

RURAL NURSE KNOWLEDGE OF HEART FAILURE
SELF-CARE PRINCIPLES

by

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ABSTRACT

Heart failure is one of the leading causes of death in the United States and the most common reason for hospital admission among the elderly. It was estimated that in 2010, heart failure cost the U.S. \$39.2 billion. The number of people with heart failure is predicted to increase by 25% by 2030 and the total direct costs may increase by 215%. In addition, in 2013, the Centers for Medicare and Medicaid Services began withholding 1% of all Medicare payments to hospitals for excess readmission rates for heart failure, pneumonia, and myocardial infarction. Those rates will increase to 2% in 2014 and 3% in 2015.

One of the ways to decrease the human and financial cost of heart failure is to provide patients with the necessary education to effectively care for their disease. Heart failure self-care includes medication compliance, dietary restrictions, monitoring weight, monitoring for the signs and symptoms of heart failure, and exercise. Nurses are largely responsible for patient education but studies have shown that they may not be knowledgeable about heart failure.

A descriptive study using a convenience sampling of nurses working at Critical Access Hospitals was undertaken to determine the extent of knowledge that they have regarding heart failure self-management guidelines. A 20-question instrument was used in an internet-based survey to discover nurses' overall knowledge of heart failure with the secondary aim of assessing knowledge in diet, fluids or weight, signs or symptoms of worsening condition, medications, and exercise.

Seventy-seven completed surveys were returned. Baccalaureate- and masters-prepared registered nurses with more than 20 years nursing experience scored the highest on the questionnaire while licensed practical nurses, associate/diploma-prepared nurses, and those with less experience scored the lowest. The majority of respondents scored highest in areas concerning symptom recognition and had the most difficulty with questions regarding weight monitoring, using salt substitutes, and whether or not hypotension is concerning.

Nurses may not have the information necessary to effectively educate their patients on heart failure self-care principles, and recommendations were made for adding targeted information to nursing education activities in the areas of weight monitoring, salt substitutes, and hypotension.

INTRODUCTION

Heart failure (HF) is a chronic disease with no cure. There are millions of sufferers and the numbers are rising. It is characterized by the initial diagnosis of HF and acute decompensations that frequently result in inpatient hospital treatment. Researchers from the American Heart Association (AHA) estimated that in 2007, HF led to 990,000 hospital admissions and 3,434,000 doctor visits (Roger, et. al., 2011). Because of this, and because more people are living with heart failure longer (Albert, et. al., 2002), HF is an expensive disease to treat.

Keeping in mind the ever spiraling cost of healthcare in general and Medicare in particular, the Medicare Payment Advisory Commission (MedPAC) advised the United States Congress about ways to contain Medicare costs in an effort to keep the program solvent (MedPAC, 2007). Using these recommendations, the Congress authorized the Centers for Medicare and Medicaid Services (CMS) to begin penalizing hospitals in 2013 for HF readmissions within 30 days of discharge. The penalties will be up to one percent of all inpatient Medicare payments starting in 2013, up to two percent of payments in 2014, and up to three percent in 2015 and thereafter (Foster & Harkness, 2010). Note that CMS will withhold a percentage of all Medicare payments from all disease categories, not just from those specific to HF. The financial ramification for hospitals will be enormous.

Studies have shown that providing comprehensive HF patient education that focuses on improving self-care increases quality of life for patients and decreases readmissions (Krumholz, et.al., 2002; Boyde, Tuckett, Peters, Thompson, Turner, &

Stewart, 2009; Vreeland, Rea, Montgomery, 2011). To improve self-care, the AHA recommends that patients be educated in the importance of taking medications as prescribed, monitoring their symptoms, dietary adherence, fluid restrictions, and exercise and weight loss to effectively manage their HF (Riegel, et. al., 2009).

Researchers generally agree that nurses are key providers of patient education (Washburn & Horneberger, 2008; Goodlin, Trupp, Bernhardt, Grady, & Dracup, 2007; Albert, et. al., 2002). Specifically, “nurses have the potential to contribute to risk factor reduction as a result of their familiarity with the patient [and their] availability for sustained consultation” (Joanna Briggs Institute, 2010, pg. 288). For nurses to be effective educators in the self-care of HF, they need to be knowledgeable in the current HF self-management principles.

Purpose

The purpose of this study is to determine the extent of knowledge that nurses employed by critical access hospitals have regarding heart failure self-management guidelines.

Background

Heart failure is a chronic disease in which the heart cannot pump effectively due to weak or stiff ventricles. An ineffective pump cannot meet the body’s oxygen and nutrient demands and cannot move fluid efficiently. The kidneys are especially susceptible to decreased perfusion. When blood flow to the kidneys is decreased, they

cause sodium and water to be retained. This, coupled with an ineffective pump, causes fluid to back up into the extremities leading to edema and water weight gain. The excess fluid and weak heart can also lead to fluid backing up into the lungs leading to pulmonary effusion and edema. This causes shortness of breath and exercise intolerance. Decreased oxygen to the brain can cause fatigue, dizziness, or mental confusion, and decreased oxygen to the organs and tissues can cause weakness (Cleveland Clinic, 2011).

HF is one of the leading causes of death in the United States and is the most common reason for hospital admission among the elderly (Eapen, Reed, Curtis, Hernandez, & Peterson, 2011). The lifetime risk of developing heart failure is 1 in 5, and 1 in 9 deaths has HF mentioned on the death certificate (Roger, et. al., 2011). The CDC (2011) estimated that in 2010, HF cost the United States \$39.2 billion or about 1-2% of all health care expenditures.

The number of people with a new diagnosis of HF and the number of people living with HF are expected to rise dramatically in the next 40 years. The reasons are twofold. First, our population is aging. According to the United States Census Bureau (2011), the population of those over age 65 is expected to increase from 12.4% of the population in 2000 to 20.7% in 2050. The second reason for the dramatic rise in those living with heart failure is because we are not only living longer in general, we are surviving the causes of heart failure—principally myocardial infarction—and thereby living longer with HF (Norton, Georgiopolou, Kalogeropoulos, & Butler, 2011; Stewart, MacIntyre, Capewell, & McMurray, 2003). An older population that lives longer will increase the burden of health care costs on the economy. The American Heart

Association (AHA) predicts that the number of people with HF will increase by 25% by 2030 and the total direct costs of HF will increase by 215% (Heidenreich, et. al., 2011).

According to Leventhal, Riegel, Carlson, and De Geest, (2005), “In spite of improvements in medical therapies over the past few decades, up to 47% of persons discharged following hospital admission for decompensated HF are readmitted within 90 days.... Of major significance, is that approximately half of the readmissions worldwide are considered preventable. Failure to adequately comply with the prescribed plan of care has been identified as a contributor in the vast majority of readmissions” (p. 299).

MedPAC, “an independent federal body established by the Balanced Budget Act of 1997 (P.L. 105–33) to advise the U.S. Congress on issues affecting the Medicare program” (MedPAC, 2007, pg. i), reported to the Congress in 2007 that hospital readmissions within 30 days of discharge was costing the Medicare program billions of dollars in excess payments. MedPAC stated that, “Hospital readmissions are sometimes indicators of poor care or missed opportunities to better coordinate care” and that these readmissions are oftentimes a “failure to adequately attend to the care transition at discharge from the hospital results in additional Medicare spending” (MedPAC, 2007, pg. 103). The MedPAC committee found that 17.6% of patients were readmitted to a hospital within 30 days and that 13.3% of these redmissions were potentially preventable. The spending on potentially preventable readmissions based on 2005 discharge claims was \$12 billion (MedPAC, 2007, pg. 107).

Because of these findings, the Congress authorized CMS to begin penalizing hospitals in 2013 for excess readmission rates for HF, acute myocardial infarction, and

pneumonia with CMS deciding on those rates. The law allows CMS to withhold up to one percent of all inpatient Medicare payments starting in 2013, up to two percent of payments in 2014, and up to 3 percent in 2015 and thereafter (Foster & Harkness, 2010). Note that the penalty is for all Medicare payments, not just those for the targeted diseases. This has the potential to cost hospitals a large sum of money and will have a significant impact on their profit margin.

To mitigate the cost of treating HF, it is essential to provide patients with the necessary education to effectively care for their disease (Albert, et. al., 2002; Boren, Wakefield, Gunlock,& Wakefield, 2009; Washburn & Horneberger, 2008; McAlister, Stewart, Ferrua,& McMurray, 2004; Hart, Spiva,& Kimble, 2011). Numerous studies support the effectiveness of providing HF education to decrease the number of hospitalizations, improve knowledge of self-care, and increase the quality of life (Krumholz, et.al., 2002; Boyde, Tuckett, Peters, Thompson, Turner, & Stewart, 2009; Fredericks, Beanlands, Spalding,& Da Silva, 2010; Vreeland, Rea, Montgomery, 2011).

The AHA provides guidance on self-care for HF patients. They recommend teaching in several different areas: medication compliance, fluid and sodium restrictions, monitoring weight, monitoring for the signs and symptoms of heart failure, decreasing alcohol intake and smoking cessation, and exercise (Jessup, et. al., 2009).

Since nurses are integral to patient education, it largely falls upon them to provide HF education (Albert, et. al., 2002; Washburn & Horneberger, 2008; Fredericks, Beanlands, Spalding,& Da Silva, 2010). However, nurses are not always prepared to educate patients because they may be lacking in knowledge about HF (Albert, et. al.,

2002). In addition, they may not realize they are lacking in knowledge (Hart, Spiva, & Kimble, 2011).

Contributions of this Study

In 2002, Nancy Albert and colleagues studied HF self-care knowledge among nurses working in a university-based hospital and smaller hospitals in a large Midwestern healthcare system (Albert, et. al., 2002). They developed an instrument to measure nurse knowledge of HF self-care that has been used in several studies since. These studies included nurses from a smaller Midwestern hospital (Washburn, Hornberger, Klutman, & Skinner, 2005), community-health nurses (Fowler, 2012), nurses from a healthcare system in the southeastern U.S. (Hart, Spiva, & Kimble, 2011), and home-health nurses (Delaney, Apostolidis, Lachapelle, & Fortinsky, 2011). The current study fills a gap by focusing on the knowledge of HF self-management in nurses working in critical access hospitals in a large Western state.

Critical access hospital (CAH) is a designation that allows for cost-based Medicare payments for inpatient and outpatient services provided at small, rural hospitals. Congress created this program in 1997 to help keep these hospitals open. By definition, CAH may have no more than twenty-five acute care and swing beds and they must be rural (Flex Monitoring Team, 2012).

The definition of rural for the purposes of CAH designation are that the hospital is not located in a Metropolitan Statistical Area as designated by the White House's Office of Management and Budget or the hospital is located in a census tract considered rural

under the Goldsmith Modification (developed because of the need to identify small towns or rural areas within large metropolitan counties) or the hospital is treated as rural by the State through a statutory or regulatory provision adopted by the State.

Rural nurses face particular challenges in delivering specialized care. In one day, they may go from labor and delivery to the emergency room to surgery to pediatrics (Hendrickx, 2010). They are generalists in their practice. In addition, it is more difficult to obtain continuing education because it is not always feasible for a small, rural facility to provide in-house training and because of the logistics involved in traveling long distances to regional or national conferences. Rural nurses tend to work alone or with minimal staff (Hendrickx, 2010), and they do not always have the resources available to get ready answers to their questions. While it is imperative that rural nurses be up-to-date in their knowledge, it is not an easy task to accomplish.

Theoretical Framework

The concept of self-efficacy is often used as the theoretical framework for studies involving a person's ability to cope and change. Self-efficacy is a main tenet of Albert Bandura's social cognitive theory.

Bandura's theory centers on a person's belief of whether or not he can succeed in a given situation. Self-efficacy determines whether a person will attempt to cope with a situation, the effort he will expend in trying to cope, and his level of perseverance in the face of obstacles or difficulties (Bandura, 1977). Self-efficacy guides how people think, feel, and act in certain situations. Bandura (1984) writes, "When beset with difficulties,

people who entertain serious doubts about their capabilities slacken their efforts or give up altogether, whereas those who have a strong sense of efficacy exert greater effort to master the challenges....Persons who have a strong sense of efficacy deploy their attention and effort to the demands of the situation and are spurred to greater effort by obstacles” (pg. 123). People with a strong sense of efficacy actively seek knowledge and skills that will help them cope with their challenge. They persevere in the face of difficulties, and they tend to meet their goals. While people with low self-efficacy tend to have poor adherence to medical regimens (Hanyu, et. al., 1999), those with high self-efficacy can change detrimental health habits, whether it be to quit smoking, lose weight, or manage their heart failure (Bandura, 2004).

Self-efficacy also applies to nurses as educators. It is important for nurses to feel capable of and comfortable with providing instruction to patients. One way to provide this sense of competence is through knowledge. Mastery of a situation or topic contributes to perceived efficacy and influences how a person thinks, feels, and acts. The more a person knows, the more comfortable a person is with his knowledge, the more effective he is in learning and teaching. Nurses with high self-efficacy may be more willing to educate their patients if they have mastery of the subject (Albert, et. al., 2002).

Summary

Heart Failure is an incurable, debilitating chronic disease that affects millions of people. It accounts for nearly one million hospital admissions and nearly 3.5 million doctor visits per year. Because more people are living with heart failure longer, it is an

expensive disease to treat. There are many economic and personal reasons to decrease the number of HF cases.

An effective way to mitigate the incidence and cost of HF is through education. Providing patients the information they need to decrease the number of exacerbations and to successfully live with HF would decrease costs associated with the disease and would increase quality of life.

Nurses are one of the primary providers of information to patients. It is important for them to be knowledgeable and current in their information. The more comfortable and capable nurses are in teaching, the more apt they are in helping their patients live with this chronic disease.

LITERATURE REVIEW

A literature search was conducted via Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, and Medline using the term *heart failure*. Using the Advanced Search feature, terms such as *physiology*, *patient education*, and *nurse knowledge* were included. Only journal articles dealing with adult populations were included for review. Articles published earlier than 2000 were not considered. Additional articles were acquired using reference lists from previously reviewed articles obtained via CINAHL, PubMed, and Medline.

Internet searches were conducted via Google using the same search terms listed in the previous paragraph. Only government sites, such as the CDC, or sites of reputable organizations, such as the Cleveland Clinic, were considered for review.

Heart Failure

While heart failure begins with some sort of pathophysiology of the heart, it is not merely a disease of the heart. It is a complicated disease process that involves cardiac output, extracellular fluid volume, blood pressure control, and, for long-term regulation, the renal system (Summers & Amsterdam, 2009). It may be more appropriately defined as:

a hemodynamic state in which the systemic circulation is unable to meet the immediate needs of the body tissues secondary to a destabilization of the complex physiologic interactions between the heart, peripheral vasculature and their supporting neurohormonal systems (Summers &

Amsterdam, 2009, pg. 10).

People may have right and/or left HF and systolic and/or diastolic HF. Right HF occurs when the right ventricle, for whatever reason, is not effectively pumping blood to the lungs. This results in fluid backing up into the periphery. Left HF occurs when the left ventricle is not effectively pumping blood to the systemic circulation. This results in fluid backing up into the lungs. Oftentimes, patients with chronic HF will have some degree of both right and left HF.

Systolic HF occurs when the heart does not contract forcefully enough to eject enough oxygen-rich blood to meet the body's needs, resulting in decreased cardiac output. This is measured as the ejection fraction (EF). An EF of less than 40% is diagnostic for systolic HF (Cleveland Clinic, 2011). In diastolic HF, the EF is normal but the left ventricle is stiff and does not relax or fill properly resulting in decreased cardiac output.

There are several different causes of or contributing factors towards HF. The two major contributors are coronary artery disease (CAD) and high blood pressure or hypertension.

CAD, also known as Coronary Heart Disease (CHD), is the leading cause of death in the United States (NHLBI, 2011; CDC 2012). In 2008, it led to 616,000, or 25% of all deaths in the U.S. (CDC, 2012). Each year, about 785,000 people will have a first heart attack, and another 470,000 will have their second or subsequent attack (CDC, 2012). The CDC (2012) estimated that in 2010, CAD cost the United States \$108.9 billion.

CAD occurs when cholesterol deposits, or plaques, build up inside the walls of

coronary arteries. These plaques continue to build up, narrowing the lumen of the arteries until they are occluded. This deprives the heart muscle nourished by the occluded artery of oxygen, causing it to become ischemic. If the ischemia continues, the cardiac muscle will infarct. CAD is the most common cause of heart failure usually because of myocardial infarction (CDC, 2012).

Another cause of HF is hypertension. The CDC (2012) estimates that about 68 million Americans have hypertension. It was the primary cause or contributing factor in 347,000 deaths in 2008, and it was estimated to cost the United States \$93.5 billion in direct and indirect costs in 2010.

Blood pressure is the measure of force blood exerts against arterial walls as it circulates through the body. Too much force, or hypertension, can cause CAD, arteriosclerosis, aneurysms, pulmonary hypertension, chronic kidney disease, and peripheral vascular disease. It causes HF by forcing the heart to contract more forcefully to overcome the high pressure. Over time, the left ventricle of the heart will hypertrophy. This can cause the ventricular wall to become stiff or lose elasticity, pump inefficiently, or compress the vessels feeding it thereby cutting off its oxygen supply (CDC, 2012, NHLBI, 2012).

Diagnosing HF includes a history and physical exam, laboratory studies, a chest x-ray, electrocardiogram, and an echocardiogram or angiogram.

During a history and physical exam, the practitioner looks for the signs and symptoms of HF. These can include shortness of breath with activity or at rest, orthopnea, paroxysmal nocturnal dyspnea, cough, and/or rales or crackles in the lungs all

of which can indicate fluid in the lungs. A heart murmur, rapid or irregular heartbeat, extra heart sound, or a laterally displaced apex beat all can indicate a cause or effect of HF. Peripheral edema, ascites, jugular venous distension, or sudden weight gain can indicate right-side HF. Exercise intolerance, fatigue, and weakness can all indicate decreased oxygenation to the muscles or brain (Cleveland Clinic, 2011; Summers & Amsterdam, 2009; CDC, 2011).

Laboratory studies can help diagnose and determine the underlying cause of HF. Tests include serum electrolytes looking particularly for sodium and potassium imbalances; urinalysis, blood urea nitrogen (BUN), and creatinine to determine kidney involvement or impairment; thyroid-stimulating hormone (TSH) to determine thyroid function; a complete blood count (CBC); liver function tests; and B-type natriuretic peptide (BNP). The BNP level is diagnostic for heart failure. It is released in response to ventricular stretch and causes vasorelaxation and aldosterone inhibition (Dressler, 2008; Chang, Maisel, & Hollander, 2009; Summers & Amsterdam, 2009). The higher the BNP, the more severe the HF.

Other diagnostic tests include an electrocardiogram to help determine a cause for HF, a chest x-ray to check for the presence of pulmonary edema or pulmonary effusion, and an echocardiogram or angiogram to determine the level of heart impairment (Dressler, 2008).

There are two common HF classification systems and both use the patient's symptoms to determine their HF classification. The American College of Cardiology (ACC) and the AHA have developed the ACC/AHA Classification of Heart Failure.

Patients in Stage A are at high risk of developing HF. A person in Stage B has left ventricular dysfunction but is asymptomatic. People in Stage C have left ventricular dysfunction and are symptomatic, and someone in Stage D is in refractory end-stage heart failure (Dressler, 2008).

The more commonly used HF classification system is the New York Heart Association (NYHA) Classification of Heart Failure. It stages HF from Class 1 to Class 4. Class 1 is asymptomatic with no limitations of activities of daily living (ADLs). Class 2 is asymptomatic at rest with some limitation on ADLs. Class 3 is marked limitation on ADLs and symptomatic with less than ordinary activity. Class 4 is symptomatic at rest (Dressler, 2008).

Heart Failure Self-Management Principles

The AHA suggests teaching patients about medication compliance (Riegel, et. al., 2009). HF patients are usually prescribed an angiotensin-converting-enzyme (ACE) inhibitor, a diuretic, a beta blocker, a statin, and an aspirin. They may also take other medications to treat co-morbidities. Oftentimes, patients are unsure what their medications treat. They may call them heart pills or water pills and only take them when they are symptomatic (Field, Ziebland, McPherson, & Lehman, 2006). They may not know about side effects, generic versus brand names, or cost (Riegel, et. al., 2009). They also need education on using over-the-counter medications or homeopathic remedies while taking prescribed medications. For instance, non-steroidal anti-inflammatory drugs (NSAID) can reduce the effectiveness of diuretics and various herbal remedies can

actually worsen HF (Albert, et. al., 2002).

Dietary adherence is another area that needs to be addressed. Patients need instruction on lowering their sodium intake. There are conflicting studies on the recommended daily intake of sodium, so the AHA recommends no more than 2.3 grams/day which is the upper limit of sodium recommended for the general population (Riegel, et. al., 2009). Many people do not realize how much sodium is in processed food, so teaching them to read food labels is important. In addition, some salt substitutes are potassium based, so teaching patients who are on potassium-sparing diuretics is necessary to avoid hyperkalemia (Albert, et. al., 2002).

In addition to restricting sodium, HF patients should restrict their fluid intake. The AHA recommends a fluid restriction of less than 2 liters/day (Riegel, et. al., 2009). Patients should also be taught to restrict their fluids during exacerbations of HF. A 2001 study by Carlson, Riegel, and Moser found that only 44% decreased their fluid intake when they experience a sudden weight gain. There are conflicting studies on how much fluid is safe for HF patients, so restrictions may be based on the individual patient's condition (Riegel, et. al., 2009).

It is important for patients to monitor their symptoms (Riegel, et. al., 2009). Patients are often unclear when their signs and symptoms are significant. Many times this is due to a lack of knowledge and/or a lack of monitoring. They may see a weight gain of three pounds in two days as insignificant when not accompanied by edema by attributing it to a change in diet or overeating. In addition, they may not correlate their sudden weight gain with the appearance of other signs and symptoms such as dyspnea or chest

pain. People who do not recognize the early signs and symptoms of worsening heart failure are at risk for an acute decompensation and hospitalization. However, “those adept at early symptom recognition are relatively more likely to engage in self-initiated treatment strategies such as restricting fluid or sodium intake or taking an additional diuretic dose” (Riegel, et. al., 2009, pg. 1143).

Weight loss should be included in patient education. While the evidence for various recommendations is inconclusive, the AHA recommends that weight loss should be encouraged in people with a body mass index (BMI) greater than 40 kg/m^2 (Riegel, et. al., 2009). People with a BMI less than 30 kg/m^2 should not be encouraged to lose weight. Rather, they should be taught to watch for loss of appetite, unexpected weight loss, and muscle wasting (Riegel, et. al., 2009).

Alcohol intake and smoking cessation should be included in all patient education. While studies acknowledge that low to moderate alcohol consumption may have a cardiac protective component, alcohol is toxic to the liver, decreases motivation to comply with various disease restrictions, and is addictive. Prolonged and substantial alcohol consumption can also lead to cardiomyopathy. The AHA “recommend limiting intake of alcohol to no more than 1 to 2 glasses (6 to 8 oz per glass) of wine per day, or no more than 2 glasses for men and 1 glass for women per day. Persons with alcoholic cardiomyopathy should not drink any alcohol” (Riegel, et. al., 2009, pg. 1144).

Smoking cessation is important in the treatment of HF. Studies show that it decreases adverse effects and lowers mortality in HF patients (Riegel, et. al., 2009). However, in one survey, 52% of people with a circulatory disorder continue to smoke

(Riegel, et. al., 2009), so it is not enough to offer education or advice to smokers on how to quit. There is some evidence to support a tailored approach to smoking cessation, one that includes nicotine replacement therapy, antidepressants, and possibly newer medications such as varenicline (Riegel, et. al., 2009, pg. 1146).

The importance of exercise should be included in HF education. It improves oxygen delivery and blood flow and decreases inflammation and depression. Even patients with severe HF can benefit from a tailored exercise regimen. However, in spite of the evidence, few people with heart failure exercise regularly (Riegel, et. al., 2009).

Patients who are ignorant of the signs and symptoms of their disease, or who are non-compliant in the care of their disease, are hospitalized more frequently “resulting in the need for costly crisis management for what might otherwise be a long-standing stable condition” (Caldwell, Peters, & Dracup, 2005, pg. 983). Gonzales, et. al. (2005) found that nurse-guided education increased patients’ understanding of HF and its treatment and also expanded their knowledge and compliance in several HF self-management areas. Studies have found that more knowledgeable patients equates with fewer hospital admissions and a higher quality of life (Krumholz, et. al., 2002; Fredericks, Beanlands, Spalding, & Da Silva, 2010).

Heart Failure Discharge Education and Hospital Readmission

Researchers in New York conducted a study on how providing HF education may affect HF readmission and mortality (Krumholz, et. al., 2002). After applying several exclusionary criteria, they ended up with eighty-eight participants who were randomly

assigned to a control group or an intervention group. The intervention was an hour-long face-to-face session with a nurse educator followed by seventeen telephone calls over the course of one year. They estimated that the intervention cost \$530.00 per participant.

Krumholz, et. al. (2002) found that providing HF discharge education decreased hospital readmissions for HF specifically (47% decrease) and for all causes generally (39% decrease) one year after discharge. Of the patients in the intervention group who were readmitted, the cost of their hospital stay averaged \$7,515.00 less than patients who were readmitted from the control group

Researchers in Michigan also found that HF discharge education resulted in fewer hospital readmissions (Koelling, Johnson, Cody, & Aaronson, 2005). 223 people admitted to the hospital with a primary diagnosis of HF participated in the study. They were randomly assigned to receive the usual HF care instructions (control) or to receive the usual instructions plus a 60-minute long, one-on-one session with a nurse educator (education). They found that the number of participants who were hospitalized for all causes or who died within the 180-day follow-up period was significantly lower in the education group (47%) versus the control group (64%). The percentage of participants in the education group who were readmitted for HF was 15% versus 28% for the control group.

Koelling, Johnson, Cody, & Aaronson (2005) concluded that a patient-targeted HF education program delivered at discharge led to a reduction in hospitalizations or death within the 180-day follow-up period because, “a significantly higher proportion of patients exposed to the education intervention reported weighing themselves daily,

following a specific sodium restriction, and abstaining from cigarette smoking on 30-day follow-up compared with controls” (pg. 182).

Self-Efficacy in Learning and Teaching

Self-efficacy is the central tenet of Albert Bandura’s social cognitive theory (Bandura, 1977). In 1977, Albert Bandura suggested that a person’s self-efficacy influences everything from an emotional state to accomplishing a goal. It determines how a person thinks, behaves, and feels in a given situation and heavily influences the belief that one can succeed (Bandura, 1977).

Since the state of a person’s health is oftentimes related to personal choices, people have some measure of control over their health, but they first need the knowledge they are lacking. “If people lack knowledge about how their lifestyle habits affect their health, they have little reason to put themselves through the travail of changing the detrimental habits they enjoy” (Bandura, 2004, pg. 144). People need to be taught about the pathophysiology of their disease, the effective self-management of their disease, and the possible consequences of not managing their disease. Once they are armed with this knowledge, and depending on their level of self-efficacy, they will be able to better manage their health.

People with high levels of self-efficacy will be able to better manage their chronic diseases (Bandura, 1982; Bandura, 2004). They will view challenges as opportunities and be less likely to view setbacks as obstacles they cannot overcome. They will develop a deeper interest in their disease and actively seek ways to improve their health (Bandura,

1997). Conversely, people with low self-efficacy view obstacles as impossible to overcome and will not attempt to improve their health or will give up easily in the face of setbacks (Bandura, 1997). Bandura writes, “If people are not fully convinced of their personal efficacy, they undermine their efforts in difficult situations and readily abandon the skills they have been taught when they suffer reverses or fail to get quick results” (1997, pg. 287).

People with a high level of self-efficacy strive to master their situation. This is also true of people who find themselves in the role of teacher. “People get themselves to put forth the effort necessary to accomplish what they value for the satisfaction they derive from fulfilling the goals they have set for themselves” (Bandura, 1997, pg. 304). In the case of educators, their goals are often helping their students learn and master their subject of study. To master a topic, people need to be willing to seek knowledge and to pursue answers.

Those who are able to increase and maintain a high level of self-efficacy look for ways to succeed in many different situations and try to place others in situations in which they will also be successful. They try to help others avoid a sense of failure (Bandura, 1994). It is because of this that nurse educators need to have high levels of self-efficacy. The more mastery of the topic the nurse has and the more the nurse wants the patient to succeed, the more likely he or she will be to teach in a way the patient can understand and provide strategies the patient can implement and be successful with.

Nurse as Educator

Researchers agree that nurses are an integral part of patients' education. In 2004, McAlister, et. al, published the results of a systematic review of the available literature on managing HF patients with a high risk of readmission. Of the twenty-nine studies they included in their review, seventeen included nurse-led patient education as the primary intervention. Most of the others specifically mentioned nurses being part of the management team (McAlister, et. al., 2004). Nurses were important components in all of these studies.

Because they have the most contact with patients, nurses are the key providers of patient counseling and education in most healthcare settings (Albert, et. al., 2002; Washburn, Hornberger, Klutman, and Skinner, 2005; Washburn and Hornberger, 2008). However, some studies show that nurses may not be sufficiently educated in HF self-management principles, and they may lack awareness of their knowledge deficit (Albert, et. al., 2002; Washburn, Hornberger, Klutman, and Skinner, 2005; Washburn and Hornberger, 2008). In order for patients to be successful in managing their HF, nurses must be effective and knowledgeable educators. In addition, the more education nurses receive in HF, the more likely they are to exhibit high levels of self-efficacy and personal mastery by teaching in their daily role and by continuing to find ways to educate their patients even when conditions (nurse, patient, or family) are not optimal (Albert, et. al., 2002).

Nurse Knowledge of Heart Failure Self-Care Guidelines

In 2002, a group of researchers led by Nancy M. Albert recognized the need for pertinent and timely patient education in HF self-management but discovered a lack of research in the educational needs of HF nurses. They observed that nursing school curricula focused on pathophysiology of disease processes and that various nursing orientation programs focused on policies and procedures and the mechanics of care (Albert, et. al., 2002), but “little was known about the learning needs of the HF nurse caregiver” (Albert, et. al., 2002, pg. 103). Albert and her fellow researchers developed a 20-item true or false written survey to measure knowledge of basic HF self-management principles and administered it to 300 nurses from a large, Midwestern healthcare system. The nurses were employed by a large university-based hospital, five community hospitals, or in home or hospice/palliative care. Their study, published in 2002, found “a clear deficit in knowledge of [HF] self-care management techniques, as well as a lack of awareness of those deficits” (Albert, et. al., 2002, pg. 111).

In 2005, researchers used the same 20-item survey that Albert, et. al. created to conduct a study that included fifty-one nurses at a 99-bed hospital in a different area of the Midwest (Washburn, Hornberger, Klutman, & Skinner, 2005). These researchers found that “this study demonstrate that nurses working in a small community hospital may not be sufficiently educated in HF self-management principles. Additionally, they appeared to lack awareness of their HF knowledge deficits” (Washburn, Hornberger, Klutman, & Skinner, 2005, pg 219).

In 2009 (Fowler, 2012) and 2010 (Hart, Spiva, & Kimble, 2011; Delaney,

Apostolidis, Lachapelle, & Fortinsky, 2011), researchers used the Albert survey for a study of sixty-one community health nurses from the northeastern U.S., a study of 122 nurses from a healthcare system in the southeastern U.S., and a study of ninety-four home health nurses from a northeastern state, respectively. The results from these studies were virtually the same as the Albert study (2002) and the Washburn study (2005).

Rural Nursing

Rural nurses often work in several different specialties in one day. According to Scharff (2010), they can be called expert generalists. They may move from pediatrics to cardiac to obstetrics to trauma in one shift (Hendrickx, 2010). Because they cannot know everything about everything and because they do not have the resources available that urban hospitals have, they tend to rely on each other for expertise and knowledge (Scharff, 2010).

Rural nurses know or are at least acquainted with most, if not all, of their patients (Scharff, 2010). Because of this and because of the serious and profound sense of responsibility they have toward their patients who are oftentimes close friends or family members (Scharff, 2010), rural nurses are committed to remaining current in their knowledge (Hendrickx, 2010).

Nurses in rural areas have to take on much more personal responsibility in obtaining continuing education than their urban counterparts (Scharff, 2010). They have to be quite motivated with a high degree of self-efficacy. This was borne out in a 2010 study by Scharff in which rural nurses “indicated a thirst for knowledge in accredited

professional continuing education” (pg. 258). She found that rural nurses received their continuing education most often from local and regional workshops and conferences and from nursing journals. They also learned from each other (Scharff, 2010).

When discussing continuing education, rural nurses often cite time and distance as deciding factors when making a decision on whether or not to attend a conference (Hendrickx, 2010). The cost of taking the time and traveling the distance often makes attending a conference prohibitive. In addition, many smaller facilities do not have the staff available to cover for others who are away (Hendrickx, 2010). So, while nurses want to be up-to-date in their knowledge, they may not have the resources or support necessary to accomplish that goal.

METHODOLOGY

Study Design

A survey instrument designed in a 20-question, true-false format was used to assess the strengths and weaknesses of nurse knowledge of heart failure self-care principles. In addition to true-false questions, several demographic questions were asked: level of education and licensure, years of practice, the participant's primary role at their healthcare facility, and the zip code of the facility in which the participant works. An internet-based survey tool was used to collect the data.

Sample Selection

A convenience sample of all registered nurses and licensed practical nurses working at Critical Access Hospitals (CAH) in a large rural state in the western United States was invited to participate in this descriptive study. The only inclusion criteria were that the participant must be a registered or licensed practical nurse working at a CAH and be willing to complete the survey.

Procedure

An opportunity to participate was electronically mailed directly to the senior nursing managers of all of the CAH in the state to request their assistance in recruiting participants for the study. Two follow-up e-mails that included the same information were sent to the nurse managers within the next three months. In addition, an

advertisement requesting that nurses working at CAH take part in the study was placed in the fall edition of the state nurses' association newsletter. In all of these communications, participants were directed to the website <http://www.surveymonkey.com/s/heartfailuresurvey> for more information. It was noted that participation in the study was anonymous and completely voluntary. Consent was implied by completing the survey.

Participants answered the survey questions by clicking on true or false. When completed, participants submitted the survey by clicking "submit." Each survey was automatically downloaded into a spreadsheet program where data were processed and results obtained. Once the study was completed, the results were submitted to the state nurses' association for publication in their newsletter.

The target sample size for the study was calculated to be 375 persons based on a population of 1,000 nurses, a confidence level of 95%, and confidence interval of + 4 (Creative Research Systems, 2012).

Instrument

The survey instrument was developed by Nancy M. Albert and colleagues (2002) (Appendix A). Permission to use the instrument was granted by Dr. Albert (Appendix B). The survey instrument had been thoroughly tested by four HF experts and two education experts for face and content validity and has been used in nine different studies (N.M. Albert, personal communication, January 17, 2013). It was not tested for reliability; however, subsequent studies had similar results. Since the tool was first used, researchers

in Brazil conducted test-retest assessment for reliability, and Kappa was 0.70 (N.M. Albert, personal communication, January 17, 2013).

Albert and colleagues (2002) specifically created this tool to assess overall nurse knowledge of HF self-management. Secondary aims were to discover the “strength of nurse knowledge related to five education themes: diet, fluids or weight, signs or symptoms of worsening condition, medications, and exercise” (Albert, et. al., 2002, pg. 104). Researchers contended that nurses should have been able to score at least 87.5% and that 100% was attainable and even realistic.

The survey measures knowledge in basic information related to HF self-management in “diet (three questions), fluids or weight (seven questions), signs or symptoms of worsening conditions (six questions), medications (two questions), and exercise (two questions)” (Albert, et. al., 2002, pg. 104). The subject matter and the emphasis placed on particular themes were based on HF literature.

The time needed to complete the survey was approximately twenty minutes.

Human Subjects Consideration

The purpose of the study was explained to participants on an introductory page on the web-based survey site. They could only advance to the study by clicking on the “I have read and understand the purpose of the study and agree to participate” button at the bottom of the explanation. The study was completely voluntary. Nurses could choose to participate or not. Anonymity and confidentiality were maintained by not collecting personal information. This study was approved by the Institutional Review Board at

Montana State University.

Statistical Analysis

Completed surveys were accessed from <http://www.surveymonkey.com/s/heartfailuresurvey>. Data were imported into Microsoft Excel 2010 and analyzed using descriptive statistics to determine item frequencies and measures of central tendency. Comparisons between naturally occurring groups were made to further explore the data. Tables and graphs were designed to visually aid the interpretation of the survey results.

RESULTS

The heart failure knowledge survey was opened on June 8, 2013 and closed on October 22, 2013. Emails requesting participation were sent to all directors of nursing at the state's critical access hospitals on June 8, July 12, and September 6. An advertisement was placed in the state's nurses' association fall 2013 publication. A total of 100 responses were received, which is estimated to be a 10% response rate. Of the 100 responses, 77 surveys were completed. According to the zip codes of the participants, surveys were received from nearly all geographical areas of the state.

Of the 77 respondents who completed the majority of the survey, 2 (3%) classified themselves as licensed practical nurses (LPN) and 75 (97%) classified themselves as registered nurses (RN). As noted in Table 1, the majority of the RNs (61%) were baccalaureate prepared or higher. Most of the participants (68%) have been practicing as a nurse for at least 11 years, with the majority of these (71%) having 20 or more years of experience (See Table 2).

The majority of respondents' primary area of practice was adult medical/surgical (41 or 53.25%) followed by emergent/emergency department (27 or 35%). Only two respondents reported adult cardiac as the primary patient population they work with. Eight participants (10.4%) reported more than one primary area of practice, which likely reflects the more generalist nature of rural nursing (Hendrickx, 2010), and a few reported practice areas that were not included on the survey such as administration, case management, or intensive care (See Table 3).

Table 1: Level of Licensure & Education

Licensure & Education	N=77 (%)
LPN	2 (2.6)
RN: Associate/Diploma	26 (33.8)
RN: Baccalaureate	47 (61)
RN: Masters	2 (2.6)
RN: PhD	0 (0)

Table 2: Years of Practice

Years of Practice	1–3	4–6	7–10	11–15	15–20	>20
n	6	9	10	6	9	37

Table 3: Primary Area of Practice

Area of Practice	N=104*
Emergent/Emergency Department	27
Obstetrics	8
Adult Medical/Surgical	41
Pediatric Medical/Surgical	6
Adult Cardiac	2
Surgical/Endoscopy/Recovery	10
Other	10

*Several respondents checked more than one option

The average score of all participants was 15.07 correct responses (75.35%). The highest score was 19 out of 20 correct (95%) from a baccalaureate-prepared RN with greater than 20 years of experience whose primary practice area was adult

medical/surgical. The lowest score was 11 out of 20 correct (55%) from an associate or diploma-prepared RN with greater than 20 years of experience whose primary practice area was adult medical/surgical. Overall, masters-prepared nurses (See Table 4) and nurses with greater than 20 years of nursing experience (See Table 5) scored the highest.

Of the 33 respondents who scored 80% or better, 22 were baccalaureate- or masters-prepared RNs. Of these 22 RNs, 15 had 16 or more years of experience as a nurse, and 8 of the 15 reported their primary practice area as emergent/emergency department or adult medical/surgical.

Table 4: Average score by level of licensure & education

Licensure & Education	Number of correct answers (%)
LPN	14.5 (72.5)
RN: Associate/Diploma	14.8 (74)
RN: Baccalaureate	15.19 (76)
RN: Masters	16 (80)

Table 5: Average score by years of nursing experience

Years of Nursing Experience	Number of correct answers (%)
1–3 years	14 (70)
4–6 years	14 (70)
7–10 years	15.2 (76)
11–15 years	15.33 (76.65)
16–20 years	14.9 (74.5)
> 20 years	15.9 (79.5)

As noted in Table 6, three questions were answered correctly by all participants: once the patient's heart failure symptoms are gone, there is no need for obtaining daily weights; the patient should call his or her heart failure provider if there is a new onset or worsening of fatigue; and the patient should call his or her heart failure provider if there is a new onset of worsening leg weakness or decreased ability to exercise.

Three questions were answered incorrectly by a majority of participants: When assessing weight results, today's weight should be compared with the patient's weight from yesterday, not the patient's ideal or dry weight (61 incorrect or 79.2%); the patient should call his or her heart failure provider if he or she has a blood pressure recording of 80/56 without any heart failure symptoms (66 incorrect or 85.7%); and the patient should call his or her heart failure provider if he or she experiences dizziness or lightheadedness when arising that disappears within 5 minutes (61 incorrect or 79.2%).

Table 6: Survey questions and answers with number of correct responses

Question	Correct Answer	N=77 (%)
Patients with heart failure should drink plenty of fluids each day.	No	50 (68.8)
As long as no salt is added to foods, there are no dietary restrictions for patients with heart failure.	No	66 (85.7)
Coughing and nausea/poor appetite are common symptoms of advanced heart failure.	Yes	74 (96)
Patients with heart failure should decrease activity and most forms of active exercise should be avoided.	No	70 (90.9)
If the patient gains more than 3 pounds in 48 hours without other heart failure symptoms, they should not be concerned.	No	64 (83.1)
Swelling of the abdomen may indicate retention of excess fluid due to worsening heart failure.	Yes	62 (80.5)

Table 6 Continued

If patients take their medications as directed and follow the suggested lifestyle modifications, their heart failure condition will not return.	No	75 (97.4)
When patients have aches and pains, aspirin and non-steroidal anti-inflammatory drugs (NSAIDs like ibuprofen) should be recommended.	No	47 (61)
It is OK to use potassium-based salt substitutes (like No-Salt or Salt Sense) to season food.	No	41 (53.25)
If patients feel thirsty, it is OK to remove fluid limits and allow them to drink.	No	75 (97.4)
When a patient adds extra pillows at night to relieve shortness of breath, this does not mean that the heart failure condition has worsened.	No	70 (90.9)
If a patient wakes up at night with difficulty breathing, and the breathing difficulty is relieved by getting out of bed and moving around, this does not mean that the heart failure condition has worsened.	No	68 (88.3)
Lean deli meats are an acceptable food choice as part of the patient's diet.	No	67 (87)
Once the patient's heart failure symptoms are gone, there is no need for obtaining daily weights.	No	77 (100)
When assessing weight results, today's weight should be compared with the patient's weight from yesterday, not the patient's ideal or dry weight.	No	16 (20.8)
Patients should notify their heart failure provider for BP recording of 80/56 without any heart failure symptoms.	No	11 (14.3)
Patients should notify their heart failure provider for weight gain of 3 pounds in 5 days without symptoms.	Yes	54 (70.1)
Patients should notify their heart failure provider for dizziness or lightheadedness when arising that disappears within 5 minutes.	No	16 (20.8)
Patients should notify their heart failure provider for a new onset or worsening of fatigue.	Yes	77 (100)
Patients should notify their heart failure provider for a new onset of worsening leg weakness or decreased ability to exercise.	Yes	77 (100)

DISCUSSION

The results from this study suggest that rural nurses working in CAHs are not as well versed in heart failure education as they might be. The area of dietary restrictions seemed to be the most problematic. For instance, 97.4% (75) of participants knew that it is not acceptable to remove fluid restrictions for a heart failure patient if that patient feels thirsty, but 31.2% (24) thought that it is necessary for heart failure patients to drink plenty of fluids each day. While 85.7% (66) of respondents know there are dietary restrictions for patients with heart failure, 46.75% (36) thought it is permissible for heart failure patients to use potassium-based salt substitutes to season food. Potassium-based salt substitutes are not recommended in the setting of heart failure, especially if the patient is on a potassium-sparing diuretic, as this can cause hyperkalemia (John, Rangan, Block, & Koff, 2011).

Another area of confusion for respondents was the necessity of checking a daily weight. All of the respondents knew that it is important to check a daily weight, and 83.1% of participants knew that a patient should be concerned if he or she gains more than 3 pounds in 48 hours. However, 79.2% were unsure of what to compare the weights against: yesterday's weight or the patient's ideal or dry weight. It is possible that if the respondents had thought the question through, they would have answered correctly. For instance, when comparing a current weight to the weight from the previous day, it would be possible, using 79.2% of the respondents' answers, to gain 2 pounds per day and not be concerned. However, the same respondents would likely answer correctly if they were asked if the patient should be concerned if he or she gained 14 pounds in one week. It is

important that nurses know that ideal weight has nothing to do with one's Body Mass Index (BMI) or weight for height. Ideal weight is a dry weight; that is the patient's weight in a euvolemic, or normal volume, state (Albert, et. al., 2002; Sulzbach-Hoke, Kagan, & Craig, 1997).

Many respondents may benefit from education on the use of NSAIDs to treat aches and pains. Thirty-nine percent (39%) of respondents thought it was permissible to use NSAIDs in the setting of heart failure to treat aches and pains, but NSAIDs cause sodium retention and can contribute to renal failure in patients suffering from heart failure (AHA, 2005). According to the AHA (2005), NSAIDs should be avoided if possible.

Finally, when to notify the heart failure provider seemed to cause some confusion. While all of the respondent knew that a patient should notify the heart failure provider for new or worsening fatigue or leg weakness or a decreased ability to exercise, 79.2% (61) also thought it necessary to notify the provider of dizziness or lightheadedness upon rising that passed within 5 minutes. This is usually an insignificant occurrence that is easily remedied by rising slowly. In addition, 85.7% (66) of respondents thought it necessary to notify the provider if the patient had a blood pressure recording of 80/56 without any heart failure symptoms. However, an asymptomatic systolic blood pressure of 80 indicates adequate perfusion in most people. It also indicates decreased afterload and decreased workload of the heart. This is considered successful treatment (Grady, et. al., 2000).

Respondents did best in the area of recognizing signs and symptoms of heart

failure. All of them knew that worsening fatigue or leg weakness and decreased exercise tolerance are all symptoms of worsening heart failure. Nearly all (74 or 96%) knew that coughing, nausea, and poor appetite are common signs of advanced heart failure, 90.9% (70) knew that adding pillows at night to relieve shortness of breath is a symptom of worsening heart failure, and 88.3% (68) knew that waking at night with difficulty breathing that is relieved by getting out of bed and moving around is an indication of worsening heart failure.

The findings from this study suggest that the more education and experience nurses have, the more knowledgeable they are in the area of heart failure self-management guidelines. Masters-prepared registered nurses scored highest, followed by baccalaureate-prepared registered nurses, then associate or diploma-prepared registered nurses, then LPNs. In the area of experience, RNs and LPNs with 1–6 years scored lowest, followed by those with 7–10 years, then those with 11–15 years, and those with greater than 20 years of experience scored the highest. The one anomaly was nurses with 16–20 years of experience had the next to lowest score.

These results seem to be supported by Bandura's theory of self-efficacy. Bandura's theory holds that the more experience and education a person has in a particular area, the more capable and comfortable they are in seeking and learning new information (Bandura, 1984). The more information these individuals have, the more comfortable they are in teaching that information to others. It is likely, then, that the nurses who scored the highest in this survey: those with a baccalaureate or master's degree with at least 16 years of experience as a nurse and whose primary practice area

was in the emergency department or in adult medical/surgical, are more apt to educate their patients on heart failure self-care principles than those with less education or experience.

Limitations

There are several limitations to this study. For instance, when plotting the zip codes of participants on a state map, it was discovered that there were no responses from the center of the state which covers a large geographic area. This lack of participation is puzzling since there are many CAH located in the center of the state. A better representation of rural nurses would include nurses from all geographic areas.

This study had a small sample size, especially for LPNs and MSNs. Also, only nurses working at critical access hospitals were surveyed. To better assess the heart failure self-care knowledge of rural nurses who frequently come into contact with heart failure patients, a larger sampling of nurses that included those who worked in out-patient clinics, home health, and public health would be necessary.

The possibility of participants not completing the questionnaire on their own must be taken into consideration. Since this survey was web-based and the participants were not monitored, they would have been able to ask for help, look up information, or research answers. While finding the correct answers and the reasoning behind them is desirable, it would skew questionnaire results in favor of a higher score if that was done while completing the survey.

Another limitation is the nature of electronic communications. Emails were sent

to nursing directors requesting they ask their nursing staff to participate. However, there is no guarantee that message was actually forwarded to staff. In addition, email may be an unreliable way to request participation in a study. Studies show that business professionals receive too many emails that results in email overload. “Some of the consequences of a huge email volume are that people may fail to respond, respond less accurately or incorrectly, ignore information or even quit” (Sumecki, Chipulu, Ojiako, 2011, p. 408). While not always practical for contacting many people at once, telephone or face-to-face contact is a more effective way of communicating (Sumecki, Chipulu, Ojiako, 2011).

Since survey responses were received, it is apparent that managers passed the request to participate on to their staff. It is possible, though, that some or even all of the staff nurses might have felt pressured to participate. “Paycheck vulnerability” refers to the vulnerability of an employee as a study participant while in the workplace (Rogers, 2005). While the feeling of coercion may be very low-level or imagined, it is nonetheless real and should therefore be considered.

Finally, the rate of participation in web-based surveys must be accounted for. Research has shown that the response rate for web-based surveys is 11% less than for other survey modes (Fan & Yan, 2010). While web-based surveys are less expensive to conduct and are more convenient for many participants, better results are obtained via telephone or mail-in surveys (Fan & Yan, 2010).

Implications for Practice and Future Research

Although there were several limitations to this study, the results were comparable to the results of other studies using the same survey tool. The mean score of this study was 75.35%. In Albert, et. al (2002), the mean score was 76%, Washburn (2005) was 73%, Willette (2007) was 79.85%, and Fowler (2012) was 80%. In addition to comparable survey results, respondents scored about the same on individual questions. In this survey and all of the surveys previously mentioned, with the addition of Hart (2011), respondents scored very well on questions regarding adherence to a low sodium diet and fluid restriction, checking daily weights, and to call a provider with new or worsening symptoms. The participants in all of these surveys also scored the lowest when questioned about whether or not to call a provider for a blood pressure of 80/56, transient dizziness when rising, potassium-based salt substitutes, and comparing weights from either the previous day or from the patient's ideal weight (Albert, et. al., 2002; Washburn, Hornberger, Klutman, & Skinner, 2005; Willette, Surrells, Davis, & Bush, 2007; Fowler, 2012; Hart, Spiva, & Kimble, 2011).

It is possible that participants learned something about heart failure self-care principles while taking this survey. At the least, it is possible that participants, particularly those with a high degree of self-efficacy, will recognize their lack of knowledge in heart failure self-care principles and will seek out that knowledge on their own. Future research could focus on knowledge gained, for instance, by administering a pre- and post-intervention questionnaire and using this survey tool as the intervention.

The primary implication of this study is the need for heart failure specific

education, particularly for newer nurses but also for experienced nurses. Nurses who continue working in the field will gain nursing experience, but depending on their primary practice area, there is no guarantee they will gain expertise in heart failure and heart failure self-care principles.

Since this study and previous studies seem to show a knowledge deficit in specific areas, perhaps targeted education in the areas of weight management, salt substitutes, and what constitutes a low blood pressure would be of use. Heart failure is a rather broad topic that people spend their lives studying, so breaking it down into discreet parts may be more manageable and of more interest to nurses.

Summary

The results of this study suggest that nurses working at CAHs are not as knowledgeable in heart failure self-care principles as they might be. This is problematic as nurses are the primary educators of patients. In addition, even if nurses have some knowledge of heart failure, they are less likely to provide education to their patients because they are not comfortable with their knowledge or lack thereof. Given our aging population, the number of people who have or will be diagnosed with heart failure, and the cost of treating this chronic disease, the need for heart failure education for both nurses and for their patients has never been higher.

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APPENDICES

APPENDIX A

NURSE KNOWLEDGE OF HEART FAILURE PRINCIPLES SURVEY

Nurses Knowledge of Heart Failure Education Principles Survey

Dear Nurse:

We would also like to assess your education needs related to instructing patients about self-management of heart failure. Please complete the following 20 item yes (true) / no (false) survey to help us determine your needs.

Instructions: Please answer each question by placing an X in the yes or no answer box. If you would like more information on the topic in the question, place an X in the box to the left of each question marked *Need more Info on Subject?* If you do not know the correct answer, give us your best guess but please answer every question, even if you requested more information.

You do NOT need to place your name or your hospital's name on this sheet; however, please fill in other identifying information so that we have an idea of what types of nurses are caring for patients with heart failure. Data will be compiled as group information only. Thank you for completing this survey.

Nurse information:

Level of Licensure (choose only ONE): LPN RN

Highest Degree Obtained (choose only ONE): LPN ADN or ASN BSN MS/NP/CNL DNP/PhD

Years of Practice: 1-3 4-6 7-10 11-15 16-20 greater than 20 years

Primary Nursing Role (choose only one): ED OB Med/Surg Peds Cardiac ICU OR

Zip Code of the Critical Access Hospital in which you're employed: _____

Need more

<u>Info on subject?</u>	<u>Question</u>	<u>Yes (T)</u>	<u>No (F)</u>
<input type="checkbox"/>	1. Patients with heart failure should drink plenty of fluids each day.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	2. As long as no salt is added to foods, there are no dietary restrictions for patients with heart failure.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	3. Coughing and nausea/poor appetite are common symptoms of advanced heart failure.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	4. Patients with heart failure should decrease activity and most forms of active exercise should be avoided.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	5. If the patient gains more than 3 pounds in 48 hours without other heart failure symptoms, they should not be concerned.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	6. Swelling of the abdomen may indicate retention of excess fluid due to worsening heart failure.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	7. If patients take their medications as directed and follow the suggested lifestyle modifications, their heart failure condition will not return.	<input type="checkbox"/>	<input type="checkbox"/>



Nurses Knowledge of Heart Failure Education Principles Survey

Need more Info on subject?	Question	Yes (T)	No (F)
<input type="checkbox"/>	8. When patients have aches and pains, aspirin and non-steroidal anti-inflammatory drugs (NSAIDs like ibuprofen) should be recommended.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	9. It is OK to use potassium-based salt substitutes (like No-Salt or Salt Sense) to season food.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	10. If patients feel thirsty, it is OK to remove fluid limits and allow them to drink.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	11. When a patient adds extra pillows at night to relieve shortness of breath, this does not mean that the heart failure condition has worsened.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	12. If a patient wakes up at night with difficulty breathing, and the breathing difficulty is relieved by getting out of bed and moving around, this does not mean that the heart failure condition has worsened.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	13. Lean deli meats are an acceptable food choice as part of the patient's diet.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	14. Once the patient's heart failure symptoms are gone, there is no need for obtaining daily weights.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	15. When assessing weight results, today's weight should be compared with the patient's weight from yesterday, not the patient's ideal or dry weight.	<input type="checkbox"/>	<input type="checkbox"/>

The following 5 statements are signs and symptoms that patients may have. Please mark yes or no to reflect if the patient should notify their heart failure physician of these symptoms:

Need more Info on subject?	Question	Yes	No
<input type="checkbox"/>	16. BP recording of 80/56 without any heart failure symptoms.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	17. Weight gain of 3 pounds in 5 days without symptoms.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	18. Dizziness or lightheadedness when arising that disappears within 5 minutes.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	19. New onset or worsening of fatigue.	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	20. New onset of worsening leg weakness or decreased ability to exercise.	<input type="checkbox"/>	<input type="checkbox"/>

Thank you for completing this survey!

3/2002 RNKnowledge ©, Nancy M. Albert, 2002

APPENDIX B

NURSE KNOWLEDGE OF HEART FAILURE EDUCATION PRINCIPLES:
AGREEMENT FORM

NURSES KNOWLEDGE OF HEART FAILURE EDUCATION PRINCIPLES: AGREEMENT FORM

Nurses Knowledge of Heart Failure Education Principles is a clinical screening instrument used to assess nurse knowledge regarding 5 heart failure themes (HF) that should be included when providing home-going or chronic education to patients (and families) about self-management. The *Nurses Knowledge of Heart Failure Education Principles* instrument is an empirical scale that measures basic knowledge of heart failure (HF and HF self-care knowledge). The scale developer, who holds the copyright, wishes to assure standardization in the use of the instrument to build a normative database for interpreting scores. With this goal in mind, please agree to the following conditions in exchange for using this instrument:

- 1) User agrees to maintain the *Nurses Knowledge of Heart Failure Education Principles* instrument in the form provided, without modification, unless written approval is obtained from the scale developer;
- 2) User agrees to use the *Nurses Knowledge of Heart Failure Education Principles* instrument for her/his own work, without distribution to other colleagues, unless written approval is obtained from the scale developer;
- 3) User agrees to use the *Nurses Knowledge of Heart Failure Education Principles* instrument for no more than three years, with continued use beyond that period requiring a new request;
- 4) Within six months of acceptance of research findings at a regional, national or international meeting, user agrees to provide the following information (when applicable): title of abstract and name of meeting where work was accepted. If the abstract is/will be published in a peer-reviewed journal (not just a meeting syllabus), please provide citation information: author, title, journal name, year, volume, issue and page;
- 5) User agrees to cite the appropriate *Nurses Knowledge of Heart Failure Education Principles* instrument reference.

If in agreement with the above conditions, please sign this form, retain a copy for your records, and return the original for final signature and approval. This agreement is made with:


 Nancy M. Albert PhD, RN, CCNS, CCRN, NE-BC 1/31/2013
 Date

User's Name	(Typed or printed): Katherine M. Mitchell	
Signature (s):		
Date:	January 24, 2013	
Title of Project:	Rural nurse knowledge of heart failure self-management principles (master's thesis)	
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