HEART FAILURE KNOWLEDGE AND PERFORMANCE OF SELF-CARE BEHAVIORS

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Patients with heart failure (HF) must adjust to many life-altering behaviors and are often readmitted to acute care due to lack of knowledge about self-care. Self-care patient education may decrease readmission rates and increase independence of individuals with HF (Artinian, Magnan, Sloan & Lange, 2002b). The purpose of this descriptive correlational study is to examine the frequency of self-care behaviors and the relationship between patients’ level of knowledge and performance of self-care behaviors. The framework is Orem’s Theory of Self-care. A convenience sample of 200 HF patients will be recruited from two Midwestern facilities in Kettering, Ohio; an inner-city hospital and a physician based HF outpatient clinic. The Revised Heart Failure Self-Care Behavior Scale will be utilized to identify self-care behavior frequency. Patient understanding of HF knowledge will be demonstrated by The Heart Failure Knowledge Test. Information about self-care behaviors and patient knowledge can help to tailor interventions and education to improve outcomes for HF patients.
Heart failure (HF) is a significant health problem worldwide that poses a burden to healthcare systems. Nearly 5.3 million Americans are living with HF and over 550,000 new cases are diagnosed each year (American Heart Association, 2008). HF is the primary admitting diagnosis for hospitalization for people over age 65 (Ellis, 2005). The incidence of HF has not declined during the past 2 decades, but the survival after diagnosis has improved overall (American Heart Association). A considerable increase (171%) in hospital discharges for HF was noted from 400,000 in 1979 to 1,084,000 in 2005 (American Heart Association). A growing elderly population and improved survival from cardiovascular disease results in an increasing prevalence of HF (Jaarsma et al., 2000; Kutzleb & Reiner, 2006; Schnell, Naimark, & McClement, 2000; Washburn & Hornberger, 2008).

HF has a significant effect on costs for hospitalization (Washburn & Hornberger, 2008). According to the American Heart Association (2008), total costs of HF in the U.S. for 2008 are estimated at $34.8 billion. Hospital readmission rates are high and a repetitive readmission cycle for acute symptom relief is common. Many HF readmissions are thought to be preventable through more intense patient education programs (Artinian, Magnan, Christian, & Lange, 2002a; Kutzleb & Reiner, 2006;
Riegel, Dickson, Goldberg, & Deatrick, 2007; Schnell et al., 2000; Washburn & Horberger). Addressing multiple complex factors which contribute to readmission rates should be the focus of HF education and include disease knowledge, risk factors and self-care. Increased patient education could reduce healthcare costs and increase independence of individuals with HF.

HF is a condition in which the heart cannot maintain adequate circulation. Circulation decreases over time as the muscles of the left or right side of the heart grow weaker. According to the National Heart, Lung, and Blood Institute (n.d.), common diseases that damage or weaken the heart and lead to HF are coronary heart disease, hypertension and diabetes. High blood pressure, smoking, being overweight, eating foods high in fat and cholesterol, not exercising and having diabetes can all cause heart failure (American Heart Association, 2008). Hypertension is an especially common risk factor for HF and 75% of HF cases occur in patients with hypertension (American Heart Association). HF can eventually affect every organ in the body which explains the wide array of symptoms and treatments needed to promote positive outcomes.

Past studies have found that a structured multidisciplinary approach to HF treatment which adheres to evidence based guidelines improves outcomes (Caldwell, Peters & Dracup, 2002; Kutzleb & Reiner, 2006; Miranda et al., 2002). HF treatment guidelines have been established by the Agency for Health Care Research and Quality (AHQR), American College of Cardiology/American Heart Association (ACC/AHA), and the Heart Failure Society of America that focus on a team approach to maximize medical management (Washburn & Horberger, 2008).
Numerous treatment options are available for HF management that include: medications, implantable cardioverter-defibrillators, cardiac resynchronization therapy, internal cardiac monitoring devices, left ventricular assist devices, cardiac transplantation and self care (Albert, 2008). Pharmacologic treatment alone for patients with heart failure is complex and lifelong. In addition to managing multiple medications, patients must follow a low sodium diet, monitor body weight to detect fluid retention, and manage constantly changing energy levels. Active and continued patient participation can be recognized as a sign the individual is complying to treatment.

Patient education has been effective in improving self-care behavior of patients with HF (Jaarsma et al., 2000). While education does not always lead to optimal self-care, education is a component of nearly all HF management programs and is considered an essential element in HF treatment (Washburn & Hornberger, 2008). To ensure HF education outcomes several national guidelines have been developed. Guidelines were established by the AHRQ to guide HF patient education. The Joint Commission of Healthcare Organizations included patient education as one of four standard quality initiative performance measures considered essential in treating HF (Ellis, 2005). Guidelines from the ACC/AHA for HF education are similar to the Joint Commission’s performance standards to measure HF education delivery (Albert, 2008). Several studies have also shown patients value HF knowledge (Artinian et al., 2002b; Riegel et al., 2007; Wu et al., 2008). Patient education has been considered the key to HF management and the importance of education for self-management has been widely recognized. Further study is needed to support outcomes of patient education.
Background and Significance

Heart disease, known as HF, has been described since ancient times in Egypt, Greece and India but it was not until 1628 that William Harvey described the circulation problem that the nature of the disease began to be understood. Discoveries of digitalis therapy, stethoscopes, x-rays and electrocardiography through the 1800 and 1900’s continued to improve treatment for HF patients.

The 20th century brought about the development of diuretics although early mecurial agents caused toxicity among users. After 1950 HF was recognized at an earlier stage and the introduction of thiazide diuretics, angiotension converting enzyme inhibitors and angiotension receptor blockers dramatically changed the treatment for HF. Survival benefits related to Enalapril use in HF were published in 1987 in the Scandinavian CONSENSUS-I study (Davis, Hobbs, & Lip, 2000).

More recent developments have led to slower disease progression and improvement in symptoms, quality of life and survival rates for HF patients (Davis et al., 2000). HF is the only cardiovascular disease with a rise in incidence (Heart Failure Society of America, n.d.). According to the Framingham Heart Study (American Heart Association, 2008), HF incidence approaches 10 per 1,000 population after age 65. In spite of improved treatment options, the number of HF deaths continues to increase. Less than 50% of patients with HF are living 5 years after diagnosis and less than 25% are alive at 10 years (Heart Failure Society of America). One in five people with HF will die within the first year after diagnosis (American Heart Association).

Increased survival rates and improved quality of life have been attributed to patient education, particularly on self-care. Changes in existing healthcare systems have
led to an increased emphasis on promoting self-care. Patients must be empowered to meet the goals of self-care to improve quality of life (Clark et al., 2006). Because HF is a chronic disease, self care is a vital component of successful HF management. Daily management requires self-care by the patient and support from caregivers (Thomas & Riegel, 1999). Self-care refers to the choices and behaviors performed by patients to manage HF (Thomas & Riegel). Self-care has been shown to be an effective strategy to improve patient outcomes and decrease healthcare costs.

HF self-care has been examined by many researchers (Artinian et al., 2002b; Bennett, Cordes, Westmoreland, Castro, & Donnelly, 2000; Carlson, Riegel, & Moser, 2001; Gary, 2006; Riegel et al., 2007; Rockwell & Riegel, 2001). However low levels of patient understanding of self-care performance continues. Riegel and Carlson’s (2002) study explained the relationship of motivation to self-care. Riegel et al.’s (2007) study investigated the development of self-care expertise. Many patients still lack knowledge and understanding of the disease, symptom recognition and self-care behaviors needed for HF management. Lack of compliance among patients is common and poor self-care has been related to associated poor outcomes.

The growing number of rehospitalizations of HF patients points to a gap in knowledge about effective educational interventions to improve self-care compliance. Education must be aimed at facilitating competent patient self-care. Knowledge and self-care behaviors were found to be improved 3 months after discharge following Jaarsma et al.’s (2002) study using a supportive educational intervention aimed at self-care abilities and behaviors. Caldwell et al.’s (2005) study applied a simplified education program for use in rural areas and also found improved HF knowledge and self-care behaviors.
Kutzleb and Reiner’s (2006) study showed improvement in self-care behavior following a nurse-directed approach to patient education for HF. It is essential for nurses who work with HF patients to develop creative educational programs to improve self-care behaviors, to increase independence, decrease readmission rates and improve patient outcomes.

In order to develop effective educational programs to improve self-care behaviors, it is important to have a good understanding of self-care among HF patients. Individuals’ self-care needs are unique and can be influenced by many factors. Artinian et al.’s (2002b) study focused on describing the frequency of self-care behaviors and the relationship of knowledge and self-care. Knowledge has been found to be essential for development of proficient self-care. As found in other research, Artinian et al.’s (2002a) study demonstrated deficiencies in HF knowledge overall. Further study on knowledge and self-care can contribute to increased knowledge for nurses who work with HF patients to develop creative programs.

*Statement of Problem*

Patients with heart failure (HF) must adjust to many life altering behaviors (Artinian et al., 2002b). Patients with HF are often readmitted to acute care due to lack of knowledge about self-care. Self-care patient education may decrease readmission rates and increase independence of individuals with HF.

*Purpose of the Study*

The purposes of this study are to describe the most and least frequently performed self-care behaviors of HF patients and to examine the relationship between HF
knowledge and self-care behaviors. This is a partial replication of Artinian et al.’s (2002b) study.

Research Questions

1. What self-care behaviors do patients with HF perform most and least frequently?
2. What is the relationship between HF knowledge and self-care behaviors?

Theoretical Framework

Orem’s Self-care Deficit Theory of Nursing will guide this study. This commonly used framework has established value in professional nursing. Orem’s model consists of three inter-related theories; Self-care, Self-care Deficit and Nursing Systems (Orem, 1995). Self-care deficit is identified when self-care demand is greater than self-care abilities, defines when nursing is needed, and leads to development of individualized nursing systems (Orem). The relationships examined in this study include concepts outlined in Orem’s Theory of self-care. This framework will efficiently guide this study to examine these relationships and lead to conclusions for professional nursing practice.

Definition of Terms

Self-care: Conceptual.

Artinian et al. (2002b) referred to self-care as “the practice of activities that individuals initiate and perform on their own behalf in the interest of maintaining life, health, continuing personal development, and well-being” (p.162).
**Self-care: Operational.**

The Revised Heart Failure Self-Care Behavior Scale (Artinian) will measure 29 self-care behaviors needed to control health functioning. The original scale was modified to include five of six components of Orem’s health-deviation self-care requisites, include additional clinical practice recommendation guidelines, change the response format to a Likert-type scale, and improve the internal consistency reliability by increasing the number of items. A total score is obtained by summing each item score.

**Patient Knowledge: Conceptual.**

According to Artinian (2002b), patient knowledge includes “understanding of HF and reason for symptoms; symptoms of worsening HF; low-sodium food selection; medications and actions to take if there are side effects; and self-management relative to weight monitoring, physical activity, and worsening symptoms” (p. 166). Knowledge is a necessary basis for self-care that facilitates performance of self-care (Artinian et al., 2002a).

**Patient Knowledge: Operational.**

HF knowledge will be assessed by the Heart Failure Knowledge Test (Artinian). Patient understanding of HF knowledge and self-care specifics will be assessed by 15 multiple choice questions plus 1 open-ended item with correct answers summed for a total score.

**Limitations**

Generalization is limited due to sample selection from a single setting in the Midwest. Inaccurate reporting on tools by HF patients could also limit study results.
Self-care compliance can be overestimated because of a tendency to give socially desirable answers.

Assumptions

This descriptive correlational study replication will be grounded by the following assumptions:

1. Improved self-care by HF patients is desirable.
2. Improved self-care is a vital component of HF management.
3. HF self-care is influenced by patient knowledge.
4. Many HF readmissions are preventable with improved patient education.
5. Participants will answer questions in an honest manner.

Summary

The incidence of HF is increasing and affecting the lives of millions. Self-care is considered essential to HF management and patient knowledge is thought to improve self-care behaviors. Information about self-care behaviors and patient knowledge can help to tailor interventions to improve outcomes for HF patients. The purpose of this study is to describe the least and most frequently performed HF self-care behaviors and to examine the relationship between HF knowledge and self-care behaviors. This study will be a partial replication of Artinian et al.’s (2002b) study. Orem’s Theory of Self-care will provide a framework which can measure self-care deficits and assess educational needs while offering direction to nursing practice.
Chapter II

Literature Review

Patients with heart failure (HF) must adjust to many life-altering behaviors and are often readmitted to acute care due to lack of knowledge about self-care. Self-care patient education may decrease readmission rates and increase independence of individuals with HF (Artinian et al., 2002b). This descriptive correlational study is a partial replication of Artinian’s et al.’s (2002b) study. The purpose is to examine the frequency of self-care behaviors and the relationship between patients’ level of knowledge and performance of self-care behaviors. Information about self-care behaviors and patient knowledge can help to tailor interventions and education to improve outcomes for HF patients.

Organization of Literature

The literature review covers selected studies associated with the self-care practices of HF patients. Quantitative studies were reviewed to identify previous research findings and directions. The addition of qualitative studies will help to understand the experiences of patients with HF. Recent literature was a focus to capture current evidence in practice. The supportive literature reviewed is divided into five sections:

1. Theoretical framework: Orem’s Self-care Deficit Theory of Nursing
2. Knowledge and perceptions of self-care
3. Self-care behaviors of HF patients
4. Factors that impact compliance of self-care
5. Educational interventions for HF

**Theoretical framework**

Orem’s Self-care Deficit Theory of Nursing is the framework for this study. This framework has been used in both quantitative and qualitative research. This commonly used and widely accepted framework has established value in professional nursing. Orem’s Theory of self-care is known around the world. Orem’s model is a Grand theory which can be applied to a variety of settings, offering direction to nursing practice, and providing a complete view of nursing. The model consists of three inter-related theories; Self-care, Self-care Deficit and Nursing Systems (Orem, 1995).

*Theory of self-care.*

The theory of self-care is a description of the reasons and means of taking care of self. According to Orem (1995), self-care can be defined as the activities a person initiates and performs in order to maintain life, healthful functioning, continuing personal development and well being. Orem also refers to self-care as a purposefully learned function, a continuous self-maintenance or self-regulation. The ability of a person to know and meet requirements to regulate functioning of self is known as the self-care agency. Self-care demand is the summation of care measures necessary at specific times for meeting self-care needs. The self-care agent is the provider of self-care. The theory of self-care is a foundation for the other two inter-related theories; theory of self care deficit and theory of nursing systems.
Theory of self-care deficit.

The theory of self-care deficit is an explanation and description of why patients may be helped by nursing and according to Orem (1995) is the essential element of self-care deficit theory. Self-care deficit is identified when self-care demand is greater than self-care abilities; the self-care capabilities are not adequate for meeting self-care needs. This theory explains the relationship between the self-care abilities and the self-care demands. Self-care deficit defines when nursing is needed leading to development of individualized nursing systems.

Nursing systems theory.

Nursing systems theory is necessary to explain and describe relationships that must be brought about and maintained for nursing to be present. This theory is complex and may require frequent redesign. Nursing systems theory includes seeking and accepting nursing, an agreement to provide and receive nursing and relationships between individuals who provide nursing and individuals who agree to participate in the service. Nursing systems explains a relationship among unifying actions of nurses and patients to meet self-care demands and defines the structure and content of nursing practice (Orem, 1995).

The relationships examined in this study include concepts based on Orem’s Theory of self-care. Literature has shown that patient self-care is essential for HF management. This study will examine self-care behaviors and the relationship between level of knowledge and performance of self-care behaviors for HF patients. Orem’s Theory provides a framework which can simplistically define self-care deficits and assess educational needs. If the need for care (therapeutic self-care demand) is greater than the
ability to meet needs (self-care agency), then a self-care deficit is identified. Orem’s framework will efficiently guide this study to examine HF patient self-care and levels of knowledge. The findings may support Orem’s Theory by examining self-care actions which regulate patient functioning (Orem, 1995).

*Knowledge and perceptions of self-care*

Patients with HF can provide valuable information from a personal perspective about concerns. The purposes of this qualitative grounded theory study were: (a) describe the symptoms of HF as reported by patients and families, and (b) detail and categorize the self-care strategies used by patients with HF (Bennett et al., 2000).

The convenience sample of 23 patients with HF and 18 family members was recruited from two out-patient clinics; one a specialized heart failure clinic at a Veterans Administration medical center and the other an inner-city, county teaching hospital general medicine clinic. Sample criteria included: ability to understand English, alert and oriented, access to working telephone and residing within a 60 mile radius of the facility (Bennett et al.).

Six focus groups of patients along with six corresponding family member focus groups were used. Group size ranged from two to six members. Bennett et al. (2000) developed guidelines for interview questions based on quality of life. The same guidelines were used in discussions with both patients and families. Interview sessions lasted from 60-90 minutes and were audio-taped. Data analysis was performed by a principal investigator identifying emerging themes by continuum classification for both groups.
Physical symptoms associated with HF were commonly reported and considered troublesome by patients and families. Symptoms were classified according to the number of focus groups in which each symptom was reported, and included if reported by patients in four, five or six focus groups. Patients were found to have assorted strategies that were used to manage HF-related and treatment-related symptoms. Some self-care symptom management strategies addressed multiple symptoms. Bennett et al. (2000) clustered the self-care strategies into 11 categories for reporting.

According to Bennett et al. (2000), symptom reporting was consistent with findings from previous studies. Shortness of breath, effects of diuretic therapy and episodes of swelling were identified by members in all six focus groups. In five of six groups, patients reported problems with loss of concentration, attention and memory. Also identified in five of six focus groups were the symptoms of loss of balance, falling, tiredness, weakness, chest pain and trouble sleeping. Four of six groups had patients reporting difficulty bending over and weight loss as troublesome symptoms. Bennett et al. reported diverse categories of self-care strategies used to manage HF symptoms. The most common self-care strategies identified were change in physical activity levels, breathing assistance measures, position changes, temperature alterations, medication management, assistive devices, sodium-restricted diet adherence, self-monitoring, distraction techniques, family support and positive self-talk. Self-monitoring strategy was noted primarily in the V.A. heart failure clinic patients. Patient and family results were found to be generally consistent.

Bennett et al. (2000) concluded that patients have many symptoms to manage. One self-care strategy found that is used to manage symptoms by the subjects was
decreased physical activity, although previous research has shown benefits of increased activity for HF patients. Physical symptoms are very problematic for patients with HF.

Self-care and self-monitoring are the basis for HF management. Positive health outcomes among HF patients depend on appropriately focused self-care. Adequate knowledge is essential to enable the performance of HF self-care. The purposes of a descriptive correlational study by Artinian et al. (2002a) were to describe knowledge about HF and related treatment and to explore factors associated with higher levels of knowledge.

The study sample was recruited from an urban teaching hospital (n=37), a suburban community hospital (n=13) and an out patient cardiology clinic (n=73) within a large metropolitan area of a Midwestern city (n=123) (Artinian et al., 2002a). Inclusion criteria were age greater than or equal to 18 years, a primary or secondary diagnosis of HF, ejection fraction less than or equal to 40%, outpatient of participating clinic or inpatient ready for discharge, and signed consent. Exclusion criteria were dementia or mental illness, self-reported substance abuse, hemodialysis or terminal cancer.

Sociodemographic information was collected by an investigator-developed general information questionnaire. Along with the New York Heart Association (NYHA) Functional Classification, a self-reported health perception tool was used to measure health in order to provide more information about the sample. Participants with less shortness of breath and chest pain perceived themselves as healthier, which supported the validity of using the measures of health (Artinian et al., 2002a).

Patient knowledge was measured by the Heart Failure Knowledge Test. Knowledge scores are determined by the number of correct responses. The multiple
choice test was devised by Artinian. Content validity was evaluated by one nurse practitioner and two patient education experts. Cronbach’s alpha reliability of test in this sample was .61 (Artinian et al., 2002a).

The sample was 72% male and 26% female (two participants did not report gender). Mean age was 65 years with majority (60%) being African American and 68% were married. Mean education level was 11.69 years with 16% of sample with less than 8th grade education. Perceived health findings showed on average participants perceived themselves to be somewhat less healthy than others of same age (Artinian et al., 2002a).

HF knowledge scores were found to be low in this sample. Mean knowledge score was 5.83 out of a possible score of 15. Knowledge score was found to be higher at the suburban community hospital (mean score 8.23) than at the urban teaching hospital (mean score 4.78) or the outpatient cardiology clinic (mean score 5.94). Between 50-75% of sample recognized symptoms of HF and understood alcohol restrictions, diuretic therapy, sodium content on food labels, high sodium food choices and advanced directives. Inability to distinguish between nontherapeutic and important self-care practices was found among 54% of sample. Less than 31% correctly answered HF questions about medications, weight monitoring or recognize the correct definition of HF. Knowledge scores showed no significant difference between gender and racial groups. Higher knowledge scores were associated with higher levels of education. Lower knowledge scores were found in older participants. Previous HF teaching or support group experience showed higher knowledge scores but the differences were found to be insignificant when compared using a nonparametric test (Artinian et al., 2002a).
The authors concluded that this sample had low levels of knowledge about HF, which supports the findings of other research. Implications of the findings are that patients are at risk for hospitalizations and poor outcomes. Artinian et al. (2002a) suggested testing new strategies that are culturally suitable to provide information and increase knowledge to help patients with HF self-care.

Artinian, Magnan, Sloan, and Lange (2002b) believed that patients with HF must adjust to many life-altering behaviors, and are often readmitted to acute care due to lack of knowledge about self-care. Self-care patient education may decrease readmission rates and increase independence of individuals with HF. The purpose of this descriptive correlational study was to examine the frequency of self-care behaviors, the affect of basic conditioning factors on self-care behaviors, and the relationship between patients’ level of knowledge and performance of self-care behaviors based on Orem’s Theory of Self-care.

The population was selected from two facilities in a large Midwestern city. The sample was 110 participants; 78% men and 22% women. The sample was 68% African Americans, 34% white and 3% other; with mean education level at 11.45 years. Sample criteria included: age 18 years or older, a primary or secondary diagnosis of HF which was confirmed by an ejection fraction less than 40%, and either an inpatient ready for discharge or a scheduled outpatient (Artinian et al., 2002b).

Two investigator-developed tools were used: Revised Heart Failure Self-Care Behavior Scale and Heart Failure Knowledge Test. The Revised Heart Failure Self-Care Behavior Scale measures 29 self-care behaviors needed to control health functioning. Behavior frequency is recorded by means of a Likert-type scale then a total score is
obtained. A panel of experts, including two nurse practitioners and two self-care experts evaluated the Revised Heart Failure Self-Care Behavior Scale for content validity. Cronbach’s alpha in this sample was 0.84 (Artinian et al., 2002b).

The other author-developed tool used was the Heart Failure Knowledge Test. This tool was developed on the basis of clinical experience and a review of literature. Understanding of HF knowledge was assessed by 15 multiple choice questions plus 1 open-ended item with correct answers summed for a total score. Content validity was evaluated by one nurse practitioner with HF patient experience and two patient education experts. Compared to other knowledge scales, criterion-related validity has not been determined; but Cronbach’s alpha reliability of the knowledge test was 0.62 (Artinian et al., 2002b).

According to Artinian et al. (2002b), HF self-care behaviors performed most often included behaviors related to taking prescribed medication, keeping doctor appointments and believing that a person can live a happy and good life with HF. The least frequently performed self-care behaviors were related to symptom management and reporting. Total self-care behavior scores and the basic conditioning factors failed to show a significant relationship. Several significant relationships were demonstrated when basic conditioning factors were examined in relation to specific individual self-care behaviors. Findings from the Revised Heart Failure Knowledge test reported low scores with a mean of 5.31 out of a 0-11 range with maximum score of 15. A significant relationship was found between the mean total knowledge score and the mean total self-care behavior score.
The authors concluded that all self-care behaviors can be influenced by outside factors. Patients had low levels of knowledge about the specifics of HF self-care. Some knowledge was apparent which supports Orem’s Theory proposal that knowledge enables self-care. According to Artinian et al. (2002b), nursing interventions should be aimed toward providing information to HF patients that leads to understanding the hindering and helping effects of basic conditioning factors on self-care behaviors.

**Self-care behaviors of HF patients**

Carlson et al. (2001) believed maintaining health or managing a disease such as HF is optimized by patient self-care management. HF patients have difficulty monitoring disease symptoms and practicing self-care. The purposes of this descriptive, cross sectional, comparative study were to: (a) describe HF self-care abilities and the difficulties that persons with HF encounter practicing self-care, and (b) determine whether experience facilitates self-care by comparing newly diagnosed HF patients with patients already experienced with the HF diagnosis.

The participants were selected from six Southern California and Ohio hospitals. The sample consisted of 139 patients recruited at the time of hospitalization for HF, or from patients enrolled in a HF clinic. An inclusion criterion was to have a clinical diagnosis of HF confirmed by a physician. Exclusion criteria included significant cognitive impairments, primary renal failure, severe psychiatric illness, inability to speak English and diagnosis of only transient HF (Carlson et al., 2001).

Investigator-developed surveys were used to assess demographic and clinical factors that may interfere with self-care and to identify accommodations made in lifestyle due to HF diagnosis. The Specific Activity Survey (SAS) was used to measure
functional status. Comorbidities were measured by the Charlson Index interview format. Further information about self-care, such as symptoms and response to symptoms, were assessed by the Self-Management of Heart Failure questionnaire (SMHF). This 65 item and six subscale instrument identifies four stages of self-care management and ease of evaluating signs and symptoms. Internal consistency from .79 to .92 was identified for the six subscales (Carlson et al., 2001).

Findings from the demographic survey were that the majority of patients were elderly, male, retired, and earning less than $20,000 annually. Most subjects were unmarried but had satisfactorily-rated support. Most subjects (94.2%) had finished high school, while 37.2% had completed 2 or more years of college. Newly diagnosed HF patients comprised 42.4% of sample, whereas 55.4% were considered experienced. The experienced HF group reported younger age, higher income and more symptoms. Almost all patients (97.1%) reported having symptoms during the previous year, 91.4% with multiple symptoms; and shortness of breath (SOB) was found among 93.5% of subjects as the most common symptom. Alcohol consumption was low, with 75% having no alcohol intake in previous 2 weeks. Few patients were current smokers (8%), but 60.7% were former smokers. Most patients (53.2%) did not participate in regular physical activities. The SAS found most patients (71.9%) were somewhat functionally impaired with half having marked limitations in ordinary activity. The Charlson Index interviews showed more than 40% of group had moderate to high number of other comorbidities (Carlson et al., 2001).

Findings for the SMHF showed both experienced and newly diagnosed HF patients had difficulty with symptom recognition. Misperceptions were evident with
62.9% of patients rating SOB during activity as highly important, while only 45.5% rated SOB at rest as highly important. There was no significant difference in the SMHF importance scores between experienced and new HF patients. Experienced patients were more apt to practice certain specific self-care management behaviors; such as limiting sodium intake, increasing diuretics and sleeping in recliner. The highest subscale score was the ability to evaluate treatment effectiveness for both the experienced and new HF patient. Confidence in recognizing symptoms improved with experience. Self-care self-efficacy scores showed no differences among experienced and new HF diagnosis groups (Carlson et al., 2001).

Carlson et al. (2001) concluded participants had poor self-care abilities, and confidence levels to effectively treat symptoms. Patients with experience with the HF diagnosis showed improvement in the areas of symptom recognition and action taken. The authors also concluded there was difficulty in symptom recognition, and this provided direction for educational programs for HF patients. Regular exercise was not practiced by more than half of the sample for this study. Authors suggested exercise guidelines should be discussed more with patients so that proper advice is assured.

Rockwell and Riegel (2001) recognized the importance of understanding what influences a patient’s ability to practice self-care. Promotion of self-care can lead to improved functional status, improved quality of life and a decrease in the number of hospitalizations related to HF exacerbations. Connelly’s Model of Self-Care in Chronic Illness was used as a framework for this secondary analysis study. The purpose of this study was to test individual characteristics as predictors of self-care in persons with HF.
The population was selected from patients participating in a disease management program of a primary study from one of six hospitals in southern California. Subjects with HF were selected on admission. The nonrandom sample consisted of 209 participants. Sample criteria included: at least 18 years of age and able to read, write and speak English at a fifth grade level. The sample was equally divided by gender and the typical study participant was 73 years old, married, grade school educated and earning an income of less than $20,000 per year (Rockwell & Riegel, 2001).

Rockwell and Riegel (2001) used the Evaluating the Change subscale of the Self-Management of Heart Failure Instrument to collect data. The subscale had a Likert-type scale to measure whether a patient is able to evaluate 15 important signs and symptoms of HF. The alpha coefficient for reliability of this subscale was 0.92.

The patient’s ability to perform normal daily activities in spite of symptoms was measured by the SAS. Abilities to complete specific activities were ranked by an interviewer. The SAS has a reproducibility of 73% for measuring functional ability showing reliability. According to Rockwell and Riegel (2001), the tool has been a better predictor of disability degree than the NYHA classification system which demonstrates the tool’s validity. Comorbidity was measured by a self-reported survey tool based on the Charleston Index. Test-retest reliability for this self-report survey was 0.91. To collect data on other predictors of self-care, a demographic survey was also utilized.

Findings from the Self-Management subscale noted two significant predictors of self-care. A positive correlation between education and HF compliance behaviors was noted. Self-care may be practiced more by better educated persons. Findings from Evaluating the Change subscale found that patients with more severe symptoms had
higher self-care scores. Understanding of signs and symptoms of HF improved as functional status worsened. According to Rockwell and Riegel (2001), the two predictors of self-care together accounted for only 10.3% of the variance in self-care. The self-reported survey tool based on the Charleston Index showed a majority of subjects had 1-3 comorbid conditions besides HF. Comorbidity could be either a predisposing or an enabling variable.

The authors concluded that the Evaluating the Change subscale identified two important predictors of self-care: education level and symptom severity. Rockwell and Riegel (2001) noted that self-care scores associated with more severe symptom severity may implicate that self-care education could be more difficult to promote early in the disease process. Findings supported Connelly’s Model of Self-Care in Chronic Illness by demonstrating the identification of variables which influence self-care behaviors.

Education aimed at facilitating self-care is commonly included in HF treatment programs, but does not always lead to behavioral changes needed to prevent HF exacerbations. The reasons are unclear about why some master HF self-care and others do not. The purpose of a study by Riegel and Carlson (2002) was to explore how HF influences patients’ lives, assess how self-care activities are performed, and determine how life situation facilitates or impedes HF self-care.

Twenty-six individuals were enrolled in this study. Prior HF studies conducted within a large health care system in southern California provided eligible participants. Individuals were telephoned to request participation. Inclusion criteria were previous HF hospitalization and chronic HF diagnosis. Exclusion criteria included cognitive impairment or inability to speak English (Riegel & Carlson, 2002).
Each 15-90 minute interview was audiotaped as subjects were interviewed individually or in small groups. One interviewer used an interview guide to standardize content. Field notes and memos were completed following interviews. Audiotaped interviews were transcribed verbatim and analyzed using content analysis methods. Coding scheme was proposed by Riegel and Carlson (2002) with both authors in agreement. Interrater agreement was assured by intermittent double-coding. Pattern coding was eventually used to group categories into small numbers.

An investigator-developed survey was used to collect demographic data and factors identified as potential environmental influences on self-care. The SAS was used to measure functional status; based on metabolic equivalents of oxygen consumption required for performed activities. Cardiovascular disability was classified into one of four functional classes by a structured interview (Riegel & Carlson, 2002).

Demographic information revealed the sample was mostly elderly, male, retired and poor. Participants had a mean age of 74.4 years and a mean length of time with HF of 3.86 years. The sample included 65.4% males with 53.8% married. Income for 45.5% of sample was below poverty level. The SAS found most patients (58%) were class III or IV functionally impaired (Riegel & Carlson, 2002).

Riegel and Carlson (2002) reported themes from qualitative data reflecting common challenges of HF patients as physical limitations, coping with treatments, lack of knowledge, negative emotions, other health issues and personal struggles. Inability to perform daily activities as before was stated by HF patients. Medication issues and dietary difficulties were reported among treatment coping challenges. Lack of knowledge included patient misconceptions about HF treatment. Distressed emotions of
HF patients included anxiety, panic, frustration, scared, worried, and depressed. Multiple comorbidities complicate HF management; with almost one-third reporting diabetes mellitus. Numerous personal struggles were described as stressors with HF self-management.

Qualitative data also found recognition of symptoms and interpretations of atypical symptoms acknowledged as self-care strategies. Classic HF symptoms were usually recognized as a negative sign. While patients recognized common symptoms, others failed to notice symptoms or had a significant delay in recognition. Most patients could not relate atypical symptoms to HF diagnosis. Several methods of self-care were reported about diet, activity and treatment compliance but some patients noted confusion about recommendations (Riegel & Carlson, 2002).

Riegel and Carlson (2002) reported a variety of methods patients use to adapt to life with HF. Many patients make use of creative practical methods to modify the environment in an attempt to adapt to limitations. Although confused about several aspects of self-care, many patients described acquiring knowledge as helpful in facilitating self-care. Maintaining control was valued as a method to stay out of hospital and often was reported as accomplished with self-monitoring. Internal resources used to adapt included available support from physicians, God, family and friends. Others adapted by ignoring the problem, withdrawing, being alone and acceptance of the inevitable.

The authors concluded that many HF patients are motivated to avoid hospitalization. A motivation assessment is suggested as an integral part of patient teaching sessions. Riegel and Carlson (2002) also noted barriers to compliance decrease
motivation for self-care and limit ability to learn. Providing patients with resources to help with life stressors could improve motivation to learn. Because patients emphasized the importance of control, the authors concluded that improvement in treatment adherence may result if patient-designed HF self-care solutions are utilized.

Poor self-care is common in the HF population. Mastering HF self-care is unpredictable and little is known about how patients learn self-care. The purpose of this study by Riegel et al. (2007) was to describe and understand the development of expertise in HF self-care by exploring ways that information shaped decision-making about self-care; through influence on knowledge, experience, skill, and values.

The authors used both qualitative and quantitative methods with a sample of 29 chronic HF patients. Participants were recruited from a HF clinic associated with a large urban medical center in northeastern United States. Inclusion criteria were documentation and physician confirmed diagnosis of chronic symptomatic HF, abnormal left ventricular function confirmed by echocardiogram, English speaking and judged to be HF self-care outliers; either particularly good or poor in HF self-care. Exclusion criteria were severely impaired cognition, complicating serious comorbidity or uncorrected hearing loss (Riegel et al., 2007).

Data were collected primarily by qualitative interviews until saturation of themes occurred. Structured interviews, mostly done in patient homes, were directed by an interview guide designed to capture knowledge, experience, skill and values. The interview was focused but allowed participants to express freely about self-care with open-ended questions. The interviews were audiotaped and transcribed verbatim. Field
notes were used to augment information and were analyzed using content analysis (Riegel et al., 2007).

In addition to a brief sociodemographic survey, standardized instruments were used to quantify the level of self-care and to gather data on factors influencing self-care. This included the areas of comorbidity, functional impairment, cognition, depression, excessive daytime sleepiness, and social support. Comorbidity was assessed by use of the Charlson Index which places responses into categories of low, moderate or high. Validity of this instrument was established. Functional impairment was assessed by the NYHA functional class. This questionnaire is used in major National Health Institute clinical trials, provides approximately 60% concordance in classification, and has a reproducibility of 90%. Cognition was assessed by two neurobehavioral tests. The Probed Memory Recall Test was used to assess short-term memory and learning ability and has shown good contrast and discriminant validity in prior testing. The Digit Symbol Substitution Test was used to measure attention and cognitive processing and has demonstrated discriminant validity. Depression was assessed by the Patient Health Questionnaire PHQ-9 used as a diagnostic tool for depression and depressive symptoms. The tool has a 4 point Likert scale. This tool has a sensitivity of 88% and specificity of 88% for detecting major depression when compared to professional interviews. Excessive daytime sleepiness was measured with the Epworth Sleepiness Scale. Test-retest reliability (r = .82) and internal consistency (alpha = .88) have been established. Support was evaluated with the McMaster Family Assessment Device widely used with an internal consistency between .86 and .92 (this study measured .96) and the test-retest reliability at .71 (Riegel et al., 2007).
The majority of the sample was male, elderly, Caucasian, retired, and high school educated; with HF for an average of 6 years. There were three experts in HF self-care (10.3%). All women lived alone as homemakers with NYHA class III or IV. Riegel et al. (2007) found experts in HF self-care were older, less educated, had higher levels of comorbidity, lower body mass index, less common history of sleep disordered breathing and rated health as good. This group of expert HF self-care participants had the ability to describe symptoms, link symptoms with HF physiology, and verbalize understanding of treatments. Another important finding was that the expert self-care participants had support to actively assist in self-care practices.

A group of 16 participants were ranked “good” in self-care. Many of the quantitative scores were ranked “good” and “expert” in self-care; however the “good” in self-care group showed lower self-confidence than the “expert” group. Riegel et al. (2007) noted the main difference between good and expert groups was daytime sleepiness which was more prevalent in the “good” in self-care group.

Ten participants were rated as being “poor” in self-care and had more misconceptions and lack of knowledge than other groups. Riegel et al. (2007) found characteristics of this group included impaired memory, impaired attention and cognitive processing, excessive daytime sleepiness, depression and impaired family functioning. Most participants ranked as “poor” in self-care felt supported but had scores which reflected poorer family functioning on the Family Assessment Device.

Study findings included patient-described concepts which influence the proficiency of HF self-care. Among the concepts identified by Riegel et al. (2007) were knowledge, experience, skill and values. Some participants mentioned seeking further
knowledge and asking questions to improve self-care. Vigilance and the belief in importance of self-care are noted as contributory toward positive outcomes.

Riegel et al.’s (2007) findings are similar to previous research showing overall poor HF self-care. The authors concluded new approaches to develop HF self-care expertise were needed. The importance of screening for, diagnosing, and treating sleep disordered breathing problems among HF patients was noted and linked to findings of the disorders more frequent among the poor HF self-care. Riegel et al. also noted that assistance in day-to-day monitoring and managing of symptoms may support knowledge and skills to improve HF self-care. Approaches designed to actively involve supportive family members are suggested to help with the development of HF self-care expertise.

Factors that impact compliance of self-care

Responsibility for self-care abilities lies with individual HF patients and influential factors can enhance or impede self-care practices. Understanding why some patients perform self-care is important to facilitate care towards improving self-care management. The purpose of this study by Schnell et al. (2006) was to describe the influences that enhance or impede self-care and to explore behavioral responses to influences. This is the qualitative piece of a larger quantitative parent study on self-care determinants guided by Connelly’s Model of Self-Care in Chronic Illness.

Schnell et al. (2006) used purposeful sampling to identify 20 participants from the quantitative parent study. Eleven patients living in a Canadian urban centre or in the surrounding community were eventually interviewed. The mean age was 64 years with 9 participants married, 10 Caucasian and 1 Aboriginal. Ejection fraction was 40% or less
in all participants. Inclusion criteria were HF for at least 6 months, 18 year of age or older and English speaking.

Semi-structured interviews were conducted to collect data. The lead author interviewed patients for 15-30 minutes via telephone or in person. Standardization of the question content and format was ensured by use of an interview guide derived from Connelly’s Model of Self-Care in Chronic Illness. Saturation was demonstrated by occurrence of repetitive themes. Hand written notes were recorded during interview and further detail was added after interviews were complete. The themes that emerged from this analysis were then reviewed by an expert qualitative researcher for significance with the barriers and facilitators of self-care as described in Connelly’s Model (Schnell et al., 2006).

Identified themes consistent with Connelly’s enabling variables of satisfaction of care received, cues to action (reminders to perform self-care behaviors), and social support (Schnell et al, 2006). Factors associated with satisfaction of care among participants were information and support needs being met, positive communication with care providers, and favorable traits associated with staff. Cues to action were described as changes in baseline symptoms and in relation to perceived health care roles for follow-up care. Social support from family and friends was acknowledged as a positive influence on self-care practices.

The themes of “self-concept” and “health belief perceptions” were identified as predisposing variables in study participants. Self-concept was difficult to maintain for participants as a sense of self without the disease stigma. Positive health beliefs and perceptions provided a sense of control to motivate participants to continue self-care
practices. Self-care decision making strategies identified themes of being either “patient generated” or “clinic generated” strategies. Patient generated strategies were generally found to be a balance between behavior modification and lifestyle maintenance for quality of life. Health care providers were recognized as a valuable source of information that guided behavior modification for self-care (Schnell et al., 2006).

Schnell et al. (2006) concluded that the factors influencing self-care were complex and interact with personality characteristics of patients. This interaction determines self-confidence and ability in self-care or reluctance to perform self-care activities. This exploration of self-care behaviors pointed to the importance of individualized patient plans and frequent self-care monitoring.

HF symptoms can lead to hospital readmission as a result of non-compliance with healthcare recommendations. The aim of a study by Van Der Wal et al. (2006) was to determine which variables were related to compliance among HF patients by identifying: (a) self-reported compliance rates of HF patients, (b) levels of knowledge of patients on HF related issues, (c) patient beliefs about compliance with medication and diet, and (d) variables associated with compliance.

Data (Van Der Wal et al., 2006) were collected from 501 consecutive patients hospitalized for HF and participating in a coordinating study on the effect of education and counseling in HF patients. The mean age of sample was 72 years, and 94% were in a NYHA class II or III at discharge. Inclusion criteria followed that of the parent study: hospitalization for cardiologist confirmed HF and documented underlying heart disease. In addition, this substudy had inclusion criteria of documented use of diuretics and documentation of HF symptoms at least 1 month before hospitalization. Exclusion
criteria were an invasive intervention within last 6 months, inclusion in another study requiring additional nurse visits, or heart transplantation evaluation.

The descriptive cross-sectional design study (Van Der Wal et al., 2006) utilized tools to assess compliance, HF knowledge, beliefs and depressive symptoms. Medical records and interviews were used to collect clinical and demographic information. The Revised Heart Failure Compliance Scale was used to measure compliance with six health behaviors. A 5-point Likert scale rated patient compliance the last month or the last 3 months. Face validity of this tool was assessed by two experienced HF nurses. Internal consistency was .68 using Cronbach’s alpha scale. Knowledge of HF symptom recognition, diet, fluid restriction, medication and exercise was assessed by the Dutch HF Knowledge Scale. Answers to questions included three options with one correct answer. This tool has been reliable and valid to test HF patient knowledge. Two 12-item subscales of the HF Belief Scale assessed beliefs by identifying benefits and barriers. The authors referenced the reliability and validity of the instrument that rates each item on a 5-point scale; but only assessed content validity by two experienced HF nurses. The Centre for Epidemiology Surveys-Depression Scale was used to measure depressive symptoms. A 4-point Likert scale is used on this 20-item scale to indicate the presence of depressive symptoms.

The Revised HF Compliance Questionnaire found the overall compliance was 72%. Medication compliance was very high at 98.6%. Appointment keeping was the next highest compliance, over 90%. Although acknowledged as important, dietary compliance was reported somewhat lower at 79%. A 73% compliance rate with fluid restriction was found. Considerably lower compliance rates were noted among
participants with regular weighing at 35% and exercise at 39% (Van Der Wal et al., 2006).

The mean knowledge score in this population was 11.0 on the Dutch HF Knowledge Scale which has a score range of 0-15 points. Knowledge deficits were identified as weighing frequency, causes of worsening HF and fluid restriction. The Heart Failure Belief Scale found the most important benefits identified by HF patients with diuretics are lessening of swelling (84%) and improvement in quality of life (73%). Decrease in fluid retention was also identified by 86% as a benefit to low sodium diets as well as keeping one healthy (69%) or the heart healthy (61%). Barriers to diuretic therapy noted by 58% of patients were waking up at night to go to bathroom and problems with leaving home among 46% of participants. Barriers to the low sodium diet were noted as food taste by 53% and restricted ability to eat out by 32%. Variables associated with overall compliance included more knowledge, lower educational level, experienced more benefits to diet and medication, and less depressive symptoms; but after a multivariant analysis only benefits of diet, medication and a lower educational level remained associated with overall compliance (Van Der Wal et al., 2006).

According to Van Der Wal et al. (2006), findings pointed to a knowledge deficit related to HF, particularly with diet, fluid restriction, and daily weighing. Strategies to improve compliance should be directed at improving knowledge and at changing beliefs about HF regimes to improve benefit perceptions and reduce barriers. Extra attention should be directed towards patients with depressive symptoms because of lower compliance. Self-care strategies and self-management guidance to improve HF
compliance is a major challenge for health care professionals, but studies such as this help to direct strategies in HF management programs to improve outcomes.

The incidence of diastolic heart failure (DHF) in older women has been steadily increasing. Little is known about this population since women with DHF have been excluded from many HF studies. Self-care abilities for women with DHF may be reduced due to additional health care problems and aging issues. The purposes of a study by Gary (2006) were to describe the performance of self-care behaviors and demographic and clinical characteristics that affect self-care practices in women with DHF. The theoretical framework of Riegle’s Self-Care Model guided this descriptive study.

Study sample was recruited through cardiologist referral from an outpatient HF clinic. Thirty-two women with NYHA Class II or III DHF were included in the study. Inclusion criteria were age greater than 50 years, documented diagnosis of DHF, left ventricular ejection fraction of greater than 45%, Mini-Mental Status Examination score of 25, and having received generally accepted optimal pharmacologic therapy. Exclusion criteria included acute myocardial infarction within the past 6 months, chronic chest pain, renal insufficiency, uncontrolled hypertension, or current hospitalization (Gary, 2006).

A semi-structured interview guide, developed on the basis of a detailed literature review, was used to collect data during individual interviews. Interview guide questions were reviewed and revised by two experts in HF management. Interviews lasted approximately 2 hours and were conducted by the same investigator. Question details were recorded during the interview. Responses were reviewed, tabulated according to frequency of response and coded into categories. Participants’ medical records were used for descriptive statistics of demographic and clinical characteristics (Gary, 2006).
Heart failure self-care performance was assessed on several content topics in Gary (2006). While half of the participants acknowledged daily weighing as necessary, only six women (19%) weighed on a daily basis. Most participants weighed fewer than two times per week. Only one third reported always avoiding sodium and 44% did not know salt and sodium were synonymous. Serving size for dietary sodium was misinterpreted by 87%. Dietary choices were found to be influenced by lack of money, individual and family food preferences, cultural dietary practices, and restaurant food availability. Most women only knew medication by color, shape or size of pills but 78% reported taking medications exactly as prescribed. Lasix was the most common drug identified not taken as prescribed due to inconvenience of response. The most physically challenging activities for 69% of women were vacuuming and mopping floors.

The symptom verbalized most often was SOB. Most women prepared for anticipated activities with rest. Seeking medical attention was generally practiced due to anxiety about symptoms. Medical attention was not sought for symptoms not considered important, not wanting to bother the physician, dislike of the hospital, lack of insurance and transportation difficulties. A negative influence on quality of life was associated with dyspnea and fatigue related to household chores by 78% of sample; while 16% found family responsibilities difficult. Concern about sexual relations was identified by 22%. Daily or weekly support contacts were available for most women and 87% had someone to rely on for discussion of important matters. Some women voiced concerns about being alone (Gary, 2006).

Demographic information collected found an average age of 68 years; mostly unmarried and living alone. Annual incomes at or below the poverty level were found
among 81%. Clinical characteristics included multiple comorbidities including depression (47%), hypertension (88%), arthritis (69%), chronic obstructive pulmonary disease (34%), diabetes (31%) and anxiety (12%). Obesity, with a mean body mass index greater than 30 on average, with sedentary lifestyle was typical. More than half of the sample had received HF education in the past and rated knowledge as fair to good. Patients’ perceived learning needs included ways to improve quality of life and information about specific HF symptoms (Gary, 2006).

Gary (2006) found that educational programs currently used for HF patients may be inadequate to meet the needs of women with DHF. Older women with DHF may need physical activity and social support initiatives incorporated into interventions. Gary suggested home visits and telephonic monitoring may benefit this group with transportation difficulties and varying social isolation. Gary also noted a common finding of depression among women with DHF, suggesting the importance of depression screening at regular intervals. The author found a lower socioeconomic status was related to poor self-care among women with DHF and addressing this relationship may lead to development of interventions to improve the lives of older women with DHF.

*Educational Interventions*

The grave effects of HF were noted by Bushnell (1992). HF is associated with a high rate of mortality, morbidity and hospital readmission. Preventative nursing interventions such as patient education programs can improve self-care behaviors thus improve HF quality of life and decrease health care costs. The purpose of this study was to: (a) describe the knowledge of HF patients admitted for acute care and (b) determine readmission rates of HF patients.
The sample for this descriptive one-group, pretest post-test design study included 41 patients with a primary diagnosis of chronic HF admitted to an acute care facility. Participants were selected for inclusion by meeting hospitalization criteria, being admitted to one of five medical units over a 2 year period and a lack of acute myocardial infarction diagnosis. In addition, patients had to successfully pass a mental status assessment to be included in the study. The sample consisted of 58% men and 42% women with a mean age of 71 years. Race distribution was 75% white, 17% black and 8% Hispanic. The majority was not married and 75% had attended high school or college. Most participants (92%) had annual incomes of $20,000 or less (Bushnell, 1992).

The researcher-administered questionnaire determined patients’ HF knowledge and compliance with instructions. Questions were based on information in a HF self-care booklet given to patients. Sufficient knowledge demonstrated allowed participation in a self-care program for hospitalized patients.

Bushnell (1992) found that HF knowledge of patients admitted to this acute care facility was poor. Almost all patients (97%) could not define the disease and only 42% could correctly identify medications. Seventy-one percent of participants weighed in less than weekly. Equally less than ideal results were found about dietary knowledge. The self-care program introduced included a HF self-care booklet, one-on-one self-care teaching and a self-care medication regime. Patients also weighed in daily, independently selected meals and reported any identifiable HF symptoms. Three months after hospital discharge, 16% had two or more hospital readmissions, 26% had one hospital readmission and 58% had no hospital readmission. Six months after hospital
discharge, 25% had one or more readmissions. Before study was completed 34% of participants expired.

Bushnell (1992) concluded that HF patients need instruction on medications, diet, activities and symptoms. Teaching self-care in the hospital increased patients’ ability to take prescribed medications, follow proper dietary recommendations and identify HF symptoms. HF self-care can help to reduce hospitalizations and improve outcomes.

Jaarsma et al. (2000) believed that HF symptoms and treatment can influence the lives of patients. Better self-care abilities and behaviors have been associated with improved feelings of well-being. The authors hypothesized that a supportive educational intervention would increase HF self-care abilities and behaviors thus improving quality of life. The purpose of this experimental study was to determine the actual effects of a supportive educational intervention on self-care abilities, self-care behaviors and quality of life in patients with HF.

Eligible participants included all patients admitted to the cardiology unit of the University of Masstricht from May 1994 to March 1997 with symptoms of HF. Screening involved verifying the inclusion criteria of NYHA functional class III and IV, HF diagnosis for longer than 3 months, age 50 years or older and Dutch literacy. Eligible participants were also screened for exclusion criteria which included coexisting severe debilitating disease, discharged to a nursing home, psychiatric illness, previous CABG, angioplasty or valve replacement within 6 months. The sample was comprised of 179 patients with comparable baseline characteristics. The typical study participant was 73 years old, male, NYHA classification III or IV and lived independently (Jaarsma et al., 2000).
Multiple instruments were used for assessment and measurement of the variables. Medical records and patient interviews were utilized for collection of clinical data and demographic information. To assess the patient’s self-care ability the Appraisal of Self-care Agency scale was used. This 24 item self-appraisal instrument is considered a reliable and valid instrument with the Cronbach alpha of the scale in this study ranging from 0.80 to 0.87 (Jaarsma et al., 2000).

The Heart Failure Self-care Behavior Scale, a 19 item questionnaire, was used to measure self-care behaviors. The tool was developed for this study and validity was established by a panel. The Cronbach alpha ranged from 0.62 to 0.68 for this scale. A multidimensional approach was used to assess quality of life. Functional capabilities were assessed by the Heart Failure Functional Status Inventory; a self-report questionnaire. An additional questionnaire was utilized to assess symptoms including the occurrence, severity and level of discomfort. The Psychosocial Adjustment to Illness Scale was also used to measure psychosocial adjustment to illness. This 46 item self-report questionnaire’s subscales had a Cronbach alpha ranging from 0.66 to 0.90. Overall well-being was measured by Cantrill’s Ladder of Life. Self-rated levels of well-being were assigned numbers. Previous studies have considered this tool a valid measurement of overall well-being (Jaarsma et al., 2000).

Patients were randomly assigned to receive either routine care or a supportive educational intervention which included intensive education by a study nurse during hospital stay, phone calls and home visits. Data were collected at discharge and at 1, 3, and 9 months following discharge. While no statistical significant differences were found between groups in self-care abilities, the supportive educational intervention was
found to improve self-care behaviors 3 months post discharge. The quality of life assessments showed no differences between groups in functional capabilities at baseline or after discharge. The number of symptoms and symptom distress decreased in both groups showing no difference between groups statistically although a trend was noted for the intervention group indicating a larger decrease in symptom severity and distress. No significant statistical differences were noted between groups on analysis of well-being after discharge (Jaarsma et al., 2000).

Self-care behaviors were significantly improved but quality of life did not reflect a similar improvement. According to Jaarsma et al. (2000), improving outcomes is a complex process to entertain. Health care interventions may not improve quality of life for HF patients at all. Study findings pointed to the need for improved educational endeavors which include individualized plans designed to meet the many needs of HF patients.

Self-monitoring for worsening HF symptoms is an important foundation for HF management. Educational and disease management programs are not always available to support education for self-care. Rural areas in particular have major barriers to improve healthcare due to limited access. The purpose of a pilot study by Caldwell et al. (2005) was to determine whether a simplified education program focused on a single component of HF self-management could improve knowledge, patient reported self-care behavior, and HF severity in a rural setting.

A rural setting in Northern California was the site for patient recruitment from a cardiology practice that offered no formalized HF education program. Caldwell et al. (2005) used a randomized experimental design for this pilot study. Sample included 36
HF patients divided into control or intervention groups. Inclusion criteria were clinical stability with NYHA Class of II to IV or Class I with recent exacerbation requiring treatment; ability to read, write and understand English, and to be living independently. Exclusion criteria were impaired cognition, untreated malignancy or participation in a formalized HF education program.

Prior to the intervention, Caldwell et al. (2005) used tools to measure knowledge, self care behavior, and HF severity. These were repeated at 3 months to assess impact of intervention. HF knowledge was assessed by means of a questionnaire which included 24 multiple choice, yes/no or true/false questions. Five experts in cardiovascular care established content validity of this instrument while predictive validity was established in a previous study. Cronbach’s alpha of 0.83 established internal consistency.

An abbreviated form of the European Heart Failure Self-Care Behavior Scale focusing on symptoms and fluid weight management was used to measure self-care behaviors. Pooled data of prior use for original instrument established face and content validity; while Cronbach’s alpha was 0.81. The BNP blood test was used to measure HF severity. A portable Triage device was used to perform this test and has been shown to have high sensitivity and specificity in a number of studies (Caldwell et al., 2005).

HF knowledge findings showed the mean knowledge score was unchanged at 3 months for the control group but HF knowledge was significantly improved in the intervention group. In addition Caldwell et al. (2005) found that the knowledge level of the control group was significantly lower than the intervention group (14.9 and 18.1 respectively; P = .01) 3 months after the intervention. The European Heart Failure Self-care Behavior Scale identified self-care behaviors scores significantly higher than that of
the control group (P = .03) at 3 months. While the intervention improved patient weight monitoring, the positive behavior change did not reflect in improvement with help seeking behaviors. HF severity (BNP level) was measured lower in the intervention group at 3 months compared with the control group but the difference was not at the level of significance (P = .21).

Caldwell et al. (2005) concluded that a simplified education and counseling intervention with a brief follow-up phone call focused on symptom recognition and fluid weight management improved knowledge and patient reported self-care behavior at 3 months when compared to a control group in a rural setting. This study confirmed previous findings that daily weighing and recording of weights is low. The primary change in self-care noted was in daily weights, but this failed to lead toward improvement in help seeking when symptoms worsened. According to authors, this recognizes the need to identify and reduce barriers to calling a health care provider when symptoms worsen.

An educational program was introduced to patients in a study by Kutzleb and Reiner (2006), which offered a nurse directed multi-disciplinary approach to HF treatment. The authors hypothesized that patients who participated in a nurse directed multi-disciplinary approach to HF treatment will demonstrate an increased knowledge of self-care management, improved quality of life (QOL) and functional capacity. The purpose of this quasi-experimental study was to evaluate the impact of such a program on HF patient education and to examine the impact on QOL and functional capacity.

Eligible participants included all patients 18-75 years of age who were referred to two cardiology clinics. All patients had a diagnosis of HF confirmed by a cardiologist.
Exclusions for participation included patients not literate in English language, HF diagnoses which were not the primary problem, multiple chronic comorbidities, illnesses that could jeopardize survival over duration of study, cognitive impairments or patients taking mood-altering medications. Twenty-three patients ultimately consented to participate and were divided into two groups; one receiving the study intervention and the other receiving routine care. Participants’ mean age was 58 years; with 65% women and 35% men. The average ejection fraction for study participants was 47% (Kutzleb & Reiner, 2006).

Kutzleb and Reiner (2006) used the QOL instrument (Ferrans & Powers) to measure both satisfaction and importance of various aspects of life. The instrument was selected for the high level of reliability and validity. Cronbach’s alpha ranged from .84 to .98. Functional capacity was measured objectively with a walk test.

Findings for QOL tool showed a statistically significant improvement in QOL for intervention group versus routine care group. Both groups improved in QOL scores but there was significantly more improvement noted in the intervention group. Improvement was also found over a 9-month study period in the area of health and function; the intervention group showing a 62% improvement whereas the routine care group had only a 25% improvement indicating improvement in disease self management. Similar results were noted for functional capacity showing a correlation between QOL and functional capacity (Kutzleb & Reiner, 2006).

Kutzleb and Reiner (2006) concluded that participants in this study demonstrated disease self-management which directly reflects the study intervention. This nurse directed patient education intervention was effective in improving QOL and improved
patient self-care. In addition; several patient crises, emergency room visits and readmissions were avoided through this intervention by improving patient compliance and self-management.

Summary

HF is a major health problem and a complex disease making self-care challenging for most patients. The literature review provided evidence that these patients have misperceptions about the disease, little HF knowledge and poor self-care abilities. These findings support Orem’s theory concept of self-care deficit. The literature review revealed the key to HF management is through knowledgeable and effective patient self-care.

Self-care practices and strategies were identified in the studies by Bennett et al. (2000) and Gary (2006). Relationships of self-care and patient knowledge were noted in the studies by Artinian et al. (2002a) and Artinian et al. (2002b). These authors found low knowledge scores among HF patients implying a risk for poor outcomes and a significant relationship between knowledge and self-care behaviors supporting continued efforts toward successful patient education. The studies by Rockwell and Riegel (2001), Riegel and Carlson (2002), and Schnell et al. (2006) identified influences and predictors of self care. Education level, symptom severity, self concept, and health belief perceptions were found to be related to self-care. Van Der Wal (2006) recognized knowledge deficits and identified variables related to HF self-care compliance as knowledge, beliefs, and depressive symptoms. HF experience and expertise was found to improve some areas of self-care in the studies by Carlson et al. (2001) and Riegel et al.
These studies provided research background and valuable information about HF self-care.

Literature review also supported focused educational programs to improve HF patient outcomes. Bushnell’s (1992) study found that self-care programs for hospitalized patients increased the ability to perform self-care and reduced hospitalization rates. Jaarsma et al.’s (2000) study of a supported educational intervention, Caldwell et al.’s (2005) study applying a simplified single-focus educational intervention, and Kutzleb and Reiner’s (2006) study promoting a multi-disciplinary educational program all had positive effects on patient knowledge and self-care. This research points to a need for evidence-based educational programs aimed at improving self-care management.

The literature review included the use of patient, family, and small group interviews, interview guides, and several general and self-reported questionnaires or surveys. In addition, over 20 tools were utilized to examine numerous variables and collect data related to HF self-care behaviors and knowledge. Study frameworks included those of Orem’s Self-care Deficit Theory of Nursing, Connelly’s Model of Self-Care in Chronic Illness and Riegle’s Self-Care Model. This diverse collection of evidence pointed to knowledge deficits affecting self-care behaviors. Patients with HF depend on the healthcare profession to seek new and innovative approaches to educational programs. The challenge lies in applying research so as to offer the most effective interventions to expand knowledge, promote self-care, and improve outcomes for HF patients.
Chapter III

Methods and Procedure

HF is a major health problem worldwide affecting the lives of millions. Literature has shown that self-care is essential for this chronic illness to decrease readmissions, soaring healthcare costs, and improve outcomes. Knowledge deficits affecting self-care behaviors of HF patients have been identified. This study is a partial replication of Artinian et al.’s (2002b) study. The purpose of this study is to examine the frequency of self-care behaviors and the relationship between patients’ level of knowledge and performance of self-care behaviors based on Orem’s Theory of self-care. This chapter includes information about the population, sample, procedure, measurement, methodology and design used to guide this study.

Research Questions

1. What self-care behaviors do patients with HF perform most and least frequently?

2. What is the relationship between HF knowledge and self-care behaviors?

Population, Sample and Setting

The population will include chronic HF patients from a hospital and a private practice outpatient clinic in Kettering, Ohio. In-patients ready for discharge will be recruited from Kettering Medical Center which has approximately 300 patients with a principal diagnosis of HF in 1 year. Outpatients will also be recruited from Cardiology
South Heart Failure Clinic, a private practice clinic within the Kettering Medical Center Network which cares for approximately 150 HF patients over the course of 1 year. The anticipated sample is 100 patients conveniently selected who meet inclusion criteria and who can meet the information needs of the study replication. Inclusion criteria will include age 18 years or older, a primary diagnosis of chronic heart failure confirmed by an ejection fraction of 40% or less, HF clinic outpatients or facility inpatients ready for discharge, and consent for participation. Exclusion criteria are history of dementia or mental illness, self-reported substance abuse, receiving hemodialysis or in the terminal stages of cancer. Demographic data collected will include age, sex, and educational level.

The non-private inner-city hospital was chosen to support the accessible population to include all income levels. The physician-based HF clinic could be considered representative of the target population in that findings could include generalization to the wider target population. The representativeness is limited however since the sample will be selected at a certain time and place leading to a possibility of a sample not absolutely representative of the target population.

Protection of Human Subjects

This study will be submitted to the institutional review boards of Ball State University and Kettering Medical Center Network for approval prior to conduction. Ethical consideration will be given attention for this study by adhering to ethical principals for research. Prior to initiation of this study, a consideration of the potential to improve patient care versus risks to participants was thoughtfully assessed. A fair selection of subjects will occur with risks and benefits fairly distributed. Benefits from
this study include awareness of health professionals about frequency of self-care behaviors and the relationship to patient knowledge possibly leading to more effective interventions to improve outcomes for HF patients. No risks have been identified with the study. Voluntary participation along with the right of participants to refuse any part of the study will be explained thoroughly. Each patient will receive a cover letter with full disclosure of the study. All data collected will be anonymous.

Procedure

After receiving the institutional review board approval, the research project will be introduced to and approved by the hospital unit managers, clinic manager and cardiologists in charge of the heart failure clinic. The researcher will be notified of in-patient admissions with a principal diagnosis of HF by the hospital unit nurse manager on a biweekly basis and anticipated discharge date will be jointly assessed. HF clinic outpatients will be recruited from the daily appointment lists provided to researcher by the clinic manager weekly. Exclusion and inclusion criteria will be examined. The researcher will invite potential participants to join the study on the day of hospital discharge in patient room or at conclusion of a HF clinic visit. The researcher will then give participants a full disclosure of the study. If participants are willing to proceed, a written consent will be obtained. The researcher will then collect demographic information and administer study instruments to promote consistency and accuracy of data, requiring approximately 30 minutes of time.

Research Design

This study will use a descriptive correlational design. The purpose of descriptive research is to describe concepts and identify relationships among variables (Burns &
A non-experimental design is appropriate because the intent of this study is to describe relationships among clearly defined, identified variables. This study will examine HF self-care behaviors and describe relationships between HF knowledge and self-care behaviors. No attempt to control or manipulate the study situation will occur; nor will a casual connection be explored.

**Instrumentation, reliability and validity**

Artinian’s Revised Heart Failure Self-Care Behavior Scale will measure 29 self-care behaviors needed to control health functioning. The self-care behaviors are measured and grouped according to 5 of the 6 components of Orem’s described self-care requisites. Patients will be asked to indicate how often each behavior is used. Behavior frequency is recorded by means of a Likert-type scale then a total score is obtained. If all self-care behaviors are performed all of the time the maximum score possible is 145. Internal consistency reliabilities for the original Heart Failure Self-Care Behavior Scale ranged from 0.62 to 0.68 (Artinian et al., 2002b).

The Revised Heart Failure Self-Care Behavior Scale used for this study improved the original scale’s internal consistency reliability by increasing the number of items. According to Burns and Grove (2005), estimates of reliability are specific to the sample being tested. To assure internal consistency, Cronbach’s alpha will be determined with study sample prior to other statistical analysis. Results will be published in study report. A panel of experts will evaluate the Revised Heart Failure Self-Care Behavior Scale for content validity.

The other tool developed by Artinian to be used is the Heart Failure Knowledge Test. This tool was developed on the basis of clinical experience and a review of
literature to measure knowledge. Understanding of HF knowledge will be assessed by these 15 multiple choice questions plus 1 fill in the blank with correct answers summed for a total score. Each question has 1 correct answer and score is a total number of correct responses (Artinian et al., 2002b). Cronbach’s alpha will be determined with study sample prior to other statistical analysis and results will be published in study report. According to Burns and Grove (2005), validity varies among samples and situations therefore should be examined in a study situation. Content validity for the Heart Failure Knowledge Test will be evaluated by a panel of experts. Evaluation against other knowledge scales for criterion-related validity has not been determined (Artinian et al., 2002b).

*Measures of Data Analysis*

Descriptive statistics will be used to analyze study variables and to determine which self-care behaviors patients with HF perform most and least frequently. Mean scores will be calculated for each self-care behavior. Items will be ranked in order from most frequently performed to least frequently performed behaviors. Mean total knowledge scores will also be determined. The relationship between HF knowledge and self-care behaviors will be addressed with correlational analyses. The most commonly used correlation measure, Pearson’s correlation, will be used to determine the degree of linear relationship between variables. Significance level will be set at 0.05, meaning that there is a probability of 5% or less of having a Type I error.

*Summary*

In this chapter, the methods and procedures to be used for this study are described. The specific variables examined will be self-care behaviors and patient HF
knowledge. A descriptive correlational study design will be used with the anticipated sample numbering minimum of 100 participants. Data will be collected via the Revised Heart Failure Self-Care Behavior Scale and the Heart Failure Knowledge Test. Data will be analyzed with descriptive statistics and correlational analyses at the 0.05 significance level. This study will replicate a previous study by Artinian et al. (2002b) and attempt to validate previous findings while providing valuable further information which may lead to interventions that may improve outcomes for HF patients.
References


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<th>Source</th>
<th>Problem, Purpose and Research Questions</th>
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<tr>
<td>Carlson et al. (2001)</td>
<td>HF patients have difficulty with self-care. Describe HF self-care abilities and difficulties. Determine whether experience facilitates self-care.</td>
<td>Concepts: Self-care abilities HF experience</td>
<td>139 HF patients</td>
<td>Descriptive, cross-sectional, comparative</td>
<td>Investigator developed survey, SAS, Charlson Index Self-Management of Heart Failure questionnaire (SMHF)</td>
<td>Majority functionally impaired with moderate to high comorbidities. No difference in SMHF scores between new and experienced patients. Symptom recognition and actions taken was better among experienced HF patients.</td>
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<tr>
<td>Artinian et al. (2002a)</td>
<td>HF patients must adjust to many life-altering behaviors, and are often readmitted to acute care due to lack of knowledge about self-care. Examine frequency of self-care behaviors (SCB), affect of basic conditioning factors (BCF) on self-care and relationship between level of knowledge and performance of self-care behaviors</td>
<td>Orem’s Theory of self-care</td>
<td>110 participants with primary or secondary diagnosis of HF.</td>
<td>Descriptive Correlational</td>
<td>Revised Heart Failure Self-care Behavior Scale and Heart Failure Knowledge Test</td>
<td>No overall significant relationships found between SCB scores and BCF’s but several significant relationships found between individual SCB’s and BCF’s. Low HF knowledge scores with a significant relationship found between mean total knowledge score and mean total SBC score.</td>
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<td>Artinian et al. (2002b)</td>
<td>Adequate knowledge is needed for appropriate focused self-care. Describe knowledge about HF and explore factors associated with higher levels of knowledge.</td>
<td>Concepts: Self-care Knowledge Outcomes</td>
<td>123 patients with primary or secondary HF diagnosis.</td>
<td>Descriptive Correlational</td>
<td>General information questionnaire, NYHA functional classification, self-reported health perception tool, and Heart Failure Knowledge Test.</td>
<td>Low HF knowledge scores; especially about meds, weight monitoring and definition of HF. Patients at risk for poor outcomes and hospitalizations.</td>
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<tr>
<td>Authors</td>
<td>Details</td>
<td>Concepts:</td>
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<td>Riegel And Carlson</td>
<td>Self-care education does not always lead to behavioral changes. Explore HF influence on patients’ lives, assess self-care activities and determine how life situation facilitates or impedes self-care.</td>
<td>HF influence, self-care activities</td>
<td>26 patients from prior HF study.</td>
<td>Qualitative</td>
<td>Individual or small group interviews, Investigator developed survey, Specific Activity Scale (SAS)</td>
<td>Many challenges of HF patients reported. Symptom recognition varied. Motivation is related to self-care and ability to learn.</td>
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<td>Schnell et al. (2006)</td>
<td>Individual influential factors can enhance or impede self-care practices. Describe these factors and explore behavioral responses to influences.</td>
<td>Connelly’s Model of Self-Care in Chronic Illness</td>
<td>20 HF participants of a self-care parent study</td>
<td>Qualitative</td>
<td>Semi-structured interviews, model derived interview guide.</td>
<td>Self-concept/health belief perceptions identified as predisposing variables. Health providers guide behavior modification for self-care. Social support has positive influence on self-care.</td>
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<td>Van Der Wal et al. (2006)</td>
<td>Non-compliance contributes to worsening HF symptoms and may lead to hospitalization. Determine which variables were related to HF compliance by identifying self-reported compliance rates, levels of knowledge, patient beliefs about compliance and variables associated with compliance.</td>
<td>HF patient compliance, beliefs about compliance, and knowledge</td>
<td>501 hospitalized HF patients participating in a co-op study</td>
<td>Descriptive cross-sectional</td>
<td>Revised Heart Failure Compliance Scale, Dutch HF Knowledge Scale, HF Belief Scale, Centre for Epidemiology Surveys-Depression Scale</td>
<td>Compliance with weighing and exercise were low. Compliance with medication and appointment keeping was high. Compliance was related to knowledge, beliefs, and depressive symptoms. Knowledge deficits identified.</td>
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<tr>
<td>Author</td>
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<td>Gary (2006)</td>
<td>Self-care abilities for women with diastolic HF (DHF) may be reduced due to health care problems and aging issues. Describe performance of self-care behaviors and characteristics that affect self-care.</td>
<td>Riegle’s Self-Care Model</td>
<td>32 women with New York Heart Class II or III DHF</td>
<td>Descriptive</td>
<td>Semi-structured interviews with guide</td>
<td>Taking medications was only consistent self-care practice. Lower socio-economic status and advancing age increase vulnerability for poor self-care and negative clinical outcomes. Current programs may be inadequate for DHF women. Depression common.</td>
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<td>Study</td>
<td>Summary</td>
<td>Concepts: Education</td>
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<td>Jaarsma et al. (2000)</td>
<td>Better self-care abilities and behaviors lead to improved well-being. Determine effects of a supportive educational intervention on self-care abilities and behaviors and quality of life.</td>
<td>Education Self-care Quality of Life</td>
<td>179 patients admitted for HF.</td>
<td>Experimental random assignment</td>
<td>Appraisal Of Self-Care Agency Scale (ASA), Heart Failure Self-care Behavior Scale, Heart Failure Functional Status Inventory Psycho-social Adjustment to Illness Scale, Cantrill’s Ladder of Life</td>
<td>No statistical difference in self-care abilities, quality of life, functional capabilities, analysis of well-being and number of symptoms found between groups, but educational program improved self-care behaviors 3 months after discharge.</td>
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<td><strong>Caldwell et al. (2005)</strong></td>
<td>Programs are not always available to support education for self-care in rural areas. Determine effectiveness of a simplified education program on improving knowledge, self-care behavior, and HF severity.</td>
<td>Concepts: Education Knowledge Self-care HF severity</td>
<td>36 rural HF patients</td>
<td>Randomized clinical trial</td>
<td>HF knowledge Questionnaire, European Heart Failure Self-care Behavior Scale, BNP blood test.</td>
<td>Simplified education program improved knowledge and self-care behaviors at 3 months. Weight monitoring improved. No improvement in help-seeking. BNP lower in intervention group at 3 months.</td>
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<td><strong>Kutzleb And Reiner (2006)</strong></td>
<td>HF is a costly healthcare problem and the prevalence of HF is expected to rise due to the aging population. Evaluate the impact of a nurse-directed approach to patient education and the extent to which the approach influenced quality of life (QOL) and functional capacity.</td>
<td>Concepts: Education QOL Functional capacity</td>
<td>23 HF patients</td>
<td>Quasi-Experimental</td>
<td>Ferrans and Powers’ QOL instrument, 6 minute walk test.</td>
<td>Statistically significant improvement in QOL, and patient self-care in intervention group. Functional capacity was not significantly impacted.</td>
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