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Nurses' Knowledge Related to Heart Failure Essentials

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Nurses' Knowledge Related to Heart Failure Essentials

by

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Abstract

Heart Failure is a complex syndrome which continues to be a major health issue in the United States and worldwide. Strategies and educational interventions implemented by hospitals to reduce hospital admissions and readmissions for this costly chronic disease have not been consistently successful. Patient education is an important strategy for the management of HF to improve quality of life, optimize patient outcomes, and reduce the use of healthcare resources by reducing readmissions. The purpose of this program development was to increase nurses' knowledge regarding HF education to be provided to HF patients prior to discharge from the acute care setting. A quasi-experimental program design with a pre and post-test intervention was performed on a 38 bed medical telemetry unit at RI Hospital a Level 1 trauma center in Providence, RI. Registered nurses were asked to complete a pre and post-test survey, *Nurse Knowledge of Heart Failure* by Albert et al (2002). Nine RNs out of thirty two (28.8%) agreed to participate and completed the pre-test, attended one of the HF education classes followed by completion of the post-test. Pre-tests scores ranged from 60-90 out of possible 100, with a mean score of 73.3%. Post-test scores ranged from 70-95 out of possible 100, with a mean score of 86.1%, an increase of almost 13%. These findings suggest that providing HF education can be successful in increasing nurses' knowledge regarding HF education provided to HF patients prior to discharge from the acute care setting.

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Problem Statement

According to the American College of Cardiology (ACC) and American Heart Association (AHA), heart failure (HF) affects 1 million Americans, with 670,000 newly diagnosed cases annually (ACC/AHA, 2013). Heart failure is the principal reason for more than one million hospitalizations yearly (Ermis & Melander, 2012). The United States (US) population is aging and therefore HF costs are projected to more than double in the next 20 years, from 31 billion in 2012 to 70 billion in 2030 (AHA, 2013). Heart failure is often characterized as a long term chronic condition requiring multiple readmissions over its course. The 30 day readmission rates for Medicare patients with HF cost 17.4 billion in 2004 (Jencks, Williams, & Coleman, 2009). The Institute for Health Care Improvement (IHI) in partnership with the American College of Cardiology (ACC) initiated a program called *Hospital to Home Initiative* (H2H) whose mission was to reduce readmissions and improve transitions to home (IHI, 2011). The goal was to reduce readmission rates among patients discharged with HF by 2012, yet the readmission rates continue to increase. In fact, National Readmission rates approach 25% while best practice is 16 % (Ermis & Melander, 2012).

Even though there have been advances in detection and therapies for management of HF, it still remains a major health care management challenge today. Providing individualized discharge instructions including medication reconciliation, scheduling follow up appointments, and educating patients about the early signs and symptoms of worsening HF will lead to improved clinical outcomes (Silow-Carroll, Edwards, &

Lashbrook, 2011). Health care providers should use a multidisciplinary approach in educating and coaching patients, based on the guidelines published by the ACC, the AHA, and Heart Failure Society of America (HFSA). The primary objectives are to slow the progression of this chronic illness, increase quality of life, reduce readmissions, and decrease mortality. The AHA/ACC guidelines (2011) emphasize importance of discharge planning, with a focus on activity level, diet, medication reconciliation, weight monitoring, and symptom identification and management (AHA, 2013). The latest guidelines from the HFSA emphasize the importance of education and recommend that patients receive educational materials as part of the standard of care.

The Joint Commission National Quality performance measure requires that HF patients who are discharged from hospitals should receive educational material and written discharge instructions about activity level, diet, discharge medications, weight monitoring, and symptom management (The Joint Commission [JCAHO], 2010). As of 2011, performance measures from hospitals have been publicly reported with an emphasis on the importance of setting up post discharge appointments for HF patients. (Agency for Healthcare Research and Quality [AHRQ], 2013).

Nurses are at the forefront of educating people about HF and self-care management. Heart failure education provided by nurses can be key in reducing readmissions and thus healthcare costs. This education can be defined as the process of improving knowledge and skills in order to influence the attitudes and behaviors required to maintain or improve health (Rankin & Stallings, 2001). Teaching patients better self-care behaviors can positively affect lifestyle modifications, such as diet and daily weights, and can also

improve quality of life (Paul, 2008). Yet nurse led education may not be effectively delivered to the patients with HF (Albert, 2013). The purpose of this program development was to increase nurses' knowledge regarding heart failure so that they can provide effective education to HF patients prior to discharge from the acute care setting.

Review of Literature

A literature search was conducted via databases CINAHL, Ovid, and PubMed as well as bibliographic reference list searches of relevant articles. The major keywords searched were heart failure (HF), HF guidelines, HF core measures, nurse as educator, HF discharge instructions, and knowledge of nurses related to HF teaching. Additional information was obtained from journal articles cited as references or government educational websites such as JCAHO and Agency for Healthcare and Research Quality (AHRQ). Most of the information attained was published less than 10 years prior.

Heart Failure: Pathophysiology

Heart failure “is a condition in which the heart cannot expel sufficient blood to satisfy the metabolic demands of the body as a result of diseases such as coronary artery disease, hypertension, valvular insufficiency, or rheumatic heart disease” (McChance, Huether, Brashers, & Rose, 2010, p. 1759). Heart failure is a chronic condition with increased morbidity and mortality that affects not just the patient but also impacts the family. A healthy heart can pump out enough oxygen rich blood to feed all parts of the body, but when the heart’s pumping action weakens, blood may back up to other areas of the body, resulting in increased fluid buildup in the lungs, gastrointestinal tract, arms, and legs (National Institutes of Health [NIH], 2013).

Heart failure occurs when the heart is unable to meet the demands of the body via sufficient cardiac output to perfuse vital tissues. Adequate cardiac output depends on both the heart rate and stroke volume, defined as the volume of blood pumped from a ventricle of the heart in one beat. Likewise stroke volume is affected by three factors:

preload, afterload and contractility. Preload is defined as the pressure generated at the end of diastole in the left ventricle while afterload is resistance to ejection of blood from the left ventricle during systole (McChance et al., 2010). Myocardial contractility is what the stroke volume, or blood ejected during systole depends on to decrease the workload on the myocardium (Borlaug, Lam, Roger, Rodeheffer, & Redfield, 2009). These three factors can be disrupted by different disease states such as myocardial infarction, hypertension, valvular disease, increased plasma volume, and HF.

Heart failure can affect both the right and left sides of the heart. Right heart failure is the inability of the right ventricle to provide adequate blood flow to the pulmonary circulation thus causing increase in systemic venous circulation. The inability of the right ventricle to work properly results from left HF that causes an increase in left ventricular pressure back in the pulmonary circulation (McChance et al., 2010). This results in jugular venous distension, peripheral edema, and liver engorgement. Left HF, which is commonly called congestive heart failure, affects the left side of the heart. The left side of the heart is not able to pump out all the blood it gets, causing fluid to back up into the lungs, resulting in dyspnea, waking up feeling out of breath, dry hacking cough or frothy sputum, and edema (Purcell & Fletcher, 2012). This edema occurs because the body is retaining too much fluid and putting an added work load on the heart. These clinical manifestations of left HF are the result of inadequate perfusion in the systemic circulation and increased pulmonary vascular congestion (Cehlbach & Ceppert, 2004).

Heart failure can affect either systolic or diastolic ventricular function (McChance et al., 2010). Systolic HF is the inability of the heart to promote enough cardiac output to

perfuse all the vital tissues, which then impairs the hearts contracting ability. Diastolic dysfunction impairs relaxation or filling of the heart (Fontana, 2006), increases the risk for HF development, and has an eight times increased risk of mortality (Bui, Horwich, & Fonarow, 2011).

Patients can develop symptoms such as sudden weight gain, swelling of legs and ankles, and swelling or bloating of body that may require two or more pillows to sleep, hacking cough, and loss of appetite (Purcell & Fletcher, 2012). Physical examination of people with HF may reveal pulmonary edema, S3 gallop, neck vein distension, rales, nocturnal dyspnea or orthopnea, and cardiomegaly. These symptoms may result in admissions and readmissions to hospitals (Mahmood & Wang, 2013).

Epidemiology of Heart Failure

Heart failure affects nearly 5.7 million Americans of all ages and results in more hospitalizations than all forms of cancer combined (AHA, 2011). The proportions of HF hospitalizations occurring in people under the age of 65 have increased from 23% in 2000 to 29% in 2010 (Hall, Levant, & De Frances, 2012). Even though there have been advances in detection and therapy, HF remains a major problem in the health care system today, with continued admissions and readmissions. Heart failure is now considered to be at epidemic proportions in people greater than 65 years, with increased morbidity and mortality and increased healthcare costs (Roger, 2013).

With more than 670,000 new cases of HF diagnosed each year, this disease accounts for 34% of cardiovascular-related deaths and is the fastest growing clinical cardiac disease, affecting 2% of our population (AHA, 2011). There is a one in five risk of

developing HF in a person's lifetime, with a prevalence of over 5.8 million Americans and more than 23 million worldwide (Bui et al., 2011). This growing prevalence may be related to the aging population. A higher incidence and prevalence is reported in blacks, Hispanics, Native Americans, and immigrants from developing nations, which is directly related to the higher incidence of hypertension and diabetes in these populations (AHA, 2011). This in turn may be related to suboptimal health care or lack of preventive health care for common diseases such as hypertension, diabetes, and ischemic heart disease in other countries (Bui et al., 2011) as well as in the US.

Management of HF

The primary management strategy for HF is to reduce morbidity and mortality and prevent complications to improve clinical outcomes (Kalogiru, Lambrinou, Middleton, & Sourtzi, 2012). Treatment is based upon symptoms and is directed at decreasing the work load on the heart. Both the ACC and the AHA have published Hospital Clinical Performance Measures for in-patients with HF which include discharge medication instructions, evaluation of left ventricular systolic function, angiotensin-converting enzyme inhibitors, angiotensin-receptor blocker, adult smoking cessation, and anticoagulation therapy if atrial fibrillation is present (Bonow, Bennett, & Casey, 2005).

Medications may include diuretics to reduce preload, oxygen, nitrates, and morphine to improve myocardial oxygenation, ace inhibitors which reduce preload and afterload by lowering BP thus reducing workload on the heart, and beat-blockers that reduce myocardial demand by slowing the heart rate (Ermis & Melander, 2012). Oxygen is used

for symptomatic management. Nitrates induce an increase in cardiac output in heart failure patients by causing a reduction in left ventricular afterload (Breidhardt et al., 2009). Diuretics are extremely important in that they increase the excretion of salt and excess fluid, resulting in decreased fluid retention, especially in the lungs and lower extremities, as well as decreased cardiac workload. ACE inhibitors or angiotensin receptor antagonists (ARB) have been shown to have life prolonging effects by improving the structure and function of the heart by blunting the increase in heart size which can be a cause of the diminished heart function and low ejection fraction (EF) (Gardetto & Carroll, 2007). Beta blockers are one of the first line medications used to reduce preload, decrease the risk of sudden death, and improve function of the left ventricle by slowing the heart rate and decreasing the workload on the heart (Ermis & Melander, 2012).

HF Guidelines

The AHA/ACC guidelines (2013) focus on the importance of discharge planning that includes activity level, diet, discharge medications, weight monitoring, and what to do if symptoms worsen. The Joint Commission National Quality performance measures also require that when patients with a diagnosis of HF are discharged from hospital they receive educational material and written discharge instructions about activity level, diet, discharge medications, weight monitoring, and what to do if symptoms worsen (JCAHO, 2010). As of 2011, hospital performance measures have been publicly reported and booking post discharge appointments for patients with HF was added to the list of

recommendations for HF performance measures (AHRQ, 2013). A brief review of each content area will be presented next.

Activity Level and Exercise. To reduce readmissions and improve ambulatory status, it is important that people with HF increase exercise and activity as tolerated (AHA, 2011). Guidelines from the Joint Commission National Quality Performance Measures require that patients with HF should receive discharge instruction about what activities they are able to perform upon discharge (JCAHO, 2010). There should be recommendations by the nurse educator upon discharge about what type of activity the individuals are able to do, how long the activity is appropriate to carry out, and what physiological changes may be noted with increased activity (AHA, 2011). The importance of warm up and cool down exercises should be encouraged for HF patients prior to starting.

Diet. Foods high in sodium, more commonly known as salt, make the body hold fluid, so it is recommended that people with HF eat less of them (Purcell & Fletcher, 2012). Excessive intake of dietary sodium is a common cause of hospitalizations and worsening symptoms for HF patients (AHA, 2011). With 90% of Americans at risk for hypertension in their lifetime, the AHA suggests reducing sodium intake by 1,200 mg daily for everyone. People with HF must be educated and counselled that sodium intake should be limited to 2000 mg per day (Lainscak et al., 2011) They should be advised on how to read food labels correctly and how to identify the sodium content per serving on a label (AHA, 2011). Counseling by health care providers to people about restricting sodium intake if going out to dinner or are away from home is an important aspect of

discharge instructions (Welsh et al., 2010). Positive outcomes are seen when people with HF adhere to low sodium diet, demonstrated by decreased swelling, decreased shortness of breath, decrease hospitalizations, and more energy. This should be described in detail to HF patients when educating about the importance in adhering to a sodium restricted diet (Welsh et al.).

Discharge medications. According to the AHA (2011), it is imperative that people with HF be educated about HF medications, including name and basic reason for the medication, dosing scheduling, side effects, and what to do if there is a missed dosage. Having patients read back the instructions after receiving education helps in assessing the patient's literacy and potential compliance. Another area when reviewing HF prescriptions is to go over the dates for the medications to be refilled (AHA).

Weight management. To better manage HF health, it is important for people with HF to weigh themselves daily, early morning on the same scale, after getting up and emptying the bladder. They should understand the concept of a daily weight monitoring, how today's weight is compared with "dry" weight, and actions to take when weight increases. People with HF should report any rapid weight gain of greater than three pounds in one to two days of normal eating or two pounds overnight to their provider (Purcell & Fletcher, 2012).

Symptoms to Report. People with HF should be aware of specific symptoms that would indicate a need to take action, such as calling the provider or going to the hospital. Examples of warning signs and symptoms would include shortness of breath, persistent coughing or wheezing, excess body fluid in ankles, feet, hands, stomach, or legs,

decrease inactivity tolerance, lack of appetite, and nausea (AHA, 2011). A tool that can be utilized in educating patients about HF is the one page *Red-Yellow-Green Congestive Heart Failure Tool*. This HF tool uses the color of a stoplight to guide patients in managing their HF symptoms and should be reviewed with HF patients prior to discharge. The written tool is divided into green (“all clear”), yellow (“caution”), and red (“medical alert”) zones. Each of these zones provides the patient with HF signs and symptoms, ways to manage their condition, and when to seek emergency help (AHRQ, 2013).

Discharge Education and Hospital Readmissions

Research has shown that many HF patients will be readmitted soon after they are discharged and may have repeated admissions (Ermis & Melander, 2012). Discharge education about HF provided by health care providers is an important component in preventing readmissions (JCAHO, 2010). The aim is to provide education about HF management to assist people to make changes in their behavior conducive to improved HF management. Providing individualized discharge instructions including medication reconciliation, scheduling follow up appointments, and warning patients about signs and symptoms of worsening HF has been one way used by some hospitals to improve clinical outcomes by decreasing readmission rates (Silow-Carroll et al., 2011).

HF classes provided by a nurse educator prior to discharge were compared to traditional HF education to determine which educational program would yield more improvement in clinical outcomes in patients with HF. The classes included one-on-one HF classes by a HF nurse educator delivered to a total of 223 total inpatients, who were

randomized to a standard HF discharge education (control), or standard HF education plus the hour nurse educator class (intervention). The one hour nurse educator class consisted of education about low sodium diet, fluid restriction, causes of HF, and reasons for specific HF medications. The subjects were followed at 30, 90, and 180 days after discharge, at which time the Minnesota Living with Heart Failure Questionnaire was administered. One hundred and eighty days was the endpoint of the study to evaluate the number of days that patients were hospitalized or died during that period. Results demonstrated a lower incidence of hospitalizations and deaths in patients who received educational intervention by the nurse educator (n=107) as compared to the control group (n=116) who received the standard discharge process (p=0.009). Patients who received the targeted HF education by the nurse educator had less hospitalizations and less chance of dying with better clinical outcomes (p=0.018).

McAlister, Stewary, Ferrua, and McMurray (2004) evaluated, through a systematic review of 29 randomized control trials, if multidisciplinary strategies used to improve HF outcomes in patients at high risk were successful. Data in this study were retrieved by searching electronic data bases, bibliographies, and contact with HF experts. The selection criteria included that studies had to report on the impact of mortality or hospitalization rates in patients with HF. Multidisciplinary teams providing specialized follow up were associated with a reduced mortality risk (RR 0.75 CI 0.59 to 0.96). In strategies that utilized telephone follow-up with instructions to see the regular physician in the event of deterioration, there was a reduction in hospitalizations (RR 0.75, 95% CI 0.57 to 0.99) but there was no decrease in mortality (CI 0.67 to 1.29). Six of 19 trials

found significant reductions ($p= 0.36$) in at least one hospitalization. The results of this meta-analysis concluded that there was a 27% reduction in HF hospitalizations due to the use of multidisciplinary strategies.

At John Hopkins Hospital and John Hopkins Bayview Medical Center, a prospective randomized trial was performed that included 200 hospitalized subjects with class III/IV HF who were at high risk for readmission (Kasper et al., 2002). The purpose of the study was to reduce hospitalizations, readmissions, and death due to HF, using an outpatient multidisciplinary approach. The median age of the subjects was 63.5 years and all had LVEF <40%; all subjects were at high risks for hospital readmissions because of their age and low EF. The intervention group was designed to improve treatment, patient compliance, and thus improve outcomes over a six month period. The intervention group consisted of a telephone nurse coordinator, HF nurse, HF cardiologist, and PCP. The nonintervention group was cared for by the PCP alone. The main outcome variable was mortality from any cause and total number of HF admissions. Data were evaluated using the t test and the Wilcoxon rank-sum statistic. The findings noted that there were 59 hospital admissions for HF among 35 patients in the nonintervention group and 43 admissions among 26 patients in the intervention group ($p=0.09$). In the intervention group, there were fewer admissions overall ($p= 0.03$). Results of the study concluded that a multidisciplinary approach using frequent monitoring, patient education, and close interaction with the PCP can reduce readmissions, mortality, and improve quality of life for the HF patient.

Effectiveness of Patient Education Strategies

In a systematic review of randomized controlled trials conducted between the years 1998 to 2008, Boyde, Turner, Thompson, and Stewart (2011) evaluated educational interventions implemented for HF patients and their effectiveness. A total of 19 studies were evaluated that included a total of 2,686 patients. A variety of educational interventions were reviewed in the trials including: one-on-one patient education sessions lasting one to two and one half hours; use of multidisciplinary teams; use of health educators for patients; a three hour session to educate nurses and physicians about ways to educate their HF patients; follow-up education including take home booklets of guidelines to follow; take home videos; or phone calls. One component measured in these educational interventions was to evaluate the effectiveness of these strategies and the effect that they would have on patient outcomes such as readmissions, quality of life, and readmission rates. In eight studies, knowledge of HF was evaluated and in 12 of the studies, quality of life was reported using a variety of questionnaires such as the Minnesota Living with HF (MLHF). Of the 19 randomized trials reviewed, only seven of the 19 used theorists to guide their research. Results of this systematic review demonstrated that verbal teaching was found to be the least effective and needed to be supplemented with other educational reinforcement to be successful. In studies that measured knowledge, continued improvement in knowledge was demonstrated, though it was noted that there might not be a corresponding change in self-care behavior. Of the 12 studies measuring quality of life using the MLHF, only two reported improvement in scores following an educational intervention. In 13 of the studies, readmission rates were

measured with four studies displaying a substantial decrease in readmissions following educational interventions. In conclusion, this review demonstrated that verbal HF education is the least effective. There were no clear conclusions as to what was the best intervention because of variation in educational interventions and outcomes measured.

A qualitative study by Britz & Dunn (2010) examined if there were self-care deficits and quality of life indicators among HF patients at the time of discharge from acute care settings. The descriptive study examined the relationship between HF, quality of life, and self-care. A convenience sample of 30 HF patients, 19 males and 11 females, was recruited to complete a 22-item questionnaire that examined self-care maintenance, self-care management, and self-care confidence. Quality of life was measured using the MLHF questionnaire. Results demonstrated that females in the study were more apt to manage and maintain their HF symptoms and self-care better than the male participants ($p < 0.05$), and older participants had more confidence in their self-care ($p < 0.5$). According to the authors, the study overall demonstrated that persons who had more confidence in addressing their individual self-care needs had significant better quality of health than those who were less confident ($p < 0.01$). Patients who had a decrease in self-care abilities, as measured by decreased activities, challenges with medication compliance, following low sodium diet, maintaining fluid restriction weighing themselves daily, and being able to recognize early signs and symptoms of worsening HF, were identified as having frequent hospitalizations and decreased quality of life ($p < .01$).

Jaarsma et al. (2013) conducted a secondary analysis and collected data from 5964 HF patients from 15 different countries using the Self-care Index and the European Heart Failure Self Care Behavior scale. The descriptive study examined if patients were knowledgeable about five self-care behaviors, identified as restriction of salt intake, physical activity, regular weighing, flu shot, and knowledge of medications. The data were analyzed using descriptive statistics. The authors determined that there were variability in the results depending on the country. In 50% of the respondents, both exercise and knowledge about regular weighing were lacking. Annual flu shots, diet restrictions, and knowledge of self-care were also poor and varied according to the country studied. The researchers concluded that all countries needed clinicians to improve in the area of providing quality education related to self-care behaviors to HF patients. Jaarsma et al. stated that this education could potentially be effective in promoting self-care and preventing readmissions in people with HF. The authors also attributed the disparity in self-care behavior to lack of access to medical care, lack of availability to programs, cultural differences, and dietary customs.

A study conducted by van der Wal et al. (2006) examined compliance and related factors in a cohort of 501 people with HF in Europe. This population consisted of symptomatic HF patients in the Netherlands hospitalized between November 2002 and February 2005. The purpose of the study was to determine the variables that were related to compliance. A definition of compliance from the World Health Organization (WHO) was used, that is the extent to which the patient's behaviors correspond with agreed recommendations from a health care provider. The qualitative study evaluated factors

associated with compliance including the patients' actual knowledge about HF and the HF regimen. The Health Belief Model was used as a theory in this study to help explain the health behaviors of individuals with HF. Compliance was measured using the Revised HF Compliance Questionnaire. The questionnaire identified important health behaviors including appointment-keeping, daily weighing, exercise, medication, sodium-restricted diet, and fluid restriction. The most important problem noted for those involved with the study was being thirsty, medication compliance, and daily weighing. Patients had difficulty with diuretics compliance due to nighttime voiding. The authors noted a knowledge deficit related not only to daily weights and fluid restriction but also about the HF regimen. The researchers concluded that it is a challenge to educate people in healthy behaviors to reduce barriers with HF. Finding the variables that are related to HF patients being compliant with their self-care is most important for health care providers to educate and integrate strategies to improve compliancy. The authors recommended a change of patient's beliefs through education and counseling by health care providers.

Discharge Education

Nurse HF specialists and multidisciplinary teams have the potential to improve HF outcomes and quality of life if utilized effectively in the discharge process. Phillips, Kern, Singa, Shepperd, & Rubin (2011) evaluated the effect of comprehensive discharge planning plus post-discharge support on readmission rates for older adults with HF (mean age >55 years). The meta-analysis aim was to evaluate what improved health outcomes for HF patients and thus reduced readmissions. An extensive review of 18

studies with data from eight countries was used. All the studies evaluated the efficacy of comprehensive discharge planning with discharge support. Post discharge support varied by study. Risk of readmission was stratified by what types of post discharge support the patient received. The review demonstrated that all-cause mortality was lower ($p=0.6$) and quality of life improved from baseline by 25.7% in patients randomized to a tailored intervention. Comprehensive discharge planning and post discharge support were associated in a 25% reduction in readmission rates and a 13% decrease in all-cause mortality. Results of the studies demonstrated the importance of education, discharge planning, and follow up of the patients with HF in preventing frequency of readmissions.

Nurse as Educator

Patient education provided by nurses has always been a key component in the comprehensive care plan for patients with HF. A cardiac nurse led, evidence based practice based education class, offered to people with HF, has been shown to improve outcomes (Paul, 2008). In the review of literature, Paul identified a variety of educational strategies as useful when providing discharge education to people with HF. Heart failure education needs to incorporate evidence based recommended guidelines and address self-care needs. Evidence shows that patients who are educated prior to discharge have less readmissions and decrease morbidity and mortality (Paul). Strategies used to promote positive outcomes were reviewed as well as barriers that block HF patients being compliant with self-care. Once barriers are identified, nurses as educators may adjust the educational methods used. Examples of barriers associated with noncompliance with self-care include: complex medication regimens; cognitive

impairments; inconsistent teaching by nurses; and lack of motivation and noncompliance with following sodium restricted or limited fluid intake diets. Nurses have an obligation to educate patients, families, and other nurse's about HF guidelines. The author noted that nurses' educational teaching methods vary, but that consistent use of evidenced based strategies will improve outcomes (Paul, 2008). Nurses also need to be knowledgeable about the information they are they are educating HF patients about.

Patient education programs provided by nurses about managing HF related self-care at home have shown to be effective in reducing readmissions (Stromberg, 2005). In this review of literature, Stromberg examined HF management programs that focused on education as a key component in reducing readmissions. According to Stromberg, readmissions for HF patients may be caused by patients' failure to adhere to medical treatment, including the diet regime, inability to perform self-care behavior, including worsening symptoms, and failure to take action to prevent further deterioration. Knowledge as well as lack of knowledge can contribute to problems; for example, a person may know to record daily weights but not realize that weight gain is an indicator of a problem. The author concluded that nursing education related to HF is paramount to patient's ability to perform self-care behaviors after discharge. Educational strategies need to be designed for HF patients, and nurses need to assess patients' level of understanding and design interventions accordingly.

Nurses' Knowledge of Heart Failure

The Joint Commission mandates nurse led education for HF patients prior to discharge, yet how long, what is being taught, and how much information is being

provided have not been studied. Research that examines nurses' knowledge about HF will be reviewed next.

According to Hart, Spiva, and Kimble (2011), nurses are at the forefront of educating patients and must have the knowledge and skills to adequately educate patients about HF management. The authors conducted a two part psychomotor non-experimental design study that compared the psychometric characteristics of the original *Nurses' Knowledge of Heart Failure Education Principles Survey* by Albert et al. (2002) to test-retest reliability of a revised survey. The aim was to identify which survey would be most useful in identifying nurses' knowledge gaps in teaching HF management skill. The surveys identify HF self- management principles that nurses should be knowledgeable about, including diet, patients weighing themselves, signs and symptoms of worsening conditions, medications, and exercise. A total of 74 nurses completed two versions of the *Nurse's Knowledge of Heart Failure Education Principles* survey. Results concluded that nurses were knowledgeable about the importance of asymptomatic people continuing daily weight but were least knowledgeable about how to advise asymptomatic people to deal with a low BP reading. The revised survey was found to be more useful in identifying gaps in nurses' knowledge about HF management such as monitoring daily weights and dealing with low BP and dizziness.

In a study by Delaney, Apostolidis, Lachapelle, & Fortinsky (2011), the researchers evaluated home care nurses' knowledge of evidence base education topics in managing HF. The purpose of the study was to evaluate home care nurses educational needs in providing HF education. There were 94 nurses from four home care agencies included in

the study, which reflected a 57 % response rate. A 20-item HF knowledge questionnaire by Albert et al. (2002) was administered to participants. Individualized questions within each topic were analyzed by high or low- scoring. The results demonstrated that the home care nurses had a 78.9% knowledge level of HF education principles. The nurses scored lowest on knowledge related to asymptomatic hypotension, daily weight monitoring, and transient dizziness in HF patients. Correct responses to individual survey questions ranged from 24.5% -100%. Overall the results suggested that home care nurses may not be knowledgeable about evidenced based education in managing HF, and that there is a need for educational programs to increase home care nurses knowledge in managing HF.

Nurses' lack of knowledge related to HF self- management may affect their ability to perform discharge instructions adequately. In a prospective exploratory study conducted by Mahramus et al. (2013), a group of clinical nurse specialist researchers assessed nurses' knowledge of HF in three primary care settings: a teaching hospital; community hospital; and a home health care agency in Southeastern US. A total of 160 registered nurses were recruited to participate by accessing an online site to complete a knowledge assessment of HF. Of the 160 RN's, 108 nurses actually accessed the test site and 98 completed the HF knowledge test. The research also used *the Nurses Knowledge of Heart Failure Education Principles* survey developed by Albert et al. (2002). Nurses' knowledge of self-care management principles patients was low, with a mean score of 71%; the passing score was 85%. Of the 98 nurses who completed the test, only nine received the passing score. Three items on the survey (knowledge about medications;

management of signs and symptoms; weight monitoring) were answered incorrectly more than 75% of the time. Nurses who worked in an acute care setting had numerically higher mean scores (72.9) than the home care nurses score (70.4), yet there was lack of knowledge of HF by all the nurses enrolled. Results indicated that nurses continue to lack knowledge about HF self-care management principles. According to the researchers, strengthening nurses' knowledge about HF is imperative and the CNS can provide evidenced- based education to increase nurses' knowledge about self-management of this chronic disease.

As demonstrated through this review of literature, there appears to be a deficit in nurses' knowledge related to key principles that need to be taught to people with HF about comprehensive HF self-management. Extensive literature has examined t ways to reduce readmissions through educating the patients, but there was much less literature about exploring nurses' knowledge about HF management. The purpose of this program development is to increase nurses' knowledge regarding HF education to be provided to HF patients prior to discharge from the acute care setting.

Theoretical Framework

The Theory of Self-efficacy by Albert Bandura is the theoretical framework chosen for this study. The belief in self-efficacy is the belief in one's effectiveness in performing tasks or producing an effect. An efficacy expectation is the conviction that one can successfully execute the behavior required to produce the outcomes. The basic principle of self-efficacy theory implies that people are most likely to engage in a certain activity if they perceive they will be competent at the activity. Self-efficacy provides the foundation for people being motivated, feeling a sense of well-being and personal accomplishments. According to Bandura (1977) people with these feelings of personal accomplishment become more active in their efforts to achieve goals and produce outcomes. Self-efficacy derives from 4 sources: performance accomplishments, vicarious experiences, verbal persuasion, and physiological state. Performance accomplishments are the most influential sources of self-efficacy because they are derived from personal experiences and successes (Bandura).

Self-efficacy is important for the learner as well as educators. The theoretical framework can also be used for nurses in educating patients about HF. Nurses should have the conviction or self-efficacy that they can be successful in teaching patients about HF guidelines thus improving the patient's self-care management. It is important that nurses, as educators, feel motivated in helping HF patients produce positive outcomes that will improve their quality of life. Nurses who have a higher instructional efficacy may become more knowledgeable about the HF guidelines and devote more instructional time to HF patient's resulting in better compliancy for the patient. The nurse with high-

efficacy will also put determination and motivation in their HF education to the patient. Not succeeding and seeing a patient fail by being readmitted within 30 days is not an option for a nurse with a strong self-efficacy. By increasing the nurse's knowledge about HF the researcher hopes that the nurses feel competent and determined to succeed in educating HF patients about the HF guidelines and self-care management.

Albert et al. (2002) conducted a study to evaluate nurse's knowledge about HF self-management principles using the self-efficacy theory. Prior to nurses developing improved personal mastery in HF education the nurses need to have an understanding of HF education to succeed. In the study the self- efficacy theory was used in relation to increasing nurse's knowledge, behavior and motivation in educating HF patients. The outcomes of nurses' knowledge of HF self-management education can be influenced by the nurse's self-efficacy. If nurses master self-efficacy it will lead nurses to have mastery of the information they are educating HF patients about (Albert et al.). The study concluded that nurses were not being properly educated in HF self-management principles. Before implementation of HF education programs it is important to assess nurse's knowledge about heart failure education principles and nurses must receive correct information about HF principles in order to educate patients effectively (Albert et al.).

Methodology

Purpose

The purpose of this program development was to increase nurses' knowledge regarding HF education to be provided to HF patients prior to discharge from the acute care setting. The research question is: Will an education program increase nurses' knowledge about what to teach people with HF?

Design

The design of this study was a quasi-experimental program development with a pre-test, intervention, and post-test. The intervention was an educational session developed and provided to nurses on a medical telemetry unit.

Sample/Site

This project used a nonprobability convenience sampling. The participants were a convenience sample consisting of registered nurses (RNs) who worked on a 38 bed medical telemetry unit at Rhode Island Hospital (RIH), a 719 bed Level One trauma center in Providence, Rhode Island. The plan was for 1/3 of the RNs working on the study unit to participate in the study. The inclusion criteria consisted of all part time and full time RNs with an AD, BSN, or diploma degree who worked on the study unit. The exclusion criteria consisted of all nurse administrators, nurse managers, or float RNs.

Procedures

Prior to beginning the project, the researcher obtained approval from Rhode Island College and Lifespan IRBs. Permission was also obtained from the Chief Nursing Officer and the telemetry unit clinical manager.

An IRB approved informational letter (Appendix A) describing the study, purpose, and procedure was sent to all RNs on the study unit via hospital email and was also available in the nurses' break room. Nurses were informed of the purpose of the study, the procedures, and that there are no identifiable risks or benefits to them except that participation may increase their knowledge of HF. Nurses were notified that their participation was voluntary and would not effect their employment, relationship with their clinical manager, or yearly evaluation if they decided not to participate.

The IRB approved informational letter and an attached copy of the pre-test (Appendix B) was placed in an envelope in the nurses' break room. The nurses were then asked to anonymously complete the pre-test and to add on a designated space the first two letters of their mothers' maiden name followed by first two letters of their birth month as an identifier. Nurses were asked to return the pre-test in a sealed drop box that was placed in the break room. The survey was available for nurses to complete over a two week period, with reminders provided by email at four days, 10 days, and 15 days. All surveys were collected by the researcher within two weeks of placement on the unit.

After the pre-test was completed, the nurses were invited, via the IRB approved informational letter placed in the nurses' break room, to sign up and attend a 25 minute HF education class. A calendar with the dates and times that the researcher was available to provide the education was also posted in the break room. The 25 minute class was offered seven times over a six week period at lunch or dinner breaks, with the researcher supplying pizza and soft drinks.

Prior to beginning each class, a copy of the IRB approved informational letter was distributed. Nurses were asked to review the letter, and reminded that participation was voluntary and that they could withdraw at any time. They were told that at the end of the class, they would again be asked to complete a post-test (Appendix B), which was identical to the pre-test. They were asked to include the same personal identifiers on the post-test and after completion to insert the test into the sealed lock box in the break room.

The class content was designed by the student researcher, guided by the review of literature, and included HF guidelines, with consideration of the principles included in the HF booklet provided to patients at the study hospital.

Development of the Educational Intervention

The HF education program development was developed and implemented using the W. K. Kellogg Foundation's Logic Model for Program development (Logic Model Development Guide, 2004). The Logic Model is a framework that documents program or service goals, related and measureable objectives to achieve the goals, related activities to achieve the objectives, and related performance measures and individual outcomes.

When read from left to right, the Logic Model (Figure 1) describes a program's development over time from planning through results.

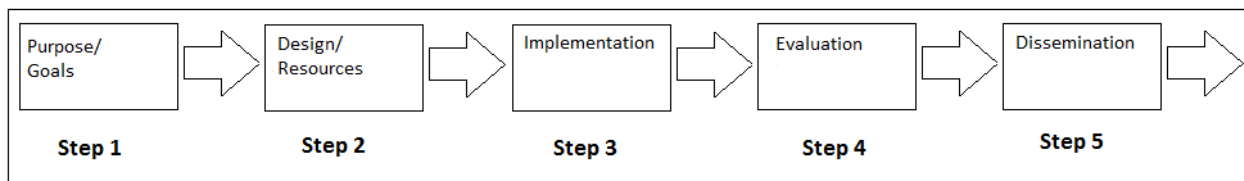


Figure 1: Template of Logic Model

Step 1: Purpose/Goals. This step determines the overall goal of the program, which was to educate nurses on the study unit about HF guidelines and hospital core performance measures. The purpose of this program development was to increase nurses' knowledge regarding heart failure education to be provided to HF patients prior to discharge from the acute care setting. Prior to developing the program, a focused needs assessment was conducted.

Needs Assessment. Rhode Island Hospital (RIH), a Lifespan facility, is the main teaching hospital of the Warren Alpert Medical School at Brown University. This facility is a 719 acute care hospital in Providence, RI. Rhode Island Hospital and its' Department of Nursing have initiated six dimensions of quality care to improve health care according to the recommendations from the Institute for Healthcare Improvement (IHI, 2013). The six dimensions were used hospital-wide and included safety, effectiveness, efficient, patient centered, timely, and equitable. These dimensions were evaluated by an interdisciplinary hospital team including nursing staff, nurse leadership, quality management, and physicians in an effort designed to improve the structures, processes, and outcomes of care. The hospital initiated this Quality Improvement Team for HF, or "QIT", since HF indicators were below target. Over time, the work of the QIT team resulted in one indicator remaining below the desired target: discharge instructions given to HF patients. Many interventions had been implemented, such as a revised HF education tool was added to the hospital HF booklet. This tool included what were referred to as 'HF zones', which consisted of colored zones warning patients to call

physician if they have certain symptoms. Despite these interventions, this quality indicator continued to warrant further improvement efforts.

The compliance scores for HF discharge instructions are tracked by both the Centers for Medicare and Medicaid Services (CMS) and RIH and are publically reported. Rhode Island Hospital's focus had been on how the organization could ensure that all HF patients received discharge education that included diet, weight monitoring, medications, activity, what to do if symptoms worsen, and scheduling follow up appointments at discharge. The goal of the hospital was to improve nursing documentation and education regarding HF education provided during hospitalization and upon discharge, ultimately improving patient outcomes and compliance scores.

Analysis by the HF "QIT" as of March 2013 indicated that the HF discharge instruction process included barriers and variables that were impacting the discharge teaching process. These variables included unclear roles and responsibilities of RNs, HF considered as secondary diagnosis during the admission, unit to unit or RN to RN HF knowledge variance depending on specialty, and whether patients were newly diagnosed with HF upon admission. The RN to RN knowledge level variance related to HF teaching was the focus of this program development. Emphasis was placed on educating the nurses about current HF principles and guidelines to improve and standardize the content taught to HF patients prior to discharge.

Step Two. Design/Resources. The design and resources include the human, financial, and organizational resources that a program has available to direct toward implementation. The most significant resource needed to launch the educational

intervention was the time availability for the nurses on the study unit to participate in the educational intervention. The developer had the support of the nurse manger on the study unit to conduct the study and to provide adequate time for nurses to attend when the classes were offered. The student developer also had the support of nurses, quality nurse HF educators, and members of the HF “QIT” team. The plan for the project was discussed with the HF committee members, nurse managers, and members of the HF “QIT” committee.

Step Three. Implementation. Implementation is the management plan that assisted the researcher to identify and collect data needed to monitor the program development. This plan was launched after the nurses completed the pre-test. The intervention consisted of a 25 minute educational program that was developed using the latest evidenced based guidelines and guided by the HF booklet provided to people with HF at the time of admission. In Table 1 below, the program content and objectives are illustrated.

Table 1.

Content and Objectives: HF Education Intervention

Content	Objectives
I. What is heart failure? Common signs and symptoms.	The nurse will understand how heart failure affects heart function and common signs and symptoms of HF.
II. Dietary and alcohol restrictions for HF patients.	The nurse will be knowledgeable about dietary and alcohol restrictions for HF patients.
III. Significance of daily weighing of HF patients.	The nurse will be informed of the importance of daily weighing and worsening signs & symptoms of HF.
IV. Signs and symptoms of worsening heart failure.	The nurse will be knowledgeable about the worsening signs and symptoms of heart failure.
V. Heart failure medications and what patients should know.	The nurse will be knowledgeable about HF medications and what patients should know.
VI. Importance of activity for HF patients.	The nurse will recognize the importance of HF patients being active.
VII. HF elements that nurses are knowledgeable about prior to discharge of patients: diet, activity level, medications, medications, worsening signs & symptoms, follow up appt.	The nurse will be knowledgeable about the six HF elements to educate patients about prior to their discharge.

Step 4: Evaluation: According to Kellogg Logic Model Development Guide (2004), the success of a program relies on how and why a program may solve a particular problem or generates new possibilities. Nurses were asked to complete a pre and post-

test survey and after the class were asked if they considered the education program was helpful to them in understanding what to educate HF about prior to their discharge.

Measurement. Nurses' knowledge of HF self-care was assessed using a 20 question true or false pre- and post-test survey called the *Nurses Knowledge of Heart Failure Education Principles Survey* developed by Albert et al.(2002) (Appendix B). According to the author, since the tool had many themes that were measured, it was not meant to have strong internal reliability. The tool has undergone test-retest reliability and the Kappa score was reported at 0.70 that equates to "good" or "substantial" range (Albert et al.). Validity was evaluated by expert HF nurses involved in HF research conducted by the instrument's author.

Step 5: Dissemination. Results were shared with participants, unit managers, and the CNO as well as presented at RIC as part of the Graduate Symposium presentation of MSN major project.

Data Analysis

Descriptive statistics were performed on study variables and pre- and post-test scores were compared.

Next, the results will be described.

Results

Nine RNs out of thirty two (28.8%) agreed to participate in the study. All RNs completed the pre-test, attended one of the HF education classes, and then completed the post-test. Participants' test scores for the pre and post- tests are illustrated in Table 1.

Table 1

Pre-Test, Post-Test, and Change Scores for Participants (N = 9)

ID #	Pre-Test Score	Post-Test Score	Change Score
1	80	90	+10
2	90	95	+5
3	85	95	+10
4	55	85	+30
5	70	85	+15
6	70	80	+10
7	60	70	+10
8	80	90	+10
9	70	85	+5

Pre-tests scores ranged from 60 to 90 out of a possible 100, with a mean score of 73.3%. Post-test scores ranged from 70 to 95 out of a possible 100, with a mean score of 86.1%. As can be seen, all participants' scores increased in the post-test; on average, scores increased almost 13%.

Table 2 Illustrates the percent correct on each of the survey questions for both the pre and post-tests. (N=9).

Table 2

Nurses Knowledge of Heart Failure Principles Survey

Questions	Pre-test	Post-test
1	100%	100%
2	88.8%	100%
3	44.4%	88.8%
4	88.8%	88.8%
5	88.8%	100%
6	77.7%	88.8%
7	88.8%	100%
8	33.3%	88.8%
9	33.3%	66.6%
10	77.7%	100%
11	77.7%	88.8%
12	88.8%	100%
13	77.7%	100%
14	100%	100%
15	44.4%	66.6%
16	0%	22.2%
17	100%	100%
18	44.4%	88.8%
19	100%	100%
20	100%	100%

The percentage of participants answering individual survey questions correctly ranged from 0% to 100% on the pre-test and 22.2% to 100% on the post test. The mean percent correct by question was 72.8% for the pre-test and 89.5% for the post test, reflecting an increase of 16.7%. Most questions revealed an increase in percent correct from pre to post (n = 14), with six questions showing no increase.

Some of the lowest scores on the pre-test, less than 50%, were questions addressing coughing, nausea and poor appetite as common HF symptoms (Item 3), use of NSAIDS

and aspirin if HF patient has aches and pain (Item 8), use of potassium based salt substitutes to season food (Item 9), Understanding difference of daily weights from dry weight (Item 15), and notifying their physician if they experience dizziness or lightheadedness (Item 18).

Four questions were answered correctly by all RNs both pre and post; these questions focused on HF patients drinking plenty of fluid each day (Item 1), obtaining daily weights once HF symptoms gone (Item 14), notifying physician if worsening fatigue (item 19), and worsening leg weakness or inability to exercise (item 20).

Five of the 20 questions were answered correctly by 88.8% of the RNs participating in the pre-test. There was one question about notifying physician if HF patient had BP recording of 80/50 without any HF symptoms (item 16) that was not answered correctly by any RN on the pre-test, and only two (22.2%) answered correctly on the post test.

On the post-test 11 questions were answered correctly by 100% of the RNs' after the education class (Items 1, 2, 5, 7, 10,12,13,14,17,19,20). Six of the 20 questions were answered correctly by 88.8% of the RNs' participating in the post-test (Items 3,4,6,8, 11, 18). One question (Item 16) was answered correctly by 22.2% of the RNs on the post-test; no RNs answered this correctly on the pre-test. This question related to patients notifying their physician if they have a BP recording of 80/56 without any HF symptoms.

Summary and Conclusions

Heart failure is a chronic disease requiring multiple hospitalizations over its' course and a growing problem in our health care system today. Heart failure is the principal reason for more than one million hospitalizations yearly (Ermis & Melander, 2012). The high readmission rates for Medicare patients with HF within 30 days of discharge cost 17.4 billion in 2004 (Jencks et al., 2009). Providing individualized discharge instructions, including medication reconciliation, scheduling follow up appointments, and warning patients about signs and symptoms of worsening HF has been one approach used by some hospitals to improve clinical outcomes and decrease readmission rates (Silow-Carroll et al., 2011). The review of the literature supported that strategies and interventions implemented by hospitals to reduce hospital admissions and readmissions for HF have not been consistently successful. Heart failure impacts the quality of life of people with the disease and imposes an economic strain on both the community and the healthcare system overall.

Patient education is an important strategy for the management of HF in order to improve quality of life, optimize patient outcomes, and reduce the use of healthcare resources by impacting admissions and re-admissions. Health professionals, particularly nurses, are at the forefront in the development of educational programs for people with HF. It is essential that nurses are knowledgeable and have access to the most up to date, evidence based materials to educate patients prior to their discharge from an acute care setting. Such nurses would be well equipped to implement evidenced based educational

interventions for people with HF; the intent is that better educated patients will demonstrate more positive outcomes.

The purpose of this study was to increase nurses' knowledge regarding HF education to be provided to HF patients prior to discharge from the acute care setting. A needs assessment was performed prior to implementation of the study. The facility had initiated a Quality Improvement Team for HF ("QIT") to work on HF indicators. One of the indicators identified as needing improvement was discharge instructions provided to HF patients prior to discharge. It was determined by the researcher that development of a HF education program targeting nurses was indicated.

The class content was designed by the student researcher, guided by the review of literature, and included HF guidelines, with consideration of the principles included in the HF booklet provided to patients at the study hospital. Content was based on nurses' understanding of the six HF elements: diet; activity level; daily weights; HF medications; worsening signs and symptoms; and follow up appointments. Registered nurses on the study unit (n = 9) participated in the class, which was offered several times. Nurses were administered a test developed by Nancy Albert prior to and after the session to measure HF knowledge.

Findings from this study indicated that providing HF education classes to nurses can be successful in increasing nurses' knowledge. In this study, the pre-test scores ranged from 55-90 out of possible 100, with a mean score of 73.3%. Post-test scores ranged from 70-95 out of a possible 100, with a mean score of 86.1%, an increase of almost 13% from pre-test.

Several limitations were acknowledged. The sample size was limited; while one third participation was desired, which would have equaled 10 nurses, nine participated. The study unit was an extremely busy medical telemetry unit; the classes were scheduled, with some refreshments provided, during a brief break. Attendance was a challenge for some; most who did participate worked on the weekend, on the 12 hour night shift (n=6), and were able to take the time when patients were sleeping to attend the education class. Only three nurses from the day shift where discharge instructions are also provided were able to attend.

Nurses on the study unit had been asked just prior to participating in this project to complete another unrelated survey. This may have caused overload and contributed to nurses not participating. While nurses' knowledge improved pre to post test, this did not necessarily mean that the instruction that they provide to patients will improve or that patients will achieve better outcomes.

In conclusion, this educational intervention improved nurses' knowledge. Based upon the results of the pre and post-test, it was recommended that the study institution implement an educational HF program for all RNs. With appropriate reinforcement and follow-up, this could potentially result in more effective teaching as well as improved outcomes for patients. Institutional support in developing and implementing such a program will be essential. Concrete supports such as: enhancing the ability of nurses to attend on-unit sessions; translating the program to Net Learning, a computer generated program available at the site; using existing education materials held by the QIT team; using resources available through Heart Failure Society of America, American Heart

Association, and Agency for Healthcare Research Quality, and The Joint Commission.

Another resource would be the use of a Clinical Nurse Specialist, who could be instrumental in reviewing the existing program, expanding it as indicated, evaluating the program, and providing direct support to nurses and patients. Further research is needed to determine if an educational class provided to nurses about HF guidelines would not only increase knowledge but also make nurses more effective in providing discharge instructions to HF patients.

Next, implications and recommendations will be discussed,

Recommendations and Implications

Based upon the results of the pre and post-test it would be recommended to implement an educational HF program for all RNs at the institution. If all nurses were being taught the same material with the goal of increasing their knowledge of the HF guidelines the discharge instructions may be more effective for the patient and provide better outcomes. In addition if nurses were well versed in the HF guidelines they would be providing information to the patients that they may also receive in the outpatient setting reinforcing the material. In conclusion the addition of a 25 minute education class providing nurses with education regarding the HF guidelines prior to discharge and delivered by the researcher resulted in improve knowledge scores for the nurses on the study unit.

Although much of the literature has been devoted to strategies to improve care processes for HF patients there has been less attention given to assessing nurses' knowledge pertaining to HF guidelines. Nurses' caring for HF patients need to take on the role of being an educator providing HF patients with the most recent evidence, tools and guidelines. There needs to be mores research focused on evaluating nurses' knowledge about HF guidelines and effectiveness of HF discharge instructions. It is paramount and plays an important role in educating HF patients before discharge. The study institution would have to possibly add to Net Learning the education HF power point that the researcher used to educate the nurses and use the QIT team for any follow up questions. Net Learning is a computer generated program that supplies educational and competency programs through the hospital IT department and nursing education. The QIT team has wonderful educational materials about the HF guidelines and may also be

instrumental in providing HF education classes. Other resources could include Heart Failure Society of America, American Heart Association, and Agency for Healthcare Research Quality, and The Joint Commission.

The CDC has developed public health efforts related to HF. These state funded programs were implemented to identify, prevent and monitor chronic diseases and to promote changes to policies and systems. Advanced Practice Registered Nurses (APRN) are encouraged to get involved in these initiatives, become HF experts and bring back the knowledge they obtain back to the institution where they are employed. Another resource would be the use of a CNS who could help in developing a HF educational program throughout the institution, implement the program, monitor and evaluation to assess if it has been successful.

Successful management of HF requires a collaborative interdisciplinary partnership. This can be implemented by an APRN focusing on a nurse centered education plan that begins in the acute care setting and has continuity into the outpatient and community setting. Elements of the HF educational development program would focus on hospital performance core measures, and consideration of the principles included in the HF booklet provided to patients at the institution. Advanced Practice Nurses with HF knowledge should illicit a team approach in educating and coaching nurses, to provide thorough discharge HF education using the HF guidelines published by the ACC, AHA and HFSA. Recent AHA guidelines reiterate that education given to patients with HF should include, diet, nutrition, activity restrictions and medication therapy (AHA, 2013). An APRN is in a unique position as a primary care provider to care for HF patients. The

APRN has advanced education, knowledge and skills to provide primary care and to take on the role of coordinator of care always collaborating with other members of the health care team.

The role of the APRN may enhance nurses' knowledge about HF guidelines and use this knowledge to achieve behaviors in the nurses' that will enhance HF discharge instructions and increase patient self-care. The APRN has an important role as educator for both patient and nurses and is a role model for all nurses. APRNs are also skilled in data collection, research using the most recent EBP which is important in managing HF and future health care modalities. Both the APRN as an important care facilitator, nurses' and a multidisciplinary team will play an important role in the future care of HF patients.

Advanced Practice Registered Nurses' can play an important role implementing continued research on what the best strategies for educating nurses about HF guidelines by involving the institutions nurses, QIT team, and administration. By implementing research and involving nurses it may peak the nurses interest in understanding the importance of research in delivering the best EBP for HF patients upon discharge. The APRN can be successful in being instrumental in initiating a HF educational program for nurses and being a resource as an educator.

The measure of educational effectiveness is outcomes. As an APRN besides being a HF expert in developing educational programs for the nurses, APRNs can also work through RISNA, the state and legislature in implementing state wide HF initiatives. These initiatives should include the most recent EBP, guidelines and research initiated on

HF strategies that all institutions would have access to. Educational policies focusing directly on strategies to improve HF discharge instructions given by nurses could be implemented.

APRN's are great resources for the patient, nurses, and family. The high readmission rates for Medicare patients within 30 days of discharge cost 17.4 billion in 2004 (Jencks, Williams & Coleman, 2009). The APRN is in a position to provide education to both the patient and nurse again using EBP strategies that have been successful thus reducing LOS and hopefully readmissions. This education should focus on the guidelines that all HF patients should understand prior to being discharged from a health care facility.

The measure of educational effectiveness is outcomes. In addition to being a HF expert and champion educator the APRN can work in state legislature through local groups like RISNA in implementing state wide HF initiatives. These initiatives should include the most recent EBP, guidelines and research initiated on HF strategies that all institutions would have access to. Educational policies focusing directly on strategies to improve HF discharge instructions given by nurses could be implemented. APRN's are a great resource for patients, families and nurses in managing patients with the complex diagnosis of HF and improving their quality of life.

References

- Agency for Healthcare Research and Quality (2013). *AHRQ innovations exchange*. Retrieved from <http://www.innovations.ahrq.gov>
- Agency for Healthcare Research and Quality (2013). *Transitional care interventions to prevent heart failure readmissions*. Retrieved from www.effectivehealthcare.ahrq.gov
- Albert, N. (2013, May). Parallel paths to improve heart failure outcomes: Evidence matters. *American Association of Critical-Care Nurses*, 22, 186.
- Albert, N. M., Collier, S., Sumondi, V., Wilkinson, S., Hammel, J. P., Vopat, L., ... Bittel, B. (2002). Nurses' knowledge of heart failure education principles. *Heart & Lung*, 31, 102-112.
- American College of Cardiology and the American Heart Association (2013). ACC/AHA update guideline for management of heart failure. Retrieved from <http://newsroom.heart.org/news/acc-aha-update-guideline-for-management-of-heart-failure>
- American Heart Association (2011). *Get with the guidelines: Heart failure enhanced heart failure patient education prior to hospital discharge*. Retrieved from <http://circ.ahajournals.org/cgi/reprint/CIRCULATIONAHA.109.192064>
- American Heart Association (2013). Costs to treat heart failure expected to more than double by 2030. Retrieved from <http://newsroom.heart.org/news/costs-to-treat-heart-failure-expected-to-more-than-double->

- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.
- Bastable, S. (2003). *Nurse as educator* (2nd ed.). Sudbury, MA: Jones and Bartlett.
- Bonow, R. O., Bennett, S., & Casey, Jr., D. E. (2005). ACC/AHA clinical performance measures for adults with heart failure. *Journal of American College of Cardiology*, 46, 1144 -1178.
- Borlaug, B. A., Lam, C. S., Roger, V. L., Rodeheffer, R. J., & Redfield, M. M. (2009). Contractility and ventricular systolic stiffening in hypertensive heart disease. *Journal of the American College of Cardiology*, 54, 410-418.
- Boyde, M., Turner, C., Thompson, D., & Stewart, S. (2011). Educational interventions for patients with heart failure. *Journal of Cardiovascular Nursing*, 26(4), E27-E35.
- Breidthardt, T., Noveanu, M., Potocki, M., Reichlin, T., Egli, P., Hartwiger, S., ... Mueller, C. (2009). Impact on high-dose nitrate strategy on cardiac stress in acute heart failure: A pilot study. *Journal of Internal Medicine*, 267, 322-330.
- Britz, J., & Dunn, K. (2010). Self-care quality of life among patients with heart failure. *Journal of the American Academy of Nurse Practitioners*, 22, 480-487.
- Bui, A. L., Horwich, T. B., & Fonarow, G. C. (2011). Epidemiology and risk profile of heart failure. *National Review Cardiology*, 8(30-41).
- Cehlbach, B., & Ceppert, E. (2004). The pulmonary manifestaions of heart failure. *CHEST*, 125, 669-682.

- Delaney, C., Apostolidis, B., Lachapelle, L., & Fortinsky, R. (2011). Home care nurses' knowledge of evidence-based education topics for management of heart failure. *Heart & Lung, 40*, 285-292.
- Ermis, A., & Melander, S. (2012). Minimize admissions for heart failure. *Clinical Advisor, 7*, 23-30.
- Fontana, D. (2006). Nesteride: The latest drug for treating heart failure. *Critical Care Nurse, 26*(1), 39-47.
- Gardetto, N. J., & Carroll, K. C. (2007). Management strategies to meet the core heart failure measures for acute decompensated heart failure. *Critical Care Nurse Q, 30*, 307-320.
- Hall, M. J., Levant, S., & DeFrances, C. J. (2012). *Hospitalizations for Congested Heart Failure: United States, 2000-2010* [Issue brief]. Hyattsville, MD.: Centers for Disease Control and Prevention.
- Hart, P. L., Spiva, L., & Kimble, L. (2011). Nurses' knowledge of heart failure education principles, survey: a psychometric study. *Journal of Clinical Nursing, 20*, 3020-3028.
- Heart Failure Society of America (2010). Nonpharmacologic management and health care maintenance in patients with chronic heart failure. *Journal of Cardiac Failure, 16*, e61-e72.

- Institute for Healthcare Improvement (2011). Hospital to home: Reducing readmissions, improving transitions. Retrieved from www.IHI.org
- Jaarsma, T., Stromberg, A., Ben Gal, T., Cameron, J., Driscoll, A., Duengen, H., Riegel, B. (2013). Comparison of self-care behaviors of heart failure patients in 15 countries worldwide. *Patient Education and Counseling*, 92, 114-120.
- Jencks, S. F., Williams, M. V., & Coleman, E. A. (2009). Rehospitalizations among patients in the Medicare Fee-for Service Program. *The New England Journal of Medicine*, 360, 1418-1428.
- Joint Commission on Accreditation of Healthcare Organizations (2010). *Joint Commission National Quality Performance Measures* Retrieved from <https://manual.jointcommission.org/releases/archive/TJC2010B/MIF0028.html>
- Nonpharmacologic management and health care maintenance in patients with chronic heart failure. *Journal of Cardiac Failure*, 16, e61-e72.
- Kalogirou, F., Lambrinou, E., Middleton, N., & Sourtzi, P. (2012). Cypriot nurses' knowledge of heart failure self-management principles. *European Journal of Cardiovascular Nursing*, 12(2), 159-166.
- Kasper, E., Gerstenblith, G., Heffter, G., Van Anden, E., Brinker, J. A., Thiermann, D. R., ... Gottlieb, S. H. (2002, February 6). A randomized trial of the efficacy of multidisciplinary care in heart failure outpatients at high risk of hospital readmissions. *Journal of the American College of Cardiology*, 39, 471-480.
- Lainscak, M., Blue, L., Clark, A., Dickstein, K., Ekman, I., McDonagh, T., ... Jaarsma, T. (2011). Self-care management of heart failure: Practical recommendations from

- the Patient Care Committee of the Heart Failure Association of the European Society of Cardiology. *European Journal of Heart Failure*, 13(115-126), 115-126.
- Mahmood, S. S., & Wang, T. J. (2013). The epidemiology of congested heart failure: Contributions from the Framingham Heart Study. *Global Heart*, 8(1).
- Mahramus, T. L., Penoyer, D. A., Sole, M. L., Wilson, D., Chamberlain, L., & Warrington, W. (2013). Clinical nurse specialist assessment of nurses' knowledge of heart failure. *Clinical Nurse Specialist*, 198-204.
- McAlister, F. A., Stewart, S., Ferrua, S., & McMurray, J. J. (2004). Multidisciplinary strategies for the management of heart failure patients at high risk for readmission. *Journal of the American College of Cardiology*, 44, 810-819.
- McChance, K. L., Huether, S. E., Brashers, V. L., & Rose, N. S. (2010). *Pathophysiology: The biological basis for disease in adult and children* (6th ed.). Philadelphia, PA.: Elsevier.
- National Institutes of Health (2013). Heart failure-overview. Retrieved from <http://www.nlm.nih.gov/medlineplus/ency/article/000158.htm>
- Paul, S. (2008). Hospital discharge education for patients with heart failure: What really works and what is the evidence? *Critical Care Nurse*, 28(2), 66-82.
- Phillips, C. O., Wright, S., Kern, D., Singa, R., Shepperd, S., & Rubin, H. (2002). Comprehensive discharge planning with postdischarge support for older patients with congestive heart failure; A meta-analysis. *JAMA*, 11, 1358-1367.

- Purcell, J. A., & Fletcher, B. J. (2012). *A stronger pump*. Atlanta, GA.: Pritchett & Hull Associates INC.
- Rankin, S. H., & Stallings, K. D. (2001). *Patient education: Principles and practice* (4th ed.). Philadelphia, PA: Lippincott, Williams & Wilkins.
- Roger, V. L. (2013, March 6). Heart failure compendium: Epidemiology of heart failure. *Circulation Research American Heart Association Journals*, 113, 646-659.
- Silow-Carroll, S., Edwards, J., & Lashbrook, A. (2011). *Reducing hospital readmissions: Lessons from top-performing hospitals* [Synthesis Report from the Common Wealth Fund]. : .
- Stromberg, A. (2005). The crucial role of patient education in heart failure. *The European Journal of Heart Failure*, 7, 363-369.
- van der Wal, M. H., Jaarsma, T., Moser, D. K., Veeger, N. J., van Gilst, W. H., & van Veldhuisen, D. J. (2006). Compliance in heart failure patients: The importance of knowledge and beliefs. *European Heart Journal*, 27, 434-440.
- W.K.Kellogg Foundation. (2004, January). *Logic model development guide* [Guideline Model]. Retrieved from W. K. Kellogg Foundation website: <http://www.wkkf.org>
- Welsh, D., Marcinek, R., Abshire, D., Lennie, T., Biddle, M., Bentley, B., & Moser, D. (2010). Theory-based low-sodium diet education for heart failure patients . *Home Health Nurse*, 28, 432-433.

Appendix A

IRB Approval: 1/27/2014

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Informational Letter

You are being asked to take part in a research study called *Nurses' Knowledge related to Teaching Heart Failure Essentials*. Educating the nurses on Bridge 7 about heart failure guidelines and measuring the effects of an educational intervention on nurses' knowledge will be assessed. If you agree to participate in this research, you will be asked to complete a 20 question true or false pre test. You will then be asked to attend one 25 minute educational class that will be offered 5 times over a six week period during lunch or dinner break. Pizza and drinks will be supplied by the researcher as the class will be offered during lunch or dinner breaks. After attending the educational class on heart failure you will then asked to again take the 20 question true or false test, which is the same as the pre-test.

There are no questions that should cause you discomfort and there are no identified risks to participating. Your taking part in the research project is completely voluntary. If you do not want to participate, you are free to choose not to and may withdraw participation at any time. Your participation may increase your knowledge regarding heart failure. Neither the pre nor the post test will identify you individually. When you fill out the test, please use the first two letters of your mothers' maiden name followed by the first two letters of your birth month as your identifier. After completing the test, please place in the locked box in the break room that has been provided.

If you have any complaints about this study or would like more facts about the rules for research studies, or the rights of people who take part in research studies you may contact

Patricia E. Houser, or Janice Muratori in the Lifespan Office of Research Administration, at (401)-444-6246.

If you have any questions about this research or the test you may contact Ann Mary Garris at 207-9644, or at agarris@lifespan.org. You may also contact faculty mentor, Cynthia Padula, PHD, RN at 456-9720 or cpadula@ric.edu.