sources and arranged to identify themes and their relationships. During the analysis, the subgroups were kept separate. Since the similar themes were identified from both subgroups, the subgroups were integrated at the end of the analysis and the results were presented according to themes only.

Results

Study Characteristics

Out of an initial 146 studies, 13 met inclusion criteria. In examining the literature, all of the included studies investigated the influence of social support on activities associated with self-care maintenance and self-care management. Self-confidence, which influences one’s ability to perform self-care behaviors (Riegel & Dickson, 2008) was also investigated in four of the included studies (Chiaranai et al., 2009; Riegel et al., 2010; Salyer et al., 2012; Sayers et al., 2008). However, since HF-related self-care behaviors are classified as either self-care maintenance or management (Riegel & Dickson, 2008), this review focused solely on those studies that investigated social support and self-care maintenance and/or self-care management related behaviors and the results will be presented in this manner.

All of the studies had similar sample characteristics, with the exception of three studies (Chiaranai et al., 2009; Salyer et al., 2012; Sayers et al., 2008) which used
samples consisting of primarily African Americans (Sayers et al., 2008) and relatively equal numbers of African Americans and Caucasians (Chiaranai et al., 2009; Salyer et al., 2012). The mean age of participants ranged from 56 to 74 years and included mostly Caucasian male participants. Although this review was not limited by study design, the majority of included studies were cross-sectional/correlational studies (Chiaranai et al., 2009; Friedman & Quinn, 2008; Gallagher et al., 2011; Heo et al., 2008; Rockwell & Riegel, 2001; Salyer et al., 2012; Sayers et al., 2008); however, two longitudinal studies (Chriss et al., 2004; Wu et al., 2008), two qualitative studies (Riegel & Carlson, 2002; Tierney et al., 2011), one experimental study (Riegel & Carlson, 2004), and one mixed methods study (Riegel et al., 2010) were also included in this review, adding to the diversity of study designs and enhancing the ability to examine the influence of social support on self-care behaviors. Several studies also measured antecedents to self-care, including age, race, gender, educational level, and socioeconomic status (Chiaranai et al., 2009; Heo et al., 2008; Rockwell & Riegel, 2001; Wu et al., 2008), while one study focused on facilitators and barriers to self-care (Riegel & Carlson, 2002).

Several studies provided definitions of self-care (Chriss et al., 2004; Heo et al., 2008; Riegel & Carlson, 2002; Riegel et al., 2010; Rockwell & Riegel, 2001; Salyer et al., 2012; Sayers et al., 2008), while others provided definitions of the specific self-care behavior that was measured, such as medication adherence (Wu et al., 2008) and HF-related physical activity (Tierney et al., 2011). Some definitions were more generic, with one study defining self-care as a process that individuals use to maintain health and manage symptoms (Riegel & Carlson, 2004), while other studies expanded on this definition by defining it as a “cognitive process” (Chriss et al., 2004; Rockwell & Riegel,
2001). However, the process of HF self-care involves particular behaviors that are specific to the disease process and promote or enhance health and well-being (Riegel et al. 2008). Thus, other studies defined self-care in this regard by defining self-care in terms of self-care maintenance and/or self-care management (Heo et al., 2008; Salyer et al., 2012; Sayers et al., 2008), which identifies HF-related self-care behaviors that are specific to the disease process. These last definitions of self-care (Heo et al., 2008; Salyer et al., 2012, Sayers et al., 2008) were in accordance with the definition of HF self-care as described by Riegel et al. (2008).

Few studies provided a definition of social support, yet provided definitions for the specific type of support investigated, such as supportive relationships (Salyer et al., 2012) and peer support (Riegel & Carlson, 2004). However, one study defined social support as the presence of supportive relationships that enhance health and buffer stress by incorporating several aspects including the quality of the relationship, caring, and concern for the individual, as well as the provision of practical, emotional, and informational support (Gallagher et al., 2011), consistent with a classic definition of social support provided by House et al. (1988).

**Social Support and Self-care Maintenance**

Self-care maintenance refers to activities associated with maintaining physiologic well-being and includes behaviors associated with symptom monitoring and treatment adherence (Riegel & Dickson, 2008), such as adhering to the medication and dietary treatment regimen, engaging in moderate exercise, and monitoring symptoms related to fluid retention (i.e., weight gain, dyspnea, and edema) (Sayers et al., 2008). Nine studies
investigated the influence of social support on self-care maintenance behaviors. While four were cross-sectional, two were qualitative, two were longitudinal, and one was a cross-sectional mixed methods study.

Social support was found to be positively associated with self-care maintenance in several studies. In one study, external support was found to facilitate self-care maintenance behaviors. The use of external sources, such as family, friends, and health care professionals were reported in a qualitative study to provide informational, emotional, and tangible support which enabled individuals with HF to maintain their medication and dietary treatment regimen (Riegel & Carlson, 2002). In another qualitative study, family also assisted individuals with maintaining adherence to the recommended exercise regimen through encouragement and provision of emotional support (Tierney et al., 2011).

Likewise, family, particularly spouses, assisted with maintaining the medication regimen and making medical decisions versus other relatives (Sayers et al., 2008). The provision of emotional and instrumental support was significantly related to dietary and medication adherence (Sayers et al., 2008), with perceived support having a significant relationship with both dose-count and dose-time (Wu et al., 2008). These findings are similar to those of Gallagher et al. (2011), in which high levels of social support were significantly related to specific self-care maintenance behaviors, such as monitoring weight gain, limiting fluid intake, adhering to the medication regimen, getting an annual flu shot, and exercising regularly.

Two studies specifically examined gender differences in self-care maintenance behaviors (Heo et al., 2008; Riegel et al., 2010). In a mixed methods study (Riegel et al.,
social support was reported to be a factor which influenced self-care maintenance behaviors, such as maintaining the medication regimen; however, differences were noted between males and females in the types of support which were most beneficial. Men reported receiving more tangible support, primarily from their spouses, while women reported more emotional support and insufficient tangible support. Quantitative data indicating that men received higher levels of support from a significant other and family compared to women. However, more of the men were married (n = 14), whereas the women were more likely to be widowed (p = .03) and living alone (p = .05) (Riegel et al., 2010), possibly biasing study findings. In contrast, findings from a study by Heo et al. (2008) indicated that social support was not significantly related to self-care maintenance behaviors, nor was social support significantly related to either men or women’s self-care maintenance behaviors.

Although findings suggest that social support is positively correlated with self-care maintenance behaviors (Chiaranai et al., 2009), data are inconsistent as to whether social support is a predictor of self-care maintenance. In one study, a high level of social support was a significant predictor of self-care maintenance (Gallagher et al., 2011). However, in another study, social support was not a significant predictor of self-care maintenance (Chriss et al., 2004).

Findings of this review suggest that social support has a positive influence on self-care maintenance, specifically medication and dietary treatment adherence. Although support can come from multiple sources in one’s social network, family and spousal support appear to be the most influential in assisting with self-care maintenance.
behaviors. However, data are inconsistent as to whether social support is a predictor of self-care maintenance.

**Social Support and Self-care Management**

Self-care management refers to behaviors related to the decision-making process in response to increases in symptoms (Riegel & Dickson, 2008) and involves activities such as managing increased symptoms and deciding when to seek professional treatment (Sayers et al., 2008). Only one study solely investigated the influence of social support on self-care management. In this cross-sectional study, symptoms, actions, and the time before hospital admission for HF was investigated. Findings of this review suggest that family support is vital in the decision-making process to seek treatment for symptoms of HF, with most individuals contacting a family member to discuss symptoms prior to seeking treatment at a hospital. Spouses, however, were the family member most often consulted regarding HF symptoms, with those unmarried commonly consulting children (Friedman & Quinn, 2008). Findings indicate that family plays a pivotal role in the decision-making process to seek treatment for symptoms of HF, providing both informational and appraisal support.

**Social Support and Self-care Maintenance and Management**

Self-care maintenance and management, although two separate concepts, when combined make up critical behaviors of HF self-care. In order to have optimal self-care, individuals with HF need to be proficient in both areas (Riegel & Dickson, 2008). Three studies investigated the influence of social support on both self-care maintenance and
management. One study was experimental in design, while two studies were cross-sectional. In a random controlled trial (Riegel & Carlson, 2004) investigating the effect of peer support on self-care in HF patients, mentors maintained weekly contact by telephone or visit with mentees during the first month after hospital discharge and then at least monthly thereafter for 90 days. Mentors addressed areas related to HF self-care maintenance and management, such as diet and fluid management, medication adherence, exercise, recognizing and evaluating symptoms, and when to seek treatment. However, findings of this random controlled trial indicated that only self-care management was significantly increased over the 90 day period in the intervention group versus the control group. Researchers hypothesized that a longer follow-up period may be necessary to see significant increases in self-care maintenance (Riegel & Carlson, 2004).

Supportive relationships were also found to influence self-care maintenance and management in a mediational study by Salyer et al. (2012). The perceived availability of a supportive relationship had a positive direct relationship on self-care maintenance, in addition to an indirect effect on self-care maintenance through self-care confidence. Likewise, perceived support had a positive indirect effect through self-care confidence on self-care management. Additionally, social network was related to both self-care maintenance and management. The size of one’s social network was negatively related to self-care confidence, thereby creating a positive effect on self-care maintenance. Likewise, the size of one’s social network had a negative effect on self-care confidence, thus creating a positive effect on self-care management. The size of one’s social network also had a significant negative effect on self-care management. These findings indicate that the association between supportive relationships and self-care maintenance had both
direct and indirect (through self-care confidence) relationships with self-care maintenance; whereas, self-care confidence mediated the relationship between supportive relationships and self-care management (Salyer et al., 2012). However, data are inconsistent regarding the association of social support and self-care. In another study investigating predictors of self-care maintenance and management, findings indicated that social support was not a predictor of self-care maintenance and management (Rockwell & Riegel, 2001), thereby illustrating a lack of consensus in this area.

However, findings from this review suggest that that availability of support persons is positively related to self-care maintenance and management behaviors. Although, family was identified as a significant source of support in prior studies (Friedman & Quinn, 2008; Sayers et al., 2008), findings from this review also support the importance of peers as sources of support, as well as the availability of supportive relationships (Riegel & Carlson, 2004; Salyer et al., 2012).

**Discussion**

The purpose of this review was to examine recent literature regarding the relationship between social support and self-care behaviors in individuals with HF and to synthesize findings across those studies. Thirteen studies were identified that investigated aspects of social support and self-care behaviors (i.e., self-care maintenance and management), such as adhering to medication and dietary regimen, monitoring HF-related symptoms, managing symptoms, and making decisions related to seeking treatment. The 12-year review period allowed for examination of the most recent literature regarding social support and self-care behaviors in individuals with HF.
The findings of this review suggest that social support has a positive relationship with self-care maintenance and management. Social support appears to be related to self-care maintenance by assisting with treatment adherence (i.e., medication, diet, and exercise), as well as providing guidance when monitoring symptoms and promoting healthy behaviors (i.e., obtaining yearly flu vaccinations) (Gallagher et al., 2011; Riegel & Carlson, 2002; Tierney et al., 2011; Wu et al., 2008). The type of support that enhances self-care appears to differ between males and females. Males receive more tangible support, while females commonly receive more emotional support (Riegel et al., 2010). Although, data are inconsistent with regards to social support and gender differences (Heo et al., 2008). However, family members appear to play an important role in influencing self-care behaviors (Riegel & Carlson, 2002; Tierney et al., 2011). However, there is little consensus regarding whether social support is actually a predictor of self-care maintenance behaviors (Chriss et al., 2004; Gallagher et al., 2011).

Although studies that only investigated social support and self-care management were limited, the findings of this review suggest that social support influences self-care management by assisting in the decision-making process to seek treatment for HF-related symptoms. Family, specifically spouses, was found to be the main source of support to participate in the decision-making process (Friedman & Quinn, 2008). Additionally, findings indicate that self-confidence may mediate the relationship between social support and self-care maintenance and management. However, it appears that social support also has a positive direct relationship with self-care maintenance (Salyer et al., 2012).
These findings indicate the importance of social support on the health and well-being of individuals with HF. Although findings suggest that social support is related to self-care behaviors, there are other factors to consider that may influence an individual’s self-care behaviors. For example, findings suggest that antecedents, such as age and gender predict self-care behaviors, with older age and male gender being predictive of self-care maintenance activities (Chriss et al., 2004). Additionally, educational level and symptom status may also be predictive of self-care behaviors. Previous findings indicate that higher educational level and increased symptom severity are significant predictors of self-care maintenance and management behaviors (Rockwell & Riegel, 2001).

Likewise, several barriers have been found to influence one’s ability to perform self-care behaviors. For example, impaired cognition, which is common in this population, (Bennett & Sauve, 2003; Pressler, 2008) has been found to be associated with poor self-care (Dickson et al., 2006; Riegel et al., 2007). Individuals with HF who also have cognitive impairments experience deficits in several areas, including attention/concentration, long-term memory, working memory, psychomotor speed, language, problem-solving, and executive function (Woo et al., 2003; Woo et al., 2009), which may increase the difficulty of performing and maintaining self-care activities. Similarly, sensory deficits, as well as decreased functional status and comorbidities have also been found to influence individuals’ ability to perform self-care behaviors (Moser & Watkins, 2008).

However, the family unit is the most important social unit in many countries of the world and a major source of support (Grant et al., 2013). Peterson (2010) and others (Schröder-Butterfill, 2004) emphasized the importance of physical and emotional contact.
between individuals for relationships to develop and exist, as well as emphasized how these close associations among people are reciprocal and benefit those who make up these social units. Therefore, this perspective of family and other relationships may leverage benefits in cultures where there is a less individualistic focus.

**Strengths and Weaknesses**

The majority of studies included in this review used non-random sampling methods (i.e., convenience or purposive). Although it is common in health-related research to use these sampling methods when a specific patient population is desired, the generalizability of findings is impacted (Polit & Beck, 2012). Even though the majority of studies included in this review had adequate sample sizes, several studies used samples that were not characteristic of the population under investigation. For example, three studies used samples that consisted of primarily Caucasian participants (Friedman & Quinn, 2008; Heo et al., 2008; Wu et al., 2008). Likewise, samples in several studies consisted of mostly male participants (Chiaranai et al., 2009; Friedman & Quinn, 2008; Heo et al., 2008; Riegel & Carlson, 2002; Riegel et al., 2010; Salyer et al., 2012; Sayers et al., 2008; Tierney et al., 2011; Wu et al., 2008). The use of non-representative samples further limits the generalizability of findings to a larger population (Polit & Beck, 2012).

Another limitation noted in this review was the frequent use of instruments with low reliability coefficients. Several studies (Chiaranai et al., 2009; Gallagher et al., 2011; Heo et al., 2008; Riegel et al., 2010) used the Self-Care of Heart Failure Index (SCHFI) to measure self-care behaviors; however, the self-care maintenance subscale consistently had low Cronbach alphas ranging from 0.55 – 0.71, with the exception of two studies
(Chriss et al., 2004; Sayers et al., 2008) in which the Cronbach’s alpha for this subscale ranged from 0.76 – 0.77. The use of instruments with low reliability coefficients significantly impacts the confidence of study findings, as the ability to detect significant relationships is decreased (Polit & Beck, 2012). Additionally, the use of various instruments to measure self-care behaviors make it difficult to generalize findings, especially with some studies measuring specific self-care activities, such as medication regimen adherence (Sayers et al., 2008; Wu et al., 2008) and dietary adherence (Sayers et al., 2008) and others using instruments specifically designed to measure HF self-care (Chiaranai et al., 2009; Gallagher et al., 2011; Heo et al., 2008; Riegel & Carlson, 2004; Riegel et al., 2010; Salyer et al., 2012).

Lastly, although a variety of study designs were used to investigate social support and self-care, the majority of the studies included in this review were cross-sectional (Chiaranai et al., 2009; Friedman & Quinn, 2008; Gallagher et al., 2011; Heo et al., 2008; Riegel et al., 2010; Rockwell & Riegel, 2001; Salyer et al., 2012; Sayers et al., 2008). Therefore, the ability to infer causality is significantly limited.

**Recommendations for Future Research**

Self-care is an important factor in preventing poor HF-related outcomes (Riegel et al., 2009). Therefore, continued research in this area is needed. Based upon the findings of this review, several recommendations for future research are suggested. First, considering the limited number of studies solely investigating self-care management (Friedman & Quinn, 2008; Riegel & Carlson, 2004; Salyer et al., 2012), more research is needed in this area to examine the effect of social support on the decision-making
process to manage symptoms and seek treatment. Second, given that several studies (Chiaranai et al., 2009; Gallagher et al., 2011; Heo et al., 2008; Riegel et al., 2010) used an instrument to measure self-care with low reliability coefficients, future researchers should strive to use more reliable instruments to measure this construct, so that significant relationships, if present, can be detected. Also, the frequent use of cross-sectional designs (Chiaranai et al., 2009; Friedman & Quinn, 2008; Gallagher et al., 2011; Heo et al., 2008; Riegel et al., 2010; Rockwell & Riegel, 2001; Salyer et al., 2012; Sayers et al., 2008) illustrates a need for more diverse study methodologies, including more longitudinal and experimental studies in this area. The use of cross-sectional designs limits the ability to infer causality (Polit & Beck, 2012). Lastly, since the majority of studies used samples consisting primarily of male participants (Chiaranai et al., 2009; Friedman & Quinn, 2008; Heo et al., 2008; Riegel & Carlson, 2002; Riegel et al., 2010; Salyer et al., 2012; Sayers et al., 2008; Tierney et al., 2011; Wu et al., 2008), the ability to generalize findings is limited. In the future, researchers should attempt to recruit more diverse samples by considering the recruitment sites and potential participants that are available.

**Implications for Nursing Practice**

Findings of this review indicate that presence and availability of social support plays an integral role in assisting with various self-care related behaviors in individuals with HF. Health care providers should question individuals with HF at each appointment regarding the presence and availability of social support sources (i.e., spouse, significant others, family, and friends) that may be able to assist with the daily activities related to
self-care maintenance and management. Additionally, health care providers should incorporate identified support sources (i.e., spouse, significant others, family, and friends) in HF self-care related educational discussions with the patient in order to facilitate and enhance self-care. Lastly, for those individuals without an adequate support system, health care professionals may need to schedule more frequent appointments to assess the individual’s ability to maintain self-care alone or refer the individual to home health care for closer monitoring and assistance with self-care related activities.

**Conclusion**

Self-care behaviors are vital to maintaining health and well-being in individuals with HF (Moser & Watkins, 2008; Riegel et al., 2009). This review illustrates that family plays a pivotal role in assisting individuals with HF to maintain positive self-care behaviors (Riegel & Carlson, 2002; Riegel et al., 2010; Tierney et al., 2011). Additionally, this review suggests that all four types of support (i.e., emotional support, instrumental/tangible support, informational support, and appraisal support) are important in the interactive process between one’s social network (i.e., family and peers) and the individual with HF in maintaining self-care behaviors that enhance optimal health (Friedman & Quinn, 2008; Riegel & Carlson, 2002; Riegel & Carlson, 2004; Riegel et al., 2010; Sayers et al., 2008). However, there is not enough evidence to determine which type of support is the most beneficial in this process.

Yet, findings of this review suggest that a relationship exists between social support and positive self-care behaviors. However, findings are not consistent as to whether the availability of social support is predictive of self-care behaviors. More
research is needed in this area using longitudinal and experimental designs to determine the effectiveness of social support on self-care behaviors in this population, since this review revealed mostly cross-sectional, correlational studies. Hence, the ability to infer causality and make recommendations for practice is limited.
References


Dickson, V., Deatrick, J., Goldberg, L., & Riegel, B. 2006. A mixed methods study exploring the factors that facilitate and impede heart failure self-care. *Journal of Cardiac Failure, 12*(6), S124-S125.


143 articles identified via databases

3 articles identified through other sources

131 after duplicates removed

69 records screened

62 records screened & excluded; did not meet inclusion criteria
- Not written in English
- Dyad studies
- Unpublished manuscripts

41 full-text articles assessed

28 full-text articles assessed & excluded; did not meet inclusion criteria
- Did not examine both social support and self-care

2 Qualitative included

11 Quantitative included

Figure 1. PRISMA diagram
<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Study Purpose</th>
<th>Methods</th>
<th>Findings</th>
<th>Strengths &amp; Weaknesses</th>
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<tbody>
<tr>
<td>Riegel &amp; Carlson (2002)</td>
<td><strong>Purpose:</strong> (1) To explore how HF influences the lives of patients; (2) To investigate how patients with HF perform self-care; and (3) To determine how their life situation facilitates or impedes heart failure self-care</td>
<td><strong>Population:</strong> Outpatients with HF (n = 26); mean age 74.4 ± 10.05 years</td>
<td><strong>Findings:</strong> Participants described depending on others for emotional, informational, and tangible support. Emotional support from a variety of sources, including family, friends, and health care professionals supported individuals’ self-care efforts. Participants described their physician as the primary source of informational support related to self-care, while family was reported to be the most common source of tangible support by assisting with bathing, meal preparation, and transportation.</td>
<td><strong>Strengths:</strong> 1) Study design allowed for investigation of personal factors related to self-care. <strong>Weaknesses:</strong> 1) Sample consisted primarily of males (65.4%) with NYHA Class III HF (46.2%) who were elderly, retired, and poor, impacting generalizability; 2) interviews were conducted only one time</td>
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<td>Chriss et al. (2004)</td>
<td><strong>Purpose:</strong> To replicate and extend an earlier study (Rockwell &amp; Riegel, 2001), which aimed to investigate individual and illness-related characteristics as predictors of HF self-care maintenance.</td>
<td><strong>Population:</strong> Hospitalized patients with HF (n = 66); mean age 71 ± 13.3 years</td>
<td><strong>Findings:</strong> Similar to findings in the parent study (Rockwell &amp; Riegel, 2001), social support was not a significant predictor of self-care maintenance (β = -.012; p = .91). Most of the variance in self-care maintenance at three months was attributed to baseline self-care participants’ scores. However, age (p = .03) and gender (p = .01) were significant predictors of self-care maintenance.</td>
<td><strong>Strengths:</strong> 1) Internal consistency of both instruments were acceptable (i.e., UCLA-SSI: α = 0.87; self-care maintenance subscale of the SCHFI: α = 0.76); 2) measured self-care at two different time points <strong>Weaknesses:</strong> 1) The sample consisted of mostly unmarried (56.1%) females (56.1); 2) use of secondary analysis design limited examination of additional variables</td>
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<td>Sayers et al. (2008)</td>
<td>Purpose: (1) To investigate the effects of social support and (2) whether aspects of social support were associated with self-care behaviors, specifically medication and dietary adherence and heart failure symptom monitoring</td>
<td>Population: Outpatients with HF (n = 74); mean age 63.21 ± 11.9 years</td>
<td>Findings: Family, particularly spouses (69.9%) were commonly involved in care ($\chi^2 (2) = 14.2; p &lt; .001$) and decision-making ($\chi^2 (2) = 14.5; p &lt; .001$) related to self-care. Support from friends had a positive association with self-care confidence, while support from family was negatively associated with self-care confidence. Structural support or social network was not associated with any self-care variables. Emotional and instrumental support was significantly related to dietary ($F (2, 71) = 3.41; p &lt; .05$) and medication adherence ($F (2, 71) = 3.71; p &lt; .05$).</td>
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<td>Measures: Social Support: The Multidimensional Scale of Perceived Social Support (MSPSS) and the Medical Care Questionnaire (MCQ)</td>
<td>Sampling method: Non-random, convenience sample</td>
<td>Strengths: 1) Use of instruments with good reliability and validity to measure social support and self-care (MSPSS subscales: $\alpha = .87$ and $.73$; SCHFI: $\alpha = .77$); 2) sample consisted of a large percentage of black (55.4%) participants, which is commonly an underrepresented group in research studies.</td>
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<td>Self-Care: Self-care of HF Index (SCHFI)</td>
<td>Design: Cross-sectional, correlational design</td>
<td>Weaknesses: 1) Sample consisted primarily of males (96%); 2) the majority of participants were recruited from one site, a Veterans Administration Medical Center</td>
<td>Also measured: Educational level and physical functioning</td>
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<tr>
<td>Study</td>
<td>Purpose</td>
<td>Population</td>
<td>Findings</td>
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<td>Heo et al. (2008)</td>
<td>(1) To examine factors related to self-care in patients with HF and (2) to investigate gender differences in factors related to HF self-care.</td>
<td>Outpatients with HF (n = 122); mean age 60.3 ± 12.0 years</td>
<td>Social support was not significantly related to self-care behaviors (i.e., self-care maintenance) (p &gt; .05). Likewise, social support was not related to either men or women’s self-care behaviors (i.e., self-care maintenance) (p &gt; .05).</td>
<td>1) The social support instrument had an excellent Cronbach’s alpha (α = .95)</td>
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<td>Wu et al. (2008)</td>
<td>To investigate factors contributing to medication adherence in patients with HF, using the World Health Organization’s Multidimensional Adherence Model.</td>
<td>Outpatients with HF (n = 134); mean age 61.2 ± 11.5</td>
<td>Perceived social support was significantly related to medication adherence, specifically dose-count (F = 7.253; p &lt; .001) and dose-time (F = 6.293; p &lt; .001).</td>
<td>1) Validity of the MEMS has been demonstrated in prior studies involving cardiac diseases and HF; 2) the Perceived Social Support Scale was cited to be valid and reliable by the study investigators; however, no reliability coefficients were reported using HF patients</td>
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<td><strong>Chiaranai et al. (2009)</strong></td>
<td><strong>Purpose:</strong> To describe the self-care process in individuals with HF and investigate relationships between demographic characteristics, social support, self-care processes, self-care confidence, and quality of life.</td>
<td><strong>Population:</strong> Outpatients with HF (n = 98); mean age 56.33 ± 13.65 years</td>
<td><strong>Findings:</strong> Social support was significantly related to self-care maintenance (r = .352; p = .01) and self-care confidence (p &lt; .05). However, social support was not significantly related to self-care management.</td>
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<td><strong>Sampling Method:</strong> Non-random convenience sample</td>
<td><strong>Strengths:</strong> 1) Sample consisted of a relatively equal number of Caucasian and African-American participants (48% and 45.9%, respectively); 2) social support instrument had excellent reliability for the overall scale (α = .97), in addition to the subscales (α ranged from .91 -.96)</td>
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<td><strong>Design:</strong> Cross-sectional, correlational design</td>
<td><strong>Weaknesses:</strong> 1) Sample consisted of mostly married/cohabitating (61%), white (88%) males (70%)</td>
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<td><strong>Measures:</strong> Social Support: the Medical Outcomes Study Social Support Scale</td>
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<td>Self-Care: Self-care of HF Index</td>
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**Perceived Social Support Scale (PSSS)**

Self-Care:
Medication adherence was measured using a microelectronic monitoring device in the caps of medication bottles, the MEMS, which registers the date and time of each opened bottle.

**Also measured:**
Demographic variables, attitudes and knowledge related to medication adherence, symptom severity, comorbidities, depression, treatment complexity, barriers to medication adherence.

**Weaknesses:** 1) The sample consisted of mostly married/cohabitating (61%), white (88%) males (70%)
<table>
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<tr>
<th>Study</th>
<th>Purpose</th>
<th>Population</th>
<th>Measures</th>
<th>Findings</th>
<th>Strengths</th>
<th>Weaknesses</th>
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<tr>
<td>Riegel et al. (2010)</td>
<td>To describe HF self-care in men and women and to identify gender-specific barriers and facilitators to HF self-care.</td>
<td>Outpatients with HF (n = 27); mean age 68.7 ± 14.7 years</td>
<td>Qualitative: One-time semi-structured interviews</td>
<td>Qualitative data revealed that social support was a factor that influenced self-care behaviors in individuals with HF. Men described receiving more tangible support versus women; whereas women reported receiving more emotional support from family and friends and insufficient tangible support. Quantitative data indicated there was no significant difference between men and women in self-care management. Compared to women, men had significantly higher self-care confidence and reported significantly higher levels of support from a significant other (p = .04).</td>
<td>1) Use of a mixed methods design; 2) adequate reliabilities for the MSPSS instrument with Cronbach alphas ranging from .85 - .91 for the subscales used in this study</td>
<td>1) Low Cronbach alphas for the maintenance (α = .55-.63) and management (α = .65-.70) subscales of the SCHFI; 2) sample consisted primarily of male participants (n= 19)</td>
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<td>Gallagher et al. (2011)</td>
<td>To examine types of social support provided to individuals with HF and the effect of differing levels of social support.</td>
<td>Hospitalized patients with HF (n = 333); mean age 72 ± 11 years</td>
<td>Social support: Multidimensional Scale of Perceived Social Support (MSPSS)</td>
<td>Patients with high levels of support reported significantly better self-care (p = .003). Likewise, a high level of support was found to be a significant</td>
<td>1) Large sample from multiple data collection sites; 2) researcher-developed social support tool had a Cronbach’s alpha</td>
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</table>
support on HF self-care.

**Design:** Cross-sectional, descriptive design representing a secondary analysis of a subgroup of patients from the COACH study (Jaarsma et al., 2004)

**Measures:**
- **Social Support:** Researcher-developed instrument measuring level of support (i.e., presence of partner), level of instrumental and emotional support, and quality of relationship with partner
- **Self-Care:** European Heart Failure Self-care Behavior Scale (EHFScB)

**Predictor of HF self-care maintenance behaviors** ($\beta = .265; p < .05$). High levels of social support was significantly related to self-care behaviors, including consulting with health care professionals for weight gain ($p = .02$), to limit fluid intake ($p = .02$), adhere to medication regimen ($p = .04$), to get a flu shot ($p = .01$), and to exercise on a regular basis ($p = .01$).

**Weaknesses:**
1) Sample consisted of a larger percentage of males (66%); 2) the Cronbach’s alpha for the EHFScB scale was at a lower level of .71; 3) this study was a secondary analysis of data from a study not originally designed to examine the role of social support; 4) study focused on comparing levels of social support between patients with partners and those without; however, social support can come from many sources other than partners. This study did not address these sources; 5) the social support instrument has not been used previously and requires further development to determine utility of the overall scale and subscales.

**Purpose:** To explore reasons why individuals with HF do and do not engage in regular physical activity.

**Population:** Outpatients with HF ($n = 22$); mean age $68.9 \pm 8.1$ years

**Sampling Method:** Non-random, purposive sample

**Findings:** Participants described family as being a source of encouragement in maintaining recommended exercise regimen, with family intermittently participating with them in their exercise program.

**Strengths:**
1) Qualitative design allows for in-depth examination of facilitators and barriers to maintaining a regular exercise regimen.

**Weaknesses:**
1)
### Social Support and Self-Care Management

**Friedmann & Quinn (2008)**

**Purpose:**
1. To compare presenting symptoms and treatment delay time of patients admitted for their first HF admission with that of HF patients previously admitted with a diagnosis of HF;
2. To investigate whether there were differences between the two groups on whom they contacted and when and what advice was received after the onset of symptoms; and
3. To describe and investigate differences in actions taken by patients in the two groups before their hospital admission.

**Population:**
Hospitalized patients with HF (n = 212); mean age 72.5 years

**Sampling Method:**
Non-Random, convenience sample

**Design:**
Correlational design

**Measures:**
Social Support and Self-Care: Researcher-adapted Preadmission Illness Behavior Questionnaire that measured participants’ symptom experiences and actions, including behaviors in seeking treatment for these symptoms

**Also measured:**
Number and types of symptoms experienced by participants

**Findings:**
Family (89.2%) was the most common source of support, providing both informational and appraisal support during the decision-making process related to symptom management and decision to seek treatment for these symptoms. Spouses (77%) were most often consulted, followed by children (55%) for those participants who were unmarried.

**Strengths:**
1. Investigated informational and appraisal support, which is not commonly examined;
2. Content validity was established for the researcher-adapted Preadmission Illness Behavior Questionnaire

**Weaknesses:**
1. Sample consisted of mostly white (84.4%) male (53.3%) participants; 2) questionnaires relied on the ability of the individual to be able to mentally recall information about their symptoms for the days/weeks before hospital admission.
<table>
<thead>
<tr>
<th><strong>Social Support and Self-Care Maintenance &amp; Management</strong></th>
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<tr>
<td><strong>Rockwell &amp; Riegel (2001)</strong></td>
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<td><strong>Purpose:</strong> To test a model (Connelly, 1993) of individual patient characteristics, including symptom severity, comorbidity, social support, education, age, socioeconomic status, and gender as predictors of HF self-care.</td>
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<tr>
<td><strong>Population:</strong> Hospitalized patients with HF (n = 209); mean age 73 ± 12.5 years</td>
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<tr>
<td><strong>Sampling Method:</strong> Non-random, convenience sample</td>
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<tr>
<td><strong>Design:</strong> Correlational design</td>
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<tr>
<td><strong>Measures:</strong> Social Support: Researcher-developed survey related to marital status, presence of person to confide in, and level of support received</td>
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<td><strong>Also measured:</strong> Severity of symptoms, comorbidities, and socioeconomic status.</td>
</tr>
<tr>
<td><strong>Findings:</strong> Social support was not a significant predictor of self-care maintenance (p &gt; .05) and management (p &gt; .05). However, educational level (p = .009) and symptom severity (p = .046) were significant predictors of self-care maintenance and management.</td>
</tr>
<tr>
<td><strong>Strengths:</strong> 1) Large sample size; 2) the Cronbach’s alpha for the Evaluating The Change subscale of the SMHF was 0.92</td>
</tr>
<tr>
<td><strong>Weaknesses:</strong> 1) No report of content validity or reliability coefficients for the researcher-developed social support tool; 2) the majority of participants were married (45%); 3) only one subscale was used to measure self-care</td>
</tr>
</tbody>
</table>

<p>| <strong>Riegel &amp; Carlson (2004)</strong> |
| <strong>Purpose:</strong> To examine the acceptability and effectiveness of a peer support intervention for patients hospitalized with HF. |
| <strong>Population:</strong> Hospitalized patients with HF (n = 88); mean age 72.95 ± 12.97 |
| <strong>Sampling Method:</strong> Random assignment of convenience sample |
| <strong>Design:</strong> Randomized |
| <strong>Findings:</strong> At 90 days, self-care management ($F = 4.4, df = 1, 37; p = .04$), self-care confidence (p = .02), and total SCHFI scores (p = .04) rose significantly more in the intervention group than in the control group. |
| <strong>Strengths:</strong> 1) Use of experimental design allows for the inference of causality; 2) random assignment of participants decreases risk of sampling bias; 3) UCLA-SSI had good reliability ($\alpha = .87$) in prior studies with cardiac patients. |</p>
<table>
<thead>
<tr>
<th>Study</th>
<th>Purpose</th>
<th>Population</th>
<th>Sampling Method</th>
<th>Design</th>
<th>Measures</th>
<th>Findings</th>
<th>Weaknesses</th>
<th>Strengths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salyer et al. (2012)</td>
<td>(1) To investigate the effects of supportive relationships on self-care behaviors and (2) To examine the extent to which these relationships are mediated by self-care confidence in individuals with HF.</td>
<td>Outpatients with HF (n = 97); mean age 56.33 ± 13.73</td>
<td>Non-random, convenience sample</td>
<td>Cross-sectional design representing a secondary analysis of a subgroup of patients from a previous study on self-care and quality of life (Chiaranai et al., 2009).</td>
<td>Social Support: The Social Support Scale of the Medical Outcomes</td>
<td>Perceived social support had a positive effect on self-care confidence ($\beta = .37; p = .0002$) and an indirect positive effect on self-care management, with self-care confidence mediating this effect. The size of one’s social network had a negative effect on both self-care confidence ($\beta = -.22; p = .0145$) and management ($\beta = -.23; p = .007$). Social network size also had a positive effect on self-care management ($\beta = .33; p = .0002$). There were no direct effects of social support on self-care management, only indirect relationships.</td>
<td>1) Use of a reliable tool to measure social support, with Cronbach’s alpha of 0.86 for the overall scale and alphas ranging from 0.88 to 0.96 for the subscales; 2) use of structural equation modeling to examine mediational effects; 3) relatively equal number of white and African American participants (48% vs. 45.9% respectively);</td>
<td>1) Use of a reliable tool to measure social support, with Cronbach’s alpha of 0.86 for the overall scale and alphas ranging from 0.88 to 0.96 for the subscales;</td>
</tr>
<tr>
<td>Study</td>
<td>Self-Care: Self-Care of Heart Failure Index (SCHFI)</td>
<td>support had a positive direct effect on self-care maintenance ($\beta = .27; p = .003$) and a positive indirect relationship through self-care confidence on self-care maintenance ($\beta = .37; p = .0002$). Social network size had a negative relationship with self-care confidence ($\beta = -.22; p = .015$), which subsequently had a positive effect on self-care maintenance ($\beta = .22; p = .001$). Social support had both a direct effect on self-care maintenance, in addition to an indirect effect through self-care confidence on self-care maintenance.</td>
<td>additional variables; 2) sample consisted of mostly male participants (56.7%); 3) sample was comprised of primarily Class II HF patients who may not have been experiencing severe symptoms, thereby potentially biasing study findings; 4) the SCHFI had low reliability coefficients for the self-care maintenance ($\alpha = 0.56$) and self-care management ($\alpha = 0.70$) subscales.</td>
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</table>
RELATIONSHIPS AMONG HEART FAILURE SYMPTOMS, SOCIAL SUPPORT, SOCIAL PROBLEM-SOLVING, AND DEPRESSIVE SYMPTOMS IN INDIVIDUALS LIVING WITH HEART FAILURE: A PILOT STUDY

by

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In preparation for Journal of Health Psychology

Format adapted for dissertation
ABSTRACT

As heart failure (HF) symptoms increase, individuals are at greater risk of developing depressive symptomatology. Social support and social problem-solving may decrease the risk of depressive symptoms in those with HF. Fifty outpatients with HF were recruited and underwent individual interviews using self-report questionnaires for this descriptive, correlational pilot study. Findings indicated that HF symptoms were positively related to depressive symptoms and that social support and social problem-solving may potentially influence this relationship. Higher levels of social support were related to less depressive symptoms, while use of maladaptive problem-solving strategies was associated with more depressive symptoms.

Keywords: heart failure, physical symptoms, social support, social problem-solving, depressive symptoms
Introduction

Individuals living with heart failure (HF) have varying degrees of symptom severity, with approximately 30 percent of individuals reporting moderate to severe HF symptoms (American Association of Heart Failure Nurses, 2013). In fact, previous research suggests that increases in symptom severity and functional decline lead to increased stress in those with HF (Bosworth et al., 2004; Heo et al., 2009; Thornhill et al., 2008) and are associated with an increased risk for depressive symptoms (Alosco et al., 2012; Havranek et al., 2004; Paukert et al., 2009). However, empirical findings suggest that social support and social problem-solving are coping resources that may potentially lessen depressive symptoms in individuals living with HF (Carels, 2004; Park et al., 2006; Trivedi et al., 2009; Vollman et al., 2007).

Background

The incidence of HF continues to rise in the United States, creating an increase in the total annual expenditures related to HF treatment. Heart failure is one of the most common reasons for hospitalization among individuals 65 years and older (American Heart Association [AHA], 2013). In addition, the AHA (2013) reports that approximately 26.8 million individuals with HF make about 16 million visits to ambulatory care centers for HF-related issues each year. These statistics highlight the importance of research intended to decrease morbidity and mortality and improve health-related quality of life in
individuals with a chronic illness, such as HF (National Institute for Nursing Research, 2010; Healthy People 2020, 2010).

The progressive nature of physical symptoms that accompany HF can have a devastating effect on individuals’ daily activities (Heo et al., 2009). Empirical evidence suggests that the severity of HF symptoms are associated with decreases in quality of life, functional status, the ability to perform self-care behaviors, and increases in psychosocial distress, such as depressive symptoms (Carels et al., 2004; Heo et al., 2008; Heo et al., 2009; Riegel & Carlson, 2002; Song et al., 2009). Prior research indicates that approximately 50 percent of individuals with HF experience depressive symptoms (Gottlieb et al., 2004) secondary to HF symptom frequency and functional impairment, such as extreme fatigue and dyspnea with activity (Carels, 2004; Cully et al., 2010). Findings from several studies suggest that social support and social problem-solving may also influence the development of depressive symptomatology in individuals with HF by influencing coping abilities and resources, as well as adaptation to life changes associated with the progression of HF symptoms (Carels, 2004; Carels et al., 2004; Dekker et al., 2009; Park et al., 2006; Thornhill et al., 2008; Trivedi et al., 2009; Vollman et al., 2007).

Coping resources such as emotional, instrumental, and tangible support provided by family may be beneficial in alleviating depressive symptoms in individuals with HF (Dekker et al., 2009). Likewise, decreased use of emotional support, as a coping strategy, and lower levels of perceived support, have been related to higher depression scores and more depressive symptoms (Trivedi et al., 2009). Additionally, the type of coping style and subsequent strategies used by individuals with HF may also influence the development of depressive symptoms. Several studies have suggested that the use of
more problem-focused coping strategies (e.g., planful problem-solving and seeking social support) is related to decreases in depressive symptoms (Park et al., 2006; Thornhill et al., 2008; Trivedi et al., 2009; Vollman et al., 2007). In contrast, previous research also indicates that the use of more emotion-focused coping strategies (e.g., mental and behavioral disengagement, avoidance, and self-blame) is associated with greater depressive symptomatology in individuals with HF (Bean et al., 2009; Doering et al., 2004; Klein et al., 2007; Murberg et al., 2002).

In summary, the progression of HF symptoms is often stressful and requires adequate coping. Commonly, individuals with HF experience depressive symptomatology as the illness progresses and HF symptoms increase (Dekker et al., 2009; Havranek et al., 2004; Heo et al., 2009; Paukert et al., 2009). Social support and social-problem solving, as coping resources, may influence the relationship between physical symptoms of HF and depressive symptomatology in individuals with HF, thereby decreasing the risk of psychological distress (i.e., depressive symptoms) (Heo et al., 2009; Park et al., 2006; Trivedi et al., 2009; Vollman et al., 2007).

Therefore, the purpose of this study was to examine relationships among physical symptoms of HF, social support, social problem-solving, and depressive symptomatology in individuals living with HF in outpatient settings. This study answered the following research question: What are the relationships among HF symptoms, social support, social problem-solving, and depressive symptomatology in outpatients with HF?
Methods

Design

In order to understand how individuals adapt psychologically to stressful situations, this pilot study was guided by components of stress, appraisal and coping theory (Lazarus & Folkman, 1984). A descriptive correlational design was used. This study received approval from two university-affiliated institutional review boards in addition to a hospital-affiliated institutional review board.

Participants and Settings

A convenience sample of outpatients with HF ($N = 50$) was recruited for participation from three outpatient clinics, including two cardiology practices and one primary care clinic in Northwest Florida. Several methods were used to recruit participants, including posters and flyers describing the study, which were displayed in each office; and letters describing the study, which were mailed to eligible patients from each office. Additionally, physicians and other health care providers in each office shared basic information regarding the study with their patients. Patients who were interested in participation contacted the primary investigator to learn more about the study.

Potential participants were eligible for the study if they had: (a) a diagnosis of HF confirmed by a primary health care provider; (b) were age 55 years or older; (c) resided in an outpatient setting (i.e., home, assisted living facility); and (d) had the ability to speak, read, and understand English. Additionally, to be eligible for participation, potential participants had to be cognitively unimpaired, as evidenced by a score $\geq 31$ on the Telephone Interview for Cognitive Status (TICS) (Brandt et al., 1988). During
recruitment, only one potential participant did not meet the minimum score of 31 on the TICS; and was therefore not enrolled in the study.

Initially, the potential participants underwent cognitive and clinical screening over the telephone to further determine eligibility. Once determined to be eligible for participation, each individual was scheduled for an interview with a data collector at the supporting office in which the participant was a patient. Following consent, participants completed an individual interview using a set of self-report questionnaires, administered in randomized order, in a private, quiet room. Participants’ answers were recorded using a computerized data entry system, with completeness of all questionnaires assessed before the interview was concluded. No incentives for participation were provided by the researchers.

**Instruments**

The Telephone Interview for Cognitive Status (TICS) (Brandt et al., 1988) was used to screen potential participants’ cognitive status to determine eligibility for participation. The TICS consists of 11 items that assess five areas of cognitive function, including orientation, attention, language, learning, and memory. The maximum score is 41, with scores of 30 or less indicative of cognitive impairment. Empirical evidence supports the content and construct validity and reliability of the instrument (Brandt et al., 1988).

Sociodemographic information also was used to further determine clinical eligibility (e.g., age) and assess key characteristics of individuals living with HF (e.g., gender, age, race, etc.). Clinical information related to the severity of HF (i.e., New York
Heart Association [NYHA] Classification) and last hospital admission for HF was also collected.

**Heart failure symptoms.** Physical symptoms were measured using the 14-item Heart Failure Symptom Survey (HFSS) (Hertzog et al., 2010; Pozehl et al., 2006), developed for use in outpatient settings (Quinn et al., 2010). Using an 11-point scale, individuals rate each of the 14 items according to four domains: frequency, severity, and interference with physical activity and enjoyment of life (Hertzog et al., 2010; Pozehl et al., 2006). Higher scores indicate more frequent and severe symptoms of HF, as well as more interference with physical activity and enjoyment of life (Hertzog et al., 2010; Pozehl et al., 2006). While empirical evidence supports the instrument’s content validity (Hertzog et al.) and reliability (Quinn et al.), there have been no previously reported studies examining whether the HFSS instrument is best viewed as a single- or multidimensional instrument. Following factor analysis of instrument items, frequency, severity, and interference with physical activity and enjoyment of life were viewed as one domain to represent physical symptoms of HF in this study, as evidenced by factor loadings of .30 or higher on one factor (Graven, 2014). In this study, Cronbach’s alpha was .97.

**Social support.** Perceived social support was measured using the 12-item, four point Likert-type scale, Interpersonal Support Evaluation List (ISEL-12) (Cohen et al., 1985). Empirical evidence supports its construct validity using the original 40-item instrument (Cohen et al.) and reliability (alpha = .79; Bakan & Akyol, 2008). Higher
scores indicate greater social support (Cohen et al.). Cronbach’s alpha in this study was .94.

Social network was measured using the researcher developed Graven and Grant Social Network Survey (GGSNS) (Graven, 2014). This 12-item self-report survey asks participants to rate their agreement with statements involving people that they are connected to and involved with who provide them with help, assistance, and support. Scores range from 12-84, with higher scores reflecting a higher level of social network. Content validity for this questionnaire was established using a modified Delphi Technique and three content reviewers with expertise in social support, heart failure, and psychometrics (Graven, 2014). The instrument was internally consistent in this study, with a Cronbach alpha of .93.

Social problem-solving. Social problem-solving was measured using the sixth-grade reading level version of the Social Problem-Solving Inventory-Revised Short-version (SPSI-R:S) (D’Zurilla et al., 2002). This 25-item, five point rating scale evaluates individuals’ adaptive (i.e., constructive, effective, and facilitative problem-solving) and maladaptive (i.e., defective, ineffective, and dysfunctional) styles toward solving everyday problems (Christopher & Thomas, 2008). Empirical evidence supports the content and construct validity of the SPSI-R:S and estimates of reliability indicate the inventory is internally consistent as well as stable over time for general populations (D’Zurilla et al., 2002). For the present study, both adaptive (problem-focused) and maladaptive (emotion-focused) problem-solving styles were derived from the un-weighted sum of items, with higher scores representing more of the respective problem-
solving style. In this study, the Cronbach’s alpha for the adaptive problem-solving items was .86, while a Cronbach’s alpha of .77 was noted for the maladaptive problem-solving items.

Depressive symptomatology. The 20-item Center for Epidemiological Studies – Depression (CES-D) scale (Radloff, 1977) was utilized to measure depressive symptoms. Higher scores indicate higher levels of depressive symptomatology (Park et al., 2006), with a cutoff score of 15 indicating an individual is at risk for some degree of depressive symptomatology (McDowell & Newell, 1996). Previous studies investigating individuals with HF support adequate validity and reliability, with Cronbach’s alphas consistently over 0.85 (Lesman-Leegte et al., 2009; Park et al.). The Cronbach’s alpha in this study was .91.

Data Analysis

Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 20 software (IBM Corporation, 2011) with all tests for statistical significance set at an alpha level of 0.05. Descriptive statistics, including means, standard deviations, frequencies, and percentages were obtained to examine and report sample characteristics, as well as report scores on all study instrument variables. Correlational analyses were conducted using Pearson product moment correlation coefficients.
Results

Sample characteristics

Table 1 provides an overview of sample characteristics. The sample was comprised primarily of Caucasian ($n = 42; 84\%$) males ($n = 31; 62\%$), who ranged in age from 55 to 92 years ($M = 72.42; SD = 9.1$). Half of the sample was married ($n = 25; 50\%$) and lived with at least one other person in their household ($n = 25; 50\%$). Most participants were college graduates ($n = 15; 30\%$), yet 42\% of them had a low socioeconomic status (i.e., household income < $30,000) ($n = 21$). The majority of participants had NYHA Class II HF (i.e., mild HF) (54\%), and 30\% ($n = 15$) had been living with a diagnosis of HF for 5 to 10 years.

Descriptive analysis

Descriptive statistics related to study variables are presented in Table 1. Overall, scores were above middle ranges on all measures in this study, with the exception of the HFSS and the CES-D. Scores on the HFSS ($M = 2.13; SD = 1.90$) suggested participants experienced mild to moderate HF-related physical symptoms. This finding is supported by the high percentage of participants with Class II NYHA HF (54\%), who commonly experience fewer HF-related symptoms and a lesser degree of functional impairment compared to Class III and IV (Criteria Committee of the New York Heart Association, 1994). Scores of 15-21 on the CES-D represent mild to moderate depressive symptoms, while scores greater than 21 represent the possibility of major depression (Radloff, 1977). While the mean score for the CES-D ($M = 12.84; SD = 11.88$) indicated negligible depressive symptoms for the majority of participants, almost half of participants were
experiencing either mild to moderate ($n = 7; 14\%$) or major depressive symptoms ($n = 11; 22\%$), scoring either $15 – 21$ or greater than $21$ on the CES-D, respectively. Mean scores on the GGSNS ($M = 55.40; \text{SD} = 19.34$) and the ISEL-12 ($M = 26.54; \text{SD} = 9.43$) suggested participants had above average social network availability and perceived support. For problem-solving, mean scores indicated that even though participants reported fairly good adaptive problem-solving ($M = 27.00; \text{SD} = 8.49$), a relatively high amount of maladaptive problem-solving was also present ($M = 47.34; \text{SD} = 7.88$).

**Bivariate analysis**

Relationships among HF-related physical symptoms, social network (i.e., a subcomponent of social support), social support, social problem-solving (i.e., maladaptive and adaptive), and depressive symptomatology are shown in Table 2. Physical symptoms of HF were positively related to depressive symptoms ($p < .01$) and maladaptive problem-solving ($p < .05$). Social support was positively associated with social network ($p < .01$) and negatively related to depressive symptoms ($p < .01$). Similarly, depressive symptoms also were negatively related to social network ($p < .01$). A negative relationship was found between adaptive problem-solving and maladaptive problem-solving ($p < .01$). While adaptive problem-solving was found to be negatively related to depressive symptomatology ($p < .05$), maladaptive problem-solving was positively related to depressive symptoms ($p < .01$).
Discussion

HF symptoms, depressive symptoms, and social problem-solving

Findings in this study suggest that as individuals use more adaptive problem-solving strategies, the use of maladaptive strategies decrease, and are consistent with prior research showing that adaptive and maladaptive problem-solving styles are negatively correlated with one another (D’Zurilla et al., 2002). Furthermore, it appears that as HF symptoms increase, individuals use more maladaptive problem-solving strategies (e.g., solving problems or making decisions in an impulsive or careless manner; avoidance or minimization of problems). Although prior research is scarce, these findings are consistent with that of Carels and colleagues (2004) in which increased HF symptoms were positively associated with use of maladaptive coping strategies, such as symptom-focused coping and distraction/denial. Results in this study also suggest that individuals who use fewer adaptive problem-solving strategies experience more depressive symptoms, and support prior studies in which individuals with HF who reported using less adaptive problem-solving strategies, (e.g., planful problem-solving, seeking social support, and taking action) reported more depressive symptoms (Trivedi et al., 2009; Vollman et al., 2007). Similar findings also were found in studies examining social problem-solving and depressive symptomatology in other populations (Elliott et al., 1991; Prachakul et al., 2007). However, it is plausible that poor problem-solving could be a consequence of depressive symptomatology and negative affect (Nezu et al., 2004).

While previous research in this area is limited, this finding supports the need for continued patient education to lessen maladaptive problem-solving strategies in an effort
to maintain optimal health and well-being as physical symptoms increase. Prior research has examined interventions that may potentially decrease the use of maladaptive problem-solving strategies in individuals with HF. Interventions such as mindfulness based stress reduction, coping skills training, and expressive support group discussions have improved HF-related symptoms (Sullivan et al., 2009), while cognitive behavioral therapy (e.g., activity scheduling, role-playing, and journaling) has increased physical functioning (Gary et al., 2010). Additionally, clinicians can assist patients in learning how to manage progressive symptoms of HF (e.g., self-adjusting diuretics during times of weight gain and edema) and subsequent decrease in functional ability (e.g., adjusting environment, simplifying treatment regimens) in an effort to lessen the use of maladaptive problem-solving strategies.

Findings from this study also support the need for patient education on adaptive problem-solving strategies to promote psychological well-being in individuals with HF. Interventions such as mutual goal setting and coping skills training can reinforce adaptive problem-solving strategies and are associated with a reduction in depressive symptoms in individuals with HF (Gary et al., 2010; Sullivan et al., 2009). For example, in a study of 208 patients with HF, a coping skills training intervention related to stress management, social support, learned optimism, and assertive communication improved depression over a 12-month follow-up period (Sullivan et al.). Additionally, these findings suggest a need for clinicians to routinely assess individuals with HF for the presence of depressive symptoms at each health care visit and make referrals as needed.
**HF symptoms and depressive symptomatology**

Consistent with previous studies involving individuals with HF (Carels et al., 2004; Song et al., 2009; Trivedi et al., 2009), findings from the current study indicate that individuals who experience increases in HF symptoms also experience increases in depressive symptoms. This finding highlights the potential for psychological distress as HF progresses and symptoms increase. In addition, our findings suggest a need for programs that strengthen an individual’s coping skills and resources (i.e., social support and problem-solving) in an effort to decrease the risk of developing depressive symptomatology (Sullivan et al., 2009).

**Social support, social network, and depressive symptoms**

Few studies have previously investigated the association between social network and depressive symptoms in individuals with HF (Westlake et al., 2005; Yu et al., 2004). Nevertheless, in this study, individuals with a larger social network perceived a greater level of social support, suggesting that the availability of a social network enhances individuals’ perceptions of social support. In addition, consistent with previous research (Carels, 2004; Trivedi et al., 2009; Vollman et al., 2007; Yu et al., 2004), individuals in this sample who reported less actual and perceived support also reported more depressive symptoms. Thus, findings from this study illustrate the importance of having adequate support systems that enable individuals with HF to talk about their problems, receive needed assistance, and participate in social activities.

HF is more common in African Americans and equally frequent in both males and females (Emory Healthcare, 2013). However, the majority of participants in this study
were Caucasian, males, which limits the generalizability of findings. Therefore, effort is needed in future studies to recruit a more diverse sample. Additionally, self-selection may have led to an overrepresentation of individuals who have fewer symptoms of HF and therefore, a lower NYHA classification. The use of a convenience sample also limits generalizability of study findings. Likewise, this pilot study used a small sample to investigate multiple correlations among study variables, thereby increasing the risk of a Type I error. In future studies where larger samples of individuals with HF are used, it is recommended that antecedents (i.e., comorbidities, marital status, and the influence of antidepressant medications) be controlled for in the statistical analysis in order to decrease the influence of competing variables.

Further investigation is needed to evaluate the influence of HF-related physical symptoms, social support, and social problem-solving on depressive symptomatology. For example, are there direct or indirect relationships that exist among these variables? This information would be useful in determining whether interventional programs that strengthen social support and problem-solving could potentially be useful in decreasing the risk of depressive symptomatology in individuals with HF. Additional work also is needed to assess the importance of components of social support. For example, which component (i.e., appraisal, belonging, and tangible support) may be more beneficial in reducing the risk of depressive symptoms in individuals with HF? Lastly, intervention studies are needed to evaluate whether certain intervention components (e.g., adaptive problem-solving strategies) are more beneficial in certain subgroups of individuals with HF with regards to gender, race, and disease severity.
Conclusion

Living with the physical symptoms of HF can be an overwhelming and daunting experience, especially as the condition progresses. Depressive symptomatology is common in those with HF and has been linked with decreased functional status and increased symptom severity in prior research (Alosco et al., 2012; Smith, 2010; Song et al., 2009). Social support and social problem-solving are components of coping that may be beneficial in decreasing depressive symptoms in individuals with HF. Therefore, this pilot study explored relationships between these variables, some of which have either not been explored in prior research or were examined in a limited or different capacity. The findings of this pilot study provided new data regarding relationships among HF-related physical symptoms, social support, social problem-solving, and depressive symptomatology.
References


Table 1
Sample Characteristics and Descriptive Statistics for Study Variables (N = 50)

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<thead>
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<th>n</th>
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<td>Heart failure symptoms (HFSS)</td>
<td>2.13 (1.90)</td>
<td></td>
<td>0-7.39</td>
<td></td>
</tr>
<tr>
<td>Social network (GGSNS)</td>
<td>55.40 (19.34)</td>
<td></td>
<td>12-84</td>
<td></td>
</tr>
<tr>
<td>Social support (ISEL-12)</td>
<td>26.54 (9.43)</td>
<td></td>
<td>0-36</td>
<td></td>
</tr>
<tr>
<td>Maladaptive problem-solving</td>
<td>47.34 (7.88)</td>
<td></td>
<td>28-60</td>
<td></td>
</tr>
<tr>
<td>Adaptive problem-solving</td>
<td>27.00 (8.49)</td>
<td></td>
<td>9-40</td>
<td></td>
</tr>
<tr>
<td>Depressive symptoms (CES-D)</td>
<td>12.84 (11.88)</td>
<td></td>
<td>0-49</td>
<td></td>
</tr>
</tbody>
</table>

Note. NYHA = New York Heart Association; HFSS = Heart Failure Symptom Survey; GGSNS = Graven & Grant Social Network Survey; ISEL-12 = Interpersonal Support Evaluation List – 12 item; CES-D = Center for Epidemiological Studies – Depression.
Table 2
Bivariate Correlations for Study Variables (N = 50)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. HF symptoms</td>
<td>____</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Social network</td>
<td>-.136</td>
<td>____</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Social support</td>
<td>-.230</td>
<td>.829‡</td>
<td>____</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Maladaptive problem-solving</td>
<td>.279†</td>
<td>-.077</td>
<td>-.125</td>
<td>____</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Adaptive problem-solving</td>
<td>-.036</td>
<td>.208</td>
<td>.251</td>
<td>-.520‡</td>
<td>____</td>
<td></td>
</tr>
<tr>
<td>6. Depressive symptoms</td>
<td>.627‡</td>
<td>-.475‡</td>
<td>-.539‡</td>
<td>.549‡</td>
<td>-.343†</td>
<td>____</td>
</tr>
</tbody>
</table>

Note. HF = Heart failure.
†p < .05. ‡p < .01.
RELATIONSHIPS AMONG HEART FAILURE-RELATED PHYSICAL SYMPTOMS, SOCIAL SUPPORT, SOCIAL PROBLEM-SOLVING, DEPRESSIVE SYMPTOMATOLOGY, AND SELF-CARE BEHAVIORS IN INDIVIDUALS LIVING WITH HEART FAILURE

by

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In preparation for Social Science and Medicine

Format adapted for dissertation
ABSTRACT

Maintaining health and well-being in those with heart failure (HF) is crucial to preventing adverse outcomes. Depressive symptoms and self-care behaviors have been identified as possible factors associated with HF outcomes. Previous research has suggested that HF symptoms, social support, and social problem-solving may be related to depressive symptoms and self-care behaviors in individuals with HF. However, the direct and indirect relationships among these variables have not been investigated. Thus, this study examined these relationships using structural equation modeling. Cross-sectional data were collected from 201 outpatients with HF in Northwest Florida from August 2013 to December 2013, using self-report surveys to guide individual interviews. The final trimmed model illustrated that HF symptoms and social support were predictors of depressive symptoms, as well as self-care behaviors. Social problem-solving also predicted self-care behaviors. Social support was also found to mediate the relationship between HF symptoms and depressive symptomatology. Findings indicate that improving social support may be beneficial in decreasing depressive symptomatology and enhancing self-care behaviors, while social problem-solving may be more useful in influencing self-care behaviors in individuals with HF.

Keywords: heart failure, social support, social problem-solving, depressive symptoms, self-care, structural equation modeling
Introduction

The incidence of heart failure (HF) in the United States is alarming; with more than five million people currently living with this disorder (American Heart Association [AHA], 2013). Individuals with HF exhibit a variety of physical symptoms (e.g., fatigue, dyspnea, edema, orthopnea, and activity intolerance), which contribute to functional impairment (Butler, 2010; Carels, 2004), depressive symptoms (Alosco et al., 2012; Paukert, LeMaire, & Cully, 2009), and poor self-care (Riegel & Carlson, 2002). How individuals cope may play a key role in how they adapt to increased HF symptoms and maintain their physical and psychological well-being. However, while social support and social problem-solving (i.e., the way one solves problems or makes decisions in everyday life; Nezu, D’Zurilla, Zwick, & Nezu, 2004a) may influence depressive symptoms and self-care behaviors in those with HF (Trivedi et al., 2009; Vollman, LaMontagne, & Hepworth, 2007), published research regarding these relationships often is either inadequate or inconsistent (Graven & Grant, 2013a; 2013b; 2014).

Individuals with HF must accurately assess symptoms, self-adjust medications (e.g., diuretics), and seek professional treatment when appropriate (Butler, 2010; Riegel et al., 2009). Researchers have suggested that social support plays a key role in assisting with symptom assessment and management and adapting to functional limitations (Friedman & Quinn, 2008; Heo, Lennie, Okoli, & Moser, 2009). As symptoms of HF increase and functional impairment occurs, social support provided to individuals with
HF may be affected. However, empirical studies have not investigated the influence that HF symptoms, specifically symptom severity, have on social support.

Similarly, while evidence supports the critical role that problem-solving plays in adjusting to severe HF symptoms (e.g., using a shower chair to prevent fatigue and dyspnea during a bath), and in seeking treatment for HF symptoms (Friedman & Quinn, 2008, Riegel & Carlson, 2002), no published reports were found that evaluated the relationship between symptoms of HF and social problem-solving. Yet, researchers have suggested that social problem-solving may influence the perception of physical symptoms (Elliott, Grant, & Miller, 2004). Thus, it is plausible that how individuals with HF solve problems may influence their perception of HF symptoms.

Researchers agree that increases in HF symptoms influence psychological distress, particularly depressive symptoms (Ancheta, Battie, Cobb, Ancheta, Miller, & Chiong, 2009; Cully, Phillips, Kunik, Stanley, & Deswal, 2010; Dekker, Peden, Lennie, Schooler, & Moser, 2009). In fact, approximately 50% of individuals with HF experience clinically significant depressive symptoms (Gottlieb et al., 2004), including subjective feelings, such as hopelessness, low energy, and depressed mood (Dekker et al.; Song, Moser, & Lennie, 2009) due to increases in HF symptoms (Cully et al).

Likewise, the severity of HF symptoms may influence individuals’ ability to perform self-care behaviors. Self-care is a vital factor in maintaining health and well-being (Riegel et al., 2009) and involves very specific activities that promote health, as well as assist with illness prevention and disease management, such as taking prescribed medications, adhering to a specialized diet, and responding to symptoms (Moser & Watkins, 2008). While empirical evidence indicates that severe HF symptoms and
impaired functional status interferes with the ability to engage in self-care activities (Riegel & Carlson, 2002; Carlson, Riegel, & Moser, 2001), findings from other studies are in disagreement (Rockwell & Riegel, 2001).

Currently, no published reports have examined whether social support influences social problem-solving in those with HF. Yet, both are resources that aid coping (Lazarus & Folkman, 1984). However, in individuals with HIV, an increased perception of social support is related to adaptive problem-solving, while decreased perception of support is associated with maladaptive problem-solving (Prachakul, Grant, & Keltner, 2007). A similar association may also exist in individuals with HF.

A number of studies have examined the influence of social support on depressive symptomatology in individuals with HF, although findings are inconsistent. While several studies suggest that individuals who perceive higher levels of social support or who seek support experience fewer depressive symptoms (Park, Fenster, Suresh, & Bliss, 2006; Trivedi et al., 2009; Vollman et al., 2007), other studies have failed to identify a relationship between social support and depressive symptoms (Klein, Turvey, & Pies, 2007; Koenig, 2006).

Likewise, prior research varies regarding social support and self-care behaviors. While several studies agree that social support, particularly family support, is associated with better self-care behaviors (e.g., consult with clinicians for HF symptoms and adhere to treatment regimens) (Dunbar, Clark, Quinn, Gary, & Kaslow, 2008; Friedman & Quinn, 2008; Salyer, Schubert, & Chiaranai, 2012), other studies failed to identify social support as a factor influencing self-care behaviors (Chriss, Sheposh, Carlson, Riegel, 2004; Heo, Moser, Lennie, Riegel, & Chung, 2008).
Thus far, no studies have investigated the relationship between social problem-solving and depressive symptoms. However, current research has examined the influence of specific coping strategies on depressive symptoms, with findings suggesting that maladaptive coping strategies (e.g., behavioral and mental disengagement, venting, and denial) are positively related to depressive symptoms (Paukert et al., 2009; Trivedi et al., 2009), while problem-focused coping strategies (e.g., planful problem-solving and seeking social support) are negatively related to depressive symptomatology (Trivedi et al; Vollman et al., 2007). Even though these findings suggest that problem-solving efforts are likely to reduce or minimize depressive symptoms, it is also plausible that maladaptive problem-solving may be a consequence of depressive symptomatology (Nezu, Wilkins, & Nezu, 2004b).

The association between social problem-solving and self-care behaviors in individuals with HF has not been examined. In fact, previous research identified this area for future research (Dunbar et al., 2008). In addition, social problem-solving influences how individuals take care of themselves in other clinical populations, for example diabetes mellitus (Hunt, Wilder, Steele, Grant, Pryor, & Moneyham, 2012); thus, social problem-solving may also influence HF self-care behaviors.

Lastly, there is some evidence to support that depressive symptoms may influence self-care behaviors in individuals with HF (Riegel, Dickson, Kuhn, Page, & Worrall-Carter, 2010). However, Heo et al. (2008) found that depressive symptoms were not predictors of self-care. Though, research often views depressive symptomatology as an outcome of a problem (i.e., illness, threat, etc.), or of ineffective problem-solving
attempts (Nezu et al., 2004b), it is important to examine whether depressive symptomatology influences self-care behaviors in those with HF.

While the aforementioned factors are identified as significant factors related to depression and self-care in prior studies, their relationships to each other and their specific contributions to depression and self-care have not been evaluated. Additionally, no previous research has evaluated the influence of social problem-solving on depressive symptoms and self-care behaviors in individuals living with HF. Therefore, the purpose of this descriptive, correlational study was twofold: 1) to examine direct and indirect relationships among HF symptoms, social support, social problem-solving, depressive symptomatology, and self-care behaviors and, 2) to identify which of these study variables were predictors of depressive symptoms and self-care behaviors in individuals with HF. Using structural equation modeling (SEM), the following five research questions were examined: 1) Is there a direct effect between HF symptoms and depressive symptomatology? 2) Is there a direct effect between HF symptoms and self-care behaviors? 3) Is there a direct effect between depressive symptoms and self-care behaviors? 4) Is there an indirect effect between HF symptoms and depressive symptomatology through social support and social problem-solving? 5) Is there an indirect effect between HF symptoms and self-care behaviors through social support and social problem-solving? The proposed full causal model used to guide the SEM analysis is depicted in Figure 1.
Methods

Participants and Study Design

Outpatients with HF ($N = 201$) were recruited from three hospital-affiliated outpatient clinics in Northwest Florida between August 2013 and December 2013. Methods used to recruit the convenience sample included flyers displayed in each office and letters mailed to eligible patients from each office. Interested patients then contacted the primary investigator to learn more about the study and undergo additional screening for inclusion.

Inclusion criteria for this study included: (a) a diagnosis of HF confirmed by a primary health care provider; (b) age 55 years or older; (c) lived in an outpatient setting; and (d) the ability to speak, read, and understand English. Patients with cognitive impairment were excluded from study participation as determined by a score ≤ 30 on the Telephone Interview for Cognitive Status (TICS) (Brandt, Spencer, & Folstein, 1988).

This study used a cross-sectional, descriptive correlational design to investigate relationships among study variables and their contribution to depressive symptoms and self-care behaviors. Approval for this study was granted by two university-affiliated institutional review boards, as well as a hospital-affiliated review board.

Procedure

Potential participants contacted the primary investigator to undergo cognitive and clinical screening over the telephone to determine eligibility. Those meeting inclusion criteria were enrolled in the study and scheduled for an interview with a data collector at
the clinic in which the participant was a patient. Following consent, a set of self-report questionnaires, presented in random order, were used to guide participant interviews. Each interview was conducted in a private, quiet room within the supporting clinic. A computerized data entry system was used to record participant answers, with data assessed for completeness of all questionnaires prior to conclusion of each interview. There were no incentives offered by researchers for participation in this study.

Measures

The TICS (Brandt et al., 1988) was used during telephone screening for study eligibility to assess the potential for cognitive impairment. This short survey consists of 11 items that assess 5 areas of cognitive function (e.g., orientation, attention, language, learning, and memory). The maximum score is 41. Scores of ≤ 30 represent the potential for cognitive impairment, while scores ≥ 31 represent lack of cognitive impairment. Content and construct validity, as well as internal consistency reliability, have been supported in previous studies (Brandt et al.). Sociodemographic information was also used to determine eligibility for the study, as well as assess key participant characteristics. Clinical information included questions related to severity of HF (i.e., New York Heart Association [NYHA] classification) and length of time since HF diagnosis.

Heart failure symptoms

Symptoms of HF were assessed using the Heart Failure Symptom Survey (HFSS) (Hertzog, Pozehl, & Duncan, 2010; Pozehl, Duncan, & Hertzog, 2006). Developed
specifically for use in outpatient settings, this survey contains 14 symptoms commonly experienced by those with HF (Quinn, Dunbar, & Higgins, 2010). Using an 11-point scale (i.e., 0 – 10), participants rate each symptom according to four domains (i.e., frequency, severity, interference with physical activity, and interference with enjoyment of life) based upon the last seven days. Higher scores indicate more of the respective domain in relation to the particular symptom. Empirical evidence supports its content validity (Hertzog et al.) and reliability (Quinn et al.); however, prior studies have not previously reported whether the HFSS is best viewed as a single- or multidimensional instrument. Therefore, a factor analysis of this instrument was conducted, with results indicating that the four domains of the instrument could be viewed as one domain to represent physical symptoms of HF in this study, as exhibited by all items loading at .30 or higher on the first factor (Graven, 2014). In this study the Cronbach’s alpha was 0.96.

**Social support**

The Likert-type, Interpersonal Support Evaluation List – 12 (ISEL-12) (Cohen, Mermelstein, Kamarck, & Hoberman, 1985) was used to measure perceived belonging, appraisal, and tangible support. Overall scores range from 0-36, with higher scores indicating a higher perception of available support. Previous studies support its construct validity using the original 40-item version (Cohen et al.) and its internal consistency reliability ($\alpha = .79$) (Bakan & Akyol, 2008). The Cronbach’s alpha was 0.90 in the current study.

Actual support was measured using the researcher developed Graven and Grant Social Network Survey (GGSNS). Participants rate their level of agreement with
statements regarding their views about people they are associated with and who provide them with assistance and support, as well as identify the number of people in their life they depend upon to provide support. Scores on this 12-item survey range from 12-84, with higher scores indicating higher levels of actual support. A modified Delphi Technique, using three content reviewers with expertise in the areas of social support, heart failure, and psychometrics was used to establish content validity (Graven, 2014). The instrument was internally consistent, with a Cronbach’s alpha of 0.89 in this study.

**Social problem-solving**

The Likert-type, 25 – item Social Problem-Solving Inventory Revised – Short (SPSIR-S) (D’Zurilla & Nezu, 1990; D’Zurilla, Nezu, Maydeu-Olivares, 2002) was used to measure social problem-solving, representing adaptive and maladaptive problem-solving styles. Although this instrument has not been used in studies involving individuals with HF, empirical evidence does support its content and construct validity and internal consistency reliability for general populations (D’Zurilla et al.). For the present study, a total score was derived from the five subscales, with higher scores representing more of an adaptive problem-solving style and lower scores indicating more of a maladaptive problem-solving style. The Cronbach’s alpha was 0.91 in this study.

**Depressive symptomatology**

Depressive symptoms were measured using the 20-item Center for Epidemiological Studies – Depression Scale (CES-D) (Radloff, 1977). Overall scores range from zero to 60, with higher scores indicating the presence of more depressive
Symptoms and a cutoff score of 15 indicating an individual is at risk for some degree of depression (Radloff). Validity and reliability have been supported in previous studies involving individuals with HF (Lesman-Leegte, Jaarsma, Coyne, Hillege, Van Veldhuisen, & Sanderman, 2009; Park et al., 2006). A Cronbach’s alpha of 0.90 was noted in the current study.

**Self-care behaviors**

Self-care behaviors were measured using the European Heart Failure Self-care Behaviour Scale - 9 (EHFScBS-9) (Jaarsma, Arestedt, Martensson, Dracup, & Stromberg, 2009). Participants rate their level of agreement with activities specific to HF self-care on a five-point scale, with higher scores indicating worse self-care behaviors. Although, reliability and validity have been supported in previous studies examining self-care behaviors in those with HF (Jaarsma et al.), the Cronbach’s alpha was slightly low ($r = 0.67$) in this study.

**Data Analysis**

The Statistical Package for the Social Sciences (SPSS) version 20 (IBM Corporation, 2011) and LISREL 9.1 (Jöreskog & Sörbom, 2013) statistical software were used to analyze data, with statistical significance set at an alpha level of 0.05 for all tests. Descriptive statistics were conducted to examine and report sample characteristics, as well as report scores on all study variables. Partial correlation analyses were conducted using Pearson product moment correlation coefficients to assess relationships between study variables, while controlling for covariates (i.e., gender, age, race, income, and
education) that may influence study variables (Dekker et al., 2009; Gottlieb et al., 2004; Heo et al., 2009; Hill-Briggs et al., 2006; Riegel et al., 2010). The partial correlation matrix was used for analysis in the LISREL software.

A true latent variable was extracted for social support (ISEL-12 and GGSN) and a causal model was developed to determine the effects of HF symptoms, social support, and social problem-solving on depressive symptoms and self-care behaviors while controlling for the above covariates; this allowed the proposed model to be run without violating Bolen’s rule with the sample size of 201 and provide a more parsimonious model without including a path for all of the covariates (Kelloway, 1998). Standard fit indices were used to evaluate and compare the models. The goodness-of-fit index and the adjusted goodness-of-fit index were used because they compare the models to a saturated model versus a nested model.

The proposed model was constructed with depressive symptoms and self-care behaviors as dependent variables (depressive symptoms as an outcome was nested within the overall model), with the other latent variable and observed variables serving as predictor variables (See Figure 1). Social support and social problem-solving were modeled as potential mediators of the effects of HF symptoms on depressive symptoms and self-care behaviors. Additionally, tests of overall model fit and t-tests of the significance of each estimated path were examined, while non-significant paths were fixed to zero to enhance model fit and parsimony.
Results

A total of 205 participants agreed to undergo telephone screening. Of this, one participant had a TICS score less than 31 and, therefore, was not enrolled in the study. Three other participants were enrolled in the study but failed to show for the individual interview. Participants who failed to show for the interview were similar with regards to gender, race, and age (i.e., all three were Caucasian men between the age of 65-72 years old). There were no incidents of missing data. Thus, the complete data for 201 participants were included in the analyses. Descriptive characteristics of the sample (\(N = 201\)) and study variables are displayed in Table 1. Simple summary information was used for many of the instruments, including HFSS, GGSNS, ISEL-12, SPSIR-S, CES-D, and EHFScBS, as well as for the specified covariates (i.e., gender, age, race, income, and education). For data analysis, gender and race were recoded into dichotomous variables (i.e., male/female and non-minority/minority, respectively). The transgender participant was collapsed into the male group, given that a male status was maintained legally and within the physician office in which care was sought.

Statistical control of covariates was accomplished using partial correlational analyses. Table 2 shows the partial correlation matrix for variables used in this analysis. Otherwise, SEM analysis proceeded in a logical manner, consistent with the recommendations of Anderson and Gerbing (1988). First, the baseline model was constructed to confirm the stability of the latent variables. Then, the causal model was constructed with all of the proposed paths included, whether the paths were significant or not. Lastly, the trimmed model was constructed by eliminating the least non-significant
path and rerunning the analysis. This process was repeated until only significant paths remained in the model. Data interpretation was conducted using the final trimmed model.

Initially, the baseline model was specified to check the validity of the latent variable (i.e., social support). A reference variable (i.e., ISEL-12) was identified and specified for the one latent variable in the model that had two indicator variables. This stabilized the latent variable and provided a conservative solution by allowing the reference variable to remain in the model without removing its error variance. Dummy latent variables were constructed, with only one indicator variable, which served as the reference variable. The baseline model was tested first, with all variables correlated with each other. The minimum fit function chi-square for this model was $X^2(4, N = 201) = 9.31, p = 0.05$. Then the full causal model was specified, with no improvement of fit observed (i.e., $X^2(4, N = 201) = 9.31, p = 0.05$). However, several paths in the model were non-significant. Therefore, the model was trimmed by removing the least significant path (i.e., the path with the lowest $t$ value) one at a time and recalculating model fit following the removal of each path. This process continued until only statistically significant paths (i.e., $p < 0.05$) remained in the model. The minimum fit chi-square for the trimmed model was $X^2(7, N = 201) = 12.44, p = 0.08$. A chi-square difference test revealed no significant improvement in fit between the full and trimmed models, $X^2(3, N = 201) = 3.31, p > 0.05$. Therefore, trimming the non-significant paths from the model did not enhance model fit. Given that the GFI's were the same, this finding was not surprising. Table 3 provides an overview of the standard fit indices for the baseline, full, and trimmed models.
Figure 1 illustrates the trimmed model, including path coefficients in standardized form. The standard fit indices (i.e., GFI = 0.98, AGFI = 0.94, RMSEA = 0.06) for this model, as noted in Table 3, indicate that this model provides a good fit to the observed data. However, model fit was not significantly enhanced by trimming non-significant paths, as evidenced by the $X^2$ difference test, as well as the amount of variance explained for depressive symptoms (44% for both the full and trimmed models). However, the trimmed model did explain a slightly higher percentage of the variance for self-care behaviors (16%), while the full model (with non-significant paths) explained 15% of the variance.

The final trimmed model shows that HF symptoms directly affect social support. Symptoms of HF and social support predicted depressive symptoms, yet social problem-solving did not. Also, HF symptoms, social support, and social problem-solving directly affect self-care behaviors. However, depressive symptoms did not predict self-care behaviors, nor did symptoms of HF and social support predict social problem-solving. However, HF symptoms was strongly predictive of social support (standardized coefficient = -0.19), depressive symptomatology (standardized coefficient = 0.48), and self-care behaviors (standardized coefficient = 0.19). Thus, individuals experiencing more HF symptoms had less social support, experienced more depressive symptoms, and participated in less self-care behaviors. Social support was predictive of depressive symptomatology (standardized coefficient = -0.38) and self-care behaviors (standardized coefficient = -0.29), suggesting that those with higher levels of social support experience less depressive symptoms and participate in more self-care behaviors. Finally, social problem-solving was predictive of self-care behaviors (standardized coefficient = -0.19),
indicating that individuals with an adaptive problem-solving style have better self-care behaviors. As noted in Figure 2, in addition to these direct paths, HF symptoms had a significant indirect effect on depressive symptoms that was mediated by social support (standardized coefficient = 0.07).

Although, not the main focus of this study, preliminary analyses also were conducted using multiple regression to evaluate the contribution of components of social support and social problem-solving to depressive symptomatology and self-care behaviors. Preliminary findings support that some components of social support are more valuable than others in predicting outcome variables. Similar findings were found with regards to social problem-solving. These findings are addressed in upcoming publications, to give adequate attention to contributions these components make toward explaining these outcome variables.

**Discussion**

This primary aim of this study was to examine direct and indirect relationships among HF symptoms, social support, social problem-solving, depressive symptomatology, and self-care behaviors, as well as identify predictors of depressive symptoms and self-care behaviors from among the study variables in individuals living with HF. Given study findings, a number of conclusions can be made. Consistent with previous findings (Havranek, Spertus, Masoudi, Jones, & Rumsfeld, 2004; Paukert et al., 2009; Westlake, Dracup, Fonarow, & Hamilton, 2005), individuals experiencing more symptoms of HF are at greater risk of developing depressive symptoms. Also, it appears that social support mediates the effect of symptom severity and, thus, lowers the risk that
an individual will experience depressive symptoms. This finding is also consistent with prior studies that indicated an association between social support and decreased depressive symptomatology (Dekker et al., 2009; Park et al., 2006; Vollman et al., 2007), as well with research by Lazarus and Folkman (1984), which suggests that social support acts as a buffer to stressful situations (e.g., increased HF symptoms) and their somatic consequences.

Increased symptoms of HF were associated with worse self-care behaviors. This was a logical finding, given that functional impairment commonly results as symptoms of HF increase and limit individuals’ ability to perform self-care activities (Butler, 2010; Carels, 2004). Similarly, individuals who had more symptoms of HF also reported less social support. Although prior research is sparse, findings suggest that increased frequency and severity of HF symptoms may interfere with maintaining social relationships that provide support. It may also be plausible that those with less social support perceive more severe physical symptoms of HF. Thus, this finding may need to be explored qualitatively.

These findings illustrate the importance of adequate social support, as a coping resource (Lazarus & Folkman, 1984), in maintaining good self-care behaviors. While several studies have suggested that social support is a critical resource for maintaining self-care (Friedman & Quinn, 2008; Gallagher, Luttik, & Jaarsma, 2011; Riegel et al., 2010; Wu, Moser, Chung, & Lennie, 2008), findings of this study also highlight the importance that social problem-solving has in self-care. While not previously investigated in individuals with HF, it appears that individuals who have an adaptive problem-solving style have better self-care. Similar findings have been found in other
populations, such as diabetes mellitus, indicating that social problem-solving is related to components of self-care (Hunt et al., 2012).

The inability to find a relationship between depressive symptomatology and self-care behaviors was somewhat surprising given that depressive symptoms may interfere with the ability to assess and respond to symptoms, as well as make decisions and influence physical activity, independent of symptom severity (Wells et al., 1989). Yet, these findings do support previous research findings (Heo et al., 2008; Nezu et al., 2004b), implying depressive symptoms are not a predictor of self-care, but rather, an outcome of a particular condition or situation. However, the average overall low scores for this sample on the instrument that measured depressive symptoms (See Table 1) could have contributed to this non-significant finding in this study. Descriptive statistics indicated that at least half of participants were not experiencing depressive symptoms. Perhaps, if participants had been experiencing higher levels of depressive symptoms, a significant relationship may have been found.

It appears that HF symptoms do not influence individuals’ problem-solving style; problem-solving style may be an inherent characteristic of one’s personality, independent of physical status. According to Rich and Bonner (2004), individual differences in personality appear to influence social problem-solving, predisposing individuals to the use of specific problem-solving strategies. Although the influence of personality was not investigated in this study, prior research indicates that the potential effect of personality on problem-solving should not be ignored. For example, Murberg, Bru, and Stephens (2002) found that coping styles (which includes problem-solving) in HF patients were moderately associated with the personality traits of neuroticism and extraversion.
Therefore, the potential influence of personality on social problem-solving needs further investigation.

Lastly, an interesting finding of this study was that social problem-solving did not influence depressive symptomatology. This was somewhat surprising because previous studies involving other populations (e.g., HIV, spinal cord injury, caregivers of stroke patients) have identified a relationship between maladaptive problem-solving and increased risk for depressive symptoms (Elliott, Godshall, Herrick, Witty, & Spruell, 1991; Grant, Weaver, Elliott, Bartolucci, & Giger, 2002; Prachakul et al., 2007). Furthermore, social problem-solving style has been identified as an important factor in influencing psychological adjustment (i.e., distress) that accompanies health conditions, particularly chronic illnesses (Elliott et al., 2004). Although, the majority of participants had maladaptive problem-solving scores (See Table 1), failure to find a significant relationship between social problem-solving and depressive symptoms in this study could possibly be due to the use of a total score to measure social problem-solving. Thus, in future studies, examining types of problem-solving strategies that may be more useful in lessening depressive symptoms and enhancing self-care behaviors would be more valuable.

While the findings of this study provide insight into factors that predict depressive symptomatology and self-care behaviors in individuals with HF, limitations and strengths of the study must be considered. Major limitations in this study included: 1) a high percentage of Caucasian men, which were not representative of current national HF statistics (AHA, 2013; Emory Healthcare, 2013); 2) use of a convenience sample, predisposing the sample to a higher percentage of participants experiencing few
symptoms of HF (i.e., Class II NYHA HF); 3) use of a cross-sectional, descriptive correlational design which limited insight on how social support and social problem-solving needs may change over time, as well as limited the ability to infer causality; and 4) lack of investigation into factors which may have influenced the study variables (e.g., co-morbidities, use of antidepressant medications, and personality).

A major strength of this study lies in the variables under investigation. Although previous studies have investigated relationships among HF symptoms, social support, depressive symptomatology, and self-care behaviors, published research has yet to examine the effect of social problem-solving on depressive symptoms and self-care behaviors in those with HF. Therefore, this study provides insight into the influence of social problem-solving on these outcome variables for future research. In addition, the use of valid and reliable instruments to measure the study variables was also a strength of this study. With the exception of self-care behaviors (EHFScBS-9), which had a slightly low Cronbach’s alpha (0.67), all other instruments appeared to be highly reliable. The high percentage of participants with NYHA Class II HF may be responsible for this lower alpha, given that these participants were not partaking in activities that are commonly part of the treatment regimen for those with higher classes of HF (i.e., Class III or IV HF) (e.g., restricting fluids, monitoring daily weights). Moreover, the length of the EHFScBS-9 may also have contributed to the low alpha in this study.

Findings of this study also provide clear implications for clinicians working with HF patients. First, evidence from this study illustrates the importance of social support in maintaining optimal psychological and physical well-being in those with HF. Therefore, clinicians should assess for adequate support at each health care visit and include
patients’ support systems in the educational process. Second, clinicians should also assess for the presence of depressive symptoms in these patients and make appropriate referrals as needed. Third, given that adequate self-care is vital to maintaining health, it is especially important that clinicians work with patients to lessen maladaptive problem-solving and strengthen adaptive problem-solving in order to enhance self-care in those with HF. For example, clinicians can explore with patients those situations in their daily lives that are considered stressful and assist patients with undergoing a cognitive analysis of these situations, as well as assisting with planful problem-solving related to dietary and treatment regimens (Graven, Grant, Vance, Pryor, Grubbs, & Karioth, 2014). Lastly, clinicians need to assess the effect of HF symptom severity and functional impairment on individuals’ ability to maintain self-care behaviors and make referrals to outside agencies (e.g., home health) or assist with identifying people within their social network that can help with self-care activities as needed.

**Conclusion**

Maintaining optimal health and well-being in those with HF is crucial to preventing morbidity and mortality, as well as reducing frequent hospitalizations. However, depressive symptomatology and poor self-care behaviors increase the risk of these outcomes occurring (Riegel et al., 2009). Consequently, it is important to know what factors increase the risk of depressive symptoms and poor self-care behaviors. Findings indicate that improving social support may be beneficial in decreasing depressive symptomatology and enhancing self-care behaviors, while social problem-solving may be more useful in influencing self-care behaviors in individuals with HF.
Therefore, in addition to maintaining health, improving social support and problem-solving for those with HF is vital. Though longitudinal work is needed, findings of this study provide insight into potential components for intervention research to decrease depressive symptoms and enhance self-care behaviors in individuals with HF.
References


http://www.heart.org/HEARTORG/General/Heart-and-Stroke-Association-Statistics_UCM_319064_SubHomePage.jsp#


Figure 1. Trimmed structural equation model predicting depressive symptoms and self-care behaviors (standardized solutions). All solid lines represent significant effects ($p < 0.05$); broken lines represent proposed nonsignificant paths.
Table 1
Sample Characteristics and Descriptive Statistics for Study Variables (N = 201)

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
<th>M(SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td>72.57 (8.94)</td>
<td>55-99</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>126</td>
<td>62.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>75</td>
<td>37.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>173</td>
<td>86.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>27</td>
<td>13.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>1</td>
<td>.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest Level of Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&lt;sup&gt;th&lt;/sup&gt; grade or less</td>
<td>1</td>
<td>.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7&lt;sup&gt;th&lt;/sup&gt; – 9&lt;sup&gt;th&lt;/sup&gt; grade</td>
<td>6</td>
<td>3.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10&lt;sup&gt;th&lt;/sup&gt; – 12&lt;sup&gt;th&lt;/sup&gt; grade</td>
<td>15</td>
<td>7.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school graduate</td>
<td>50</td>
<td>24.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td>46</td>
<td>22.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College graduate</td>
<td>63</td>
<td>31.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate degree</td>
<td>20</td>
<td>10.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;$30,000</td>
<td>34</td>
<td>16.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$30,000 - $50,000</td>
<td>66</td>
<td>32.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$50,000 - $75,000</td>
<td>62</td>
<td>30.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$75,000 - $100,000</td>
<td>35</td>
<td>17.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; $100,000</td>
<td>4</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart Failure Class (New York Heart Association)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>39</td>
<td>19.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>95</td>
<td>47.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>23</td>
<td>11.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>44</td>
<td>21.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart Failure Symptom Survey</td>
<td></td>
<td></td>
<td>1.50 (1.53)</td>
<td>0-7.39</td>
</tr>
<tr>
<td>Graven &amp; Grant Social Network Survey</td>
<td></td>
<td></td>
<td>56.46 (18.74)</td>
<td>12-84</td>
</tr>
<tr>
<td>Interpersonal Support Evaluation List -12</td>
<td></td>
<td></td>
<td>29.09 (7.51)</td>
<td>0-36</td>
</tr>
<tr>
<td>Social Problem-Solving Inventory Revised – Short</td>
<td></td>
<td></td>
<td>9.76 (3.71)</td>
<td>4-20</td>
</tr>
<tr>
<td>Center for Epidemiological Studies – Depression</td>
<td></td>
<td></td>
<td>9.65(10.17)</td>
<td>0-49</td>
</tr>
<tr>
<td>European Heart Failure Self-care Behavior Scale – 9</td>
<td></td>
<td></td>
<td>25.65 (7.55)</td>
<td>9-45</td>
</tr>
</tbody>
</table>
### Table 2

*Partial Correlation Matrix for Study Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Heart Failure Symptom Survey</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Graven &amp; Grant Social Network Survey</td>
<td>-0.108</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Interpersonal Support Evaluation List -12</td>
<td>-0.189†</td>
<td>0.542‡</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Social Problem-Solving Inventory Revised –Short</td>
<td>0.154†</td>
<td>0.072</td>
<td>-0.134</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Center for Epidemiological Studies – Depression</td>
<td>0.550‡</td>
<td>-0.227‡</td>
<td>-0.466‡</td>
<td>0.136</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>6. European Heart Failure Self-care Behavior Scale -9</td>
<td>0.220†</td>
<td>-0.282‡</td>
<td>-0.306‡</td>
<td>-0.118</td>
<td>0.177†</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Note.* The following covariates were controlled for in the above partial correlational analyses: gender, age, race, income, and education.

† $p < 0.05$

‡ $p \leq 0.001$
Table 3

*Fit Measures of Baseline, Causal, and Trimmed Models*

<table>
<thead>
<tr>
<th></th>
<th>$X^2$ (df)</th>
<th>GFI</th>
<th>AGFI</th>
<th>PGFI</th>
<th>RMR</th>
<th>RMSEA</th>
<th>NFI</th>
<th>NNFI</th>
<th>PNFI</th>
<th>RFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Model</td>
<td>9.31 (4)</td>
<td>0.98</td>
<td>0.92</td>
<td>0.18</td>
<td>0.04</td>
<td>0.08</td>
<td>0.96</td>
<td>0.91</td>
<td>0.25</td>
<td>0.86</td>
</tr>
<tr>
<td>Full Causal Model</td>
<td>9.31 (4)</td>
<td>0.98</td>
<td>0.92</td>
<td>0.18</td>
<td>0.04</td>
<td>0.08</td>
<td>0.96</td>
<td>0.91</td>
<td>0.25</td>
<td>0.86</td>
</tr>
<tr>
<td>Trimmed Model</td>
<td>12.44 (7)</td>
<td>0.98</td>
<td>0.94</td>
<td>0.32</td>
<td>0.04</td>
<td>0.06</td>
<td>0.95</td>
<td>0.95</td>
<td>0.44</td>
<td>0.89</td>
</tr>
</tbody>
</table>

*Note.* The following covariates were controlled for in the above partial correlational analyses: gender, age, race, income, and education.

† $p < 0.05$
‡ $p \leq 0.001$
CONCLUSIONS

Symptoms of HF vary in intensity as the disease progresses, predisposing individuals to functional impairment, decreased quality of life, social isolation, and psychological distress, particularly depressive symptoms (Butler, 2010; Carels, 2004; Carels et al., 2004; Friedmann et al., 2006). In addition, as functional impairment occurs, it may become more difficult for those with HF to adequately perform self-care behaviors, thereby increasing the risk of poor HF-related outcomes (i.e., morbidity and mortality) (Riegel et al., 2009). However, previous research suggests that social support and social problem-solving, as coping resources, may be beneficial in assisting individuals with HF to cope with the challenges associated with HF (Dekker et al., 2009; Park et al., 2006; Trivedi et al., 2009; Vollman et al., 2007).

Following a pilot study to assess the feasibility of the study protocol and reliability of instruments, 201 participants with HF were individually interviewed using a set of self-report questionnaires related to HF symptoms, social support, social problem-solving, depressive symptoms, and self-care behaviors. Findings of this study suggest that the severity of HF symptoms predict depressive symptomatology and self-care behaviors. Social support appears to mediate the relationship between HF symptoms and depressive symptomatology, yet social support does not mediate the relationship between HF symptoms and self-care behaviors. In addition, the presence of social support appears to decrease the risk of depressive symptoms, as well as enhance self-care behaviors, while
adaptive problem-solving style appears to be more useful in improving self-care behaviors in those with HF.

These findings provide mixed support for the conceptual model guiding this study. Findings of this study support the indirect (i.e., mediating) role that social support plays in the relationship between symptoms of HF and depressive symptomatology, as well as in the relationship between HF symptoms and self-care behaviors. Findings also illustrate that social problem-solving mediates the relationship between HF symptoms and self-care behaviors. However, unlike the hypothesized relationship identified in the conceptual model, findings of this study did not indicate that social problem-solving mediated the relationship between symptoms of HF and depressive symptomatology.

Although these findings provide insight for intervention development, the strengths and limitations of this study must be considered. The lack of sample diversity and high percentage of Caucasian men, as well as the large number of participants with NYHA Class II HF, limits generalizability of study findings. Additionally, the use of a cross-sectional design limits insight regarding how relationships among the study variables change as HF progresses; therefore, longitudinal research is needed. While the examination of social problem-solving in this population with HF is a major strength of this study, other areas were identified that need to be investigated. For example, future research needs to examine which components of social support (i.e., emotional, instrumental, informational, or appraisal) are most beneficial in influencing depressive symptoms and self-care behaviors, as well as investigate whether subcomponents of social problem-solving are related to depressive symptoms.
Decreasing depressive symptoms and enhancing self-care in those with HF will ultimately impact several HF outcomes (e.g., quality of life, morbidity, and mortality) (Cully, Phillips, Kunik, Stanley, & Deswal, 2010; Murberg & Bru, 2001; Rodriguez-Artañalio et al., 2006), thus finding ways to strengthen these coping resources is important and create implications for nursing practice. Given the importance of social support in decreasing depressive symptoms and enhancing self-care behaviors, clinicians must encourage and enhance social support by assessing support availability at each health care visit and including a patient’s support system in the educational process. Likewise, clinicians must assess for the presence of depressive symptoms at each visit and refer patients to trained mental health providers, if needed. Lastly, it is important to work with patients to lessen use of maladaptive problem-solving strategies and to strengthen use of adaptive problem-solving strategies in order to enhance self-care behaviors.

Findings of this study also warrant implications for nursing education. In addition to evaluating the educational needs of patients based upon their availability of social support, nurses must also consider that educational needs may be different depending upon how the patient deals with or solves problems. Previous research has shown that individuals who use maladaptive problem-solving perceive a lower sense of personal control over their health and believe that health status is a result of chance (Elliott, Grant, & Miller, 2004). Therefore, different educational techniques may be needed when working with these patients. For example, strategies such as evaluating stressful life events and assisting with the cognitive appraisal process related to these stressful events may be useful in enhancing adaptive problem-solving in patients who commonly use maladaptive problem-solving strategies to cope with HF-related stressors.
REFERENCES


Relationships among heart failure-related physical symptoms, social support, social problem-solving, depressive symptoms, and self-care behaviors in individuals living with heart failure. *Social Science and Medicine.*


APPENDIX A

INSTITUTIONAL REVIEW BOARD AT TALLAHASSEE MEMORIAL HEALTHCARE APPROVAL
June 6, 2013

Lucinda J. Graven, MSN, ARNP
Assistant In Nursing
Florida State University;
419 DuBARRY Hall, 86 Varsity Way
Tallahassee, FL 32306.

Dear Ms. Graven:

Your Study # 2013-11, Titled "Relationships among Heart Failure-Related Physical Symptoms, Social Support, Social Problem-Solving, Depressive Symptomatology, and Self-care Behaviors in Individuals Living with Heart Failure (FSU)" met the criteria for review using the expedited review guidelines. Larry G. Deeb, MD, Chairperson, Institutional Review Board (IRB) at Tallahassee Memorial HealthCare, Inc. (TMH) reviewed the study. The study is approved to place Study Flyers at the TMH Clinics (TMHCT, TMHMCS and TMHSMG) and providing Study Information to patients only. The study was approved for a period of 12 months. The IRB approval for this study expires on May 30, 2014.

Extramural Investigator: Lucinda J. Graven,
*Key Personnel: Cora Pappas; Cindy Lewis; Martha Griffin

Materials Approved
1- Study Flyer
2- Study Information letter (April 9, 2013)

*Due to the strict regulatory requirements, all study personnel who will be at any Tallahassee Memorial Healthcare facility or have access to patient records must be cleared by Human Resources prior to the start of the study. To initiate this process, please contact Amanda Kent at Amanda.Kent@tmh.org.

Reporting Requirements:
- Report to the IRB any planned change in the study or informed consent and do not implement any change without receiving prior approval, except to eliminate immediate harm;
- Report the IRB any unanticipated problems involving risks to subjects;
- Report to the IRB any new information on the project that adversely influences the risk/benefit ratio;
- Report to the IRB any serious or unexpected adverse events;
- Report to the IRB any major protocol violations within ten days. Minor protocol deviations may be reported at the time of the Study Progress Report (Application for
APPENDIX B

FLORIDA STATE UNIVERSITY HUMAN SUBJECTS COMMITTEE APPROVAL
Office of the Vice President for Research
Human Subjects Committee
Tallahassee, Florida 32306-7742
(850) 644-8873 · FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 07/10/2013

To: Lucinda Graven <lgraven@fsu.edu>

Address: 410 Daxbury Hall, 98 Varsity Way, P.O. Box 306410, Tallahassee, FL 32306

Dept.: NURSING

From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research
   Relationships among Heart Failure-Related Physical Symptoms, Social Support, Social Problem-Solving, Depressive Symptoms, and Self-care Behaviors in individuals with Heart Failure

The application that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Secretary, the Chair, and two members of the Human Subjects Committee. Your project is determined to be Expedited per 45 CFR § 46.110(f) and has been approved by an expedited review process.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by 07/08/2014 you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to ensure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB00000446.

Cc: Donna Speake <dspeake@nursing.fsu.edu>, Dean

HSC No. 2015.101.00
APPENDIX C

UNIVERSITY OF ALABAMA AT BIRMINGHAM INSTITUTIONAL REVIEW BOARD APPROVAL FORM AND APPROVED INFORMED CONSENT FORM
Form 4: IRB Approval Form
Identification and Certification of Research
Projects Involving Human Subjects

UA's Institutional Review Boards for Human Use (IRBs) have an approved Federalwide Assurance with the Office for Human Research Protections (OHRP). This Assurance number is FWA0000660 and it expires on January 24, 2017. The IRBs are also in compliance with 21 CFR Parts 50 and 46.

Principal Investigator: GRAY, ORR (KINDA)
Co-investigators: PRYOR, PRICER
VANDERS, DAVID

Protocol Number: X140701062

Protocol Title: Relationships Among Stressors - Related Physical Symptoms, Social Support, Social Problem-Solving, Depression, Symptomatology, and Self-Care Behaviors in Individuals Diagnosed with Heart Disease

The IRB reviewed and approved the above named project on 7/26/13. The review was conducted in accordance with UA's Assurance of Compliance approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in the Assurance.

IRB Approval Date: 7/26/13

Date IRB Approved Issued: 7/26/13

Marilyn Dow, M.A.
Vice Chair of Institutional Review Board for Human Use (IRB)

Investigator please note:

The IRB approved consent form used in this study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approved date.

Any modifications to the study methodology, protocol and/or consent form must be submitted for review and approval to the IRB prior to implementation.

Adverse Events and/or unanticipated risks to subjects or others at UA or other participating institutions must be reported promptly to the IRB.

4-4022 Grace-McNary Hall, 205, Box 2011
205-348-3720
Fax: 205-348-8973

UA Health Sciences
IRB Office
4-4022 Grace-McNary Hall, 205, Box 2011
205-348-3720
Fax: 205-348-8973

IRB Office
4-4022 Grace-McNary Hall, 205, Box 2011
205-348-3720
Fax: 205-348-8973
Informed Consent Document

TITLE OF RESEARCH: Relationships among Heart Failure-Related Physical Symptoms, Social Support, Social Problem-Solving, Depressive Symptomatology, and Self-care Behaviors in Individuals Living with Heart Failure

IRB PROTOCOL: FSU 2013.10140
UAB X130702002

INVESTIGATOR: Lucinda J. Graven

OTHER INVESTIGATORS: Dr. Cara Pappas, Cindy Lewis, Martha Griffin

SPONSOR: Florida State University College of Nursing
University of Alabama at Birmingham School of Nursing

Purpose of the Research

We are asking you to take part in a research study. The purpose of this research study is to gain information about how the symptoms of heart failure influence your emotional health and self-care behaviors. The information gained from this study will be used to design strategies for improving emotional health and self-care behaviors in individuals with heart failure. The ultimate goal of these strategies is to improve emotional and physical outcomes for individuals living with heart failure in outpatient settings. This study will enroll 250 participants from three physician offices in two North Florida counties.

Explanation of Procedures

If you enter the study, you will be asked to complete an interview with one of our research staff members based on some survey questions. The research team member will read survey questions to you and mark your answers on a computerized answer sheet. Completion of the survey should take approximately 1 hour. We will ask you questions regarding your symptoms of heart failure, social support, problem-solving and coping skills, emotional health, and self-care behaviors. You may be asked to complete a second interview using the same survey questions. You will not be asked to give your name on the survey; however, you will be given a survey code number. You will receive a copy of the signed consent form containing your survey code number. Data will be analyzed at the University of Alabama at Birmingham School of Nursing and the Florida State University College of Nursing.

UAB IRB

Date of Approval: 7-26-13
Not Valid On: 7-26-14
Risks and Discomforts
The foreseeable risks and discomforts to you from participating in this study are minimal. You may experience feelings of anxiety or sadness when answering questions related to your symptoms of heart failure and/or your emotional health.

Benefits
You may not benefit directly from taking part in this study. However, this study may help us develop strategies to improve the emotional health and self-care behaviors of people who live with heart failure.

Alternatives
Your alternative is not to participate.

Confidentiality
Information obtained about you for this study will be kept confidential to the extent allowed by law. However, research information that identifies you may be shared with the University of Alabama at Birmingham Institutional Review Board (IRB), the Florida State University IRB, the Tallahassee Memorial Healthcare IRB, and others who are responsible for ensuring compliance with laws and regulations related to research, including the Office of Human Research Protections (OHRP). Your survey will be identifiable by a code only, in the event that you decide to withdraw from the study at a later date. The results of this study will be published for scientific purposes. However, your identity will not be given out.

Voluntary Participation and Withdrawal
Whether or not you take part in this study is your choice. There will be no penalty if you decide not to be in the study. If you decide not to be in the study, you will not lose any benefits you are otherwise owed. You are free to withdraw from this research study at any time. Your choice to leave the study will not affect your relationship with this institution, nor impact your care in any way.

Cost of Participation
There will be no cost to you for taking part in this study.

Payment for Participation in Research
There will be no payment for taking part in this study.

Significant New Findings
You will be told by your doctor or the study staff if new information becomes available that might affect your choice to stay in the study.

Questions

Page 2 of 3
Version Date: 07/25/2013
If you have any questions, concerns, or complaints about the research, please contact Lucinda J. Graven. She will be glad to answer any of your questions. Mrs. Graven’s number is (850)-868-0961. If you decide after completing the survey that you do not want to participate in the study, call Mrs. Graven and provide the survey number listed on the last page of this informed consent letter. Your survey will be removed from the study.

If you have any questions about your rights as a research participant, or concerns, or complaints about the research, you may contact the University of Alabama at Birmingham Office of the IRB (OIRB) at (205)-934-3789 or 1-855-860-3789. Regular hours for the OIRB are 8:00 a.m. to 5:00 p.m. CT, Monday through Friday. You may also call this number in the event the research staff cannot be reached or you wish to talk to someone else.

Additionally, if you have any questions about your legal rights as a research participant, you may contact the Florida State University Office of Human Subjects Research or the Institutional Review Board by phone at 850-644-7900 or 850-644-9694.

You may also contact the Institutional Review Board at Tallahassee Memorial HealthCare at 850-431-5676 if you have any questions or concerns regarding this research study or your legal rights as a research participant.

**Legal Rights**

You are not waiving any of your legal rights by signing this informed consent document.

**Signatures**

Your signature below indicates that you agree to participate in this study. You will receive a copy of this signed document.

<table>
<thead>
<tr>
<th>Signature of Participant</th>
<th>Date</th>
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<th>Signature of Person Obtaining Consent</th>
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<tr>
<th>Signature of Witness</th>
<th>Date</th>
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Survey #: __________

Page 3 of 3
Version Date: 07/24/2013
APPENDIX D

INFORMED CONSENT FORM
Informed Consent Document

TITLE OF RESEARCH: Relationships among Heart Failure-Related Physical Symptoms, Social Support, Social Problem-Solving, Depressive Symptomatology, and Self-care Behaviors in Individuals Living with Heart Failure

IRB PROTOCOL: FSU 2013.11012
UAB X130702002

INVESTIGATOR: Lucinda J. Graven

OTHER INVESTIGATORS: Dr. Cara Pappas, Cindy Lewis, Martha Griffin

SPONSOR: Florida State University College of Nursing
University of Alabama at Birmingham School of Nursing

Purpose of the Research
We are asking you to take part in a research study. The purpose of this research study is to gain information about how the symptoms of heart failure influence your emotional health and self-care behaviors. The information gained from this study will be used to design strategies for improving emotional health and self-care behaviors in individuals with heart failure. The ultimate goal of these strategies is to improve emotional and physical outcomes for individuals living with heart failure in outpatient settings. This study will enroll 250 participants from three physician offices in two North Florida counties.

Explanation of Procedures
If you enter the study, you will be asked to complete an interview with one of our research staff members based on some survey questions. The research team member will read survey questions to you and mark your answers on a computerized answer sheet. Completion of the survey should take approximately 1 hour. We will ask you questions regarding your symptoms of heart failure, social support, problem-solving and coping skills, emotional health, and self-care behaviors. You may be asked to complete a second interview using the same survey questions. You will not be asked to give your name on the survey; however, you will be given a survey code number. You will receive a copy of the signed consent form containing your survey code number. Data will be analyzed at the University of Alabama at Birmingham School of Nursing and the Florida State University College of Nursing.

Page 1 of 3
Version Date: 07/25/2013
HSC # 2013.11012
Risks and Discomforts:
The foreseeable risks and discomforts to you from participating in this study are minimal. You may experience feelings of anxiety or sadness when answering questions related to your symptoms of heart failure and/or your emotional health.

Benefits:
You may not benefit directly from taking part in this study. However, this study may help us develop strategies to improve the emotional health and self-care behaviors of people who live with heart failure.

Alternatives:
Your alternative is to not participate.

Confidentiality:
Information obtained about you for this study will be kept confidential to the extent allowed by law. However, research information that identifies you may be shared with the University of Alabama at Birmingham Institutional Review Board (IRB), the Florida State University IRB, the Tallahassee Memorial Healthcare IRB, and others who are responsible for ensuring compliance with laws and regulations related to research, including the Office of Human Research Protections (OHRP). Your survey will be identifiable by a code only, in the event that you decide to withdraw from the study at a later date. The results of this study will be published for scientific purposes. However, your identity will not be given out.

Voluntary Participation and Withdrawal:
Whether or not you take part in this study is your choice. There will be no penalty if you decide not to be in the study. If you decide not to be in the study, you will not lose any benefits you are otherwise owed. You are free to withdraw from this research study at any time. Your choice to leave the study will not affect your relationship with this institution, nor impact your care in any way.

Cost of Participation:
There will be no cost to you for taking part in this study.

Payment for Participation in Research:
There will be no payment for taking part in this study.

Significant New Findings:
You will be told by your doctor or the study staff if new information becomes available that might affect your choice to stay in the study.

Page 2 of 3
Version Date: 07/25/2013
FSU Human Subjects Committee approved on 7/31/2013. Void after 7/08/2014
HSC # 2013.11012
Questions

If you have any questions, concerns, or complaints about the research, please contact Lucinda J. Graven. She will be glad to answer any of your questions. Mrs. Graven’s number is (850)-868-9961. If you decide after completing the survey that you do not want to participate in the study, call Mrs. Graven and provide the survey number listed on the last page of this informed consent letter. Your survey will be removed from the study.

If you have any questions about your rights as a research participant, or concerns, or complaints about the research, you may contact the University of Alabama at Birmingham Office of the IRB (OIRB) at (205)-934-3789 or 1-855-860-3789. Regular hours for the OIRB are 8:00 a.m. to 5:00 p.m. CT, Monday through Friday. You may also call this number in the event the research staff cannot be reached or you wish to talk to someone else.

Additionally, if you have any questions about your legal rights as a research participant, you may contact the Florida State University Office of Human Subjects Research or the Institutional Review Board by phone at 850-644-7900 or 830-644-9694.

You may also contact the Institutional Review Board at Tallahassee Memorial HealthCare at 850-431-5676 if you have any questions or concerns regarding this research study or your legal rights as a research participant.

Legal Rights

You are not waiving any of your legal rights by signing this informed consent document.

Signatures:

Your signature below indicates that you agree to participate in this study. You will receive a copy of this signed document.

__________________________________________  __________________________
Signature of Participant                      Date

__________________________________________  __________________________
Signature of Person Obtaining Consent        Date

__________________________________________  __________________________
Signature of Witness                         Date

Survey #: 

Page 3 of 3

Version Date: 07/24/2013
HSC # 2013.11012
APPENDIX E

LETTERS OF SUPPORT
April 9, 2013

University of Alabama at Birmingham Institutional Review Board
Room 470, Administration building (AB)
701 20th Street South, Birmingham, AL 35294-0104

Mrs. Lucinda J. Graven, a University of Alabama at Birmingham Graduate Student, has been granted permission by this office and its health care providers to conduct research at Southern Medical Group Cardiology in Tallahassee, Florida. Her study is titled, "Relationships among Heart Failure Physical Symptoms, Social Support, Social Problem-solving, Depressive Symptomatology, and Self-care Behaviors in individuals Living with Heart Failure."

Mrs. Graven will provide guidelines for inclusion in the study to our office. Patients meeting the criteria will either be given a flyer or sent a letter explaining the study and will contact Mrs. Graven if interested in participating in her study. Those who agree to participate will be contacted via telephone by Mrs. Graven and undergo a brief cognitive screening test. If there is no impairment in cognition, the participant will be scheduled for an interview either in person or over the telephone with either Mrs. Graven or a data collector. Mrs. Graven plans to have all recruitment activities completed by May 2014.

Mrs. Graven will not need access to any patient charts. She will provide the office with copies of the approved and stamped documents from the Tallahassee Memorial Healthcare, University of Alabama at Birmingham, and Florida State University Institutional Review Boards before recruitment begins.

Sincerely,

Lewis Barwick, RN
Cardiology Manager
Southern Medical Group, Cardiology
April 9, 2013

University of Alabama at Birmingham Institutional Review Board
Room 470, Administration Building (AB)
701 20th Street South, Birmingham, AL 35294-0104

Mrs. Lucinda J. Graven, a University of Alabama at Birmingham Graduate Student, has been granted permission by this office and its health care providers to conduct research at Tallahassee Memorial Healthcare Transition Center, Tallahassee, Florida. Her study is titled, “Relationships among Heart Failure Physica Symptoms, Social Support, Social Problem-solving, Depressive Symptomatology, and Self-care Behaviors in Individuals Living with Heart Failure.”

Mrs. Graven will provide guidelines for inclusion in the study to our office. Patients meeting the criteria will either be given a flyer or sent a letter explaining the study and will contact Mrs. Graven if interested in participating in her study. Those who agree to participate will be contacted via telephone by Mrs. Graven and undergo a brief cognitive screening test. If there is no impairment in cognition, the participant will be scheduled for an interview either in person or over the telephone with either Mrs. Graven or a data collector. Mrs. Graven plans to have all recruitment activities completed by May 2014.

Mrs. Graven will not need access to any patient charts. She will provide the office with copies of the approved and stamped documents from the Tallahassee Memorial Healthcare, University of Alabama at Birmingham, and Florida State University Institutional Review Boards before recruitment begins.

Signed,

Judy Graven, MSN, ARNP
Nurse Practitioner
Tallahassee Memorial Healthcare Transition Center
April 9, 2013

University of Alabama at Birmingham Institutional Review Board
Room 170, Administration Building (AB)
701 22nd Street South, Birmingham, AL 35294-0304

Mrs. Linda L. Graven, a University of Alabama at Birmingham Graduate Student, has been granted permission by this office and its health care providers to conduct research at Tallahassee Memorial Healthcare Cardiology Specialists, Marianna, Florida. Her study is titled, “Relationships among Heart Failure Physical Symptoms, Social Support, Social Problem-solving, Depressive Symptomatology, and Self-care Behaviors in Individuals Living with Heart Failure.”

Mrs. Graven will provide guidelines for inclusion in the study to our office. Patients meeting the criteria will either be given a flyer or sent a letter explaining the study and will contact Mrs. Graven if interested in participating in her study. Those who agree to participate will be contacted via telephone by Mrs. Graven and undergo a brief cognitive screening test. If there is no impairment in cognition, the participant will be scheduled for an interview either in person or over the telephone with either Mrs. Graven or a data collector. Mrs. Graven plans to have all recruitment activities completed by May 2014.

Mrs. Graven will not need access to any patient charts. She will provide the office with copies of the approved and stamped documents from the Tallahassee Memorial Healthcare, University of Alabama at Birmingham, and Florida State University Institutional Review Boards before recruitment begins.

Signed,

[Signature]
Renee Martin
Group Coordinator
Tallahassee Memorial Healthcare Cardiology Specialists
Marianna, Florida
APPENDIX F

STUDY FACT SHEET
Heart Failure Research Study
Study Fact Sheet

Patients are invited to participate in the study if they:

1. Have a diagnosis of heart failure
2. Are 55 years of age or older
3. Live in an outpatient setting (i.e., home, assisted living)
4. Are able to speak, read, and understand English

If patients meet the above criteria and are currently in the office:

1. Give them a flyer advertising the study and bring their attention to the researcher contact information noted on the flyer.

If patients meeting these criteria are scheduled for upcoming appointments:

1. Send a study information letter to the patient.

Questions or Concerns? Contact Lucinda Graven, MSN, ARNP at 850-868-0961 or 850-644-5601.
APPENDIX G

STUDY RECRUITMENT FLYER
HEART FAILURE RESEARCH STUDY

BE PART OF IMPORTANT RESEARCH TO HELP US LEARN HOW TO BETTER HELP YOU AND OTHERS WITH HEART FAILURE

The purpose of this research is to investigate factors that influence your emotional well-being and impact your self-care behaviors. As an important research participant, you will be asked to complete a survey. You are eligible if you:

- are age 55 years and older;
- have heart failure;
- speak English; and
- reside in an outpatient setting (i.e., home, assisted living facility)

Please ask your doctor or nurse how you can participate.

Contact Lucinda J. Graven at lgraven@fsu.edu or 850-868-0961 for more information. This study is being conducted through the School of Nursing at the University of Alabama at Birmingham and has been approved by the Institutional Review Board.
APPENDIX H

STUDY RECRUITMENT LETTERS
April 9, 2013

Southern Medical Group Cardiology, P.A.
1300 Medical Drive
Tallahassee, FL 32308

Dear Patient:

We would like to tell you about a heart failure research study that is being conducted with the support of our office, physicians, and other health care providers. Mrs. Lucinda J. Graven, a University of Alabama at Birmingham Graduate Student and Florida State University College of Nursing Faculty member, has been granted permission by this office and its physicians to conduct research at Southern Medical Group Cardiology. Her study will examine factors that may influence your psychological well-being and how you care for yourself. This study is important to the future of heart failure patient care, and we hope that findings of this study will be used to develop interventions that will improve the emotional well-being and self-care behaviors of individuals with heart failure.

Those who are interested in participating in this study will need to contact Mrs. Graven directly by calling 850-868-0951, at your earliest convenience. Initially, you will be asked a few questions over the phone to determine your eligibility for participating in this study. If you are eligible, you will then be scheduled for an interview, either by telephone or in our office. The interview should last no more than 1 hour. Your name and identity will not be associated with the interview materials or data. Likewise, neither Mrs. Graven nor her research team will have access to your medical records.

We strongly endorse this project and hope that you will consider participating in this study. If you have questions regarding this study or would like to participate, please contact:

Mrs. Lucinda J. Graven, ARNP, MSN
Assistant in Nursing, Florida State University
University of Alabama at Birmingham, PhD student
(office) 850-644-5601 (cell) 850-868-0951

Signed,

[Signature]
Lew Barwick, RN
Cardiology Manager
Southern Medical Group, Cardiology
April 9, 2013

Tallahassee Memorial Healthcare Transition Center
3333 Capital Oaks Blvd
Tallahassee, FL 32303

Dear Patient:

We would like to tell you about a heart failure research study that is being conducted with the support of our office, physicians, nurse practitioner, and other health care providers. Mrs. Lucinda J. Graven, a University of Alabama at Birmingham Graduate Student and Florida State University College of Nursing Faculty member, has been granted permission by this office and its healthcare providers to conduct research at Tallahassee Memorial Healthcare Transition Center. Her study will examine factors that may influence your psychological well-being and how you care for yourself. This study is important to the future of heart failure patient care, and we hope that findings of this study will be used to develop interventions that will improve the emotional well being and self care behaviors of individuals with heart failure.

Those who are interested in participating in this study will need to contact Mrs. Graven directly by calling 850-868-0981, at your earliest convenience. Initially, you will be asked a few questions over the phone to determine your eligibility for participating in this study. If you are eligible, you will then be scheduled for an interview, either by telephone or in our office. The interview should last no more than 1 hour. Your name and identity will not be associated with the interview materials or data. Likewise, neither Mrs. Graven nor her research team will have access to your medical records.

We strongly endorse this project and hope that you will consider participating in this study. If you have questions regarding this study or would like to participate, please contact:

Mrs. Lucinda J. Graven, ARNP, MSN
Assistant in Nursing, Florida State University
University of Alabama at Birmingham, PhD student
(office) 850-644-5603
(cell) 850-868-0961

Signed,

Judy Griffin, MSN, ARNP
Nurse Practitioner
Tallahassee Memorial Healthcare Transition Center
April 9, 2013

Tallahassee Memorial Healthcare Cardiology Specialists
3020 Fourth Street
Marianna, FL 32446

Dear Patient:

We would like to tell you about a heart failure research study that is being conducted with the support of our office, physician, and other health care providers. Mrs. Lucinda J. Graven, a University of Alabama at Birmingham Graduate Student and Florida State University College of Nursing Faculty member, has been granted permission by this office and its physicians to conduct research at Tallahassee Memorial Healthcare Cardiology Specialists, Marianna. Her study will examine factors that may influence your sociological well being and how you care for yourself. This study is important to the future of heart failure patient care, and we hope that findings of this study will be used to develop interventions that will improve the emotional well-being and self-care behaviors of individuals with heart failure.

Those who are interested in participating in this study will need to contact Mrs. Graven directly by calling 850-838-0961, at your earliest convenience. Initially, you will be asked a few questions over the phone to determine your eligibility for participating in this study. If you are eligible, you will then be scheduled for an interview, either by telephone or in our office. The interview should last no more than 1 hour. Your name and identity will not be associated with the research materials or data. Likewise, neither Mrs. Graven nor her research team will have access to your medical records.

We strongly endorse this project and hope that you will consider participating in this study. If you have questions regarding this study or would like to participate, please contact:

Mrs. Lucinda J. Graven, ARNP, MSN
Assistant in Nursing, Florida State University
University of Alabama at Birmingham, PhD student
office: 850-644-5601
cell: 850-838-0961

Signed,

[Signature]

Rebecca Martin
Group Coordinator
Tallahassee Memorial Healthcare Cardiology Specialists, Marianna

3020 4th Street | Marianna, FL 32446

Specialized Medical Care. Here in Marianna.

p (850) 432-2225  f (850) 432-2631
APPENDIX I

STUDY INSTRUMENTS
### Telephone Interview for Cognitive Status (TICS)

Directions: (1) Explain exam to participant (or participant’s caregiver). (2) Get address. (3) Be sure distractions are minimal (e.g., no T.V. or radio on, remove pens and pencils from reach). (4) Be sure sources of orientation (e.g., newspapers, calendars) are not in participant’s view. (5) Caregivers may offer reassurance, but not assistance. (6) Single repetitions permitted, except for items 5 and 8.

<table>
<thead>
<tr>
<th>Instruction</th>
<th>Scoring criteria</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Please tell me your full name?</td>
<td>1 pt. for first name, 1 pt for last name</td>
<td>_____</td>
</tr>
<tr>
<td>2. What’s today’s date?</td>
<td>1pt. each for month, date year, day of week, and season If incomplete, ask specifics (e.g., What is the month? What season are we in?)</td>
<td>_____</td>
</tr>
<tr>
<td>3. Where are you right now?</td>
<td>1 pt. each for house number, street, city, state, zip. If incomplete ask specifics (e.g., What street are you on right now?)</td>
<td>_____</td>
</tr>
<tr>
<td>4. Count backwards from 20 to 1.”</td>
<td>2 pts if completely correct on the first trial; 1 pt. if completely correct on the second trial; 0 pts for anything else.</td>
<td>_____</td>
</tr>
</tbody>
</table>
5. I’m going to read you a list of ten words. Please listen carefully and try to remember them. When I am done, tell me as many words as you can, in any order. Ready? The words are: cabin, pipe, elephant, chest, silk, theatre, watch, whip, pillow, giant. Now tell me all the words you can remember.

6. One hundred minus 7 equals what? And 7 from that? Etc. Stop at 5 serial subtractions. 1 pt for each correct subtraction. Do not inform the subject of incorrect responses, but allow subtractions to be made from his/her last response (e.g., “93-85-78-71-65” would get 3 pts.)

7. What do people usually use to cut paper? 1 pt for “scissor” or “shears” only. How many things are in a dozen? 1 pt. for “12.”
What do you call the prickly green plant that lives in the desert? 1 pt. for “cactus” only.
What animal does wool come from? 1 pt. for “sheep or “lamb” only

8. Say this: ‘No ifs, ands, or buts’. 1 pt for each complete repetition on the first trial. Repeat only if poorly presented.
Say this: ‘Methodist episcopal’.
9. Who is the President of the United States right now? 1 pt for correct first and last name
Who is the Vice-President? 1 pt for correct first and last name

10. With your finger, tap 5 times on the part of the phone you speak into.” 2 pts if 5 taps are heard; 1 pt if subject taps more or less than 5 times

11. I’m going to give you a word and I want you to give me the opposite. For example, the opposite of hot is cold. What is the opposite of ‘west’? 1 pt for “east.”
What is the opposite of ‘generous’? 1 pt for “selfish,” “greedy,” “stingy,” “tight,” “cheap,” “mean,” “meager,” “skimpy,” or other good antonym.

Total ___
Survey Number: ______

Sociodemographic and Clinical Information Survey

**Sociodemographic Information**

Please answer the following questions:

1. What is your gender?
   
   a. Male
   
   b. Female

2. What is your marital status?
   
   a. Single
   
   b. Living with someone
   
   c. Married
   
   d. Divorced
   
   e. Separated
   
   f. Widowed

3. What is your age? __________

4. What is the highest level of education you have completed?
   
   a. 6th grade or less
   
   b. 7th – 9th grade
   
   c. 10th – 12th grade
   
   d. High school graduate
   
   e. Some college or certification course
   
   f. College graduate
   
   g. Graduate or Professional degree
5. What is your race?
   a. Caucasian
   b. African American
   c. Hispanic/Latino(a)
   d. Asian/Middle Eastern/Pacific Islander
   e. Multiracial
   f. Other

6. How many people are living in your household, including yourself?
   a. 1
   b. 2
   c. 3
   d. 4
   e. 5 or more

7. What is your estimated annual household income?
   a. under $30,000
   b. $30,000 – $50,000
   c. $50,000 – $75,000
   d. $75,000 - $100,000
   e. over $100,000
Clinical Information

8. How long has it been since you were diagnosed with heart failure?
   a. less than 1 year
   b. 1 – 5 years
   c. 5 – 10 years
   d. 10 – 15 years
   e. > 15 years

9. Does ordinary physical activity cause you to experience fatigue or tiredness, abnormal heart beats, or shortness of breath?
   a. Yes
   b. No

If the answer is “no” to question #9, do not proceed.

If the answer is “yes” to question #9, proceed to question #10.

10. Are you comfortable at rest, but experience fatigue or tiredness, abnormal heart beats, or shortness of breath with ordinary physical activity?
    a. Yes
    b. No

If the answer is “yes” to question #10, do not proceed.

If the answer is “no” to question #10, proceed to question #11.
11. Are you comfortable at rest, but experience fatigue or tiredness, abnormal heart beats, or shortness of breath with less than ordinary activity?
   a. Yes
   b. No

If the answer to #11 is “yes,” do not proceed.
If the answer to #11 is “no,” proceed to question #12.

12. Do you experience fatigue or tiredness, abnormal heart beats, or shortness of breath at rest?
   a. Yes
   b. No

13. Do you experience increased symptoms, such as fatigue or tiredness, abnormal heart beats, or shortness of breath when undertaking any physical activity?
   a. Yes
   b. No

14. Have you been admitted to the hospital for heart failure within the last 30 days?
   a. Yes
   b. No
If the answer to #14 is yes, proceed to questions 15 – 16.

15. How many days were you a patient in the hospital during this last heart failure admission? _______

16. What were the dates of your last admission for heart failure? _______

Note: Questions # 9 – 13 were adapted from the New York Heart Association Classification for Heart Failure (Criteria Committee of the New York Heart Association, 1994).

HEART FAILURE SYMPTOM SURVEY

You may experience the following symptoms when you have heart failure. Please read each symptom carefully. Rate the symptom by putting a number in the box for frequency, severity, interference with physical activity, and interference with your enjoyment of life. Rate each symptom based on what you have experienced in the past 7 days.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Frequency</th>
<th>Severity</th>
<th>Interference with Physical Activity</th>
<th>Interference with Enjoyment of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 = Never 10 = Very Frequently</td>
<td>0 = Not Severe 10 = Very Severe</td>
<td>0 = No Interference 10 = Great Deal of Interference</td>
<td>0 = No Interference 10 = Great Deal of Interference</td>
</tr>
<tr>
<td>1. Shortness of breath at rest?</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>2. Shortness of breath with activity?</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>3. Shortness of breath when lying down in bed?</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
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<tr>
<td>4. Shortness of breath when you wake up during the night?</td>
<td>[ ]</td>
<td>[ ]</td>
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<tr>
<td>5.</td>
<td>Swelling in your feet, ankles or legs?</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6.</td>
<td>A full or bloated feeling in your abdomen?</td>
<td></td>
<td></td>
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<tr>
<td>7.</td>
<td>Fatigue, tiredness or lack of energy?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>8.</td>
<td>Chest pressure or heaviness in your chest?</td>
<td></td>
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<tr>
<td>9.</td>
<td>Irregular heart beat or fluttering feeling in your chest?</td>
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<tr>
<td>10.</td>
<td>Worsening cough?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Dizziness or lightheadedness?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Difficulty sleeping?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Forgetfulness or difficulty concentrating?</td>
<td></td>
<td></td>
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<tr>
<td>14.</td>
<td>Depressed or feeling down?</td>
<td></td>
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</tbody>
</table>
12 item Interpersonal Support Evaluation List

This scale is made up of a list of statements each of which may or may not be true about you. For each statement check “definitely true” if you are sure it is true about you and “probably true” if you think it is true but are not absolutely certain. Similarly, you should check “definitely false” if you are sure the statement is false and “probably false” if you think it is false but are not absolutely certain.

1. If I wanted to go on a trip for a day (e.g., to the mountains, beach, or country), I would have a hard time finding someone to go with me.
   _____ definitely true  _____ probably true  _____ probably false  _____ definitely false

2. I feel that there is no one I can share my most private worries and fears with.
   _____ definitely true  _____ probably true  _____ probably false  _____ definitely false

3. If I were sick, I could easily find someone to help me with my daily chores.
   _____ definitely true  _____ probably true  _____ probably false  _____ definitely false

4. There is someone I can turn to for advice about handling problems with my family.
   _____ definitely true  _____ probably true  _____ probably false  _____ definitely false

5. If I decide one afternoon that I would like to go to a movie that evening, I could easily find someone to go with me.
   _____ definitely true  _____ probably true  _____ probably false  _____ definitely false

6. When I need suggestions on how to deal with a personal problem, I know someone I can turn to.
   _____ definitely true  _____ probably true  _____ probably false  _____ definitely false

7. I don’t often get invited to do things with others.
   _____ definitely true  _____ probably true  _____ probably false  _____ definitely false
SOCIAL NETWORK SURVEY INSTRUCTIONS

This survey asks for your views about people you are connected to and involved with who provide you with help, assistance, and support, based upon your needs. These people may include spouses/significant others, family, and friends. Types of help, assistance, and support often provided by others may include emotional, social, financial, tangible/physical, and spiritual support.

Please respond to the items below by circling your answer. If you are unsure about how to answer an item, please give the best answer you can.

1. I am currently in a committed relationship that provides me with significant support (e.g., emotional, social, financial, tangible/physical, and spiritual) in my life. (circle one answer)

   Strongly Agree (7)
   Moderately Agree (6)
   Slightly Agree (5)
   Neither Agree or Disagree (4)
   Slightly Disagree (3)
   Moderately Disagree (2)
   Strongly Disagree (1)

2. I am currently in a committed relationship that provides me the opportunity to talk about personal important matters with them. (circle one answer)
3. I have telephone contact with family or friends daily or almost daily who provide me significant support (e.g., emotional, social, financial, tangible/physical, and spiritual) in my life. (circle one answer)

<table>
<thead>
<tr>
<th>Strongly Agree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderately Agree (6)</td>
</tr>
<tr>
<td>Slightly Agree (5)</td>
</tr>
<tr>
<td>Neither Agree or Disagree (4)</td>
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<tr>
<td>Slightly Disagree (3)</td>
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<tr>
<td>Moderately Disagree (2)</td>
</tr>
<tr>
<td>Strongly Disagree (1)</td>
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</tbody>
</table>

4. I have telephone contact with family or friends daily or almost daily who provide me the opportunity to talk about personal important matters with them. (circle one answer)

<table>
<thead>
<tr>
<th>Strongly Agree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderately Agree (6)</td>
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<tr>
<td>Slightly Agree (5)</td>
</tr>
<tr>
<td>Neither Agree or Disagree (4)</td>
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<tr>
<td>Slightly Disagree (3)</td>
</tr>
<tr>
<td>Moderately Disagree (2)</td>
</tr>
<tr>
<td>Strongly Disagree (1)</td>
</tr>
</tbody>
</table>
5. I either see or talk to family or friends at least ________times a week who provide me significant support (e.g., emotional, social, financial, tangible/physical, and spiritual) in my life. (circle one answer)

1) 0-1
2) 2-3
3) 4-5
4) 6-7
5) 8-10
6) 11-12
7) 13 or more

6. I either see or talk to family or friends at least ________times a week who provide me the opportunity to talk about personal important matters with them. (circle one answer)

1) 0-1
2. I feel I can depend upon ______ numbers of family or friends who provide me significant support (e.g., emotional, social, financial, tangible/physical, and spiritual) in my life. (circle one answer)

1) 0-1
2) 2-3
3) 4-5
4) 6-7
5) 8-10
6) 11-12
7) 13 or more

7. I feel I can depend upon ______ numbers of family or friends who provide me significant support (e.g., emotional, social, financial, tangible/physical, and spiritual) in my life. (circle one answer)

1) 0-1
2) 2-3
3) 4-5
4) 6-7
5) 8-10
6) 11-12
7) 13 or more

8. I feel I can depend upon ______ numbers of family or friends who provide me the opportunity to talk about personal important matters with them. (circle one answer)
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<th></th>
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<td>2)</td>
<td>2-3</td>
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<tr>
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<td>4-5</td>
</tr>
<tr>
<td>4)</td>
<td>6-7</td>
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<tr>
<td>5)</td>
<td>8-10</td>
</tr>
<tr>
<td>6)</td>
<td>11-12</td>
</tr>
<tr>
<td>7)</td>
<td>13 or more</td>
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</table>

9. I feel that the quality of the relationship with my family or friends is such that I feel comfortable asking them for significant support (e.g., emotional, social, financial, tangible/physical, and spiritual) in my life. (circle one answer)

- Strongly Agree (7)
- Moderately Agree (6)
- Slightly Agree (5)
- Neither Agree or Disagree (4)
- Slightly Disagree (3)
- Moderately Agree (2)
- Strongly Disagree (1)

10. I feel that the quality of the relationship with my family or friends is such that I feel comfortable talking with them
about personal important matters. (circle one answer)

Strongly Agree (7)
Moderately Agree (6)
Slightly Agree (5)
Neither Agree or Disagree (4)
Slightly Disagree (3)
Moderately Disagree (2)
Strongly Disagree (1)

11. I have ________ family or friends that I feel the quality of my relationship with them are such that I feel comfortable asking them for significant support (e.g., emotional, social, financial, tangible/physical, and spiritual) in my life. (circle one answer)

1) 0-1
2) 2-3
3) 4-5
4) 6-7
5) 8-10
6) 11-12
7) 13 or more

12. I have ________ family or friends that I feel the quality of
my relationship with them are such that I feel comfortable talking with them about personal important matters. (circle one answer)

1) 0-1
2) 2-3
3) 4-5
4) 6-7
5) 8-10
6) 11-12
7) 13 or more
Below are some ways that you might think, feel, and act when faced with PROBLEMS in everyday living. We are not talking about the common hassles and pressures that you handle successfully every day. In this questionnaire, a problem is something important in your life that bothers you a lot but you don’t immediately know how to make it better or stop it from bothering you so much. The problem could be something about yourself (such as your thoughts, feelings, behavior, appearance, or health), your relationships with other people (such as your family, friends, teachers, or boss), or your environment and the things that you own (such as your house, car, property, money). Please read each statement carefully and choose one of the numbers below which shows how much the statement is true of you. See yourself as you usually think, feel, and act when you are faced with important problems in your life these days. Put the number that you choose on the line before the statement.

0 = Not at all true of me
1 = Slightly true of me
2 = Moderately true of me
3 = Very true of me
4 = Extremely true of me

1. I feel afraid when I have important problems.
2. When making decisions, I do not carefully check all my options.
3. I feel unsure of myself when making important decisions.
4. When my first attempt to solve a problem fails, I believe if I don’t give up, I will eventually succeed.
5. I try to see my problems as challenges.
6. I wait to see if a problem goes away before trying to solve it myself.
7. When my first efforts to solve a problem fail, I get very frustrated.

8. I doubt that I can solve difficult problems no matter how hard I try.

9. I believe that my problems can be solved.

10. I go out of my way to avoid dealing with problems.
Center for Epidemiologic Studies Depression Scale (CES-D), NIMH

Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week.

<table>
<thead>
<tr>
<th>Week</th>
<th>During the Past</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rarely or none of the time (less than 1 day)</td>
<td>Some or a little of the time (1-2 days)</td>
</tr>
<tr>
<td>1. I was bothered by things that usually don’t bother me.</td>
<td>[ ]</td>
</tr>
<tr>
<td>2. I did not feel like eating; my appetite was poor.</td>
<td>[ ]</td>
</tr>
<tr>
<td>3. I felt that I could not shake off the blues even with help from my family or friends.</td>
<td>[ ]</td>
</tr>
<tr>
<td>4. I felt I was just as good as other people.</td>
<td>[ ]</td>
</tr>
<tr>
<td>5. I had trouble keeping my mind on what I was doing.</td>
<td>[ ]</td>
</tr>
<tr>
<td>6. I felt depressed.</td>
<td>[ ]</td>
</tr>
<tr>
<td>7. I felt that everything I did was an effort.</td>
<td>[ ]</td>
</tr>
<tr>
<td>8. I felt hopeful about the future.</td>
<td>[ ]</td>
</tr>
<tr>
<td>9. I thought my life had been a failure.</td>
<td>[ ]</td>
</tr>
<tr>
<td>10. I felt fearful.</td>
<td>[ ]</td>
</tr>
<tr>
<td>11. My sleep was restless.</td>
<td>[ ]</td>
</tr>
<tr>
<td>12. I was happy.</td>
<td>[ ]</td>
</tr>
<tr>
<td>13. I talked less than usual.</td>
<td>[ ]</td>
</tr>
<tr>
<td>14. I felt lonely.</td>
<td>[ ]</td>
</tr>
<tr>
<td>15. People were unfriendly.</td>
<td>[ ]</td>
</tr>
<tr>
<td>16. I enjoyed life.</td>
<td>[ ]</td>
</tr>
<tr>
<td>17. I had crying spells.</td>
<td>[ ]</td>
</tr>
<tr>
<td>18. I felt sad.</td>
<td>[ ]</td>
</tr>
<tr>
<td>19. I felt that people dislike me.</td>
<td>[ ]</td>
</tr>
<tr>
<td>20. I could not get “going.”</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

SCORING: 0 for answers in the first column, 1 for answers in the second column, 2 for answers in the third column, 3 for answers in the fourth column. The scoring of positive items is reversed. Possible range of scores is 0 to 60, with the higher scores indicating the presence of more symptomatology.
The European Heart Failure Self-Care Behavior Scale

This scale contains statements about heart failure self-care. Respond to each statement by circling the number you think best applies to you. Note that the different answer alternatives constitute a scale ranging between the extremes of “I completely agree” (1) to “I don’t agree at all” (5). Even if you feel uncertain about a particular statement, circle the number you feel is most true for you.

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>1. I weigh myself every day</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. If my shortness of breath increases I contact my doctor or nurse.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. If my feet/legs become more swollen than usual I contact my doctor or nurse.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. If I gain 2 kilo in one week I contact my doctor or nurse.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I limit the amount of fluids I drink (not more than 1½-2 l/day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. If I experience increased fatigue I contact my doctor or nurse</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I eat a low salt diet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I take my medication as prescribed</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>9. I exercise regularly</td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

The European Heart Failure Self-care Behavior Scale
(Juutila, Stromberg, Maronsson, Drozdz, 1999)
APPENDIX J

HEART FAILURE SYMPTOM SURVEY FACTOR ANALYSIS
<table>
<thead>
<tr>
<th>Scale</th>
<th>Cronbach’s Alpha</th>
<th>Number of Items</th>
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<tr>
<td>Symptom frequency</td>
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<td>14</td>
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<tr>
<td>Symptom severity</td>
<td>.857</td>
<td>14</td>
</tr>
<tr>
<td>Symptom interference with physical activity</td>
<td>.853</td>
<td>14</td>
</tr>
<tr>
<td>Symptom interference with enjoyment of life</td>
<td>.878</td>
<td>14</td>
</tr>
<tr>
<td>Overall scale</td>
<td>.959</td>
<td>56</td>
</tr>
</tbody>
</table>

Table 1
Reliability Statistics (N = 201)
Table 2
*Correlation Matrix (N = 201)*

<table>
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<tr>
<th>Scale</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
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<td>1. Frequency</td>
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<td>2. Severity</td>
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<td>3. Interference with physical activity</td>
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<td>4. Interference with enjoyment of life</td>
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<td>5. Overall scale</td>
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<td>.980‡</td>
<td>.972‡</td>
<td>.963‡</td>
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</table>

*Note.*

$p < 0.05‡$

$p < 0.001‡$
Table 3
Principal Component Analysis: Total Variance Explained (N = 201)

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<th>Factors</th>
<th>Total</th>
<th>% of Variance</th>
<th>Cumulative %</th>
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Table 4
Principal Component Analysis: Component Matrix (N = 201)

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<tr>
<th>Component</th>
<th>Item</th>
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<th>2</th>
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