

NURSES' KNOWLEDGE OF HEART FAILURE GUIDELINES IN A WESTERN  
MONTANA HOSPITAL

by

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## ABSTRACT

Heart failure (HF) is an epidemic. Five million people were diagnosed with the disease in 2006 and 550,000 new cases are being reported each year. HF is associated with a decreased quality of life and high mortality rate. It also accounts for 12-15 million office visits and 6.5 million hospital stays each year. Although there is no known cure for HF, understanding the disease and guidelines put forth by the American Heart Association as well as the Heart Failure Society of America, has been shown to decrease mortality, increase quality of life, and decrease hospital admissions.

Healthcare workers play a vital role in educating HF patients about the disease, and as such, they themselves should be knowledgeable about what they teach. This study seeks to describe nurses' knowledge of the HF education guidelines in a western Montana hospital. A questionnaire was sent to 196 nurses working in a western Montana hospital testing their knowledge regarding the HF education guidelines. Only one nurse answered all questions correctly. The lowest score attained was 25% and the average score for the entire group was 72%. Demographic data explored was area worked (critical care versus non-critical care), years of experience, and educational preparation.

The results of this study demonstrated that nurses working in a western Montana hospital may not be sufficiently knowledgeable regarding the HF education guidelines. Increased education may better prepare nurses to educate patients regarding the HF education guidelines. HF patients who are taught by educated nurses may receive a higher quality of education in which, perhaps, the patients will have a better understanding of their disease and the guidelines to increase quality of life and decrease mortality and hospital admissions rates.

## CHAPTER ONE

### Problem Statement

Year after year, heart failure (HF) affects and kills an increasingly large number of people (Centers for Disease Control (CDC), 2006). It is a diagnosis characterized by increased mortality rates and hospitalizations as well as poor quality of life. Once diagnosed, those afflicted must make multiple lifestyle changes and follow a complex therapeutic regimen in order to maximize quality of life at best, and at worst, survive. Its prevalence, combined with the complexity of treatment, results in increasing hospital admission and readmission rates. Heart failure patients who are educated in their diagnosis and treatment have fewer hospital re-admissions and a better quality of life (Albert, Collier, Sumodi, Wilkinson, Hammel, Vopat, Willis & Bittel, 2002). For this reason, the importance of heart failure education should not be overlooked. According to the American Heart Association (AHA), the education topics include diet and nutrition, activity restrictions and recommendations, smoking cessation, alcoholic intake limitations, medication therapy, and signs and symptoms of worsening HF. Because of the complexity and importance of such education, it is vital that the nurses educating HF patients know and understand this material well. Albert et al. (2002) state that in order for effective education to take place the educator needs an optimum knowledge base of fundamental HF education guidelines. If the patients fail to understand these guidelines and how to implement such changes, they will not be able to effectively participate in their care when outside a care facility. When patients do not participate in their care or

disregard the guidelines, it is likely to lead to hospital re-admission or death (Albert et al., 2002).

### Purpose

The purpose of this study is to determine the extent of nurses' knowledge of the major heart failure educational guidelines in a 99-bed hospital. The study will attempt to answer the following research questions:

- 1) What is the extent of nurses' knowledge regarding heart failure education guidelines?
- 2) Is there a correlation between years of nursing experience and knowledge of HF guidelines?
- 3) Is there a correlation between educational preparation and knowledge of HF guidelines?

### Background and Significance

Heart failure is a condition in which the heart is unable to adequately pump blood throughout the body or unable to prevent blood from "backing up" into the lungs (CDC, 2006, ¶1). When the heart does not pump correctly there is not enough blood circulating through the body to meet the metabolic demands of the body. The inadequate supply of blood to the body results in a subsequent inadequate supply of oxygen to the tissues and symptoms such as fatigue or activity intolerance appear. Additionally, when the blood backs up into the lungs symptoms such as shortness of breath develop (CDC, 2006).

HF is an epidemic in the United States with no known cure at this time. The incidence of HF has been steadily increasing from 250,000 cases in 1970 to 400,000 cases in 1990. In 2006, approximately five million people were diagnosed with this disease with 550,000 new cases being reported each year (CDC, 2006). HF is a progressive disease that, without strict management, will lead to hospital admissions or death. Survival is poor once diagnosed, with an overall five-year mortality rate of fifty percent. Approximately, less than 15% of women survive more than 8-12 years and the one-year mortality rate in women is 20% (National Heart, Lung, and Blood Institute, 2007). Furthermore, according to the National Heart, Lung, and Blood Institute (NHLBI), the survival rate in men with heart failure is even less than in women (2007). Eighty percent of men less than 65 years of age will die within eight years from HF, while only 70% of women less than 65 years of age will die within eight years from HF.

Although HF can affect anyone at any age, it is predominantly seen in the geriatric population. It is primarily a disease of the elderly and is the most common discharge diagnosis in persons over 65 years, with the number of elderly being diagnosed with HF increasing since 1979 (CDC, 2006). Currently, HF affects 6-10% of persons 65 years and older. The increase in life expectancy may be one explanation for the increase in incidence of patients with HF.

HF absorbs an ever-increasing fraction of healthcare resources. It accounts for 1-2% of total healthcare costs in developed countries, with a “disproportionate amount utilized in repeated hospitalizations” (Palmer, Appleton, & Rodrigues, 2003, p. 694). In 2006, the United States spent over 29.6 billion dollars on direct heart failure-related costs

(CDC, 2006), not only in terms of initial hospital admissions, but including re-admissions related to HF. Additionally, HF is the reason behind 12-15 million office visits and 6.5 million hospital days each year. Thirty to forty percent of HF patients are readmitted within six months of their previous hospitalization. Studies have concluded that re-admissions for heart failure could be prevented in at least 40 percent of the cases (Hoyt & Bowling, 2001). Furthermore, the costs of heart failure could possibly be reduced if persons diagnosed with the disease could reduce their re-admissions into hospitals. However, Nicholas (2004) points out that the cost of heart failure is also high because people are living longer and surviving cardiac events that might have ended in death if not for advanced medical technology. With the potential for improving survival, there will be a larger number of patients who experience recurring episodes of worsening HF that require hospitalization.

Palmer et al. (2003) state, “It is well known that patient education has a positive effect on quality of life and results in decreased admission rates because of better awareness of HF” (p. 695). Ineffective education for heart failure patients plays a significant role on why patients fail to adhere to the specified guidelines and continue to be readmitted, but it is not known to what extent (Koelling et al., 2005; Krumholz et al., 2002).

There have been many studies completed regarding guidelines and heart failure management (Albert et al., 2002; Fonarow et al., 1997; Koelling, Johnson, Cody, & Aaronson, 2007; Labeau, Vandijck, Van Aken, & Blot, 2007; Lakasing & Francis, 2006; Nicholas, 2004; Palmer et al., 2003; Washburn, Hornberger, Klutman, & Skinner, 2005;

Weissman & Jasovsky, 1998). Findings from these studies have demonstrated that understanding and following such guidelines can make an impact on the quality of life and even the life expectancy of individuals diagnosed with heart failure (Nicholas, 2004). The AHA and the Heart Failure Society of America (HFSA) are two of the leading agencies promoting such educational guidelines. This particular study is focused on the guidelines put forth by the AHA.

Diet and nutrition changes are included in the guidelines to managing heart failure. One change involves decreasing the amount of sodium intake. The average American consumes between four to six grams of sodium daily; heart failure patients must decrease their intake to two to three grams daily (HFSA, 2006). Along with sodium restriction, many people also need to restrict their fluid intake to less than two liters per day (HFSA, 2006). However, as individuals vary, so do their outcomes following the established guidelines. Some degree of latitude is often warranted in how specifically the guidelines are implemented for each person. Nonetheless, the guidelines proposed have been created to provide stability and even reversibility of heart failure symptoms.

Monitoring daily weights is another factor in HF management. A weight gain of 3 pounds within twenty-four hours is significant and can mean that the HF is worsening. Albert et al. (2002) found that only 43.3% of patients weighed themselves on a daily basis. She also states that patients who are unaware of the importance of taking daily weights are less likely to relay such information to their physicians or make necessary changes at home.

Education related to medication management is another guideline and should include proper use and dosaging instructions as prescribed by the healthcare provider. In a study performed by Koelling et al. (2007), patients exposed to a heart failure education program prior to discharge showed increased compliance rates for taking their HF-related medications. The most common medications given to HF patients include angiotensin-converting enzyme (ACE) inhibitors, beta-blockers, angiotensin receptor blockers (ARBs) (if the patient is intolerant to ACE inhibitors), oral nitrates, and diuretics (Lakasing & Francis, 2006). Individuals taking diuretics need to be educated on possible side effects including electrolyte abnormalities, symptomatic hypotension, and renal dysfunction. Therefore, they need to recognize the importance of taking daily weights and monitoring blood pressures. Although, HF patients also need to be aware of all side effects that can be caused by their HF medications.

Limiting alcohol consumption and abstaining from smoking cigarettes is also included in HF education because the consumption of alcoholic beverages and smoking cigarettes may contribute to heart failure (HFSA, 2006). Alcohol has been shown to increase blood pressure causing hypertension and cardiomyopathy. Alcoholic cardiomyopathy is a condition in which the heart enlarges and the muscles become thin due to excessive alcohol intake. As the muscles thin and weaken, the heart is not able to pump efficiently and can lead to heart failure (Mukamal, 2006). Cigarette smoking also contributes to heart failure in that the smoke contains toxins that, when inhaled, cause plaque to form in the coronary arteries and leads to coronary artery disease (CAD), which is one of the leading causes of heart failure (Mukamal, 2006).

Finally, patients must also be educated on signs and symptoms of worsening heart failure. Signs and symptoms of worsening heart failure include sudden weight gain, increasing shortness of breath while at rest, increased swelling of the lower extremities, swelling or pain in the abdomen, awakening at night short of breath, increasing and frequent cough, loss of appetite, or increasing fatigue. When patients experience any of these signs or symptoms then need to know to contact their HF physician (HFSA, 2006).

### Contributions of the Study

The results of this study will help provide insight into how well nurses are informed of the heart failure guidelines in a western Montana hospital. It will illustrate in which topics nurses are presently knowledgeable regarding heart failure education guidelines and the topics in which they are deficient. Additionally, it will show if there is an association between educational preparation and years of nursing in relation to knowledge of HF guidelines.

To date, there have been two additional studies (Albert et al., 2002; Washburn et al., 2005) which have examined nurses' knowledge of HF. In 2002, Dr. Albert performed the initial study which explored nurses' knowledge of heart failure education guidelines and then, in 2005, Washburn duplicated Albert's study. Although this particular study is also a duplicate of Albert's study, some differences should be noted. First, the population consists of nurses working in a 99-bed, western Montana hospital. Whereas, Albert's population was chosen from a large Midwestern healthcare system, which consisted of 6 acute care hospitals and 5 community hospitals, and Washburn's population was from a

smaller, 200-bed, Midwestern hospital. Secondly, Albert and Washburn examined nurses' knowledge with regard to specific work setting and this study looks at years of experience, educational preparation, and critical care versus non-critical care specialty areas in relation to knowledge of HF guidelines.

Multiple studies offer support of the hypothesis that, as patients are more educated regarding their diagnosis of heart failure, there is a subsequent decline in hospital admission rates (Koelling et al., 2005; Krumholz et al., 2002; Weissman & Jasovsky, 1998). A decrease in the number of admissions could potentially have positive effects. For example, patients and their families would benefit because of better patient health and improved quality of life. They would also have fewer medical costs due to reduced hospitalizations (Rich, Becham, Leven, Freedland, & Carney, 1995).

### Theoretical Framework

Bandura (1994) states that "perceived self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (p. 71). A strong belief in self-efficacy can be the basis by which people feel, think, and behave in certain situations. It is people's perception of self-efficacy that gives them insight into their capability in a certain situation that drives their actions. Bandura (1994) states that a strong sense of self-efficacy can add to one's feelings of accomplishment and increase personal well being. People with high self-efficacy tend to face challenges with an optimistic view and tend to have strong commitments to challenging situations. They also tend to seek out knowledge

and skills that will help them face the situations to which they are exposed to in the future. People who are able to build self-efficacy and maintain a strong sense of it will look for ways to bring success to any and all situations as well as to avoid placing others in a position that is likely to fail. Therefore, they are not only looking optimistically at the situation for themselves, but are also helping others avoid having that sense of failure (Bandura, 1994).

This theory can be used as the framework to describe the importance of self-efficacy in the situation of the nurse as educator. It is important for the nurse to have high self-efficacy when educating patients regarding heart failure. It is important that the nurse, as an educator, feels capable in his or her ability to educate and even to appraise the situation as a challenge that can be met with rewarding outcomes. Nurses with high self-efficacy will structure the situation so that they are successful in what they do; this means their teaching of HF guidelines to patients diagnosed with HF will provide true insight and information and result in better compliancy from patients. Also, the nurse with high self-efficacy will strive to avoid placing HF patients in a situation where they are likely to fail and, as such, increase their determination and motivation to provide excellent education.

Albert et al. (2002) state that nurses' self efficacy can directly relate to their behavior on how they provide HF education to patients. Furthermore, research has shown that one's perception of self-efficacy, more specifically, mastering one's self-efficacy, can influence thought patterns and actions. As nurses master their own self-efficacy, they

may be more willing to provide HF education; and, if these nurses are knowledgeable regarding HF education principles, then the education provided by them will be better than those who lack self-efficacy (Albert et al., 2002). Subsequently, Albert also uses Bandura's self-efficacy theory as her theoretical framework.

### Summary

As discussed, millions of people are afflicted with HF in this country alone. It accounts for high healthcare costs including hospitalizations and doctor visits. Not only are there high costs associated with HF, there is also a decrease in quality of life for those diagnosed with the disease. HF is a progressive disease, mainly seen in the geriatric population, with a high mortality rate and, currently, has no cure. Educating HF patients regarding the HF guidelines can play a role on improving the quality of life and decreasing hospital re-admission rates.

HF absorbs a high amount of healthcare costs each year, including hospital admissions, re-admissions, and doctor visits. Additionally, persons with HF are living longer due to improved treatment and as such, the costs related to HF rise even further. Research has shown that hospital admission and re-admission rates could decrease if patients were more knowledgeable regarding HF guidelines. Additionally, if nurses who are knowledgeable in HF guidelines educate the HF patients, the chances increase that the patients will understand and retain the information. When HF patients understand the HF guidelines, their chances of performing the appropriate self-care practices at home

increase, and, thus, decrease hospital admission and re-admission rates. The guidelines for HF were established by the AHA and HFSA and include diet and nutrition, activity restrictions and recommendations, medication management, weight management, limiting or abstaining from alcohol and smoking, and understanding signs and symptoms of worsening HF.

## CHAPTER TWO

### Literature Review

A literature search was conducted via Cumulative Index to Nursing and Allied Health Literature (CINAHL), Pubmed, Medline, and Infotrac. Initially, the search began with the main focus of the research: heart failure. The term *heart failure* was entered into each of the databases using an advanced search along with the term *nursing* to narrow the results down to nursing-related topics. In addition, the words *education*, *guidelines*, *hospital admission*, and *nurse knowledge* were also entered in this search since they all apply to the study. Finally, the search was narrowed even more by specifying that all results be journal articles. Additional information was obtained from journal articles cited as references on the initial articles retrieved from CINAHL, Pubmed, Medline, and Infotrac.

The articles chosen were ones that focused on the previously mentioned topics, had a population that did not consist of pediatrics or neonates, and discussed the nurse's role in heart failure education as well as their knowledge in any field.

#### Heart Failure

The definition for heart failure, as defined by the CDC in the previous section, is very broad and, unfortunately, practitioners require a more precise definition when diagnosing patients with heart failure (Abdelhafiz, 2002; Adams et al., 2006). First, the patient's symptoms and history are explored. If suggestive of HF, diagnostic tests

including chest radiograph, electrocardiogram (EKG), echocardiography, multiple-gated acquisition scanning (MUGA scan), heart catheterization, exercise or drug-induced stress test, and blood tests are completed. Once HF is confirmed, the severity is usually classified based on the New York Heart Association (NYHA) (Adams et al., 2006).

Along with the previous studies, cardiac output must be determined before reaching a final diagnosis of heart failure. Cardiac output is defined as the amount of blood the ventricle pushes out after each heart beat (stroke volume) multiplied by the number of times the heart beats per minute (CDC, 2006). The average adult has a cardiac output of 5 liters per minute, meaning the body will circulate 5 liters of blood through its entire system in one minute (CDC, 2006; Lakasing & Francis, 2006). Heart failure causes a decrease in the cardiac output, so there is less blood being pumped forward through the body and this is when symptoms of HF, such as edema or shortness of breath, would emerge (CDC, 2006; Lakasing & Francis, 2006).

The updated New York Heart Association Functional Classification system (1994) was designed to assess the severity of the disease and ranges from class 1 to class 4. Class 1 is designated for a patient who currently has no symptoms and is able to perform normal physical activity. Class 2 is for patients who are unable to perform normal physical activity but are symptom free at rest; activity may cause shortness of breath or palpitations. Class 3 is reserved for patients whose physical activity is very limited and may have minimal, if any, symptoms at rest. Class 4 is for patients who are unable to perform any physical activity without having a great deal of discomfort.

The AHA has a different classification method. The AHA has designed their classification system into stages A through D. Stages A and B are for those patients who have no signs or symptoms of heart failure, but are at risk to develop HF. Stage C is for patients who currently have symptoms of heart failure or have had symptoms in the past, such as dyspnea. Finally, stage D is reserved for patients with heart failure who may be eligible for advanced treatment such as cardiac transplant, or require end-of-life care such as hospice.

The first and most common symptom usually seen in someone with heart failure is shortness of breath. Shortness of breath is caused when the left ventricle of the heart fails to pump blood forward into the circulatory system, which increases pulmonary pressure and leads to pulmonary edema. It is this edema, or fluid buildup, in the lungs that leads to the feeling of breathlessness (Nicholas, 2004). Peripheral edema is another common symptom. It is swelling of the extremities and is caused by fluid buildup in the interstitial spaces of the tissues. Edema is mainly seen in the ankles, but in severe cases can be in the ankles all the way up the legs and into the abdomen. Many persons with heart failure also feel increased fatigue and lethargy. These symptoms may be caused by multiple factors such as muscle wasting, unable to catch one's breath, or anorexia; all of which are caused by heart failure and the inability of the heart to pump blood to the body in order to maintain metabolic demands (Nicholas, 2004).

The two most common causes of heart failure are coronary artery disease and hypertension. Other reasons someone may begin to develop signs and symptoms of heart failure include myocardial infarction, cardiomyopathy, myocarditis, mitral regurgitation,

pericarditis, cardiac tamponade, alcoholism, valve disease, arrhythmias, cardiac drugs such as beta-blockers, sepsis, rheumatic heart disease, anemia, and congenital anomalies (Lakasing & Francis, 2006, Nicholas, 2004).

Coronary artery disease is a condition in which plaque builds up in the coronary arteries. This leads to weakened heart muscles that cannot effectively pump blood to the body leading to heart failure (NHLBI, 2008). In a person with hypertension the heart is working harder to pump blood to the body due to increased vascular resistance. Over time, the heart muscle enlarges in order to overcome the need to pump harder, eventually begins to stiffen, and is less able to fill appropriately, resulting in heart failure (NHLBI, 2008).

#### Heart Failure Guidelines

HF patients are encouraged to follow certain guidelines in order to slow the progression of the disease, increase quality of life, decrease hospital admissions and re-admissions, and decrease risk of mortality. The AHA, American College of Cardiology (ACC), and HFSA all recommend guidelines that center on diet, weight, smoking and alcohol consumption, medication management, exercise, and understanding the signs and symptoms of worsening HF. Health care providers, including nurses, are responsible for facilitating patient understanding of these management guidelines (HFSA, 2006).

Dietary guidelines for persons with heart failure include a low sodium diet and, at times, fluid restrictions. When heart failure occurs the pumping action of the heart is inhibited and cardiac output decreases. As the cardiac output decreases there is a

subsequent reduction in renal perfusion through the complex rennin-angiotensin-aldosterone system; this causes the kidneys to hold onto sodium, which then causes the body to retain water in order to maintain a strict osmotic balance (Lakasing & Francis, 2006; O'Brien & Chennubhotla, 2005). The benefit of this system is to increase the blood pressure, which can be decreased due to heart failure. However, it is also a detriment in that it increases the afterload and makes it even harder for the heart to pump out blood when it is already compromised. The water and sodium retention actually exacerbates the problem of heart failure (Lakasing & Francis, 2006).

Guidelines regarding weight and fluid management include monitoring the HF patient's weight every day. It is important to check the weight at the same time and using the same scale. When a person's weight increases more than 3 pounds in one day, it is an early sign their heart failure is worsening and, if not treated quickly, a hospital admission may result (HFSA, 2006). Additionally, sodium intake should be limited to 2-3 grams daily and even less with severe heart failure, such as New York Classification 3 or 4. As a patient decreases his or her sodium intake, an electrolyte balance may occur where there is not enough sodium in the body. This is called hyponatremia and if this does occur, a fluid restriction of less than 2 liters a day is recommended. However, fluid restrictions may also be advised in patients who merely have trouble with fluid retention but do not have hyponatremia (Adams et al., 2006).

Medication management includes taking prescribed medications and watching for side effects. Medications may include diuretics, ACE inhibitors, beta blockers, oral nitrates, or digitalis (Adams et al., 2006; AHA, 2007). Diuretics remove sodium and

water from the body and decrease or prevent fluid buildup. This is beneficial for HF patients because it helps with symptoms of dyspnea and edema, and reduces the workload of the heart so it is able to pump more efficiently (Adams et al., 2006; AHA, 2007). ACE inhibitors are a first-line treatment for HF and work by dilating the blood vessels, which decreases blood pressure (BP). A reduced BP lessens the workload of the heart and improves its efficiency. Beta blockers work similar to ACE inhibitors in that they dilate the blood vessels to decrease the BP and lower the heart rate (Adams et al., 2006; AHA, 2007). Oral nitrates also cause dilatation and help reduce the workload of the heart. Digitalis increases the force of the heart's contractions, which improves the pumping mechanism of the heart. Side effects of these medications may include low blood pressure, dizziness with standing, fatigue, and a persistent cough. Also, persons taking diuretics need to consume foods high in potassium or take potassium supplements to prevent hypokalemia, which is a decrease in the amount of potassium in the body (Adams et al., 2006; AHA, 2007).

Additionally, all patients with heart failure are encouraged to quit smoking and to limit or abstain from alcohol. If heart failure is in stage A or B according to the AHA or in stage 1 according to the New York Classification, men are limited to two drinks per day and women are limited to one drink per day (HFSA, 2006). However, if the heart failure is in a more advanced classification, patients are told to abstain from alcohol (HFSA, 2006).

Guidelines regarding exercise are different for every patient, depending upon the individual person and the severity of the disease. Someone diagnosed with New York

Heart Association class 4 would not be able to exercise nor would exercise be recommended. However, persons diagnosed with class 2 or 3 HF may benefit from exercise. Exercise would be limited to their own comfort level, but would help by “increasing their exercise tolerance, increase their quality of life and even their sense of well being” (Nicholas, 2004, p. 50).

Finally, according to the guidelines, patients with HF should be instructed on signs and symptoms that indicate the HF is worsening. Patients need to weight themselves daily and watch for sudden weight gain, which includes three or more pounds in one day or five or more pounds in one week (HFSA, 2006). Other signs and symptoms of worsening HF include increase in shortness of breath while at rest, increased swelling of the lower extremities, swelling or pain in the abdomen, awakening short of breath at night, increasing and frequent coughing, loss of appetite, and increased fatigue. If HF patients experience any of these, they need to contact their HF physician immediately (HFSA, 2006).

### Nurse as Educator

In most healthcare facilities nurses are the key providers of any education the patient may need and will receive in the healthcare setting (Albert et al., 2002; Washburn, et al., 2005). As such, it is essential that the nurses providing such information be knowledgeable about what they are teaching. Labeau, Vandijck, Van Aken, and Blot (2007) emphasize this by pointing out that lack of knowledge was designated as a hurdle

for adhering to evidenced-based practice. Nurses who are knowledgeable in the topic they are teaching increase the chance that there are no misconceptions regarding that particular topic. Palmer et al. (2003) identify that lack of continuing education by healthcare professionals is a barrier to decreasing hospital re-admission rates for heart failure patients. Furthermore, misunderstanding of instructions regarding medications prescribed by healthcare providers contributes to noncompliance with medications (Palmer et al., 2003).

Washburn et al. (2005) acknowledge the importance of having a HF-knowledgeable nurse teach heart failure patients about their diagnosis and how to manage it. Washburn states that in-depth knowledge regarding patient education is fundamental in order to optimize patient outcomes. Since nurses are the main providers of patient education in a healthcare setting it is necessary that they, themselves, be knowledgeable regarding the guidelines of heart failure (Washburn et al., 2005). The objective of Washburn's study was to determine the degree of nurses' knowledge regarding specific education themes of heart failure as put forth by the ACC, AHA, and the HFSA. Washburn et al. (2005) determined that nurses in a small-town, 200-bed hospital lack self-awareness in certain HF principles. The main areas where nurses were least knowledgeable were in the questions regarding non-steroidal anti-inflammatory drugs, potassium-based salt substitutes, "dry or ideal" weight, non-symptomatic low blood pressure, and dizziness when standing. However, it was less than 40% of the nurses who completed the study that answered these questions incorrectly and the majority of nurses, over 60%, answered these questions correctly (Washburn et al., 2005).

In that same study (Washburn et al., 2005), nurses scored an average of 70-88% in nine out of twenty HF topics. These topics included daily fluid intake, symptoms of advanced heart failure, activity recommendations, weight gain of greater than 3 pounds in 48 hours, weight gain without symptoms, abdomen swelling, orthopnea, paroxysmal nocturnal dyspnea, and consuming lean deli meat in a low-sodium diet. Nurses scored the highest in the following 6 topics, with an average score of 90% or better: following a no-salt-added diet, medication compliance, drinking fluids only when thirsty, daily weight monitoring, notifying physician with worsening fatigue, and notifying physician with decrease in ability to exercise. In summation, nurses that routinely provided care for patients with heart failure were highly knowledgeable in 6 topics out of 20 regarding HF guidelines (Washburn et al., 2005).

The National Guideline Clearinghouse (HFSA, 2006) recommends that HF patients and their families receive individualized education while highlighting the importance of self-care. Furthermore, they recommend that all education and counseling be provided by nurses with expertise in HF management, which can then be supplemented by provider, dietician, and pharmaceutical participation. HF education would be pointless without such knowledgeable instruction and would further hinder the goal in preventing HR related re-admission rates if it were not focused around self-care.

Albert et al. (2002) performed the first study that looked at nurses' knowledge of heart failure education principles. She surveyed 300 nurses from a large Midwestern healthcare system and sought to determine if there was a difference in knowledge in regard to work setting. Work settings included in Albert's research were HF specialty

nurses, critical care nurses, non-critical care nurses, home care nurses, and palliative care nurses. A 20-item true or false questionnaire was given to the nurses and, on average, they scored 76% correct. Albert et al. (2002) found that nurses whose expertise was in HF scored higher than critical care and non-critical care nurses, and home care nurses scored higher than acute care and palliative care nurses. Additionally, registered nurses (RN) scored higher than licensed practical nurses (LPN). This latter part could be attributed to the fact that the role of educating patients is usually done by the RN instead of the LPN.

#### Discharge Education & Hospital Re-admission

Discharge education information, in general, has changed drastically over the years. From a simple follow-up appointment, patients now have to be more observant and perform more healthcare activities at home than before. With this increase in self-care, more education is needed so that patients are able to perform these activities appropriately when discharged. As people try to cut healthcare costs they are doing more self-care in an at-home setting, when previously they may have remained hospitalized. For example, someone with a wound infection may have been hospitalized in the past due to the need for intravenous antibiotics. Now, that same person may be able to go home with a special intravenous (IV) line and equipment so they may administer themselves the antibiotics at home instead of being hospitalized (Weissman & Jasovsky, 1998).

The importance of discharge education in the healthcare continuum cannot be underestimated, especially when patients are expected to learn new and, perhaps, strange information in such a short period of time (Robinson & Miller, 1996). Weissman and Jasovsky (1998) report a study in which the Gallup Organization performed a post-discharge survey in a 500-bed acute care center that demonstrated that many patients did not understand, or even remember, what discharge education was provided during their hospitalization. The report is focused on the geriatric population, but states that much of the discharge education is similar for all patients. Weissman and Jasovsky (1998) also state “nurse-directed, multidisciplinary intervention (including education of patient and family, social support, review of medication, dietary modification and weight monitoring) have resulted in improvements in event-free survival and quality of life” (p. 33) in comparison to the physician solely providing discharge education to the patient.

An in-depth, comprehensive heart failure management program was found to reduce hospital re-admission rates and, thus, the cost of healthcare that is related to heart failure (Fonarow, Stevenson, Waldon, Livingston, Steimle, Hamilton, Moriguchi, & Tillisch, 1997). The major themes focused on in their education of heart failure patients were daily weight management, dietary guidelines that included fluid restrictions and a low-sodium diet, complete abstinence from alcohol and smoking, and the importance of medication compliance.

Additionally, Palmer et al. (2003) state that poor understanding of heart failure, poor compliance with medication and diet, and poorly controlled ischemic heart disease and hypertension are potentially reversible causes of heart failure. Palmer et al. (2003)

points out that if these issues could be addressed and addressed effectively, heart failure re-admissions could be reduced up to 40-50%.

The HFSA (2006) recommends that HF education begin with recognizing the patient's cognitive status, psychological state, culture, and financial status. Each of these must be taken into account before education can begin. For instance, if patients are under a significant amount of stress, they may not retain any information taught to them at that time. It is important for the patient to be mentally prepared to discuss and learn about HF. The HFSA also recommends that HF education start with an assessment of current HF knowledge, the topics that the patient would like to learn first, and any perceived barriers to education the patient might have. Additionally, it is important for the patient to have a variety of educational materials such as pamphlets, videos, one-on-one discussions, or Internet sites to name a few. Patients also need repeated exposure of such information because "a single session is never sufficient" (Adams et al., 2006, p. 25). Finally, patients need to demonstrate their knowledge of the information learned. This allows the educator to know exactly what the patient remembers, understands, and even misunderstands (HFSA, 2006).

Research has shown that discharge education needs to be specific and centered upon each patient. Discharge education can be a hindrance for the patient when such information is vague and produced for a large population (Cumprich, 1992; Robinson & Miller, 1996). Unfortunately, this patient-centered teaching is difficult to do, especially when providing written information such as pamphlets and packets that contain general information mass-produced for a large population. It is also important to realize that what

is “vague” information and what is “patient- specific” information is open to interpretation and, more often than not, the interpretations of the nurse differ from those of the patient (Robinson & Miller, 1996). This is significant because if the patient thinks the information is vague, yet the nurse believes that it is specific, then the information given will still be ineffective for the patient. If possible, it would be most effective to have input from patient as well as the nurse in regards to the “understandability” of the discharge information.

Koelling et al. (2005) performed a study with 223 patients diagnosed with heart failure. Koelling et al. randomly assigned the participants to one of two groups. The subjects of the first group received standard written discharge education while the subjects of the second group participated in a patient education program in addition to the standard written discharge education. This education program consisted of a sixty-minute-long, one-on-one teaching session with a nurse educator before the patients were discharged. A telephone follow-up was done at 30, 90, and 180 days post-discharge. The authors then determined the number of days re-hospitalized or the mortality rate within the 180 days of follow-up. They found that re-admissions and deaths were significantly lower in the education group than for the control group. Additionally, Koelling et al. (2005) also discovered that the education group was associated with a \$2,823 per-patient savings over the 180-day follow-up period.

Rich et al. (1995) performed an initial study of 98 participants and a secondary study with 282 participants to determine whether a multidisciplinary approach to HF treatment could reduce hospital re-admission rates. The experimental group received

intensive, individualized education about HF and its treatment by an experienced cardiac nurse, and received follow-up education after discharge. The control group received the standard discharge education as per hospital protocol and physician prescription for medications. Rich et al. (1995) found that the experimental group, receiving additional education, had a 67% survival rate after 90 days, whereas the control group only had a survival rate of 54%. Forty-two percent of patients in the control group had to be re-hospitalized compared to 29% in the experimental group. This particular study was limited to elderly patients who were known to be at high risk for hospital re-admission. Rich et al. (1995) state that this particular point probably resulted in more favorable outcomes because the study is biased toward patients who already have a higher chance of re-admission compared to heart failure patients who are otherwise healthy with no other co-morbidities and not at risk for re-admission for any other reason than having HF.

Krumholz et al. (2002) found similar results. Eighty-eight patients were assigned to one of two groups. The experimental group had intensive, individualized heart failure education while the control group had the standard hospital protocol heart failure education. Among these 88 participants, 57% in the experimental group had at least one re-admission or death within one year compared to the control group which had an increased rate of 81% of participants with at least one re-admission or death within one year. Additionally, 27% of patients in the experimental group had more than one re-admission, compared to 48% in the control group. The median time from discharge to hospital re-admission or death was 193 days in the experimental group compared to 126 days in the control group.

### Heart failure and Hospital Re-admission

Hamner and Ellison (2005) state that patients with HF experience the highest re-admission rates among all diagnostic groups, due to the fact that HF exacerbations are often life-threatening and need immediate medical attention. In addition, many patients and their caregivers are overwhelmed by the needed lifestyle changes and are often unprepared to make such changes upon initial discharge (Schwarz & Elman, 2003).

Hamner and Ellison (2005) performed a research study to examine the relationship and variables between heart failure patients and re-admission rates. The variables examined included race, gender, age, ejection fraction, comorbidities, living status, and medication. Out of the 557 patients studied, 224 (40%) were readmitted within six months.

While many factors of HF are undisputed, some characteristics of the disease are still controversial. For example, Hamner and Ellison (2005) discovered that heart failure patients who live alone have decreased re-admission rates, yet Schwarz and Elman (2003) state that inadequate social support was a contributing factor in 21% of rehospitalizations. However, they also concede to the fact that caregivers to HF patients may develop increased stress levels when caring for the heart failure patients. These caregivers may start by providing a quality social support system, but as the stress increases, the support becomes less and less adequate.

In addition, higher re-admission rates also correlated with the age of the patient, medications, co-morbidities (especially hypertension), financial status (Medicare vs. private pay), social support (living alone vs. living with caregiver), how the person was

initially identified as a HF patient (i.e. emergency department, office visit, specifically cardiac observation, or transfer from other facility), and use of home healthcare (Schwarz & Elman, 2003; Hamner & Ellison, 2005).

### Instrumentations Used to Measure Nurses' Knowledge

The importance of nurses' knowledge has been expressed in the literature (Costello & Coyne, 2008; Fessey, 2007; Vered, Werner, Shemy, & Stone, 2008; Wilson, 2007). Nurses' knowledge has been studied regarding osteoporosis, oral hygiene while hospitalized, dementia, ventilator-acquired pneumonia (VAP), and several other areas. Although all topics were different, the tools used to measure nurses' knowledge were similar. All of the studies reviewed had questionnaires consisting of multiple choice questions with answers below to choose from except for the study by Albert et al., which had only true or false questions.

### Summary

As discussed, the literature suggests that re-admission rates for HF are high and that discharge education is effective in reducing repeated hospital admissions. In most hospitals nurses are the key educators when it comes to discharge education and play an important role in giving discharge education to HF patients. According to the literature, HF education is effective when taught by nurses knowledgeable in the HF guidelines. The patients who receive such education have improved compliance, decreased hospital re-admissions, and a lower mortality rate. Although nurses' knowledge of guidelines alone cannot assure inclusion in teaching, common sense would suggest it certainly it

may influence what is taught. Unfortunately, the literature illustrates that nurses' knowledge of HF guidelines may be inadequate to properly educate HF patients in the principals necessary for self-management.

## CHAPTER THREE

### Methods

#### Design

The purpose of this study was to examine the extent of nurses' knowledge of heart failure education guidelines. A cross-sectional, descriptive study with a survey design was chosen to assess hospital nurses who work in a western Montana 99-bed hospital. Specifically, the study addressed the following research questions:

- 1) What is the extent of nurses' knowledge regarding heart failure education guidelines?
- 2) Is there a correlation between years of nursing experience and knowledge of HF guidelines?
- 3) Is there a correlation between educational preparation and knowledge of HF guidelines?

#### Sample Population

A convenience sample consisting of all 196 nurses working in a 99-bed, western Montana hospital was utilized for this study. Thirty questionnaires were returned; of these, 30 were completed sufficiently for their data to be included in analysis. A final return rate of 15% was achieved.

### Instrument

A review of the literature revealed an existing instrument which has been used to assess nurses' knowledge of heart failure guidelines in two previous studies. The instrument is a 20-item, true or false, questionnaire designed by Dr. Albert. The questionnaire assesses the understanding of basic information that is central to self-management of heart failure. It includes principles regarding diet, fluids or weight, signs and symptoms of worsening heart failure, medications and exercise. Example questions to which nurses responded true or false include:

- Patients with HF should drink plenty of fluid each day.
- Once the patient's HF symptoms are gone, there is no need for obtaining daily weights.
- As long as no salt is added to foods, there are no dietary restrictions for patients with HF.

Albert et al. (2002) stated that validity was determined by using expert heart failure nurses and specialty educators to evaluate the survey content and face validity. Nurses whose expertise was in heart failure were expected to answer 17 out of the 20 questions correctly. After these expert nurses were given the questionnaire, it was scored by specialty educators who were also experts in HF. According to the results, it was determined that a score of 100% was a reasonable and achievable goal. Based on this work, Albert considered the tool's psychometric properties to be adequate.

An e-mail was sent to Dr. Albert that included a brief description of the current study and also requested permission to utilize her survey. After signing and returning an agreement form, permission to use the instrument was received from Dr. Albert.

Additional demographic questions were added to the original questionnaire such as area worked (either critical care or non-critical care), years of nursing experience, and educational preparation. The questionnaire was then formatted for online completion using SNAP Survey Software and was hosted on a secure server at Montana State University. SNAP software de-identifies participant responses automatically. The questionnaire took approximately 10 minutes to complete.

### Procedure

Approval for the study was obtained from the Montana State University Institutional Review Board. Additionally, permission to survey the hospital nurses was obtained from the Vice President of Patient Services. An e-mail invitation to participate in the study was sent to each nurse via the hospital intranet (Appendix A). The e-mail included a cover letter (Appendix B) which described the purpose of the study along with a full explanation of rights and risks. Finally, a link to the online questionnaire was provided within the e-mail. Participants were asked to complete the survey within two weeks and reminder e-mails were sent out at 4 days, 10 days, 14 days, and 21 days after the initial e-mail. The survey was available for 30 days after the initial e-mail was sent out. A returned survey indicated the respondents consent to participate.

The nurses were asked to provide information regarding the area of employment (critical care or non-critical care.), educational preparation, and years of nursing experience. They were then asked to complete the survey by checking “yes” for true or “no” for false for each question. Once the questionnaire was submitted, it was forwarded directly to the researcher with all participant data de-identified. After surveys were returned, all data was saved onto a separate flash drive and was stored in a locked file cabinet. Any subsequent information or questionnaires left on the computer or in e-mails was deleted.

#### Data Analysis

Data elicited from the surveys was entered into SNAP survey software and exported to SPSS (version 16) for analysis. Descriptive statistics analyzed included area of employment, educational preparation, and years of nursing experience. The overall mean correct score was grouped by category of years of nursing, employment area, and educational preparation and the percentage of correct answers of each questions was also calculated. Relevant variables were measured at the ordinal level and Pearson correlation coefficient was used to analyze their relationships.

#### Ethics and Protection of Human Subjects

Study approval was received from the Montana State University Investigational Review Board. The purpose of the study was fully explained in advance to potential participants as was the right to refuse without fear of repercussion. There was no anticipated risk to the participants

## CHAPTER FOUR

Results

There were 196 surveys sent out to nurses in a western Montana hospital via the hospital intranet. The survey was available for 30 days and four reminder e-mails were sent out at days 4, 10, 14, and 21. A total of 30 surveys were completed, resulting in a 15% response rate. Of the 30 nurses who completed the questionnaire, 12 respondents classified themselves as critical care nurses and 18 as non-critical care nurses (Table 1). The majority (86.7%) were registered nurses. Of these, 11 (36.7%) were educationally prepared at the associate degree level and 15 (50%) at the baccalaureate level. There were no respondents who identified themselves with the educational levels RN-diploma, RN-MSN, or RN-PhD.

Table 1. Respondent Demographics

Area of Employment	<u>N (%)</u>
Critical Care	12 (40%)
Non-Critical Care	18 (60%)
Years of Experience	<u>N (%)</u>
<1	3 (10%)
1-3	6 (20%)
4-7	4 (13.3%)
7-10	5 (16.7%)
11-15	3 (10%)
>15	9 (30%)
Educational Preparation	<u>N (%)</u>
RN-Associate	11 (36.7%)
RN-BSN	15 (50%)
LPN-Associate	4 (13.3%)

Research Question #1: Extent of Nurses' Knowledge Regarding HF Guidelines

The average correct total score for the entire group was 14.43 (72%) correct responses, the median was 15.5 correct responses, and the mode was 17 correct responses. Table 2 shows the number of correct responses based on educational preparation, years of experience, and area of employment. The mean correct score for non-critical care nurses was 58.3%, with the lowest being 25% and the highest being 90%. The mean correct score for critical care nurses was 80.4%, with the lowest being 65% and the highest being 100%. Only one respondent answered all 20 questions correctly; this respondent was an RN-Associate prepared nurse and had more than 15 years of experience. The lowest score was 25%, which was equivalent to 5 correct

answers out of 20. This respondent was a RN, baccalaureate-prepared nurse and had 1-3 years of experience.

Two questions proved difficult for respondents and had a score of 30% or less, whereas, three of the twenty questions had an average score of 86% or higher. There was no particular topic in which nurses scored particularly high or particularly low. For example, nurses did not consistently answer questions correctly regarding weight management, but nor did they consistently answer questions correctly regarding weight management poorly. Scores varied from high to low regardless of the topic. The lowest scoring questions were regarding the topics fluid and weight management and signs and symptoms of worsening heart failure. While the highest scoring questions were also regarding the topics fluid and weight management and signs and symptoms of worsening heart failure. Table 3 below shows the questions with the highest scores and table 4 shows the questions with the lowest scores. Table 5 shows every question and the percentage of respondents who answered each question correctly.

Table 2. Number of Correct Responses based on Educational Preparation, Years of Experience, and Area of Employment

Educational Preparation	N (%)
LPN-Associate	12.3 (61.3%)
RN-Associate	13.4 (66.4%)
RN-BSN	13.9 (69.3%)
Years of Experience	N (%)
<1	9.3 (46.6%)
1-3	10.7 (53.3%)
4-7	14.3 (71.3%)
7-10	12.8 (64%)
11-15	16 (80%)
>15	15.7 (78.5%)
Area of Employment	N (%)
Non-Critical Care	11.7 (58.3%)
Critical Care	16.1 (80.4%)

Table 3. Questions with the Highest Scores

1. Patients for heart failure should drink plenty of fluids each day (false). (86.7%)
19. When patients have new onset or worsening fatigue, they should notify their heart failure physician (true). (100%)
20. When patients have new onset of worsening leg weakness or decreased ability to exercise, they should notify their heart failure physician (true). (93.3%)

Key: Survey question (correct answer). (percent of nurses who answered question correctly)

Table 4. Questions with the Lowest Scores

15. When assessing weight results, today's weight should be compared with the patient's weight from yesterday, not the patient's dry or ideal weight (false). (30%)
16. When patients have a BP recording of 80/56 without any heart failure symptoms, they should notify their heart failure physician (false). (26.7%)

Key: Survey question (correct answer). (percent of nurses who answered question correctly)

Table 4. Survey Questions with Percent of Respondents Who Answered Correctly

1. Patients with HF should drink plenty of fluids each day (false). (86.7%)
2. As long as no salt is added to foods, there are no dietary restrictions for patients with heart failure (false). (73.3%)
3. Coughing and nausea/poor appetite are common symptoms of advanced heart failure (true). (76.7%)
4. Patients with heart failure should decrease activity and most forms of active exercise should be avoided (false). (66.7%)
5. If the patient gains more than 3 pounds in 48 hours without other heart failure symptoms, they should not be concerned (false). (66.7%)
6. Swelling of the abdomen may indicate retention of excess fluid due to worsening heart failure (true). (76.7%)
7. If patients take their medication as directed and follow the suggested lifestyle modifications, their heart failure condition will not return (false). (76.7%)
8. When patients have aches and pains, aspirin and non-steroidal anti-inflammatory drugs (NSAIDs like ibuprofen) should be recommended (false). (43.3%)
9. It is OK to use potassium-based salt substitutes (like No-Salt or Salt Sense) to season food (false). (56.7%)
10. If patients feel thirsty, it is OK to remove fluid limits and allow them to drink (false). (80%)
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 (false). (76.6%)
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 (false). (66.7%)
13. Lean deli meats are an acceptable food choice as part of the patient's diet (false). (76.7%)
14. Once the patient's heart failure symptoms are gone, there is no need for obtaining daily weights (false). (80%)
15. When assessing weight results, today's weight should be compared with the patient's weight from yesterday, not the patient's dry or ideal weight (false). (30%)
16. Patients should notify their heart failure physician if they have a BP recording of 80/56 without any heart failure symptoms (false). (26.7%)
17. Patients should notify their heart failure physician if they have a weight gain of 3 pounds in 5 days without symptoms (true). (46.7%)
18. Patients should notify their heart failure physician if they have dizziness or lightheadedness when arising that disappears within 10-15 minutes (false). (46.7%)
19. Patients should notify their heart failure physician if they have new onset or worsening fatigue (true). (100%)
20. Patients should notify their heart failure physician if they have new onset or worsening leg weakness or decreased ability to exercise (true). (93.3%)

Key: Survey question (correct answer). (percent of nurses who answered question correctly)

### Research Question #2: Years of Experience and Knowledge of HF Guidelines

Nurses with less than 1 year of experience had the lowest average scores of 46.6% and the nurses with one to three years of experience had the second lowest average scores of 53.3%. The nurses who had four to seven years of experience scored higher overall (71.3%) than those nurses who had seven to ten years of experience (64%). Finally, the nurses who had eleven to fifteen years of experience scored slightly higher (80%) than the nurses who had greater than fifteen years of experience (78.5%). Pearson coefficient was .464 ( $p=0.01$ , 2 tailed) which suggests a moderate correlation between years of experience and knowledge of HF guidelines.

### Research Question #3: Educational Preparation and Knowledge of HF Guidelines

In regards to type of licensure, the registered nurses with a baccalaureate degree had the highest average scores of 69.3%. Next were the registered nurses with an associate degree, whose average scores were 66.4%, and the nurses who had the lowest average scores were the licensed practical nurses, who had average scores of 61.3%. Pearson coefficient was  $-0.035$  ( $p=.853$ , 2 tailed) which shows there were no statistically significant findings between educational preparation and knowledge of HF guidelines.

## CHAPTER FIVE

Discussion

The findings from this study suggest that nurses practicing in Montana may not have satisfactory knowledge of heart failure education guidelines. The average correct score on the test of nurses' knowledge of heart failure guidelines in this study was 72% for the entire group, which means, on average, the group answered 14.4 questions correctly out of 20. The critical care nurses scored higher than the non-critical care nurses, with average scores of 80.4% and 58.3% respectively. It is interesting to note that the nurses with 11-15 years of experience scored the highest of all the groups regarding years of experience. This could be because the number of respondents was low for this group; there were only 3 respondents that had 11-15 years experience and all three of them were critical care nurses. Whereas, out of the nine nurses who had 15 plus years of experience, 5 of them were non-critical care and 4 were critical care nurses.

The results regarding educational preparation were equivocal; there was minimal difference in scores from the LPN group to the RN-BSN group. One thing to note here is that none of the LPNs who responded were critical care nurses, yet their overall scores were close to the RN-Associate and RN-BSN prepared groups, which had approximately 50% of respondents who were critical care nurses.

There was only one nurse who answered all 20 questions correctly. This was a critical care, registered nurse with an associate's degree and over 15 years of experience. One nurse answered only five questions correctly, a score of 25%. This nurse was a

baccalaureate-prepared RN who worked in a non-critical care area and had 1-3 years of experience. This is consistent with the average results of this study that critical care nurses were more knowledgeable in heart failure education guidelines than non-critical care nurses, although it is not known what specific areas distinguish critical care from non-critical care.

Pearson correlation was used to measure correlation in this study and all variables were treated as ordinal data. The Pearson correlation regarding years of experience and knowledge of HF education guidelines was significant. This shows a moderate, positive correlation between years of nursing experience and knowledge of HF education guidelines. The Pearson correlation regarding educational preparation and knowledge of HF education guidelines was not significant. The Pearson correlation statistics may not have been the most appropriate for this study. Some of the data violated the underlying assumptions regarding the Pearson correlation such as representativeness and linearity. In retrospect, it would have been advisable to attain statistical support earlier to facilitate survey construction, data collection, and data analysis.

The overall response rate for this study was low, 15.3%. It is difficult to speculate as to why some nurses did not participate in the study. One reason may have to do with nurses' specialty areas. For example, obstetric or pediatric nurses may feel removed from the heart failure population and, as such, did not feel inclined to participate. This could be because they either thought the study did not pertain to them or because they thought they might not do well. In retrospect, it would have been preferable to exclude nurses whose specialty was other than adult health. The survey only inquired as to whether a nurse was

employed in the critical care area or in the non-critical care area; there was no area to identify what specific area each nurse worked in. Additionally, some nurses may have felt they were too busy to take the survey and others, simply, may have not cared to participate in the study. Regardless of the reasons, it is important to acknowledge that the nurses who did not respond remain as pertinent to this study as those who did respond. If the nurses who did not respond had high scores on the questionnaire, the results of this study would be falsely low. Furthermore, if the nurses who did not respond had low scores, then the results of this study would be falsely high.

It is interesting to note the two questions which were answered correctly by only 30% and 26.6% of the respondents. One of these questions was wordy and may have been confusing to nurses taking the survey. Additionally, the question asked about patient's dry or ideal weight and it might be that the nurses needed clarification on the meaning of dry or ideal weight. The other question inquired about whether a blood pressure reading of 80/56 was something patients should notify their physician about. Perhaps nurses were not thinking of this blood pressure reading in regards to heart failure, or that they thought that because they would most likely notify the hospital physician of this reading, the patients should notify their HF physician of this reading also.

### Limitations

There were several limitations to this study. The survey was sent out via the hospital intranet; and, to access the survey, the respondents needed to copy and paste the Web address into a separate Web page; the design of the survey did not allow the respondent to directly click on the link and have the survey open. This could have been confusing to some of the participants and may have been a reason why some did not respond to the survey. Perhaps, if the study were to be repeated, it would be best to have a direct link to the Web site available. Additionally, since the survey was sent over the intranet, it was assumed that all participants would check their e-mail; it is possible that some individuals do not access the e-mail the survey was sent to and, if so, were unaware of the study entirely.

Another limitation was the small sample size. The survey was sent out to all nurses of one hospital in Montana and, are thus, not generalizable. This is a small representation of nurses in Montana and, as such, the results of the study may be limited to one particular area. A better representation would have included nurses across the entire state and not limited to one city. Additionally, nurses of all fields should be included, not just those that work in a hospital, but nursing homes, medical offices, home health agencies, etc. However, there should be some inclusion criteria which limits participants to those that care for the adult population.

It would also be helpful to achieve a higher response rate. A higher response rate would add strength to this study. As stated previously, if the nurses who did not respond answered more questions correctly the mean score would be higher which means the

scores of this study were falsely low and vice versa, if the non-respondents answered more questions incorrectly then the results of this study were falsely high.

According to Sheehan (2001), the overall response rate for e-mail surveys is less than the response rate for postal mail surveys. Even though there are many benefits to e-mail surveys such as quicker response time and less costly, there is still the matter of a decreased response rate. Sheehan (2001) goes on to state that the overall response rate to both, e-mail and postal surveys is declining due to the United States population being oversurveyed. Consequently, even though a higher response rate would be helpful, it may prove difficult to achieve a higher response rate.

Although the questionnaire was developed by an expert nurse in the field of heart failure, the questions may not have been all-encompassing of heart failure guidelines and, as such, may not be a true demonstration of nurses' knowledge of the heart failure guidelines. For example, one of the guidelines regarding heart failure education addresses the importance of medication compliance, although there were no questions on the survey that asked about medications. Additionally, some of the questions may have been worded badly and may have made it difficult for the reader to understand clearly. For example, question number 18 states, "When assessing weight results, today's weight should be compared with the patient's weight from yesterday, not the patient's dry or ideal weight". This question in particular could be confusing to the reader because it is not clearly understood what is meant by "dry" or "ideal" weight.

Another limitation was that after all the responses were submitted, and the data was collected, it was noticed that there was a mistake on the questionnaire. Under the

subject *years of nursing experience*, there was an overlap in choices. If someone had 7 years of experience they could have chosen either 4-7 years or 7-10 years. This makes any data regarding number of years experienced that is between 4-7 years and 7-10 years invalid.

Finally, there were limitations regarding the way the correlation statistics were computed. Although the Pearson correlation was used in this study, it needed to be assumed that all the variables were ordinal. However, the years of nursing experience variable was probably interval in nature. However, the variable *years of nursing experience* was treated as ordinal so that the same correlation data could be used for both variables, years of experience and educational preparation, and could easily be compared.

#### Implications for future Research and Practice

This study may have helped contribute to research focused on nurses' knowledge of heart failure education guidelines. Even though there were many limitations to the study, results were similar to those studies previously performed regarding this topic (Albert et al., 2002; Washburn et al., 2005). The participants in Albert's study had an average score of 76%, and the average score in Washburn's group was 72%. The average score in this group was 72%. The two questions which proved difficult for the respondents of this survey also proved difficult for the nurses who participated in Albert's study as well as Washburn's study.

This particular study illustrates that nurses working in a western Montana hospital may not be adequately educated in the heart failure education principles. Future research

in this area may be able to demonstrate whether specific area of employment (intensive care, emergency room, medical floor, surgical floor, oncology, home health, hospice, etc.) is another factor in nurses' knowledge of HF education principles or if it is widespread across the entire nursing continuum, meaning nurses from all areas of employment. The results of this study may increase the awareness of nurses' knowledge of heart failure guidelines. Once it is known that there is a knowledge deficit, perhaps employers could initiate an educational program focused on increasing nurses' knowledge of the heart failure education guidelines. In addition to increasing the awareness of nurses' knowledge of heart failure education guidelines, perhaps this study has already been enlightening to the participants who took the survey. Although the nurses who participated in this study were not made aware of their scores, they may have benefited from taking the survey, since they may now recognize or be cognizant that the guidelines even exist, or even more so, the nurses may realize what knowledge they are lacking and perhaps will pursue learning the HF guidelines. Consequently, as these nurses learn about the HF education guidelines, it is hoped that they will have increased self efficacy and begin to or improve the education they give to HF patients.

Another implication for future research would be to determine if self-efficacy was really related to higher scores regarding nurses' knowledge of HF education guidelines. It would have been interesting to see how nurses ranked their own self-efficacy and then to compare that to their scores on the actual test. Perhaps, nurses with a higher perception of self-efficacy would have better scores than nurses with a lower perception of self-efficacy. According to Bandura (1994), people with high perceptions of self-efficacy tent

to seek out knowledge and skills that will help them face situations they will be exposed to in the future. It may be that nurses with high self-efficacy who take the survey will become cognizant of a knowledge base they were lacking, such as knowledge of HF education guidelines, and as such, seek out and learn that information so they will be prepared in the future to educate HF patients.

Additionally, not only is it important to realize that nurses need more education regarding HF, but it would need to be determined whether providing an educational program would be beneficial. Another study would be valuable to determine whether educating nurses on the HF education principles would actually reduce the knowledge deficit and improve outcomes for HF patients.

Another implication for future research may include the field of advanced practice registered nurse (APRN). Future research could assess APRNs knowledge of HF education principles. If the APRNs proved more knowledgeable than RNs or LPNs, perhaps they could help in educating HF patients; or it could be examined why the APRNs were more knowledgeable and use this information to increase the knowledge of RNs or LPNs. If APRNs proved to be lacking in knowledge regarding HF education principles, it may confirm that knowledge of HF education principles is lacking across the entire field of nursing.

Additionally, APRNs are seen as leaders in the nursing field and as role models to many nurses. As a leader and a role model, APRNs are in a position to help educate nurses regarding the HF education guidelines. As a provider, APRNs are in a position to directly educate the HF patient regarding the HF education guidelines. If further research

showed that APRNs are indeed more knowledgeable regarding the HF education guidelines than RNs or LPNs, they may be placed in a position to make sure patients are educated regarding the HF guidelines, whether it be as an educator personally or to facilitate the education through an RN or LPN.

### Summary

This particular study shows similar results to the two studies previously done that examined nurses' knowledge of HF education guidelines, which demonstrate that nurses may not be sufficiently knowledgeable regarding the HF education guidelines. The results of this study show statistically significant findings regarding years of experience and knowledge of the HF guidelines, but no statistically significant findings regarding educational preparation and knowledge of HF education guidelines.

Multiple studies stress the importance of having HF patients thoroughly understand their diagnosis and how this increase in knowledge has shown to have a positive impact on improving quality of life, decreasing hospital admission rates, and decreasing mortality rates. It is equally important that the nurses educating HF patients have a thorough understanding of the disease which includes knowing the HF education guidelines because they are the key educators to HF patients when they are in the hospital. HF patients who are taught by educated nurses may receive a higher quality of education, which can mean that these patients may have an improved quality of life, decreased hospital admission rates, and a decreased risk of mortality compared to those HF patients not taught by an educated nurse.

Although limitations to this study exist, there are important implications for future research and practice. Future research may be able to demonstrate if specific area of employment plays a role in nurses' knowledge of HF education or even if APRNs are more knowledgeable regarding the guidelines. If it was determined that APRNs were more knowledgeable, they may be able to personally educate HF patients or they may be able to educate the less knowledgeable nurses. No matter what nurse is educating HF patients regarding the HF guidelines, it must be reiterated that having the patients educated by a HF knowledgeable nurse will give the patients the best chance at improving their quality of life, decreasing hospital admission rates, and decreasing the risk of mortality.

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APPENDICES

APPENDIX A

EMAIL SENT TO NURSES

Dear Nurse Colleague,

I'm writing to ask your help with a research study. My research project is in the area of nurses' knowledge of heart failure education principles. Please consider taking approximately 5 minutes to complete the following survey.

A more detailed explanation of the study is attached for your review. If you choose to participate, the following link will take you directly to a short questionnaire where you will be asked questions regarding heart failure education principles: (you will need to copy and paste the following link)

[http://www.montana.edu/nursingsurveys/HeartFailure/heart\\_failure\\_guidelines.htm](http://www.montana.edu/nursingsurveys/HeartFailure/heart_failure_guidelines.htm)

Your submission of the questionnaire will imply consent and your responses will be returned anonymously to me. Thank you in advance for your time. I am most grateful for your assistance.

Sincerely,  
Anna Knopp, RN, BSN

APPENDIX B  
COVER LETTER

SUBJECT CONSENT FORM FOR PARTICIPATION IN HUMJAN RESEARCH AT  
MONTANA STATE UNIVERSITY

Dear Nurse Colleague,

You are being asked to participate in a project to explore nurses' understanding of current heart failure guidelines. This study is being conducted as part of my thesis requirement in the graduate nursing curriculum at Montana State University. Your input in this study will further the understanding of nurses' knowledge of heart failure guidelines and help identify needs in this area.

I anticipate the total time to complete the questionnaire will be approximately 5-10 minutes. There are no identifiable risks to you, nor are there direct benefits to you. Your participation in this study is completely voluntary and your electronically completed questionnaire will serve as consent to participate. You are free to decide not to participate in the study or to withdraw at any time without adversely affecting your relationship with the investigators or Montana State University College of Nursing.

To maintain your confidentiality, no personal identifying information will be included on the questionnaires. Questionnaire data is returned anonymously and electronic responses cannot be tracked to the sender.

If, at any time, you have questions about the study, you may contact me at (406) 202-2840 or my thesis chair, Dr. Susan Luparell at (406) 771-4459 or luparell@montana.edu. Additional questions about the rights of human subjects can be answered by the Chairman of the Institutional Review Board at Montana State University, Mark Quinn, (406) 994-5721.

Thank you in advance for your time.

Sincerely,

Anna Knopp, RN, BSN  
Graduate Nurse Student  
Phone: (406) 771-4459  
Email: anna.coates@myportal.montana.edu