HEART FAILURE INTERVENTIONS TO REDUCE HOSPITAL READMISSIONS

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# Table of Contents

Table of Contents ................................................................. i

Abstract .................................................................................. iii

Chapter I: Introduction and Background

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Background</td>
<td>2</td>
</tr>
<tr>
<td>Problem Statement</td>
<td>4</td>
</tr>
<tr>
<td>Purpose Statement</td>
<td>5</td>
</tr>
<tr>
<td>Research Questions</td>
<td>5</td>
</tr>
<tr>
<td>Conceptual Framework</td>
<td>5</td>
</tr>
<tr>
<td>Limitations</td>
<td>6</td>
</tr>
<tr>
<td>Summary</td>
<td>6</td>
</tr>
</tbody>
</table>

Chapter II: Review of Literature

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>8</td>
</tr>
<tr>
<td>Organizing Framework</td>
<td>8</td>
</tr>
<tr>
<td>Descriptive Components of Quality of Life</td>
<td>10</td>
</tr>
<tr>
<td>Inpatient Case Management Assistance</td>
<td>12</td>
</tr>
<tr>
<td>Outpatient Case Management Services</td>
<td>15</td>
</tr>
<tr>
<td>Summary</td>
<td>35</td>
</tr>
</tbody>
</table>

Chapter III: Methods and Procedures

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>39</td>
</tr>
<tr>
<td>Research Questions</td>
<td>39</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Population, Setting, and Sample</td>
<td>40</td>
</tr>
<tr>
<td>Protection of Human Subjects</td>
<td>40</td>
</tr>
<tr>
<td>Study Design</td>
<td>41</td>
</tr>
<tr>
<td>Procedures</td>
<td>41</td>
</tr>
<tr>
<td>Instruments</td>
<td>41</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>42</td>
</tr>
<tr>
<td>Summary</td>
<td>42</td>
</tr>
<tr>
<td>References</td>
<td>44</td>
</tr>
</tbody>
</table>
Chapter I

Introduction and Background

The care of heart failure patients is complex and costly to the health care industry. It is estimated that over five million Americans are currently diagnosed with heart failure with an annual cost to the health care industry of over $33 billion. Insurers’ annual cost of heart failure is estimated at more than $8,000 per person per year (Smith et al., 2010). Heart failure is a leading reason for readmission of Medicare patients; almost one in five Medicare readmissions is for this diagnosis. The total cost of these hospital readmissions in 2004 was $17.4 billion (American College of Cardiology & Institute for Healthcare Improvement, 2010). Heart failure is more prevalent in people aged 65 years or older whose co-morbidities increase the complexity of their care. The “baby boomer” era is starting to reach this age and the number of patients diagnosed with heart failure may double. In an era of health care cost-cutting, the health care industry needs to find ways to reduce this cost and improve patient outcomes. Many of these hospital readmissions could be avoided by the utilization of nurse case managers.

During the patient’s hospitalization for heart failure, the acute care nurse first stabilizes the patient and then focuses on health promotion and tertiary prevention in an effort to restore the patient to his or her highest level of functioning. Time limitations result in educational instructions that are commonly general in nature rather than individualized to the patient. The patient in the hospital may feel overwhelmed with a
new diagnosis of heart failure or discouraged by an exacerbation of the heart failure. This causes decreased retention of instructions or can make patients feel incapable of managing their disease process independently (Shearer, Cisar, & Greenberg, 2007). The literature suggests that, in the first six months after discharge from the hospital, readmission rates for heart failure are high. The first 30 to 90 days post-discharge are considered the most critical period with the readmission rates ranging from 29% to 47%. High readmission rates contribute to the total cost of health care for heart failure (Aliti, Rabelo, Domingues, & Clauseil, 2007).

Hospital readmission rates continue to be high even with acute care nurses providing education in the hospital setting. Education and coordination of heart failure patient care needs to continue after hospital discharge in an effort to decrease preventable hospital readmissions. The literature suggests that nurse case managers can assist heart failure patients in managing their illness with the goal of gaining independence in disease management. There is limited research that examines the relationship between nurse case management and the outcomes of patient education and economic impact of heart failure admissions.

Background

Heart failure, also known as congestive heart failure, is a complex disease that affects multiple organs. Heart failure occurs when the heart is unable to pump enough blood to meet the needs of the body. The kidneys then conserve fluid in an attempt to correct this deficit. The fluid builds up in the lungs, liver, legs, and around the eyes. The signs and symptoms of heart failure include shortness of breath, persistent coughing or
wheezing, edema, fatigue, lack of appetite, nausea, confusion, and increased heart rate (American Heart Association, 2010).

Heart failure is a progressive disease that does not have a cure but has treatment options to help manage the symptoms. The different treatment options can be categorized as lifestyle changes, medical management using pharmaceuticals, and surgical procedures with and without implantable devices. Lifestyles changes such as dietary modification and elimination of smoking can slow the progression. Patients are instructed to take medications as ordered, monitor their physical conditions, and report such changes as weight gain or increased shortness of breath to their primary physician. Advances in surgical treatment of heart failure open new possibilities for disease management.

The care of heart failure is complex; therefore, patients benefit from a collaborative health care team that assists with symptom management. This health care team may consist of the patient’s primary doctor, cardiologist, clinical nurse specialist, physical and occupational therapists, dietitian, mental health professional, pharmacist, and case manager (American Heart Association, 2010). Patients who understand the subtle signs and symptoms preceding heart failure exacerbation can better communicate with their health care professionals to manage their disease and decrease hospital readmissions.

New disease management programs have been developed over the last several years in an attempt to control the increasing cost of hospital readmissions. Disease management focuses on the disease, in this case heart failure, instead of the patient as a holistic individual. Because adverse outcomes for severely affected heart failure patients
cannot always be prevented, heart failure disease management programs are not able to consistently decrease readmission rates (Aliti et al., 2007). New management strategies may need to be adopted to improve the outcomes for heart failure patients. A different way to look at the management of heart failure patients is to consider the patient as an individual and not as a disease. This approach is taken in nurse case management. Nurse case management focuses on the needs of the individual patient instead of the symptoms of the disease (Annema, Luttik, & Jaarsma, 2009).

Case managers deliver care using a patient advocacy model that emphasizes the coordination of services from the patient’s perspective. The treatment regimen of the heart failure patient is determined not only by medical needs, but also by financial, psychological, and social circumstances. Patients with heart failure usually have multiple comorbidities which contribute to the complexity of care. In the case management model, the care of the patient is individualized specifically to the patient’s overall needs and is therefore able to address multiple chronic conditions the patient may be experiencing (Annema et al., 2009).

Problem Statement

In an era of increased focus on reducing health care costs, one of the leading causes of expensive hospital readmission is heart failure. High readmission rates, despite advances in the prevention and treatment of heart failure, contribute to the cost of managing patients with this chronic condition. This proposed study will be a replication of the original Hodgen, Ferguson, Davis, and White’s (2002) study investigating the relationship between case management, patient outcomes, and hospital readmissions.
Purpose Statement

The purpose of this study is to examine the effectiveness of nurse case management for heart failure patients on the delivery of patient education and on the financial impact of hospital readmissions. In addition, overall patient satisfaction with the services provided by case management in patients with heart failure will be evaluated.

Research Questions

1. Is there a difference in the delivery of patient education between patients with heart failure who receive nurse case management and those patients who do not receive such services?

2. Is there a difference in number of readmissions and cost of care between patients with heart failure who receive nurse case management and those patients who do not receive such services?

3. How do patients with heart failure rate their satisfaction with nurse case management services?

Conceptual Framework

The framework for this study is Orem’s self-care theory (Orem, Taylor, & Renpenning, 1991). The domains of Orem’s self-care theory encompass the proposition that human beings attend to and achieve within themselves to regain self-care. This complex view assumes that the individual, the self, is the agent of action (the one acting) and the object of action (the one acted upon). The individual may need to seek assistance from others to regain self-care. There are five different methods of helping another to
regain self-care: acting or doing for others, guiding others, supporting another, providing an environment to promote personal development in relation to meet future demands, and teaching another (Denyes, Orem, & Bekel-SozWiss, 2001). Using this theory, the nurse case manager will be able to guide heart failure patients into independent disease management when possible and to assist patients and caregivers if necessary.

Limitations

Several limitations affecting generalizability of findings are anticipated in this study. These include the size of the sample and the limited geographic area from which the sample will be drawn. Although the population from which the sample is drawn is predominantly Caucasian, efforts will be made to obtain minority representation. Data related to patient education will be obtained by chart review only which limits information that may be collected to that which has been previously documented in the medical record.

Summary

Heart failure is a complex chronic disease. Nurse case managers can assist patients with heart failure by focusing on the patient’s individual needs which will foster independent disease management. The nurse case managers can assist patients and caregivers with disease education, resource allocations, and coordination of inpatient and outpatient care services. Ongoing monitoring may identify symptoms that could be effectively managed before they lead to a hospital readmission. The purpose of this study
will be to evaluate the effectiveness of nurse case management on health care outcomes of heart failure patients.
Chapter II

Review of Literature

Introduction

The complexity of heart failure as a disease process leads to complicated disease management strategies. As a result, heart failure is one of the leading diagnoses associated with multiple costly hospital readmissions. The annual cost of treatment for the more than five million Americans diagnosed with heart failure is estimated to be approximately $8000 per person per year (Smith et al., 2010). With increasing demands to reduce costs across the health care system, a reduction in the readmission rate for heart failure patients while maintaining positive outcomes is necessary. The purpose of this study is to examine whether a nurse case management team improves the health care outcomes of heart failure patients.

The following literature review of selected research articles will be organized into four categories: the framework, descriptive components of quality of life, inpatient case management assistance, and outpatient case management services.

Organizing Framework

Heart failure is a complex disease that requires constant symptom monitoring. Helping patients to understand the importance of managing their own symptoms will foster their independence in self-care. Orem’s grounded theory addresses how nurses assist patients to achieve independent self-care skills. The three domains of this theory
include the theory of self-care, the theory of self-care deficit and the theory of nursing systems (Orem et al., 1991).

Orem explained that the focus for the theory of self-care is to answer the question “What is self-care and what is dependent care?” (Orem, 1987, p. 72). Self-care is a process learned through interactions and communication within a larger social group. Individual self-care actions vary as a result of the person’s individual culture and social interactions. Self-care is a deliberate action to fill a personal need. Dependent care occurs when self-care cannot be performed from a lack of either knowledge or physical ability to perform self-care (Orem et al., 1991).

The theory of self-care deficit answers the question “When and why do people require the health service of nursing?” (Orem, 1987, p. 72). The main focus of this domain recognizes that individuals are affected at times by limitations that do not allow them to meet their needs. These limitations can be from health conditions or factors internal or external to the individual (Orem et al., 1991).

The last theoretical domain, nursing systems, addresses how the patient’s self-care needs will be met by the nurse, the patient, or both. Three classifications describe how a patient in this system meets the self-care requisites wholly compensatory, partly compensatory and supportive. The main focus of this domain is to utilize resources in assisting the patient to reach the maximum potential of self-care (Orem et al., 1991).

These domains encompass the proposition that human beings attend to and achieve within themselves. This complex view assumes that the self is the agent of action (the one acting) and the object of action (the one acted upon). The individual may need to
seek assistance from others to regain self-care. There are five different methods of helping: acting or doing for others, guiding others, supporting another, providing an environment to promote personal development in relation to meet future demands, and teaching another (Denyes et al., 2001). This proposed study is based on all three of Orem’s domains. The nurse case manager’s role is to guide heart failure patients into independent disease management when possible and to assist patients and caregivers if necessary (Hodgen et al., 2002).

Descriptive Components of Quality of Life

Living with heart failure can be taxing on patients and their families as a result of the complex nature of the disease. There is limited research that assesses both the physical and psychosocial components of quality of life (QOL) of patients with heart failure. Clinicians and researchers many times focus primarily on physical symptoms rather than capturing the full range of psychosocial concerns. The purpose of the study by Bosworth et al. (2004) was to examine patients’ perception of how life with heart failure affects both components of QOL. By gathering heart failure patients’ descriptions of components of QOL, this study identified QOL issues specifically important to patients. Using a grounded theory approach, this cross-sectional qualitative study considered the knowledge that patients with heart failure are acutely aware of not only the physical limitations but also the psychosocial aspects that mark life with this chronic illness. The framework of the study was centered on patients’ symptoms, role loss, affective response, coping and compensation, and social support that affect their QOL.
Bosworth et al. (2004) used a centralized Veterans Administration Medical Center (VAMC) database to identify potential participants. The participants had to have a documented outpatient diagnosis of heart failure, visited the general medicine clinic of the Durham VAMC at least once in 1999 and been diagnosed with an ejection fraction of less than 40 percent. The 15 male participants in this study were divided into 3 focus groups which were stratified by New York Heart Association (NYHA) disease stage I/II (n=10) or stage III/IV (n=5). Ages ranged from 47 to 82 years and the majority of participants were married.

Participants were audio taped during focus group meetings. Focus groups were led by a psychologist using semi-structured questions. Discussions were later transcribed and the data entered into NUDIST, a qualitative analysis software package which permits identification and coding of the exemplars of specific attributes of QOL. Two investigators independently read the transcripts and analyzed them for common and recurrent themes pertaining to QOL. Thirty attributes were identified and then collapsed into five broad domains: symptoms, role loss, affective response, coping and compensation, and social support.

Bosworth et al. (2004) found that patients often spoke about the negative influence of physical symptoms such as edema, dyspnea, and fatigue on overall QOL. While patients were coping with these symptoms themselves, they were acutely aware that their experience with these physical symptoms also affected their loved ones. In the role loss domain, participants spoke with frustration about the loss of their ability to participate in usual social or work roles. Specific losses included sexual intimacy and the
bread winner role. Affective responses described by patients included feelings of depression, low self-worth, frustration, fear, anxiety, dysthymia, anhedonia, and guilt. Coping and compensation included both negative and positive mechanisms. Spirituality was an important mechanism for many participants. Others described coping in the form of substituting a previous activity with a new one. The social support domain could be negative or positive. In some examples, the patient’s family members helped out with daily activities; in others the family members or friends did not understand the patient’s limitations and severity of the illness.

Heart failure is an irreversible, devastating disease that affects QOL. Changes in the lungs, circulation, and skeletal muscles cause the symptoms of fatigue, dyspnea, and limitation in exercise capacity, which adversely affect a patient’s QOL. The study suggests patients with heart failure are aware of not only their physical limitations, but also the concomitant psychosocial dimensions that mark life with this chronic disease. Identifying ways to improve the QOL of this growing heart failure population is essential (Bosworth et al., 2004).

**Inpatient Case Management Assistance**

In an era of increased focus on health care cost reduction, one of the leading causes of hospital readmission is heart failure. High readmission rates contribute significantly to the cost of managing patients with this chronic condition. Hodgen et al. (2002) examined the relationship of nursing case management to the outcomes of resource allocation, the economic impact of heart failure patient admissions, and on the
overall patient satisfaction in patients with heart failure. The framework of this pilot study was guided by Orem’s self care theory.

The subjects for the Hodgen et al. (2002) pilot study were 62 patients of an acute care hospital in the Midwest who were randomly selected from admissions between July 2000 and February 2001. Potential participants were initially identified through a comprehensive review of patients’ medical records. The criteria for inclusion in the study were: a principal diagnosis of heart failure, admitted to an attending cardiologist for treatment, 65 years of age or greater, Medicare patient only, and Caucasian, thus reflecting the majority population served by the local hospital. The sample included medical records of patients admitted prior to and after the implementation of a new case management program. A total of 62 patients were included in the study. The pre-case management program group included 34 patients; 28 patients were part of the post-case management group. The case management services included patient education in diet, exercise, weight management guidelines, medical regimen compliance, risk factor modification, smoking cessation, pulse rate monitoring, and parameters for calling the doctor. The demographics of the pre-case management group were 16 males (47%) and 18 (53%) females with an average age of 75 years for males and 79 years for females. The post-case management group was made up of 14 (54%) males and 12 (46%) females with the average age for males of 73 years compared with 79 years for females.

To collect data from this sample of patients with heart failure, Hodgen et al. (2002) developed a data abstraction tool based on the Health Care Excel program formerly used by the Health Care Finance Administration. A second tool developed from
the Picker/Commonwealth Hospitalization Satisfaction Survey was used to assess patient satisfaction with case management services. There was no discussion on the reliability and validity of these tools.

A statistically significant difference in the length of stay was found between the two groups ($p < .001$). The length of stay in the pre-case management group was 4.26 days compared with 5.62 days for the post-case management group. The post-case management group average total hospital charges was approximately $1000 more per admission than the pre-case management group which could be related to the slightly longer length of stay for this particular group. However, the 30-day readmission rate was significantly lower for the group that received case management services ($p = .001$). Six participants from the pre-management group were readmitted to the hospital contrasted with two participants from the post-case management group being readmitted (Hodgen et al., 2002).

Hodgen et al. (2002) examined the medical records for three patient education topics: dietary instruction, weight management, and parameters for contacting the physicians. Dietary instructions were given to 16 patients in the pre-case management group; 19 patients in the post-case management group received dietary instruction. Six patients received weight parameters in the pre-case management group; 10 patients in the post-case management group received similar education. The last education topic covered parameters for calling the doctor. Eleven patients in the pre-case management group and 15 patients in post-case management group received instructions regarding when to call their doctor. There were statistically significant differences between the two groups for
these three education categories, all at the .01 level. Patient satisfaction could not be
reported due to the limited return rate from patients who received the mailed
questionnaire.

Hodgen et al. (2002) concluded that case management helps reduce the number of
hospital readmissions by focusing on resource allocation. The results of the Hodgen et al.
(2002) study suggest that case management does positively influence the health care
outcomes of heart failure patients. Acute care hospitals could consider utilization of case
management to help reduce the cost of heart failure patient readmissions.

**Outpatient Case Management Services**

Few studies have addressed the role of home care in preventing readmission
addressed the issue by assessing patient-perceived adequacy of formal and informal
assistance related to skilled-nursing tasks and functional activities of living. A
prospective design to track Medicare patients with heart disease was used. The analyses
were constructed to test literature-driven hypotheses about the relationship between home
care adequacy and hospital readmissions.

Of the 362 eligible patients discharged from a large Midwestern urban hospital, a
total of 253 patients consented to participate in the study. The inclusion criteria were that
patients be insured by Medicare, diagnosed with heart failure, served by a hospital social
worker, and discharged home between July 1990 and October 1991. Of the 253 patients,
41% were male, 63.6% were not married and 48.5% were non-White (Proctor et al.,
2000).
A trained interviewer collected post-discharge data by a telephone interview conducted at six, ten, and fourteen weeks after discharge. These data included the use of informal and formal home care, socioeconomic status, and health functioning. Test-retest reliability of the telephone assessment interviews was established with a weighted Kappa statistic ($K = .80$). The Hollingshead Index of Social Class was used to measure socioeconomic status. Readmission was measured by direct patient questions and monitoring of hospital admission records. A score indicating adequacy of formal and informal home care was derived from a structured assessment of services received in 14 areas of independent and dependent activities of daily living. The control variables for the study were health status and medication compliance. Questions about bed days and self-rated health were used to measure health status. Medication compliance was assessed with two questions asked at a two-week post-discharge interview.

Proctor et al. (2000) found 42% of heart failure patients discharged home were readmitted to the hospital during the study period. Readmissions were significantly related to the adequacy of care at home ($p = .04$). Adequate care given at home correlated with decreased hospital admissions for the patient. Medication compliance ($p = .002$) and self-rated health ($p = .03$) were also significantly related to hospital readmissions.

The findings suggest that the patients with heart failure most likely to be readmitted were those who, during the first two weeks after discharge, were sicker and less compliant with prescribed medication. These findings demonstrate the need for case managers to enhance the adequacy of home care. Upon discharge from the acute care
hospital setting, patients’ home care environment and support systems need to be addressed to help decrease hospital readmissions (Proctor et al., 2000).

Few researchers have tested the effects of informal (care given by unpaid helpers such as family and friends) and formal (care given by paid helpers such as nurses or aids) home care services on hospital readmission. Li, Morrow-Howell, and Proctor (2004) examined the independent and joint effects of informal and formal service use on hospital readmissions. The framework of this study was guided by task-specific theory developed by Litwak.

Li et al. (2004) used the patient data set from the Adequacy of Home Care Plans for Chronically Ill Elderly project. These patients were discharged from a large mid-western urban teaching hospital. The inclusion criteria were 65 years of age or older, diagnosed with heart failure, discharged to a home setting, and served by a discharge planner. Of the 362 eligible patients, 296 patients agreed to participate in the study. The final sample was 192 patients due to death, patients wanting to drop out, and readmission into the hospital within the first two weeks of discharge.

Hospital readmission, the dependant variable, was measured dichotomously according to whether patients had a hospital readmission between 2 and 14 weeks post-discharge. A telephone interview was used to measure whether assistance was needed in activities of daily living (ADL), instrumental activities of daily living (IADL) or nursing care and how often these services were utilized in one week. These telephone interview questions were pretested and test-retest reliability through Kappa statistic was at least .80. The independent variables were patient demographics, severity of heart failure, functional
and health status, compliance with medical treatment, and informal caregivers’ ability to care. Race, gender, marital status, Medicaid assistance, and living arrangements were measured dichotomously; education was measured on a seven-level scale. The patient’s socioeconomic status was measured by a two-factor index developed by Hollingshead that consists of education and occupation. This two-factor index is reliable with a Cronbach’s alpha of .70. Heart failure severity was measured on the widely used four-level New York Heart Association Classification scale. Functional status was defined as the extent to which the patients were to perform ADLs and IADLs. Cronbach’s alphas for the ADL scale and the IADL score were .88 and .85, respectively. Compliance with medications and caregiver limitations were assessed by interview questions (Li et al., 2004).

The average age of the patients in this study was 77.5 years. Most patients were not married and they were cared for after discharge by a social support network of relatives, spouses, or friends. The sample was highly impaired with 45% of the patients scoring 3 or 4 on the New York Heart Association Classification scale. At two weeks post-discharge, 70% of the patients needed ADL assistance and 90% needed IADL assistance. At 2 weeks post discharge, 87% of patients received care from informal caregivers and 89% received care from formal service providers. Nine percent relied on formal services only, 11% relied on informal services only, and 80% received both formal and informal services. Between the 2-week to 14-week follow-up phone interviews, 35% of the patients had at least one hospital readmission (Li et al., 2004).
In contrast to commonly held assumptions, Li et al. (2004) found formal services were not significantly related to hospital readmission (risk ratio = .89, 95% CI: .68 - 1.18, \( p = .42 \)). Informal services also did not show significance related to hospital readmission (risk ratio = 1.004, 95% CI: .78 – 1.29, \( p = .97 \)). Joint use of informal and formal services were not significantly related to hospital readmission (risk ratio = .72, 95% CI: .31 - 1.67, \( p = .45 \)). The study did demonstrate that hospital readmission was consistently predicted by length of heart failure history and compliance with medication.

These findings confirm that compliance with medication is crucial in reducing the risk of hospital readmissions. This important information needs to be conveyed to patients in discharge teaching. Because the high cost of prescription drugs can create a financial burden for patients and decrease patients’ compliance with their medication regimen, Li et al. (2004) concluded that referrals to appropriate assistance programs should be a component of discharge planning and home health care.

The high costs associated with heart failure have created the need to identify cost-effective treatment. The purpose of the pilot study by Pugh, Havens, Xie, Robinson, and Blaha (2001) was to explore the impact of a specific nurse-managed case management program on the quality of life and functional status of patients with heart failure while examining the cost-effectiveness of the program. The Partners-in-Care Model (PIC) involved two key factors in nursing case management of heart failure patients: patient monitoring and a nurse case manager providing care across the continuum of care. A supporting theoretical framework was not identified in this study.
Pugh et al. (2001) randomized 58 patients from two hospitals in central and eastern Pennsylvania into two groups: 31 patients in the usual care group and 27 patients in the treatment group. All patients were Caucasian, reflecting the ethnic status in that area, with an average age of 77 years. The inclusion criteria was 65 years or older, diagnosis of heart failure, heart failure level two or greater as indicated by the New York Heart Association rating, and discharged to home or a retirement community.

Quality of life, functional status, and cost of care were the outcomes measured in this study (Pugh et al., 2001). The eight multi-item scales of the SF-36 scale were used to measure QOL at baseline and again at 6 months. Validity of the SF-36 scale has been previously determined and is a widely used measure of quality of life. Functional status of patients was also measured at baseline and again at 6 months using the 6-minute walk test. There has been reported evidence for reliability and validity of this test. By tracking the patients’ ER visits, hospital readmissions, ambulance transports, nurse visits, and physician office visits, the cost of care for each patient was calculated.

Although there were no significant differences between the case management group and the usual care group, possibly due to a Type II error, the trends suggested an improvement among heart failure patients who received case management. Pugh et al. (2001) found the treatment group had a larger increase in terms of SF-36 scores for physical functioning and mental health. The treatment group’s 6-minute walk was longer than the usual care group but again, the difference was not statistically significant ($p = .61$). The median NYHA score for the treatment group decreased by 1.0 showing
improvement where as the usual care group remained the same ($p = .34$). The costs of care and readmission rates were not significantly different between groups.

In conclusion, there were no statistically significant differences between the usual care group and the treatment group in regards to QOL, functional status and cost of care. The heart failure treatment group did show improved functional status and QOL while the cost of care was neutral. The PIC program may be one way to help improve QOL for heart failure patients. Case managers can provide successful outcomes and improve QOL for patients living with the chronic disease of heart failure (Pugh et al., 2001).

With health care costs rising and reimbursement for care decreasing, another approach to cost reduction in home-based care is telehealth. Telehealth is defined as the delivery of health care and sharing of medical knowledge over a distance using telecommunication systems. McManus (2004) compared the readmission rate of home care patients with a primary diagnosis of heart failure receiving telehealth to that of similar patients receiving routine home care visits. There was no theoretical framework described as the basis for this study.

McManus’ (2004) study sample was drawn from patients with a primary diagnosis of heart failure admitted to the Visiting Nurse Association of Somerset Hills in New Jersey between January 1, 2002 and December 31, 2002. The inclusion criteria were primary diagnosis of heart failure, the ability to sit in front of the patient station for the visit, English speaking or having an interpreter present for each contact, a physician order for the program, adequate cognitive ability to interact with the telehealth nurse. If the patient was physically unable to perform the necessary tasks related to the telehealth visit,
the primary caregiver agreed to assistance from a telehealth-trained agency volunteer. The sample size consisted of 60 patients; 19 patients received telehealth monitoring and 41 received routine home care.

All participants in McManus’ (2004) study completed the 12-item Short-Form Health Survey (SF-12), which has established reliability and validity, and patient satisfaction surveys at specific intervals. Hospital readmission data were obtained from the Outcomes and Assessment Information Set (OASIS) collected at admission to home health care and at any transfer to other levels of care or discharge. Readmission rates for heart failure were identified within 30 days of admission to home health services, at 60 days, and longer than 60 days.

Although there were no significant differences in hospital readmission rates between the telehealth and traditional care groups, the trends suggested lower rates for the telehealth group (McManus, 2004). Hospital readmission rates for heart failure patients within 30 days were 5.26% for those in the telehealth group and 14.63% for patients receiving routine home care. Readmission rates at 60 days were 15.49% in the telehealth group and 10.71% for patients receiving routine home care. Of the study patients on home health service longer than 60 days, 20% of the telehealth group patients were readmitted for heart failure and 33.33% of those receiving routine home care were readmitted. McManus attributed the insignificant results to type II error and small sample size.

The patients receiving telehealth care indicated improved perception of their overall general health between admission to and discharge from the telehealth program.
and rated their satisfaction with the program as high. Uncontrolled variables such as co-
morbidities and financial concerns were not considered by McManus and may have
influenced the findings. Further research with larger sample size and other outcomes is
indicated as the use of telehealth services expands (McManus, 2004).

Changes in the home health care industry have led to the need for home care
agencies to implement and evaluate different methods for monitoring patients. Given the
relatively high cost of home telecare devices, Jerant, Azari, Martinez, and Nesbitt (2003)
questioned whether the ability to collect video information using such devices results in
corresponding incremental improvements in patient outcomes as compared to telephone
monitoring. No theoretical framework was discussed in this study.

Jerant et al. (2003) screened all patients with a primary admission diagnosis of
heart failure admitted to the University of California Davis (UCD) Medical Center
Hospital between July 1, 1999 and June 30, 2000. The eligibility criteria were 40 years of
age or older, had an active telephone line in their home, were English-speaking, and had a
family physician or general internist primary care provider in the UCD Health System.
Random assignment into one of the three groups was achieved prior to hospital discharge
using sealed envelopes containing randomly generated numbers. The three groups were
(a) video-based home telecare; (b) telephone calls; and (c) usual care. The sample
included 37 patients with 13 patients in the home telecare group and 12 patients each in
the telephone and usual care groups. Except for a trend toward increased length of time
with heart failure for the telephone group, the groups were similar. The patients had one
to two co-morbidities and had moderate to high levels of functional impairment.
Jerant et al. (2003) tracked health care utilization and charges for all participants over 180 days. This was accomplished by the visiting nurses logging all patient self-care teaching, duration of visit, travel time, administrative tasks, and direct patient care. During those visits, patients completed the Medical Outcomes Study SF-36 generic health status questionnaire and the Minnesota Living with Heart Failure Questionnaire (MLHFQ) to assess health function status. Both the SF-36 and the MLHFQ have established reliability and validity. Patient satisfaction was assessed using the eight-item Client Satisfaction Questionnaire for which the validity and reliability has been established.

The mean total duration of in-person visits for the usual care group was 45 minutes. This duration was more than three times longer than the telecare visits which had a mean total duration of 14 minutes. The in-person visit duration was five times longer than the telephone visits with a mean total duration of 10 minutes ($p < .0001$). All three groups had a slight reduction in MLHFQ scores, indicating fewer physical and emotional symptoms due to heart failure after the intervention. The SF-36 physical component scores for the telecare and telephone groups increased after the intervention indicating a slight improvement in physical health; however, this improvement was not statistically significant. There were no clinically meaningful or statistically significant changes in Client Satisfaction Questionnaire scores for any of the groups post-intervention (Jerant et al., 2003).

In conclusion, video-based home telecare may not offer significant advantages beyond frequent telephone follow-up care in reducing hospital readmissions and
emergency department visits for patients with heart failure. The current nurse caseload benchmark of five to six visits per day utilized by many home care agencies might be increased more than threefold by employing telenursing to replace some in-person visits. Nurse case managers may want to consider policies that utilize telephone nursing for follow up care instead of in-person nursing visits to reduce cost and utilize scarce resources (Jerant et al., 2003).

With heart failure being a major health concern for many Americans, literature has suggested that the utilization of nurse case management through telephone follow-up can promote self-management in heart failure patients. Literature review has also suggested that a patient empowerment approach to the management of the chronic disease may nurture self-management in patients. The purpose of the Shearer et al. (2007) study was to examine the effects of a telephone-delivered empowerment intervention (EI) on clinically and theoretically relevant outcomes in patients with heart failure. The study was guided by Rogers’ science of unitary human beings person-environment process.

A convenience sample of 90 adults from a large metropolitan hospital inpatient unit in the southwestern United States was recruited. The inclusion criteria consisted of the following requirements: 21 years of age and older, diagnosis of heart failure, ability to read and understand English, and access to a telephone once discharged from the hospital. All participants were randomly assigned to either the EI group or control group. The majority of the patients were married, white, well-educated males with a mean age of 76 years with a NYHA classification score of Class III heart failure (Shearer et al., 2007).
Outcome variables were purposeful participation in attaining health goals, functional health, and self-management. Purposeful participation in attaining health goals was measured by Shearer et al. (2007) through the Power as Knowing Participation in Change Tool VII (PKPCT). The reliability of this tool using Cronbach’s alpha was .72 and content validity was supported through factor analysis with item loadings ranging from .56 to .70. Functional health was measured through Ware’s Medical Outcomes Short-form Health Survey (SF-36) which has established reliability and validity. Self-management was measured using the Self-Management of Heart Failure (SMHF) scale. The SMHF scale’s validity was established through literature review and discussion among nurse heart failure experts. The reliability for this scale was determined by using Cronbach’s alpha for maintenance (.62), decision-making (.86), and self-confidence (.88).

Shearer et al. (2007) found no statistically significant difference between the intervention group and control group in regards to purposeful participation in attaining health goals. The mean score of the PKPCT for both groups averaged 257.9 on the pretest and 262.2 on the posttest. The SF-36 functional health dimension of physical health component and mental health component also did not show a statistical significance between the two groups. Both groups’ SF-36 score indicated a perceived moderate to high limitation in the performance of normal activities because of physical health. The mental health component summary scores were significantly higher at post-test across groups, with a mean of 50 compared with a mean of 45.9 on the pretest (p = .036). These scores indicated a perceived moderate limitation to perform normal activities because of
mental health. The SMHF scores showed a significant treatment by time interaction \( (p = .014) \). The EI group’s SMHF scores increased significantly from pretest to posttest \( (p < .001) \) compared with the control group \( (p = .059) \). These findings indicate the EI group was better able to manage their heart failure through self-care activities than the members of the control group.

The only area in which a significant difference was demonstrated was self-management. This knowledge may enhance health care providers’ ability to facilitate self-management among patients diagnosed with heart failure. Nurse case managers can help promote self-management and enhance perceived functional health by utilizing theory-based interventions in their practice (Shearer et al., 2007).

Patients’ self-management of their heart failure disease is a common goal among all health care professionals in the effort to reduce hospital readmissions. Patient-directed titration of diuretics could possibly be an area for patient self-management. Although patient-directed titration of diuretics is a component of some heart failure management programs, the effect of this practice on patient outcomes has not been established in the literature. Prasun, Kocheril, Klass, Dunlap, and Piano (2005) examined the effects of a flexible diuretic protocol in patients with heart failure. The study addressed four questions.

1. Can patients with heart failure titrate their diuretic dose using a self-directed diuretic titration protocol (DTP)?
2. Is there a difference in exercise tolerance, emergency department (ED) visits, and hospital readmission rated between patients using the DTP and those receiving usual care?

3. Is there a difference in self-reported QOL between patients using the DTP versus receiving usual care?

4. Is there a difference in biological markers of heart failure severity and progression between patients using the DTP and those receiving usual care?

A convenience sample obtained from an urban-based academic medical center and a rural medical center was used in this prospective experimental study. After consent was obtained, 66 patients were randomized into either a usual care (UC) group or an experimental diuretic titration (DT) group. Inclusion criteria required study subjects to be 18 years of age or older with a diagnosis of heart failure for 1 month or more, ambulatory, noninstitutionalized, and receiving optimum heart failure standard therapy. Study subjects also had to have stable vital signs and symptoms of heart failure (Prasun et al., 2005).

Prasun et al. (2005) examined patients’ exercise tolerance, self-reported QOL, and biological markers. The outcome variables were measured at baseline and again at 3 months. Both groups received a standardized educational protocol, but only the DT group was instructed on how to titrate their diuretic doses. A 6-minute walk test was given by a nurse at both time points to determine exercise tolerance. Health-related QOL was measured using the QOL Index which is specifically designed for cardiac patients and Minnesota Living with Heart Failure Questionnaire. Blood samples to measure B-type
natriuretic peptide (NT-BNP) and norepinephrine (NE), and urine samples to measure sodium concentrations were obtained from all patients at the beginning and conclusion of the study.

The sample used in the study by Prasun et al. (2005) can be described as being predominantly Caucasian males with a mean NYHA classification of 3.1. The DT group had a significantly higher educational level than the usual care group. Over the 3 month study period, 60% of the DT patients titrated their diuretic dose. No significant differences were found between groups for any of the dependent variables. However, within the DT group, exercise tolerance \( (p = .01) \) and health-related QOL \( (p = .001) \) were significantly improved when compared with baseline measures. The DT group also had significantly fewer heart failure-related emergency department visits \( (DT = 2.8\%, \ UC = 22.7\%, p = .015) \). There was no significant difference between the two groups in regards to hospital readmissions \( (DT = 8.5\% \text{ vs } UC = 19.3\%, p = .351) \) or deaths \( (DT = 5.7\%, \ UC = 9.6\%, p = .547) \). There were no significant differences between the two groups in regards to selected biologic markers indicative of changes in heart failure.

Patients in the DT group had significant improvement in exercise tolerance, health-related QOL, and experienced fewer emergency departments visit but had no significant difference in hospital readmissions, or deaths. Because there were no significant differences in admissions or deaths between the group that self-titrated diuretics and the group that received usual care from a cardiologist, the data from this study suggest that patients can safely self-titrate their diuretic dose using a diuretic protocol. This information can help guide case managers and cardiologists in providing
adequate education in self-titrating a patient’s diuretic dose to help reduce hospital
readmissions (Prasun et al., 2005).

Multiple studies have provided evidence that case management contributes to
reduced hospital readmissions in high-risk heart failure patients and medically
underserved populations. However, it is not known if case management for low-risk heart
failure patients has similar outcomes. DeBusk et al. (2004) performed a randomized,
controlled trial to determine whether a telephone-mediated nurse care management
program for low-risk heart failure patients would reduce the rate of rehospitalization over
one year. The authors did not describe the theoretical framework underlying this study.

DeBusk et al. (2004) selected a convenience sample of 462 patients from five
northern California hospitals in the Kaiser Permanente health maintenance organization
between May 1998 and October 2000. The inclusion criteria consisted of new-onset or
worsening heart failure on the basis of shortness of breath and at least one corroborating
clinical sign or radiologic abnormality. Patients who had or were scheduled for cardiac
surgery or who were diagnosed with renal insufficiency or respiratory disease requiring
home oxygen were excluded. The 462 patients were randomly assigned into two groups.
The usual care group consisted of 234 patients and the nurse-based case management
group had 228 patients. The nurse-based case management group received similar care as
the usual group plus coordination of care across disciplines, patient and caregiver
education, enhancement of self-management skills, and guidelines-based medications for
heart failure.
DeBusk et al. (2004) examined the time to first rehospitalization for heart failure and any other cause. This was measured over the 12 month study by project nurses using standardized forms to track the cause, number, and duration of hospitalizations and emergency department visits. The cause of death, hospital readmission, or emergency room visit was measured by two cardiologists who reviewed medical records to determine if the cause was due to heart failure or another cause.

The majority of patients were married with a mean age of 72 years. The sample was evenly divided by heart failure severity as measured by the NYHA classification scale. At the end of one year, half of the patients had been hospitalized at least once. In contrast to the high-risk heart failure patient population, there was not a statistically significant difference in hospital readmissions between those low-risk patients who received nurse-based care management and those who did not receive these services (DeBusk et al., 2004).

The findings of DeBusk et al. (2004) could be attributed to multiple factors. The lack of statistical significance in the findings could be related to the sociodemographic and medical attributes of the study sample and the scope and quality of the health care services which the participants already received. Patients who received health care management and exhibited a more severe NYHA classification score had shown improvement.

Many therapies have been shown to be effective in the medical management of heart failure patients, but many patients may not be receiving the full benefit of these therapies. Evidence-based practice recommends that, in addition to effective medical
therapies, patients are offered instruction in the importance of adherence to the treatment plan and self-monitoring. The purposes of this study by Sisk et al. (2006) were to evaluate a nurse management program, to address documented shortfalls in patient education and compliance and to evaluate the program’s effectiveness. The nurse managed program modeled a Stanford University program which examined heart failure patients and hospital readmissions.

The sample for this study by Sisk et al. (2006) was selected from patients admitted to four hospitals in Harlem, New York between March 1999 and February 2001. The inclusion criteria for the pilot program was at least one clinical visit to a participating practice, impaired systolic dysfunction, 18 years of age or older, English or Spanish-speaking, community-dwelling at enrollment, and a current patient in a participating general medicine, geriatric, or cardiology clinic or office. The sample size consisted of 406 patients, 203 randomly assigned to a usual care group and 203 randomly assigned to a nurse management group. The ethnicity of the patients was predominately non-Hispanic black at 45.8 percent.

Sisk et al. (2006) examined hospital readmissions, patients’ functional status and deaths. Billing data were utilized to measure hospitalizations. Quarterly telephone surveys were completed to track nonparticipating hospitals for admissions. The Short Form-12 physical component score and the condition-specific Minnesota Living with Heart Failure Questionnaire were used to measure patient’s functional status. These two surveys were administered at quarterly interviews and have established validity and
reliability. The National Death Index plus death reported by family members were used to measure deaths.

Sisk et al. (2006) found the nurse managed patients had fewer hospitalizations per person year (95% CI, -.025 to -.001) than the usual care patient group at 12 months. The nurse managed patients’ Short Form-12 physical component score was 39.9 versus the usual care group was 36.6 (difference 3.6 [95% CI, -15.3 to -2.2]) showing a better functional status. The Minnesota Living with Heart Failure Questionnaire score showed better functional status in the nurse managed group with a score of 38.6 versus 47.3 for the usual care group (95% CI, -15.3 to -2.2). In the 12-month study, 22 deaths occurred in each group and hospitalizations were similar in each group. After the completion of the 12 month trial, nurse managed patients’ functioning began decreasing at a rate similar to patients in the usual care group within months.

The findings provide further evidence that guidance and supervision from a nurse management program can improve the functioning and slightly reduce hospitalizations in heart failure patients. Nurse case managers play vital roles in educating and monitoring patients with heart failure to improve patients’ functional status. Continued education and monitoring are vital elements for the management of patients with heart failure (Sisk et al., 2006).

A clear understanding of the effects of heart failure management programs on morbidity and mortality is limited to short-term follow-up. Inglis et al. (2006) prospectively examined the long-term (minimum of 7.5 to 10 years) impact of a nurse-led, multidisciplinary home-based intervention (HBI) relative to usual post discharge care
The framework of this study followed earlier research relating to comprehensive geriatric assessment and the principles of individual empowerment.

Data from two related randomized controlled trials of nurse-led multidisciplinary HBI in Adelaide, South Australia were compiled for this study. The patients were recruited from the same regional tertiary referral center. A typically old and fragile cohort of 297 heart failure patients initially discharged from short-term hospital care was utilized. The participants were randomly allocated to HBI (n=149) or usual care (UC) (n=148). The inclusion criteria were aged 55 years or older, discharged to home with a diagnosis of heart failure, and a history of one or more admissions for heart failure. Patients with planned cardiac surgery or terminal malignancy were excluded.

Inglis et al. (2006) examined four factors: length of hospital stay, type of admission, healthcare utilization cost and subsequent cost per life-year saved. Data related to these factors were collected by reviewing the regional, computerized medical record system of patients. Researcher developed data collection instruments were used.

Patients in the HBI group had significantly better results than those patients who received usual care (Inglis et al., 2006). The HBI group had fewer deaths from all causes during the study period: 114 subjects from the HBI group versus 132 subjects in the UC group ($p = .0006$). The median survival of those patients receiving the home based intervention was almost twice that for those patients in the usual care group. Over the duration of the study follow-up, the HBI group had a 40% reduction in the risk of a fatal event ($p < .0001$). HBI patients experienced 198 more days of hospital-free survival than UC patients ($p < .001$). The rate of readmission, when adjusted for the length of follow-
up, was significantly lower in the HBI group: 3.66 versus 2.04 per patient per year ($p = 0.039$). The UC group accumulated more days of recurrent hospital stays (4671 versus 4312 days) when adjusted for the extended follow-up period. The cost-benefit of HBI was estimated to be AU $1729 per additional life-year gained.

When looking at the long term of survival in heart failure patients, the HBI group showed advantages in survival while avoiding the typical pattern of recurrent hospital stays for at least five years after the study intervention than the UC group. Patients in the HBI group took seven years to equal the UC group for unplanned hospital activity and lived longer than the UC group. In both groups, only six patients avoided death or an unplanned hospital stay which further demonstrates that heart failure is a complex and costly disease. The data support the hypothesis that a multidisciplinary program can cost-effectively manage patients with heart failure (Inglis et al., 2006).

**Summary**

Heart failure patients’ descriptive component of QOL was examined by Bosworth et al. (2004). The study suggests patients with heart failure are aware of their physical limitations as well as the psychosocial dimensions that mark life with this chronic disease. Pugh et al. (2001) showed improved functional status and QOL for heart failure patients utilizing case management while maintaining neutral health care costs. Case managers can provide resources, education on daily activities, and establish a support system to increase heart failure patients’ QOL and improve physical symptoms which may contribute to decreased health care utilization and morbidity.
Patient education and monitoring are key factors in successful care management of patients with heart failure. Hodgen et al. (2002) suggests that case management positively influences the health care outcomes of heart failure patients by focusing on patient education. Medication teaching is a critical component. The findings by Proctor et al. (2000) suggest that the patients with heart failure most likely to be readmitted are those who are sicker and less compliant with prescribed medications. Li et al. (2004) also confirmed that compliance with medication is crucial in reducing the risk of hospital readmissions. Prasun et al. (2005) demonstrated that patients with heart failure can be taught to safely titrate their diuretic dose using a prescribed protocol. Hospital readmissions were decreased for those patients who were given this training. A nurse-managed heart failure program in which patients receive guidance and supervision can improve heart failure patients’ functioning and slightly reduce hospital readmissions (Sisk et al., 2006). Outpatient case management programs provide not only medication education, but also can enhance the adequacy of home care by monitoring patient symptoms and barriers to the holistic treatment plan. The high cost of prescription drugs is one example of such a barrier. Case managers can assist patients to obtain medications by referral to appropriate assistance programs. Utilization of case management may reduce the cost of treating heart failure patients by reducing hospital readmissions through ongoing patient education and monitoring.

Telehealth has the potential to reduce health care costs related to heart failure while maintaining quality patient outcomes. However, findings are mixed regarding the usefulness of a technology-based approach to care management of patients with heart
failure. Although overall general health perceptions and self-management skills improved in patients who participated in technology-based interventions (McManus, 2004; Shearer, 2007), video-based home telecare may not offer significant advantages over telephone follow-up care in reducing hospital readmissions and emergency department visits (Jerant et al., 2003). Case managers may want to consider that the use of telephones for follow up care to reduce cost and better utilize scarce resources. Case managers can utilize this information to help promote self-management and enhance perceived functional health.

When assessing the need for nurse case management services, differentiating between low-risk and high-risk heart failure patients can be beneficial. High risk heart failure patients who receive nurse case management services demonstrate increased benefits over heart failure patients who are at a lower risk as shown by DeBusk et al. (2004). This information can be used by case managers to determine how best to utilize scarce resources.

Long term management of heart failure patients reduces recurrent hospital stays. Inglis et al. (2006) looked at recurrent hospital stays over the long term survival of heart failure patients. The study showed that the typical pattern of recurrent hospital stays was reduced for at least five years among those patients with case managers. Case managers play a vital role in the long term management of heart failure patients while reducing health care costs.

Cost effective care for heart failure is a challenging goal to achieve because of the complex nature of the disease. Evidence from these studies has shown multiple ways nursing case management can help reduce the cost of managing this complex disease by
reducing hospital readmissions. The key factors in the literature review are continuous monitoring and the provision of education regarding the disease process, signs and symptoms, medication compliance and when to notify health care providers of changes. A nurse case manager can coordinate all these aspects with a physician and give continuous support to the patient and family. This has shown to decrease hospital readmissions, therefore reducing health care costs and increasing the patients’ QOL. This study replication of Hodgen et al. (2002) will provide further evidence for the effectiveness of case management.
Chapter III

Methods and Procedures

Introduction

It is estimated that over five million Americans are diagnosed with heart failure with an annual cost of over $33 billion to the health care industry (Smith et al., 2010). This disease not only affects patients’ quality of life, but has significant financial implications related to multiple hospital admissions associated with disease management. This chapter will describe the methodologies and procedures of the proposed research study. The purpose of this study will be to evaluate the effectiveness of nurse case management on health care outcomes of heart failure patients. This study will replicate the work of Hodgen et al. (2002). The organizing framework will be self-care theory as described by Orem.

Research Questions

1. Is there a difference in the delivery of patient education between patients with heart failure who receive nurse case management and those patients who do not receive such services?

2. Is there a difference in number of readmissions and cost of care between patients with heart failure who receive nurse case management and those patients who do not receive such services?
3. How do patients with heart failure rate their satisfaction with nurse case management services?

Population, Setting, and Sample

The population for this study will be 200 adult patients discharged from Parkview Memorial hospital in Fort Wayne, Indiana with a primary diagnosis of heart failure. The study sample will include 100 selected medical records from the months of January, 2011 through April, 2011 that meet the criteria of a principal diagnosis of heart failure, age 65 years or greater, Medicare insurance, and admitted to an attending cardiologist for treatment. The patient sample will consist of 50% males and 50% females. Patients with terminal illness or who are in a hospice program will be excluded. Informed consent will be obtained from all patients who meet the criteria. After a review of the medical record date, patients will be divided into two groups. One group will be composed of those patients who received case management services based on the documentation by the case manager in the patient’s medical records. The second group of patients did not receive case management services and will serve as the control group.

Protection of Human Subjects

The study will be submitted to the Institutional Review Board (IRB) of Ball State University and the medical director at Parkview Memorial hospital in Fort Wayne, Indiana. All participants will receive a full explanation of the study prior to obtaining consent. Participation will be voluntary and subjects can withdraw at any time. There is a slight risk that patient data could be compromised. However, this risk will be minimized by the process of de-identification of data. All names and medical information will be kept confidential by assigning numbers to patients’ medical records. Patients’ names will
not be attached to the data used for the study. The data will be stored on the researcher’s personal computer with password security.

(*Study Design*)

The study follows a descriptive retrospective cohort design because the researcher obtains data from medical records about previous hospitalization for heart failure. Retrospective cohort study is described as an “epidemiology study in which a group of people are identified who are at risk for experiencing a particular event” (Burns & Grove, 2009, p. 240). The study design is appropriate for this study because data will be obtained from discharged patients’ medical records.

(*Procedures*)

Following approval from the IRB and medical director of the hospital, the researcher will collect data from selected medical and billing records. Data obtained for each patient will include age, race, gender, length of stay, total hospital charges, medications, patient education, and number of readmissions to the emergency department or the hospital within 30 days of their last discharge. These data will be collected by the researcher. The patients who received case management services will be mailed a survey regarding their satisfaction with the case management services. A pre-paid postage return envelope will be included with the survey. A reminder post card will be sent out two weeks after the initial survey to improve the response rate.

(*Instruments*)

A tool based on a data abstraction tool developed by the Health Care Excel program and adapted by Hodgen et al. (2002) will be utilized to compile patients’ demographics, hospital charges, patient education, and readmission rates. Patient
satisfaction with case management services will be measured with questions derived from
the Picker/Commonwealth Hospitalization Satisfaction Survey.

Data Analysis

Chi-square will be used to determine any statistical differences between the case
management group and the control group. The mean LOS will be determined as well as
the economic burden, which will be further broken down into mean number of
readmissions, patient education, and total hospital charges. Health care cost will be
calculated from known hospital costs on the basis of diagnostic-related groupings and
adjusted for other-related healthcare costs. Patient satisfaction will be evaluated from
returned surveys. T-test analysis will be used to examine patient satisfaction with the
services provided by the nurse case manager.

Summary

This chapter includes the description and methodology of the proposed study. The
purpose of this study will be to evaluate the effectiveness of nurse case management on
health care outcomes of heart failure patients. This retrospective study will include a
target sample of 100 patients meeting the specified criteria. Data collection will be
performed by using one tool from the Health Care Excel program and items from the
Picker/Commonwealth Hospitalization Patient Satisfaction Survey. Chi-square and t-test
will be used for data analysis. This study replicates a previous study by Hodgen et al.
(2002). Further information from this study will support the utilization of nurse case
management to decrease health care cost and hospital readmissions in heart failure
patients. The findings will provide valuable information on how nurse case management
influences the health care outcomes for heart failure patients regarding hospital readmissions.
References


