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Relationship of Perceived Self-Efficacy of Disease Management and Hospital Utilization Among Patients with Heart Failure

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RELATIONSHIP OF PERCEIVED SELF-EFFICACY OF DISEASE MANAGEMENT AND HOSPITAL UTILIZATION AMONG PATIENTS WITH HEART FAILURE

By

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ABSTRACT

RELATIONSHIP OF PERCEIVED SELF-EFFICACY OF DISEASE MANAGEMENT AND HOSPITAL UTILIZATION AMONG PATIENTS WITH HEART FAILURE

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This secondary analysis examined the relationship between perceived self-efficacy of disease management and hospital admissions for heart failure patients based on Bandura's social learning theory. A convenience sample of 76 patients who were receiving home care services were visited over the course of several weeks. Data were collected at baseline, 3, and 6 months using the Self-Management Tool adapted from the work of Lorig et al. (1996).

Data indicated a weak negative statistically significant relationship between perceived self-efficacy of disease management and hospital utilization at 3 months ($r = -.33$, $p = .01$). In addition, hospital utilization decreased over time, and this decrease was statistically significant at all measures. Although this secondary analysis did not support a significant change in self-efficacy over time, it does enhance the knowledge of self-efficacy perceptions in disease management. Implications for nursing are discussed.

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CHAPTER 1

INTRODUCTION

The rising cost of healthcare is a national problem that requires attention. According to Groessl and Cronan (2000), health care costs continue to account for a large proportion of all consumer expenditures in the United States. These costs constituted 9.3% of the gross domestic product of the United States in 1980 and 13.5% in 1997. In addition, a current estimate projects health care costs to reach 16.6% by the year 2007. Several reasons for the increase in health care costs have been identified, among these are the volume and intensity of services associated with chronic disease management.

Cassel (2001) indicates that since 1900, the number of persons age 65 and older has increased 11-fold, whereas the number of those younger than age 65 has tripled. From 1965 to 1995, the older population increased in number by 82%. As the life expectancy increases, so does the risk of chronic age-related diseases. It has been estimated that for every year of extra life expectancy, an average of 9.6 months (80%) is spent in a disabled state.

The prevalence of chronic illness has been identified by the U.S. Department of Health and Human Services in the National Health Interview Survey (1996). In this report, chronic conditions with the highest prevalence include arthritis, sinusitis, deformity or orthopedic impairment, hypertension, hay fever or allergic rhinitis without asthma, hearing impairment, and heart disease. In addition, the American Heart Association (2000) identified that heart failure (one form of heart disease) is a disease that is rapidly growing.

Approximately 4,600,000 Americans have heart failure, with close to 550,000 newly diagnosed cases annually.

According to Knox and Mischke (1999), in the United States, heart failure is the number one diagnosis-related group (DRG) for people over the age of 65 years, and the most expensive DRG, translating into 5 million hospital days per year at an estimated cost of $8 billion. Most of this financial burden derives from accumulated inpatient hospital days, evidenced by a 30-day national readmission rate of 23%. Fifty percent of the hospital admissions for heart failure are preventable, indicating that patient education and other follow-up care can improve adherence and reduce readmission. Some factors that influence readmission include non-adherence with medications (15%), diet (18%), and failure to seek medical attention promptly when symptoms recur (20%).

Adherence to a complex medication regimen, dietary restrictions, and symptom monitoring require long-term life-style adjustments by patients with heart failure. Because some of the major goals of management for patients with heart failure include increasing their control over their health condition, improving health status, and decreasing the costly use of heath care utilization (Happ, Naylor, & Roe-Prior, 1997), patients perceptions of their ability to change their behavior can influence the outcome. Specifically, an individual's perceived self-efficacy will determine how much effort a person will expend on a disease management task and how persistent one will be when facing obstacles (Bandura, as cited in Salazar, 1991).

Because self-efficacy develops from cognitive appraisal of information (Bandura, as cited in Jeng & Braun, 1994) and management of chronic diseases reduces hospital readmission (Stomper, 1998), determining the relationship between self-efficacy and hospital

utilization will provide useful information that can be considered when designing nursing interventions for chronic disease management. These interventions may assist in promoting one's self-efficacy of disease management, thus decreasing preventable hospital readmission and financial expenditures related to chronic disease management.

Purpose

This study was designed to determine the relationship of perceived self-efficacy of disease management and hospital utilization. Hospital utilization is defined as an acute care admission to the hospital of an individual diagnosed with heart failure. An additional area of study that was explored was perceived self-efficacy of disease management and hospital utilization changing over time. This study will build on previous studies documenting the importance of self-efficacy of disease management and factors influencing hospital admission.

CHAPTER 2

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

Conceptual Framework

Bandura's social learning theory provides the framework for this study. Self-efficacy, a central concept of Bandura's theory attempts to predict and explain human behavior. According to Bandura, health behavior and health outcomes are a function of two beliefs--efficacy expectations and outcome expectations (as cited in Grembowski et al., 1993).

Bandura (as cited in Strecher, McEvoy DeVellis, Becker, & Rosenstock, 1986) outlines the role of self-efficacy in the paradigm of a person engaging in a behavior that will result in a consequent outcome. According to this paradigm, behavior change and maintenance are a function of (1) expectations about the outcomes that will result from one's engaging in a behavior, and (2) expectations about one's ability to engage in or execute the behavior. Outcome expectations consist of beliefs about whether a given behavior will lead to given outcomes, whereas efficacy expectations consist of beliefs about how capable one is performing the behavior that leads to those outcomes. It is noted that both outcome and efficacy expectations reflect a person's beliefs about capabilities and behavior. It is these perceptions, and not necessarily the true capabilities, that influence behavior. In addition, the concept of self-efficacy relates to beliefs about capabilities of performing specific behaviors

in particular situations. Thus, an individual's efficacy expectations will vary among different tasks and situations.

Bandura (as cited in Strecher et al., 1986) identifies that perceived self-efficacy influences all aspects of behavior, including the acquisition of new behaviors, inhibition of existing behaviors, and disinhibition of behaviors. Self-efficacy also affects the amount of energy one might expend on a task, as well as the length of time they persist in the face of obstacles. Finally, self-efficacy affects one's emotional reactions, such as anxiety and distress, and thought patterns. Therefore, individuals with low self-efficacy about a particular task may think about their personal deficiencies rather than thinking about accomplishing the task, which in turn, could impede successful performance of the task.

Efficacy expectations vary on several dimensions that affect the ultimate performance. Bandura (as cited in Salazar, 1991) identified magnitude, generality, and strength as the principle dimensions affecting efficacy expectations. Magnitude refers to the levels of difficulty of a task. A person with a low magnitude expectation would imply that they feel capable of performing only simple tasks. In contrast, a higher magnitude expectation would be accompanied by a feeling of competency about performing more complex tasks.

Generality refers to the extent that the efficacy expectation can be generalized to other situations (Salazar, 1991). For example, if a person feels successful with medication management when supervised, they also may expect that they will be successful when attempting to manage their medication regimen unsupervised.

The dimension of strength may also affect the ultimate performance. The expectation of mastery may be strong or weak (Salazar, 1991). For example, patients living with heart

failure would be more likely to engage in treatment adherence if they have stronger self-efficacy expectations, i.e. confidence in their ability to carry out these behaviors.

According to Perkins and Jenkins (1998), individuals receive efficacy information through a variety of sources. The most dependable source, according to Salazar (1991), is that of performance accomplishments. This source of information refers to the learning (successful mastery) that results through personal experience. Performance accomplishment tends to increase perceived self-efficacy.

The second major source of information, vicarious experiences, includes the learning that occurs from observing others performing the activity. Observing someone performing a behavior successfully, or an event occurring with positive rewards or without adverse consequences, can influence one's own expectation of mastery (Salazar, 1991).

Salazar (1991) identified the last two sources of information as verbal persuasion and physiological state. Verbal persuasion is commonly used by health educators because of its convenience and availability. Lastly, one's physiological state provides information that can influence efficacy expectations. An increased physiological state usually impairs performance; people are more likely to expect failure when they are very tense.

According to Strecher et al. (1986), appraisal of efficacy information is important because information obtained from different sources does not automatically influence perceived efficacy. Instead, information is attended to, weighted, and interpreted in ways that determine its impact on efficacy expectations. One example of an attentional factor is selective self-monitoring. People may differ in their tendencies to attend to and remember different aspects of performance. Thus, some people may focus on their failures and underestimate what they can do, and be reluctant to try new behaviors.

Efficacy information can also be influenced by how it is weighted (Strecher et al., 1986). Weighing of information can occur based on the credibility of the person communicating the information. For example, information from a highly credible person will have a greater impact on efficacy expectations than will messages from a less credible person.

The final factor that can influence efficacy information is interpretation. Strecher et al. (1986) explain interpretation by the process of attribution. In this process, an achievement will enhance self-efficacy only if it is attributed to one's own skill and ability and not to external chance or other factors. For example, when success with changes in one's dietary intake is achieved with minimal effort, it is apt to be attributed to one's own ability, which in turn fosters a sense of self-efficacy.

The use of Bandura's self-efficacy theory in disease management of heart failure requires that nurses understand how self-efficacy influences behavior, what factors contribute to patients' self-efficacy, and how beliefs about behavior will lead to outcomes. Figure 1 outlines the relationship of self-efficacy and hospital utilization. In this depiction, Bandura's (1977) self-efficacy model has been modified to demonstrate how efficacy expectations of disease management in heart failure are influenced by the cognitive appraisal of information from four major sources: performance accomplishments, vicarious experiences, verbal persuasion, and physiological state. For the heart failure patient, the belief in the ability to participate in disease management is a result of the belief that one is capable of changing behavior (e.g. follow dietary restrictions, manage medication regimen, etc.), as well as the belief that successful changes in health behaviors will result in desired outcomes.

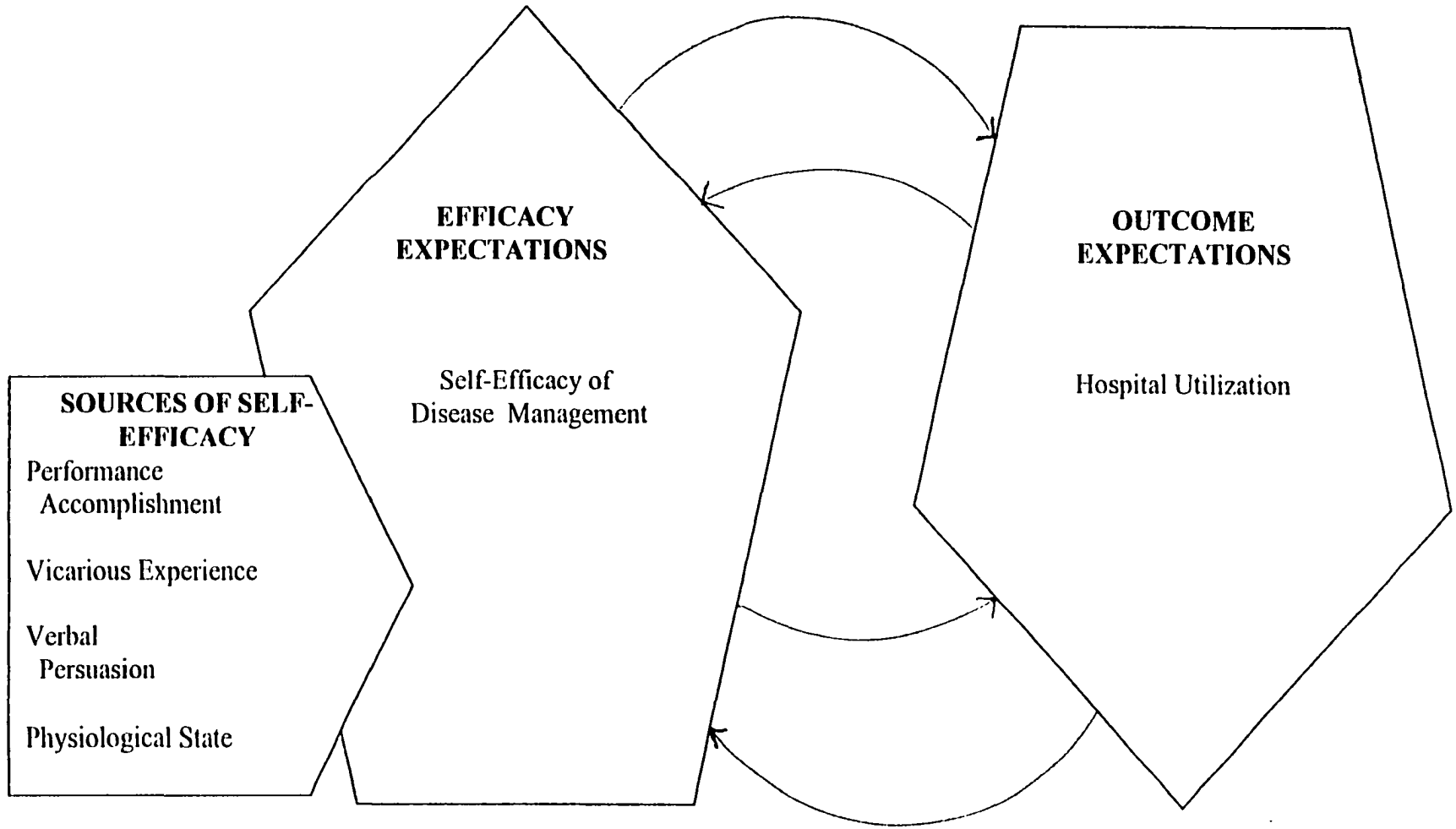


Figure 1. Relationship of Self-Efficacy of Disease Management to Hospital Utilization in the Heart Failure Patient

The model also demonstrates a cyclical relationship between self-efficacy and hospital utilization in that efficacy expectations for disease management influence the outcome expectations of hospital utilization. Efficacy expectations are strengthened when one believes that behavior will lead to the desired outcome. In addition, achievement of the outcome may reinforce one's efficacy expectations.

Literature Review

Multiple studies have been conducted to explore the relationship of perceived self-efficacy and participation in health care regimens, some of which are regimens associated with chronic disease management. However, very few studies could be identified which could provide concrete empirical support relating a patient's perceived self-efficacy of disease management and hospital utilization. In an effort to provide a basis for studying the relationship of perceived self-efficacy of disease management and hospital utilization, the categories of self-efficacy with disease management and factors influencing hospital re-admission will be explored.

Self-efficacy of disease management. The relationship between self-efficacy expectations, behavior, and mood state in patients recovering from percutaneous transluminal coronary angioplasty (PTCA) was the focus of a study conducted by Perkins and Jenkins (1998). Ninety subjects, 18 years of age or older and who had undergone a PTCA participated in the study. Self-efficacy expectation for five study behaviors (exercise, following dietary restrictions, maintaining health, role resumption, and work) was measured using the Jenkins' Self-Efficacy Expectation Scales and the Jenkins' Activity Checklist. The Profile of Mood State Inventory (POMS) provided a global estimate of affective state measurement by use of the Total Mood Disturbance Score (TMDS). The POMS is

composed of 65 items and uses a 5-point adjective rating scale designed to assess transient and fluctuating affective states. Lower scores indicate lower levels of mood disturbance or a "better" mood state.

Data were collected by Perkins and Jenkins (1998) at two time points, initially within 72 hours of successful PTCA (before hospital discharge), and finally two weeks post hospital discharge. Data analysis indicated significant, positive correlations between self-efficacy expectations for each study behavior except work, with r values ranging from .26 to .85. A paired t-test revealed that the TMDS predischarge ($M = 65.37$) was significantly higher ($t = 3.76$, $df = 89$, $p < .01$) than two weeks post discharge ($M = 54.59$). Correlations between self-efficacy expectation scores for each study behavior and the TMDS at both data collection points were statistically significant, with the exception of following dietary restrictions. These results demonstrated that patients with higher efficacy expectation tend to have higher behavior performance and lower levels of mood disturbance.

Carroll (1995) studied 122 subjects, with a mean age of 71.8 years, who had planned coronary artery bypass surgery. A prospective repeated measures design was used to determine the changes in self-efficacy expectations before surgery, before discharge, and at 6 and 12 weeks after surgery. The results showed significant increases in the self-efficacy expectations for behaviors and the performance of walking ($F = 115.6$, $p < .01$), resuming general activities ($F = 288.9$, $p < .01$), and role performance ($F = 179.2$, $p < .01$) over the recovery period, as measured by the Jenkins Self-Efficacy Expectation Scales and Activity Checklists. These results also support self-efficacy expectation as a predictor of subsequent behavior performance.

Self-efficacy was also investigated by Gilliss, Gortner, Shinn, and Tompkins (1993) in a clinical trial that demonstrated how low intensity psychoeducational nursing intervention can increase patient self-efficacy expectations for walking during recovery after cardiac surgery. The sample included 156 patients who received either a coronary artery bypass graft and/or valve repair surgery that were randomly placed in either the usual care or experimental groups. For the experimental group, the study nurse supplemented "usual care" with in-hospital education on emotional reactions to surgery. In addition, telephone contact by the study nurse with the patient on a weekly basis through the first four weeks after discharge and again at 6 and 8 weeks was completed. This intervention provided an opportunity for the study nurse to coach, encourage, and offer information about experiences of others (vicarious experience) to the patient. Patients in the usual care group viewed a slide-tape program from the American Heart Association prior to discharge, and a post-hospital visit at 6 weeks to the cardiac surgeon. Patients completed self-reports utilizing an activity checklist and the Jenkins Self-Efficacy Scales at baseline, 4, 8, 12, and 24 weeks after discharge. In addition to the above measurement, self-efficacy was also reported at 1 week after discharge.

In order to test the effect of the intervention and the time pattern of recovery, as well as to determine whether the time pattern was the same in the two groups, Gilliss et al. (1993) used mixed-effects of covariance for analysis of self-efficacy expectations and self-reported activity. The results demonstrated that patients in the experimental group reported significantly greater self-efficacy expectations for walking ($G = .013$, $T = <.001$, $G \times T = .767$). This was the only activity that demonstrated significant effects of treatment. Treatment by time interaction effects were only significant for lifting ($G = .453$, $T = .001$, G

x T = .003). The authors report that even though the effect of the intervention on changing levels of self-efficacy was limited, the intervention was shown to promote self-efficacy expectations for walking in recovery and was associated with more self-reported walking and lifting behavior after cardiac surgery.

Resnick, Palmer, Jenkins, and Spellbring (2000) prospectively evaluated patients 65 years or older, who lived in a continuing care retirement center and scored 20 or greater on the Mini-Mental State Exam. The purpose of this descriptive study was to test how age, gender, and mental and physical health influence efficacy expectations, and how these variables influence exercise behavior. One hundred eighty seven adults received a one-time health interview that measured self-efficacy and outcome expectations related to exercise, health status, and actual exercise behavior. Data analysis indicated no statistically significant difference in age or gender between those older adults who exercised regularly and those who did not. A statistically significant difference was identified, however, between those who exercised regularly and those who did not in the other areas measured. These areas included self-efficacy expectations $F(2,187) = 88$, $p < .05$, outcome expectations $F(2,187) = 50$, $p < .05$, mental health summary score $F(2,187) = 3.9$, $p < .05$, and physical health summary score $F(2,187) = 15$, $p < .05$. These findings support a growing body of evidence that efficacy expectations exert an influence on the older adults' adherence to a regular exercise program.

The effects of self-efficacy on exercise in older adults was the purpose of a study completed by Conn (1998). In this study, 147 adults between the ages of 65 and 100 provided information that was used to test the predictive ability of a model of exercise among older adults. Subjects were recruited from various sites (e.g. senior centers, religious

meetings, social organizations) in two Midwestern states. All subjects were independent adults, not requiring assistance with ambulation or personal care. The Lifelong Physical Activity Questionnaire, Exercise Benefits/Barriers Scale, Exercise Self-Efficacy Scale, Health Promoting Lifestyle Profile, and the Baecke Physical Activity Scale were administered by a trained research assistant in a personal interview. The findings supported the hypothesis that self-efficacy expectations had a direct significant effect on exercise behavior and an intervening effect between age, barriers, lifelong exercise, and current exercise behavior. Self-efficacy expectation had the strongest direct relationship with exercise of any of the study variables ($\beta = .29$, $p = .0001$). In addition, barriers ($\beta = -.49$, $p = .0001$) and age ($\beta = -.26$, $p = .0003$) had direct significant negative effects on self-efficacy, also consistent with the hypothesized relationship. The relationship between barriers and self-efficacy found in this study suggests that perception of barriers impeding progress toward the target behavior is a strong determinant of older adults' estimation of their ability to perform the behavior.

Self-efficacy, perceived success, causal attributions, and affective reactions resulting from an acute exercise session is the focus of a study completed by Courneya and McAuley (1993). In their study, 77 middle-aged subjects who had recently completed a 5-month aerobic exercise program participated in a post-program physiological exercise test. After the exercise test, subjects were asked to indicate the degree to which their performance had been successful. In addition, subjects were asked to identify a reason for their success, and the extent to which they experienced affective reactions (as a result of the exercise test). The results demonstrated that self-efficacy had a significant direct effect on perceptions of success ($\beta = .31$, $p < .01$). In addition, the relationship between previous exercise

participation and self-efficacy was supported ($\beta = .26$, $p < .05$). These results are consistent with Bandura's (1986) social cognitive framework in that past mastery of experiences are the strongest source of efficacy information.

A model of delay of gratification was developed and tested on adult dialysis patients who were continuously required to follow a strict fluid-intake (Rosenbaum & Smira, 1986). In their study, it was hypothesized that patients' self-evaluations of their past compliance and their efficacy expectations would be associated with adherence to their fluid restrictions. Fifty-three patients all diagnosed with end-stage renal disease, and who received dialysis three times a week, participated in the study. A standardized interview procedure was used to evaluate fluid-intake adherence, efficacy expectations, and health beliefs. Actual fluid-intake adherence was reliably assessed by the mean body weight increase between dialysis treatments during a 3-month period prior to the study and during two follow-up periods, 3 and 12 months following the interview. The results demonstrate that perceived self-efficacy correlated with past success in fluid-intake adherence ($r = .74$) and with fluid-intake adherence 3 ($r = .39$) and 12 ($r = .37$) months later. Past fluid-intake adherence correlated with fluid-intake adherence 3 and 12 months later, with coefficients of .57 and .55 respectively. All correlations were statistically significant at least at the .05 level. These results indicate that perceived efficacy was not a better predictor of future adherence than was past adherence. Yet, the findings demonstrate the importance of self-efficacy expectations in understanding the process of fluid-intake adherence in the adult dialysis patient.

Self-efficacy was identified as a predictor of ability to make dietary changes in a low socioeconomic status rural population according to a study completed by Shannon et al.

(1997). In their study, 304 subjects, all diagnosed with hypercholesterolemia, were randomly assigned to either the intervention or control group. The control group received usual care from their health care providers, whereas the intervention group received additional educational opportunities designed to increase self-efficacy through performance attainment and verbal persuasion. Even though the intervention group participated in a structured treatment program that emphasized healthy dietary choices and the ability to make successful dietary changes, the results did not demonstrate a significant difference in the change of self-efficacy scores by treatment group. The authors identified that the lack of association between participation in the intervention and the change in self-efficacy could be due to the Hawthorne effect. It was thought that participants in both groups felt special and received a good deal more attention from their medical providers than usual. The results did indicate, however, that preintervention ($\beta = -2.98$, SE = 1.54, $p = .05$) and postintervention ($\beta = -5.49$, SE = 1.50, $p = .0003$) self-efficacy scores were found to be significant negative predictors of the total dietary risk assessment score at postintervention. Thus, subjects with greater self-efficacy scores were more able to make positive changes in their diets (reflected in a lower dietary risk assessment score) than were subjects with a lower self-efficacy score.

Ali (1998) describes the initial development and psychometric evaluation of an instrument to measure self-efficacy in hormone replacement (HRT) use. The development of the scale was based on Bandura's (1977) self-efficacy construct. One hundred sixteen women who were 56 years old and above and who were current or past users of hormone replacement therapy participated in the study by completing the questionnaire. Factor analysis was used to develop construct validity and the instrument was found to have good internal reliability. Factor analysis isolated two factors, efficacy expectations in HRT and

outcome expectations in HRT. The possible range of scores for efficacy expectations related to HRT is 8-40, Ali's (1998) study demonstrated results of 16-40 (M = 30.21, SD = 6.65). The possible range of scores for outcome expectations related to HRT is 6-30, the same was reported by Ali's (1998) study (M = 20.42, SD = 4.66). The results show high means on both efficacy expectations and outcome expectations, which also supports other literature identifying self-efficacy and expected positive outcomes as significant factors in determining behavior.

As reflected in the literature, self-efficacy is emerging as an important variable in the study of health behaviors (e.g. exercise, diet, medication regimen, etc.) and disease management. This is also the case for management of several different types of chronic diseases, one of which is epilepsy, an area studied by Dilorio, Faherty, and Manteuffel (1992). In their study, the relationship between self-efficacy, social support, and self-management in individuals with epilepsy was explored. The study used a descriptive correlational design in which questionnaire packets were mailed to 604 individuals who participated in job training programs offered by the epilepsy foundation. The questionnaire packets contained three instruments (the Epilepsy Self-Efficacy Scale, the Personal Resource Questionnaire, Part 2, and the Epilepsy Self-Management Scale), and a demographic data form. Of the packets that were mailed, 98 were completed and returned (200 unopened packets were returned by the post office because of address changes).

Dilorio et al. (1992) reported results of the correlational analysis revealing that high levels of self-efficacy are associated with epilepsy management ($r = .50$, $p < .0001$). That is, those who express confidence in their management ability are more likely to consistently perform behaviors to control epilepsy. In the stepwise regression analysis, self-efficacy was

the only variable to enter the regression model, and it explained 25% of the variance in self-management, $F(1, 96) = 32.06$, $p < .0001$. Self-efficacy also emerged as the most significant variable in the prediction of self-management in the hierarchical regression analysis, which included demographic and seizure-related variables. These results support Bandura's (1986) theory that self-efficacy is a powerful determinant of behavior. One study limitation was noted which included the procedure used to conduct the survey. The 24% response rate represents a threat to the external validity of the study and limits the generalizability of the findings to similar persons with epilepsy.

Stuifbergen, Seraphine, and Roberts (2000) completed an investigation that tested an explanatory model of variables that influence health promotion and quality of life for persons with multiple sclerosis (MS). A sample of 786 persons with MS completed a battery of instruments, including the Self-Rated Abilities for Health Practices Scale (Becker, Stuifberhen, Oh, & Hall, 1993). This scale measured beliefs (self-efficacy) about ability to perform health-promoting practices in the areas of nutrition, physical activity/exercise, psychological well-being, and responsible health practices. The Personal Resource Questionnaire was also completed, which measured social support.

Univariate z tests were implemented by Stuifbergen et al. (2000) to assess the normality of the variables in the model. The results of these tests indicated that the measures of all the variables (e.g. barriers, acceptance, and health promoting behaviors) except self-efficacy and resources exhibited approximate normal distributions. The Self-Rated Abilities for Health Practices Scale exhibited significant skewness (z [obs] = 4.58; $p = .000$), but insignificant kurtosis (z [obs] = 2.27; $p = .012$). The Personal Resource Questionnaire, on the

other hand, exhibited both significant skewness (z [obs] = -4.58; p = .000) and kurtosis (z [obs] = 8.81; p = .000).

Given these results, Stuifbergen et al.(2000) assessed and modified the proposed model by using structural equation modeling. Because nonnormality was present, the model was estimated by using the weighted least squares estimation procedure (WLS) implemented by LISREL8 (Joreskog & Sorbom, 1996). Several goodness-of-fit indices are provided by LISREL8, including an approximate χ_2 statistic, Goodness of Fit Index (GFI), Incremental Fit Index (IFI), and the Comparative Fit Index (CFI).

Analysis revealed that the fit of the original model was adequate at χ_2 (10, N = 786) = 206.04; $p < .05$; GFI = .898; IFI = .950; CFI = .950 (Stuifbergen et al., 2000). Because of the large χ_2 and the marginal GFI, the magnitude of the modification indices was examined to improve fit. This resulted in the addition of a direct path between resources and barriers to the original model. The addition of this path improved the fit of the model at χ_2 (8, N = 786) = 77.00; $p < .05$; GFI = .962; IFI = .982; CFI = .982.

Stuifbergen et al.(2000) reported that the final model supports the hypothesis that quality of life is the outcome of a complex interplay between severity of illness, self-efficacy and other antecedent variables, and health-promoting behaviors. The findings are consistent with prior theoretical and empirical literature documenting self-efficacy as a predictor of health-promoting behaviors, and the positive relationship between health-promoting behaviors and quality of life.

The purpose of a study completed by Scherer and Schmieder (1997) was to determine the effect of attendance in an outpatient pulmonary rehabilitation program on changes in self-efficacy, perception of dyspnea, and exercise endurance in patients with chronic obstructive

pulmonary disease (COPD). Sixty patients, aged 35 to 82 years, participated in this pretest, posttest study. The COPD Self-Efficacy Scale, Dyspnea Scale, and the 12-minute walking-distance tests were completed prior to and one month after completing the program. The outpatient pulmonary rehabilitation program consisted of 36 1-hour classes, taught by a clinical nurse specialist over a 12-week period. These classes utilized methods designed to increase self-efficacy expectations, namely, performance accomplishments, vicarious experiences, verbal persuasion, and decreasing emotional or physical arousal.

Scherer and Schmieder (1997) utilized paired t-tests to examine the differences in mean scores between pre and post program scores. The results demonstrated a significant difference between the Self-Efficacy Scale pre ($M = 2.95$, $SD = .818$) and post ($M = 3.49$, $SD = .759$) program scores with $p < .01$. In addition, a significant difference between the Dyspnea Scale pre ($M = 17.63$, $SD = 5.87$) and post ($M = 14.77$, $SD = 7.77$) program scores with $p = .01$ was also identified. Lastly, the 12-minute walking-distance test demonstrated a significant difference in pre ($M = 1650.86$, $SD = 1231.9$) and post ($M = 1994.24$, $SD = 624.6$) program scores with $p = .04$.

Data analysis also included Pearson product moment correlations in order to determine whether significant relationships existed between the scores on the Self-Efficacy Scale, Dyspnea Scale, and the 12-minute walking-distance test (Scherer & Schmieder, 1997). Results demonstrated a significant negative correlation between scores on the Self-Efficacy Scale and scores on the Dyspnea Scale ($r = -.5566$, $p = .01$) and a positive correlation between scores on the Self-Efficacy Scale and the 12-minute walking-distance test ($r = .4293$, $p = .05$). These results indicate that participation in an outpatient pulmonary rehabilitation program may improve self-efficacy, perception of dyspnea, and exercise

endurance. In addition, improvement in self-efficacy correlates with decreased perception of dyspnea and increased physical endurance.

Perceived level of self-efficacy to cope with the consequences of chronic arthritis correlated most strongly with the outcomes of a study completed by Lorig, Mazonson, and Holman (1993). In their study, the effects of the Arthritis Self-Management Program were observed four years after the initial participation with the program in two groups of patients. Self-administered questionnaires (baseline and four years) measured pain, depression, physical activity, self-efficacy, and the number of physician office visits. Perceived self-efficacy was measured in the first group by an earlier version of the scale that was also used for the second group. The new self-efficacy scale, utilized with the second group, differed in that it also addressed symptoms such as fatigue, frustration, and depression.

Data analysis with a paired t-test ($p < .01$) demonstrated that the frequency of physician visits at four years for Group 1 ($M = -2.07$, $SD = 7.6$), and Group 2 ($M = -2.25$, $SD = 7.6$) remained well below baseline rates for the same groups ($M = 4.9$, $SD = 7.8$ and $M = 5.1$, $SD = 7.7$). In addition, perceived self-efficacy to cope with the consequences of arthritis rose considerably at four years for Group 1 ($M = 9.66$, $SD = 24.6$), and Group 2 ($M = 16.4$, $SD = 28.0$), compared to baseline levels ($M = 58.3$, $SD = 20.1$ and $M = 48.6$, $SD = 21.7$). In both groups, a 15-20% decline in pain was achieved, despite worsening disability and an increase in depression levels by the 4 year measure. These results support that a health education effect, mediated by changes in self-efficacy, has a long duration and can influence health care utilization.

Factors influencing hospital readmission. Identification of factors associated with unplanned hospital readmission among patients 65 years of age and older was the focus of a

study completed by Marcantonio et al. (1999). This matched case-control study among patients in a managed Medicare plan identified five factors that were independently associated ($p < .05$) with unplanned readmission within 30 days. These included four baseline patient characteristics: age 80 years or older [odds ratio = 1.8; 95% confidence interval (CI), 1.02-3.2], previous admission within 30 days (odds ratio = 2.3; 95% CI, 1.2-4.6), five or more medical comorbidities (odds ratio = 2.6; 95% CI, 1.5-4.7), and history of depression (odds ratio = 3.2; 95% CI, 1.4-7.9). One discharge factor: lack of documented patient or family education (odds ratio = 2.3; 95% CI, 1.2-4.5) was also identified. The authors report that the results from this study support those of previous studies that have found associations between advanced age, prior hospital use, medical comorbidity, and psychiatric morbidity with unplanned hospital readmission.

Medicare beneficiaries with heart failure was the sample used in an investigation completed by Krumholz et al. (1997). This sample, drawn from the Connecticut Medicare hospital database, included 17,448 patients who had been hospitalized for heart failure and discharged within a four-fiscal year time period. The main purpose of this study was to identify diagnoses and patient characteristics associated with a higher readmission after hospitalization for heart failure. The results demonstrated that within 6 months following the initial admission for heart failure, 7596 patients (44%) were readmitted to a hospital at least once. Heart failure was the most frequent reason for readmission, accounting for 18% of the readmissions. In the multivariate analysis, significant predictors of readmission included male sex (odds ratio = 1.12; 95% CI, 1.05-1.20), at least one prior admission within 6 months of the initial heart failure admission (odds ratio = 1.64; 95% CI, 1.53-1.77), Deyo co-morbidity score of more than 1 (odds ratio = 1.56; 95% CI, 1.45-1.68), and length of stay in

the initial heart failure admission of more than 7 days (odds ratio = 1.32; 95% CI, 1.24-1.41). The authors noted that one strength of this investigation was that the study sample was larger than used in many pervious studies. However, the study was also limited to Connecticut and thus, the experience in this state may not be generalizable to the entire country.

Sabourin and Funk (1999) completed an investigation that included identification of predictors of hospital readmission after coronary artery bypass grafting (CABG). In this prospective, descriptive, correlational study, 124 subjects responded to a mailed questionnaire 6 weeks after undergoing CABG at one large university medical center. The results demonstrated approximately 15% of the sample were readmitted for unplanned cardiac-related reasons, the most common of which were chest pain with and without SOB. A logistic regression analysis demonstrated that predictors of readmission were female sex (odds ratio = 4.7; 95% CI, 1.5-14.6; p = .007) and obesity (odds ratio = 3.7; 95% CI, 1.2-11.6; p = .026).

In addition to the literature identifying specific patient characteristics as predictors of hospital readmission, certain interventions and their effect on hospital readmission has also been documented. This is demonstrated in a study completed by Stewart, Pearson, and Horowitz (1998) where the frequency of unplanned hospital readmissions was evaluated. In their study, hospitalized heart failure patients were randomized to either usual care (n = 48) or home-based intervention (n = 49). Home-based intervention comprised of additional medication and symptom identification instruction completed by the study nurse before hospital discharge, as well as a home visit by a nurse and pharmacist to review medication management, recommend strategies to increase adherence to medication regimen, and

identify early clinical deterioration. The study assessed the frequency of unplanned hospital readmissions within 6 months of discharge.

Stewart et al. (1998) reported results which demonstrated that patients in the home-based intervention group had fewer unplanned readmissions (36 vs 63; $p = .03$). In addition, the results of post-hoc analysis suggested that home-based intervention was effective in preventing individual patients from requiring large number of readmissions with heart failure. Five patients assigned to the usual care group required three or more admissions for acute heart failure, whereas no patients assigned to the home-based intervention group required three or more such admissions ($p = .02$). Although this study did not speak specifically to perceived self-efficacy of disease management and hospital readmission, it identified a relationship between verbal persuasion (one source of efficacy information) and hospital readmission.

Stewart, Vandenbroek, Pearson, and Horowitz (1999) also studied the prolonged effects of the home-based intervention on unplanned readmission among heart failure patients. Even though previous studies demonstrated a decrease in unplanned readmissions at the 6 month period for those patients who received the intervention, the duration of the beneficial effect remained uncertain. In order to examine the effects of the intervention, an extended follow-up of all surviving patients for a further 12 months was completed. Results during this 18-month follow-up indicated that patients who received the home-based intervention had fewer unplanned readmissions (64 vs 125; $p = .02$) and also required fewer days of hospitalization ($M = 2.5$, $SD = 2.7$ vs $M = 4.5$, $SD = 4.8$ per patient; $p = .004$) than the usual-care group. In addition, once readmitted, the intervention patients were less likely to experience 4 or more readmissions (3/31 vs 12/38; $p = .03$) than the usual-care group.

Although the exact mechanism of the beneficial effect of the home-based intervention was not identified in either the original or extended study, the results support the intervention for reducing unplanned hospital readmissions.

The rate of hospital readmission for the heart failure patient was the focus of a study completed by Rich, Beckham, Wittenberg, Leven, Freedland, and Carney (1995). In their study, the effect of a nurse-directed, multidisciplinary intervention on rates of readmission within 90 days of hospital discharge for patients who were 70 years of age or older was evaluated. Heart failure patients who met the criteria were randomly assigned to either the treatment group (n = 142) or the control group (n = 140). The intervention consisted of comprehensive education of the patient and family by a cardiovascular research nurse; dietary counseling provided by a registered dietician; social-service consultation to facilitate planning care after discharge; medication analysis by a geriatric cardiologist; and home care services after hospital discharge, including visits and phone contact with members of the study team. Patients assigned to the control group received all standard treatments and services ordered by their physician. All patients were followed for 90 days after discharge. For patients rehospitalized during follow-up, data on the cause of readmission, contributing factors, and information of the course of hospitalization were obtained.

Rich et al. (1995) reported that a nurse-directed multidisciplinary treatment strategy can significantly reduce hospital readmissions for elderly patients with heart failure. This is evidenced by 59 patients in the control group (42.1 %) had at least one readmission during follow-up, as compared to 41 patients in the treatment group (28.9 %; absolute reduction, 13.2 %; 95 % CI, 2.1 to 24.3 %; p = .03). Multiple readmissions were more frequent in the control group (16.4 %, vs. 6.3 % in the treatment group; 95 % CI for the difference, 2.8 to

17.4 %; p = .01), so that the total number of readmissions during follow-up was reduced by 44.4 % (p = .02). In addition, patients in the control group experienced 54 readmissions for heart failure, as compared to 24 in the treatment group (risk ratio .44; p = .04). One limitation noted in their study is that because of the multidisciplinary nature of the intervention, it is not clear which elements are most important in reducing readmission rates. Although this study did not specifically measure self-efficacy, the treatment intervention included a strong emphasis on patient and family education, one source of self-efficacy information in disease management.

The effects of social support and education interventions on psychosocial variables and health care costs in people with osteoarthritis was the focus of a study completed by Groessl and Cronan (2000). The participants were 363 members of a health maintenance organization who were 60 years of age and older. Participants were randomly assigned into one of three intervention groups (social support, education, or a combination of both) or to a control group. Psychosocial assessments focusing on cohesiveness, helplessness, knowledge, and self-efficacy were conducted at pre-intervention, 1, 2, and 3 years after the intervention began. Various health care costs (e.g. emergency room, hospital stays, physician office visits, etc.) were measured throughout the study period. Participation in the intervention groups involved attendance at 10 weekly meetings followed by 10 monthly meetings. Chi-square analyses were used to compare groups on categorical variables at baseline. A 4 (intervention group) x 4 (time of assessment) repeated-measures ANOVA was conducted to examine group differences over time. The self-efficacy results reflected a significant main effect for time of assessment [$F(3,241) = 4.48$, $p=.004$]. Total self-efficacy scores increased between the baseline assessment and the 1-year follow up assessment for all participants.

The increase was sustained at the 2 and 3-year assessments. Differences among the four groups were not significant. In addition, health care costs increased less in the intervention groups than in the control group. These findings provided preliminary indications that the interventions provided can positively impact elderly people with osteoarthritis by containing health care costs. In addition, although increased self-efficacy was not directly related to specific interventions, the increase may be due to efficacy information obtained by personal mastery and vicarious experiences that would normally occur over time living with a chronic illness.

Summary and Implications for This Study

Because health care costs continue to account for a large proportion of expenditures in the United States, and hospital readmission for heart failure accounts for much of this financial burden, identification of factors that influence one's disease management and health care consumption are essential. Self-efficacy has emerged as a predictor of behavior. In addition, enhancement of self-efficacy has demonstrated a positive relationship with desired outcomes. However, little has been identified in the literature that specifically addresses one's perceived level of self-efficacy in disease management and its relationship with hospital utilization. Because the relationship between self-efficacy and disease management exists, as well as a relationship between specific interventions and health care utilization, it is thought that a relationship between self-efficacy of disease management and hospital utilization also exists. The closeness of the concepts suggests that a relationship does exist, and if so, this information can be used by health care providers in designing effective interventions that promote the development of self-efficacy with disease management, thus decreasing health care consumption.

Research Questions

Four research questions were explored in this study. These questions were:

1. What is the level of perceived self-efficacy of disease management in heart failure patients at baseline, 3, and 6 months?
2. What is the rate of hospital utilization in heart failure patients at baseline, 3, and 6 months?
3. What is the relationship between perceived self-efficacy of disease management and hospital utilization in heart failure patients at baseline, 3, and 6 months?
4. Does perceived self-efficacy of disease management and hospital utilization of heart failure patients change over time?

Definition of Terms

The following definitions of terms were identified:

1. Self-efficacy in disease management- belief in one's ability to perform treatment regimen behaviors successfully, and the belief that these behaviors will lead to a desired outcome.
2. Hospital utilization- an acute care admission to the hospital of an individual diagnosed with heart failure.
3. Time- a 6 month period measured in 3 month intervals (T_1 = baseline, T_2 = 3 months, T_3 = 6 months).

CHAPTER 3

METHODS

Design

This study involved a secondary analysis of data gathered in a previous study "Home Care Outcomes for Heart Failure: A Test of Two Nursing Interventions" (Setter-Kline, 1999). The use of secondary analysis to test a new hypothesis has both advantages and disadvantages. One of the most noteworthy advantages of a secondary analysis is that it is time efficient. Since the data have already been collected for previous study, data collection is not necessary. Another advantage of a secondary analysis is that it is considered more economical. Because data collection can be an expensive part of a research project, utilizing data already collected will help defer the cost of the study (Polit & Hungler,1995).

In addition to efficiency and economical reasons, another significant advantage of a secondary analysis is that it promotes the continued expansion of knowledge. When the same data are analyzed using different frameworks, the results can be compared. This comparison would demonstrate the similarities/differences in the findings utilizing different frameworks. These findings may help support the primary study, as well as help identify additional areas for continued research.

One main disadvantage of a secondary analysis of data would be the lack of control the investigator has in the development of the research design. In other words, the primary data set may be deficient or problematic in one or more ways (e.g. the sample used, the

variables measured, etc.). In addition, errors with the data collection may not be known to subsequent investigators, as they were not involved with the actual collection of the data.

Although a secondary analysis has advantages and disadvantages, it is thought for this study that the use of the primary data set for a secondary analysis would provide sufficient information for answering the research questions. Only portions of the primary data set were used for this study however, as explained in the following paragraphs.

The primary study used a blind, experimental, longitudinal design to examine the effect of two nursing approaches on the home care outcomes for clients with heart failure. Participants were heart failure patients from two Michigan home care agencies, who were randomly assigned to one of three groups: placebo, supportive-educative, or mutual goal setting. In addition to the skilled nursing care provided by the home care agency, additional education was provided to all three groups by the nursing approach providers. These nurses were trained in, and only administered, one approach type (i.e. placebo, supportive-educative, or mutual goal setting). The placebo group received information on topics such as immunizations, decreasing the risk for falls, general nutrition, normal aging, etc. from their nursing approach provider. The supportive-educative group and the mutual goal setting groups received additional information from their nursing approach providers based on the AHCPR Heart Failure Guidelines (1994). The supportive-educative group received this treatment based on a process that taught and supported the client in providing self-management with their heart failure condition (Orem, 1995). The mutual goal setting group received treatment based on a process in which both the patient and the nurse agreed on the treatment goals to be obtained (King, 1981).

The secondary analysis included data from all three groups as an aggregate (i.e. placebo, supportive-educative, and mutual goal setting). Self-efficacy scores and hospitalization information from three specified time points (i.e. baseline, 3, 6 months) of the primary study were used for the data analysis.

The primary study identified some threats to internal validity. Because one of the experimental problems with longitudinal studies is subject attrition, each subject received compensation for the completion of interviews throughout the study. This compensation can also be viewed as a technique to help control the threat to internal validity known as mortality. Mortality is the loss of subjects during the course of a study that differ from one group to another (Polit & Hungler, 1995). This threat is particularly valid in the primary study for a couple of reasons. First, it is possible that subjects in the different groups may have dropped out of the study differently based on their interest in the nursing approach they received. Secondly, disease progression may have resulted in death of the participant or worsening of their medical condition to a point in which they decided to end the study participation early.

A second threat to the internal validity of the primary study is that of instrumentation (Polit & Hungler, 1995). Even though the same data collection tool was utilized at the different time points, the tool could lead to more accurate measures at subsequent time points (e.g. data collector becomes more experienced with continued practice in administrating the tool). It is also possible that less accurate measures were obtained at subsequent time points (e.g. subjects become bored or fatigued). In either instance, these differences could bias the results.

In addition to the threats identified for internal validity, there are also characteristics of the environment that affect the primary study's external validity. One of these threats, the Hawthorne effect, is present when subjects behave in a particular manner largely because they are aware of their participation in a study (Polit & Hungler, 1995). In this case, the way in which a subject decided to answer the interview question may be based on how they think they should answer, not based on actual belief or performance.

A second threat to the external validity of the primary study is that of interaction of history and treatment effect. In this case, the results may reflect the impact of treatment and some other event external to the study (Polit & Hungler, 1995). Because the primary study was conducted in the subjects home setting, and subjects could have outcomes that reflect nursing care from a particular agency, the possibility of this threat was present. In order to control for this, subjects were recruited from two different agencies.

The last threat to external validity of the primary study was that of measurement effects (Polit & Hungler, 1995). Because considerable amounts of data were collected at each interview, the results might not apply to a different group of people who were not also exposed to the same data collection procedures.

Sample

The convenience sample for the primary study consisted of patients who were receiving home care services from two home care agencies in Michigan. Additional criteria for the primary study's sample selection included:

1. Heart failure was identified as the primary diagnosis for home care at the time of entry into the study
2. Over the age of 18 years

3. Able to understand and speak the English language

4. Able to give informed consent to participate in the study

5. Participants were not restricted in regard to gender, race, or socioeconomic status

Once the participants were entered into the primary study, they were randomly assigned into one of the three groups (i.e. placebo, supportive-educative, or mutual goal setting). The goal of the primary study was to obtain 62 participants in each group.

The sample for the secondary analysis includes 76 participants, all of whom completed the primary study. Group assignment in the primary study (i.e. placebo, supportive-educative, or mutual goal setting) was not an influencing factor in this secondary analysis.

Characteristics of subjects. The age of the participants in the secondary analysis ranged from 42 to 94 with a mean of 75.45 years (SD = 11.01). Most of the participants reported a marital status of being widowed, with 46.1% (n = 35) reporting this status. The majority of the participants reported having completed grades 11-12, with 56.6% (n = 43) of the participants reporting this achievement.

All participants reported being unemployed at the time of entrance into the study, with the exception of one, who reported working 2 hours a week. Of the participants who reported an income, 42.1% (n = 32) receive an income between $10,001 - $20,000 annually. Medicare was the most common reported health insurance, with 90.8% (n = 69) of the participants qualifying for this type of coverage.

The duration of having heart failure ranged from less than a year to greater than 5 years among all participants. The majority of the participants reported living with heart

failure one or more years, with 64.5% (n = 49) reporting this duration. In addition, the cardiologist was identified as the most common health care provider with 68.4% (n = 52) of the participants reporting this provider type. Additional detail of subject characteristics is identified in Table 1.

Instruments

The instruments used for data collection in the primary study included one that measured quality of life (Ferrans and Powers Quality of Life Index: Cardiac Version III), one that measured self-management (Self-Management Tool), and a third that recorded the demographic information to describe the sample. The secondary analysis examined only portions of the data collected from the primary study. Specifically, perceived self-efficacy to manage disease and hospital utilization were the two areas from the Self-Management Tool (SMT) that were explored.

The SMT incorporates measures from the Chronic Disease Self-Management Study Measures (Lorig et. al., 1996). Lorig et. al. developed the Chronic Disease Self-Management Study Measures tool in order to assess the effectiveness of a chronic-disease management program. The self-efficacy to manage disease in general section of this tool is a 5 item Likert scale (Appendix A). The range on this scale for each item is 1 to 10, yielding a total score of 5 – 50. An internal consistency reliability of .87 was established by Lorig et al. (1996) with item-scale correlations of .58 to .79.

Reliability coefficients for this secondary analysis were calculated on the "self-efficacy to manage disease in general" scale. Five-item internal consistency was tested and resulted in a Cronbach's alpha of .83. According to Polit and Hungler (1995) reliability coefficients of .70 or greater are considered sufficient to make group comparisons.

Table 1

Subject Characteristics

Attributes	Number of Subjects	Percentage of Subjects
Marital Status		
Never married	2	2.6
Married	33	43.4
Divorced	6	7.9
Widowed	35	46.1
Education		
1st –7th grade	4	5.3
8th – 10th grade	14	18.4
11th – 12th grade	43	56.6
Associate's	12	15.8
Bachelor's	2	2.6
Master's	1	1.3
Employment		
Employed	1	1.3
Unemployed	73	96.1
Annual Income		
< $10,000	18	23.7
$10,001 - 20,000	32	42.1
$20,001 - 30,000	20	26.3
$30,001 - 40,000	5	6.6
Health Insurance		
Private	2	2.6
HMO	1	1.3
Medicare	69	90.8
Medicaid	13	17.1
Supplemental	25	32.9
Other	12	15.8

Table 1 (continued)

Attributes	Number of Subjects	Percentage of Subjects
Heart Failure Duration		
< 1 year	27	35.5
1 – 2 years	10	13.2
3 – 5 years	15	19.7
> 5 years	24	31.6
Health Care Provider		
Family practice physician	14	18.4
Cardiologist	52	68.4
Internist	28	36.8
Nurse practitioner	3	3.9
Other	5	6.6

The second area on the SMT tool that was used in the secondary analysis was a section from health care utilization. Appendix B contains the questions that were completed by participant self-report. Only the section that addressed the number and reason for hospitalization from Appendix B was considered in determining hospital utilization for the secondary analysis. For this section, a test-retest reliability coefficient of .89 was established by Lorig et al. (1996).

Procedure

The procedure for the primary study was initiated by the home care registered nurse, who at a home visit, introduced the study to the patient by reviewing a predetermined script (Appendix C). If the patient voiced interest in participating in the study, the home care nurse notified the data collection nurse. Subsequently, the data collection nurse scheduled a visit to the patient's home in order to provide an explanation of the study, obtain informed consent (Appendix D), demographic information (Appendix E), and collect baseline data.

After this visit, the data collection nurse notified Dr. Setter-Kline of the participant's entry into the study, at which time a random assignment of the participant into one of the three intervention groups was completed.

Once participants were assigned into an intervention group, they were contacted by the appropriate nursing approach provider, who made home visits once a week for a period of eight weeks. During that time, all participants were still receiving routine nursing care, as covered by their insurance, from the home care agency.

In addition to the information provided by the registered nurse from the home care agency, participants received information from their nursing approach provider. The placebo group received health information focusing on health promotion. The study groups that received nursing provider visits administering the supportive-educative (Orem, 1995) and the mutual goal setting (King, 1981) approaches received information based on the AHCPR Heart Failure Guidelines (1994). The data collection nurse continued to visit all participants once every three months for period of one year.

The secondary analysis differed from the primary study in that it examined only the areas of perceived level of self-efficacy and hospital utilization for the study participants. Also it included data from only specified data collection time points (i.e. baseline, 3, and 6 months).

The primary study did not identify any risks to the subjects for participation in the study. In addition, the subjects were informed that participation in the study was completely voluntary, and that they were able to withdraw from the study at any time. The participants were also informed that they would not be identified by name with any of the information obtained, and that the results of the study would be in the form of a group format, with no

reference to individual results. The nursing approach providers, as well as the data collectors, were graduate nursing students. These students were informed that if the participant appeared fatigued, or otherwise not able to participate in the session, to reschedule the session for another day.

Benefits of participation in the primary study were also identified. One such benefit included participants receiving additional information of how to manage their health. In addition, the nursing provider visits for the study were completed at no cost to the participants or their insurance. Lastly, because the nursing visits were provided once a week for a period of eight weeks, often participants continued to receive these visits after the termination of home care services.

Human Subject Consideration

Before this secondary analysis was completed, permission to use data from the primary study was obtained. Approval from the institutional review board was also required, and this approval was received from the Research Review Committee at Grand Valley State University (Appendix F).

CHAPTER 4

RESULTS

The purpose of this study was to determine the relationship of perceived self-efficacy of disease management and hospital utilization in heart failure patients. Hospital utilization was defined as an acute care admission to the hospital of an individual diagnosed with heart failure. An additional area of study, that of perceived self-efficacy of disease management and hospital utilization changing over time, was also explored.

Research Questions

Four research questions were examined in this study. These questions were:

1. What is the level of perceived self-efficacy of disease management in heart failure patients at baseline, 3, and 6 months?
2. What is the rate of hospital utilization in heart failure patients at baseline, 3, and 6 months?
3. What is the relationship between perceived self-efficacy of disease management and hospital utilization in heart failure patients at baseline, 3, and 6 months?
4. Does perceived self-efficacy of disease management and hospital utilization of heart failure patients change over time?

Data Analysis of Research Questions

The Statistical Package for the Social Sciences (SPSS) was used to analyze the data. The level of significance was set at $p < .05$ for all statistical procedures. Descriptive statistics

were used to describe the sample, as well the variables of interest (e.g. perception of self-efficacy and rate of hospital utilization). In order to determine the relationship between perceived self-efficacy of disease management and hospital utilization at baseline, 3, and 6 months, Pearson's r correlation procedures were utilized. Because of the attrition of participants over time, the evaluation of perceived self-efficacy and hospital utilization changing over time was completed by use of paired t-tests.

Perceived Self-Efficacy

The first research question evaluated the level of perceived efficacy of disease management at baseline, 3, and 6 months. The "self-efficacy to manage disease in general" section of the Self-Management Tool, a 5 item Likert scale, provided the data for this question. With a possible score of 5 - 50, data analysis indicated a baseline range of 13 to 50, with a mean self-efficacy score of 38.38 (SD = 8.74). At the 3-month measurement, a range of 16 to 50 was noted, resulting in a mean self-efficacy score of 40.38 (SD = 7.77). At 6 months, the results demonstrated a higher score at the lower end of the range, resulting in a range from 21 to 50, and a mean self-efficacy score of 40.35 (SD = 8.50).

Table 2 displays the results of the individual items from the "self-efficacy to manage disease in general" tool for each of the 3 time points. The item on the scale that participants felt the most confident about at the baseline measurement was judging when changes in their condition required a physician visit (M = 8.24, SD = 2.06). The remaining items at the baseline measurement all scored between 7.29 and 7.82, with the item that participants felt the least confident about was doing all the things necessary to manage their condition on a regular basis (M = 7.29, SD = 2.34).

At the 3-month measurement, the item on the scale that participants felt the most

Table 2

Self-Efficacy to Manage Disease in General

Self-Efficacy Item	Baseline x (SD)	3 - Months x (SD)	6 - Months x (SD)
Judge when the changes in your illness mean you should visit a physician	8.24 (2.06)	8.67 (1.54)	8.55 (1.74)
Do things other than just taking medication to reduce how much your illness affects your everyday life	7.82 (2.04)	8.00 (1.99)	7.96 (1.94)
Do the different tasks and activities needed to manage your health condition so as to reduce your need to see a physician	7.63 (2.32)	7.77 (2.12)	8.19 (1.97)
Reduce the emotional distress caused by your health condition so that it does not affect your everyday life	7.41 (2.49)	7.79 (2.15)	7.66 (2.50)
Do all the things necessary to manage your condition on a regular basis	7.29 (2.34)	8.02 (2.19)	8.00 (2.00)

confident about continued to be judging when changes in their condition required a physician visit (M = 8.67, SD = 1.54). This item was also the highest scoring item at the 6-month measure (M = 8.55, SD = 1.74). Although the scores of all of the items at the 3-month measure increased from the baseline measurement, the only item that continued to show an increase at the 6-month measurement was doing the different activities needed in order to reduce physician visits (M = 8.19, SD = 1.97).

At the 3-month measurement, confidence about reducing the emotional distress caused by their health condition (M = 7.79, SD = 2.15) continued to be a lower scoring item. This was also the case at 6 months, when confidence about reducing emotional distress was the lowest scoring item (M = 7.66, SD = 2.50). It is noted that this is the only item that never exceeded a score above 7.79 in any of the measurements.

Hospital Utilization

The second research question evaluated the rate of hospital utilization in heart failure patients at baseline, 3 and 6 months. Data analysis at the baseline measurement indicated that 81.6% (n = 62) participants reported an acute care admission to the hospital during the previous 3 months. Of those reporting a hospital admission, 7.9% (n = 6) participants reported three or more hospital stays.

At the 3-month measure, the number of participants reporting an acute care admission to the hospital during the previous 3 months, or since the initial data collection, decreased to 27.6% (n = 21). In addition, not only did the number of participants reporting a hospital admission decrease, but also the frequency of hospitalizations decreased as only 1.3% (n = 1) participant required 3 or more admissions. This finding is consistent when also considering the attrition of participants that occurred between the baseline and the 3-month measurement. With this consideration, only 61 of the original 76 participants were measured at this time point, resulting in 34.4% (n = 21) reporting hospitalization.

At the 6-month measure, the number of participants reporting an acute care admission to the hospital during the previous 3 months decreased even further than the baseline and 3-month measure. At this time point, only 14.4% (n = 11) participants reported a hospital stay. Similar to the 3-month measure, only 1.3% (n = 1) participant required 3 or more hospital

admissions. Attrition of participants is also noted at the 6-month time point as the sample consisted of 53 of the original 76 participants. Even with this decrease in sample size, the results continue to demonstrate a decrease in hospital use, with 20.7% (n = 11) participants reporting an acute care hospital stay. Table 3 displays the results of the frequency of hospital use for the baseline, 3, and 6 month measurements.

Table 3

Hospital Utilization

Hospitalizations	Baseline (n = 76) Freq	/ %	3 - Month (n = 61) Freq	/ %	6 - Month (n = 53) Freq	/ %
Not Hospitalized						
0	14	18.4	40	52.6	42	55.3
Hospitalized						
1	38	50.0	14	18.4	9	11.8
2	18	23.7	6	7.9	1	1.3
3	5	6.6	1	1.3	0	0
4	1	1.3	0	0	1	1.3

Perceived Self-Efficacy and Hospital Utilization

The third research question evaluated the relationship between perceived self-efficacy of disease management and hospital utilization in heart failure patients at baseline, 3, and 6 months. Review of the data indicated that there was no relationship between perceived self-efficacy and hospital utilization at the baseline measurement ($r = .02$). A weak negative, yet statistically significant, relationship was identified at the 3-month measurement ($r = -.33$, $p = .01$). This relationship implies that as perceived self-efficacy to manage disease increased,

hospital utilization decreased. A weak negative relationship was also identified at the 6 - month measurement ($r = -.19$, $p = .15$), although this correlation was not significant.

Perceived Self-Efficacy and Hospital Utilization Over Time

The fourth research question evaluated if perceived self-efficacy of disease management and hospital utilization of heart failure patients changed over time. Paired t-tests were conducted to examine each variable.

Perceived self-efficacy over time. The results indicate that overall, perceived self-efficacy of disease management did not change over time. Although the mean self-efficacy scores at baseline ($M = 39.21$, $SD = 8.54$) appeared lower than the 3-month measure ($M = 40.38$, $SD = 7.77$), this difference was not statistically significant. The same can be said for the mean self-efficacy scores at baseline ($M = 39.11$, $SD = 8.69$) and the 6-month measure ($M = 40.35$, $SD = 8.50$). It is noted that although overall perceived self-efficacy of disease management did not change over time, some change was noted between the items scored at the different time points (as reflected in Table 2). The results of the paired t-test for all 3 pairs of perceived self-efficacy is summarized in Table 4.

Table 4

Self-Efficacy of Disease Management Change Over Time

Time Point	Mean	SD	t	df	p
Baseline	39.21	8.54			
3 - Month	40.38	7.77	-.92	59	.36
3 - Month	40.71	7.62			
6 - Month	40.34	8.49	.40	48	.68
Baseline	39.11	8.69			
6 - Month	40.35	8.50	-1.01	52	.31

Hospital utilization over time. Unlike self-efficacy, the results of hospital utilization changing over time is evident and statistically significant in the data analysis. The mean hospital utilization score at baseline (M = 1.26, SD = .93) does appear larger than the 3-month measurement (M = .48, SD = .74), and this difference is statistically significant. The same can be said for the 3 - and 6-month measurement and the baseline and 6-month measurement. The results of the paired t-test for all 3 pairs of hospitalization utilization is summarized in Table 5. These results indicate that hospital utilization for heart failure patients decreased over time, and that the decrease is statistically significant at all 3 measures.

Table 5

Hospital Utilization Change Over Time

Time Point	Mean	SD	t	df	p
Baseline	1.26	.93			
3 - Month	.48	.74	5.94	60	.00
3 - Month	.48	.76			
6 - Month	.22	.46	2.15	49	.03
Baseline	1.28	.95			
6 - Month	.28	.69	6.36	52	.00

CHAPTER 5

DISCUSSION AND IMPLICATIONS

Discussion Related to Research Questions and Recommendations

The first research question evaluated the level of perceived self-efficacy of disease management in heart failure patients at baseline, 3, and 6 months. Although a large variation in the mean self-efficacy scores for each time period was not evident, some differences in the scoring of the individual items were evident between time points. Only the first item remained constant between time points, that of judging when changes in condition required a physician visit. This finding is interesting when also considering that 65.4% (n = 49) of the participants reported having heart failure for one or more years. Because heart failure is a chronic disease which requires ongoing adherence to a complex medication, dietary, and exercise regimen, individual identification of changes in condition that require medical attention is essential. Further study in this area may identify if the duration of living with a chronic condition influences the recognition of symptoms that require medical attention thus, increasing one's perception of self-efficacy in this area.

Although this secondary analysis did not evaluate the number of participant - reported physician visits at baseline, 3, and 6 months, the results demonstrated that perception of self-efficacy related to completing the different tasks and activities required in order to reduce physician visits increased at each time point. Although these findings were not statistically significant, this was the only item that continued to increase at the 6-month measure. This

perception, that of being able complete the activities needed to manage one's condition and reduce physician visits, may be an important factor in chronic disease management, and is an area identified for further study.

Reducing the emotional distress caused by the health condition was one item that scored between 7.41 and 7.79 at all measurement time points. This item was also the lowest scoring item at the 6-month measure. Even though these findings were not statistically significant, it may identify an area for additional research. Because heart failure requires life style adjustments, patients' emotional responses to these changes may influence their behavior and ultimately treatment outcomes.

At the 3-month time point, all of the items on the "self-efficacy to manage disease in general" scale showed a slight increase in score from the baseline measure. Although not all of the influencing factors are known that contributed toward an increase at 3 months, it may have been that all of the participants were receiving home care services by a registered nurse, in addition to visits from the primary study's nursing approach provider. Even though these findings were not statistically significant, further research in this area may explore the relationship between the receipt of home care services and a patient's perception of self-efficacy in disease management.

The second research question evaluated the rate of hospital utilization in heart failure patients at baseline, 3, and 6 months. The results support a continued decrease in hospital use from baseline to the final measurement at 6 months. The most dramatic decrease was noted from 81.6% (n = 62) of the participants reporting hospitalization at baseline to 27.6% (n = 21) of the participants at 3 months. It is noted that subject attrition between measurement points may be an influencing factor for these results. Because the sample size

decreased from baseline (n = 76) to the 3-month measure (n = 61), it may be that the subjects who did not continue in the study contributed to the rate of hospital utilization. In future studies, it will be important to examine what variables exist that may influence hospital use in the heart failure patients.

The third research question examined the relationship between perceived self-efficacy of disease management and hospital utilization in heart failure patients at baseline, 3, and 6 months. Only one significant relationship between perceived self-efficacy and hospital utilization was identified. This was the 3-month measure, when a weak negative significant relationship ($r = -.33$, $p = .01$) was evident. This finding implies that as perceived self-efficacy to manage disease increased, hospital utilization decreased. Further study in this area could evaluate if this finding is similar in other chronic disease conditions or in other samples. Continued study could also explore the reason why a significant relationship did not exist at the 6-month interval.

The fourth research question examined whether perceived self-efficacy of disease management and hospital utilization of heart failure patients changed over time. The findings demonstrate that overall, self-efficacy of disease management did not change over time.

Unlike perceived self-efficacy, hospital utilization did change over time and the results demonstrate that these changes were statistically significant. In other words, a decrease in hospital use was noted from baseline to 3 months, 3 months to 6 months, and baseline to 6 months. In order to understand this finding more thoroughly, it will be important to consider subject attrition as well to identify other variables that may influence

hospital use in the heart failure patient. This is an area that will need to be further explored with continued research.

Relationship of Findings to Conceptual Framework

The use of Bandura's social learning theory provides a systematic direction that allows one to predict and explain human behavior. Self-efficacy theory offers a link between self-perceptions and individual actions. According to this theory, individual beliefs about personal capabilities predict later behavior (Jeng & Braun, 1994).

Self-efficacy theory has two types of expectancies that exert influences on behavior, efficacy expectation and outcome expectations. According to Jeng and Braun (1994) efficacy expectation refers to an individual's perceived ability to perform a behavior. Outcome expectation is the belief that outcomes may result from engaging in the specific behavior. In this study, both efficacy and outcome expectations were identified in the conceptual model. Efficacy expectation was determined to be one's perception of self-efficacy of disease management. Although not specifically measured, the outcome expectation in this secondary analysis was identified as one's belief that actions will result in desired outcomes (preventing hospital utilization).

One question in this study evaluated the relationship between perceived self-efficacy and hospital utilization. The results of this question provided some interesting information for consideration. Specifically, the relationship between perceived self-efficacy and hospital utilization was not the same at all three measurement points. At the baseline measure, a relationship between perceived self-efficacy and hospital utilization was not identified. This was not the case however for the 3-month measure. At 3 months, a weak negative significant relationship ($r = -.33$, $p = .01$) was evident. At 6 months, a weak negative relationship was

also identified ($r = -.19$, $p = .15$), although this correlation was not significant. Only the statistically significant relationship identified at 3 months may support the conceptual model; as perceived self-efficacy to manage disease increases, hospital utilization decreases.

These results lead one to consider the sources of efficacy information. According to Bandura (1977) expectations of personal efficacy are derived from four principle sources of information: performance accomplishments, vicarious experience, verbal persuasion, and physiological state. Because the participants of this secondary analysis were admitted to home care nursing services at the time of the baseline measure, the home care services provided between the baseline and 3-month data collection may have influenced the participants' perception of self-efficacy and hospital utilization. In addition, participants of the primary study also received weekly visits by a nursing approach provider for a period of eight weeks. Both of these interventions (home care services and nursing approach providers) are a source of efficacy information. This source, known as verbal persuasion, is the influence of others' suggestions on efficacy beliefs (Jeng & Braun, 1994).

Another source of efficacy information, that of performance accomplishments, may also be evident considering the results. Performance is the most powerful source of information for enhancing self-efficacy (Jeng & Braun, 1994). When learning can be accomplished through personal experience, individual beliefs about capabilities may be increased. Even though the mean self-efficacy score did not vary much between time points, the results of the individual items provide useful information. For example, perceptions of self-efficacy in judging when condition changes require a physician visit were consistent from the baseline measurement to 6 months. This may indicate that for those participants

who remained in the study, that past success with identification of symptoms that required a physician visit may have been a source of efficacy information for future performance.

Physiological state, another source of efficacy information, can also influence how individuals judge capabilities (Jeng & Braun, 1994). This is interesting in view of the results of the efficacy item related to reducing emotional distress caused by one's health condition. The secondary analysis identified the results of this item ranging from 7.41 to 7.79 for all 3 time points. This was the only item that never achieved a score greater than 7.79 in at least one of the measurement points, and may be an influencing factor in the slight overall change in the mean self-efficacy scores.

Although the conceptual model did not explicate the element of time, the results of the secondary analysis did demonstrate a statistically significant decrease in hospital use from the baseline measure to the 3- and 6-month measure. This outcome expectation may also be influenced by other factors besides that of perceived level of self-efficacy as identified in the conceptual model. One such factor might be subject attrition over time, perhaps participants who did not continue in the study contributed to the rate of hospital utilization at the baseline or 3-month measurement time points.

Relationship of Findings to Previous Research

Although literature supports the relationship between perceived self-efficacy and disease management (Perkins & Jenkins, 1998), as well as the relationship between specific health care interventions and hospital utilization (Stewart, Pearson, & Horowitz, 1998), the relationship between self-efficacy and hospital utilization are not as evident. This secondary analysis identified a weak negative significant relationship ($r = -.33$, $p = .01$) between perceived self-efficacy and hospital utilization at the 3-month measurement. In addition, the

secondary analysis identified that the number of individual patients requiring a large number of readmissions decreased over time. Although this secondary analysis did not specifically explore the health care interventions provided to the participants upon entry into the primary study, it is possible that these interventions influenced the results of the secondary analysis. In addition, it is possible that subject attrition over time influenced hospital use, perhaps those that were more unstable and hospitalized frequently did not continue to participate in the study.

The findings from the secondary analysis are similar to an investigation completed by Stewart et al. (1998) who reported that patients in a home-based intervention group had fewer unplanned readmissions (36 vs 63; $p = .03$). In addition to this finding, the results of a post-hoc analysis suggested that home-based intervention was effective in preventing individual patients from requiring a large number of readmissions. Although the study by Stewart et al. (1998) did not speak specifically to perceived self-efficacy of disease management and hospital utilization, it identified a relationship between verbal persuasion (one source of efficacy information) and hospital readmission.

The findings from the secondary analysis also identified that although the mean self-efficacy score did not vary much between measurements, the item related to judging when condition changes required a physician visit remained consistently high. Because of this, and the fact that 65.4% ($n = 49$) of the participants reported having heart failure for 1 or more years at the time of entrance into the study, it is thought that past experience with successful symptom identification may lead to increased efficacy expectations for this behavior.

A study completed by Courneya and McAuley (1993) supports the thought that past experiences and perceptions of success are strong sources of efficacy information. In their

investigation, 77 subjects were asked to identify the reason for their success in an exercise test. The results demonstrated that self-efficacy had a significant direct effect on perceptions of success ($\beta = .31, p < .01$). In addition, the relationship between previous exercise participation and self-efficacy was supported ($\beta = .26, p < .05$).

Limitations

One limitation identified in this secondary analysis relates to the reason for hospital utilization. Although data were analyzed that evaluated the number of hospitalizations at each time measurement, this data was not specific to heart failure admissions. Because the secondary analysis explored the relationship between perceived self-efficacy in disease management and hospital utilization, it is important to determine if the reason for hospital readmission is incidental or related to the heart failure condition.

A second limitation identified relates to the sample characteristics utilized for this secondary analysis. Information on gender was not obtained from the primary study, and may be important in considering hospital utilization and perceptions of self-efficacy. Previous research has identified the female gender to be a predictor of hospital readmission (Sabourin & Funk, 1999).

Another study limitation identified with the secondary analysis includes the setting of the primary study. Since all of the participants were receiving home care services at the time of entrance into the study, the results of the secondary analysis may be difficult to generalize to heart failure patients in other settings. Examples of other settings may include nursing homes or adult foster care facilities, in which the provision of care available to assist with chronic disease management may be different than what is available with home care services.

Finally, consideration was not given in the secondary analysis to the interventions that participants received. Because literature supports the relationship between specific health care interventions and perceived self-efficacy (Scherer & Schmieder, 1997), as well as the relationship between specific health care interventions and hospital utilization (Stewart, Pearson, & Horowitz, 1998), it is important to identify what interventions were provided to the participants that could have influenced perceived self-efficacy or hospital utilization.

Implications for Nursing

The results of this secondary analysis has implications for nursing practice, education, and administration. Because nursing practice is researched based, it is critical for the professional nurse to not only incorporate researched based interventions into practice, but to also participate in the research process. One area identified in this secondary analysis that could be of importance to the professional nurse is the relationship between self-efficacy and hospital utilization that was identified at the 3-month measure. Even though this secondary analysis did not explore the variables that may have influenced this finding, the professional nurse should incorporate strategies into care delivery that increase one's perceived efficacy of disease management. This could be accomplished by approaching behavioral change in small steps to ensure success, as well as seeking specifically about the change being sought.

The results from this secondary analysis also has implications for education. Because chronic disease management is an important component in the cost of healthcare, it is important for nursing to design patient educational programs that promote self-efficacy of disease management. Because one source of efficacy information is verbal persuasion (Salazar, 1991), health educators have a key role in influencing this perception of patient self-management.

A second source of efficacy information, that of physiological state (Salazar, 1991), also has implications for the nursing educator. Since chronic disease management requires emotional coping responses, it is necessary for the nurse educator to provide training in problem solving and stress management. This can be accomplished by providing opportunities for patients to practice these skills individually or in small group settings.

The results of this secondary analysis can also be useful to the nurse administrator. Because literature supports the fact that heart failure has a 30-day national readmission rate of 23%, and the fact that 50% of the hospital admissions are preventable (Knox & Mischke, 1999), continued research identifying strategies that assist in decreasing hospital use is necessary. This secondary analysis identified a statistically significant decrease in hospital utilization in heart failure patients from baseline to 3 and 6 months. This study should be replicated in order to further explore this finding. Continued research will help identify factors that influence hospital use and this information can be used by the nursing administrator in the development of practice standards and protocols for nursing interventions.

This secondary analysis also has implications for Bandura's self-efficacy theory. Even though the participant outcome expectation was not specifically identified (although it was identified by the author), participants' perceptions of performing particular behaviors were identified and measured. These results provide opportunities for further research that considers multiple avenues to behavioral change in heart failure management.

Appendices

Appendix A

Self-Efficacy to Manage Disease in General

Appendix A

Self-Efficacy to Manage Disease in General

We would like to know **how confident** you are in doing certain activities. For each of the following questions, please circle the number that corresponds to your confidence that you can do the tasks regularly at the present time. Having an illness often means doing different tasks and activities to manage your condition. How confident are you that you can:

1. Do all the things necessary to manage your condition on a regular basis?

Not Confident									Totally Confident
1	2	3	4	5	6	7	8	9	10

2. Judge when the changes in your illness mean you should visit a physician?

Not Confident									Totally Confident
1	2	3	4	5	6	7	8	9	10

3. Do the different tasks and activities needed to manage your health condition so as to reduce your need to see a physician?

Not Confident									Totally Confident
1	2	3	4	5	6	7	8	9	10

4. Reduce the emotional distress caused by your health condition so that it does not affect your everyday life?

Not Confident									Totally Confident
1	2	3	4	5	6	7	8	9	10

5. Do things other than just taking medication to reduce how much your illness affects your everyday life?

Not Confident									Totally Confident
1	2	3	4	5	6	7	8	9	10

Appendix B

Health Care Utilization

Appendix B

Health Care Utilization

During the **past 3 months**, did you visit any medical physician? (Please fill in the blank with a "0" or other number; do **not** include visits while in the hospital.)

How many visits? _____

During the **past 3 months**, did you receive any services from the following health professionals? (Please fill in the blank with a "0" or other number; do **not** include visits while in the hospital.)

Psychiatrist	No. of visits? ___	Reason? _____
Psychologist	No. of visits? ___	Reason? _____
Other mental health Counselor	No. of visits? ___	Reason? _____
Nurse practitioner	No. of visits? ___	Reason? _____
Home health nurse	No. of visits? ___	Reason? _____
Physical therapist	No. of visits? ___	Reason?
Occupational therapist	No. of visits? ___	Reason? _____
Respiratory therapist	No. of visits? ___	Reason? _____

How many times did you visit the **emergency room** in the **past 3 months?**

[ ] None _____ times Reason? _____

How many **different times** did you stay in a hospital **overnight or longer** in the **past 3 months**?

[ ] None _____ times Reason? _____

How many **total nights** did you stay in a hospital **overnight** in the **past 3 months**?

[ ] None _____ times Reason? _____

Appendix C

Agency Script

Appendix C

Agency Script

We are fortunate to have our home care agency included in a nursing study that has been funded by the American Heart Association. The study will be conducted by Dr. Kay Kline, Professor of Nursing at Grand Valley State University. The purpose of the study is to improve the lives of persons with heart failure.

We would like you to consider participating in the study, but know that you cannot make a decision about participation without knowing more about the study. Can we have a registered nurse who is a graduate student at Grand Valley State University contact you to tell you more about the study?

Appendix D

Informed Consent

Appendix D

Informed Consent

I _____ agree to participate in the nursing research study for persons with heart failure who are receiving home care. I understand that as a participant in this study:

- I will be interviewed five (5) times for approximately 45 minutes each time, once within this week and again at 3,6,9, and 12 months. I will be compensated $10 at the completion of each interview.
- I will receive information about managing my health and that this information will be delivered by a registered nurse who is a graduate nursing student at Grand Valley State University.
- I will receive this information once a week over the next eight (8) weeks and that each visit will last approximately 30 minutes. I will not be compensated for receiving this information.
- I will be able to withdraw from the study at any time by notifying Dr. Kay Setter Kline, the Principle Investigator, at 616-895-3517, and that my withdrawal will in no way affect the care I receive from the home care nurse.
- I understand that participation or lack of participation will have no impact on my insurance coverage or rates.
- I will not be identified by name with any of the information obtained and that any sharing of information obtained in this study will be in the form of group summaries of all participants.
- There is no identified risk from participating in this study and I may benefit from receiving information about ways to manage my health.
- If in the process of gathering information, any symptoms are identified that might need attention, the nurse gathering the information will refer me to either the home health agency or my health provider.
- I also give permission for review of my health records to verify my health care status. If I have any questions about the research study I may contact the Primary Investigator, Dr. Kay Kline at 616-895-3517, or the Chair of the Research Review Committee, Paul Huizenga at 616-895-2472.

_____ _____

Signed Date

_____ _____

Witness Date

The names of students who are participating in this study are: ____, ____, and ____.

09/20/99

Appendix E

Demographic Data

Appendix E

Demographic Data

(To be collected at time of initial interview)

Record Number: _____
Subject Number: _____

1. Age _____

2. Marital Status
   ___ Never Married
   ___ Married
   ___ Divorced
   ___ Widow/Widower

3. Employment Status
   ___ Employed (___ hours per week)
   ___ Unemployed

4. Highest Level of Education
   ___ 1^{st} - 7^{th} grade
   ___ 8^{th} - 10^{th} grade
   ___ 11^{th} - 12^{th} grade
   ___ Associate's Degree
   ___ Bachelor's Degree
   ___ Master's Degree
   ___ Doctoral Degree

5. Insurance Provider
   ___ Private Insurance (Name of Company) _____
   ___ HMO (Name of Group) _____
   ___ Medicare
   ___ Medicaid
   ___ Supplemental Insurance (Name of Company) _____
   ___ PPO (Preferred Provider Organization) _____
   ___ Other _____

6. Health Care Provider (Who treats your heart failure?)
   ___ Family Practice Physician
   ___ Cardiologist
   ___ Internist

___ Nurse Practitioner
___ Physician Assistant
___ Other

7. Annual Income in Dollars:
___ less than $10,000
___ $10,001 - 20,000
___ $20,001 - 30,000
___ $30,001 - 40,000
___ $40,001 - 50,000
___ over $50,000

8. How long have you had heart failure?
___ less than 1 year
___ 1 –2 years
___ 3 – 5 years
___ more than 5 years

9. List current medical diagnoses. _____
_____

Appendix F

Human Research Review Approval

GRAND VALLEY
STATE UNIVERSITY
1 CAMPUS DRIVE • ALLENDALE, MICHIGAN 49401-9403 • 616/895-6611

Appendix F

August 22, 2001

Linda English
2248 Crimora Drive
Schoolcraft, MI 49087

RE: Proposal #02-17-H

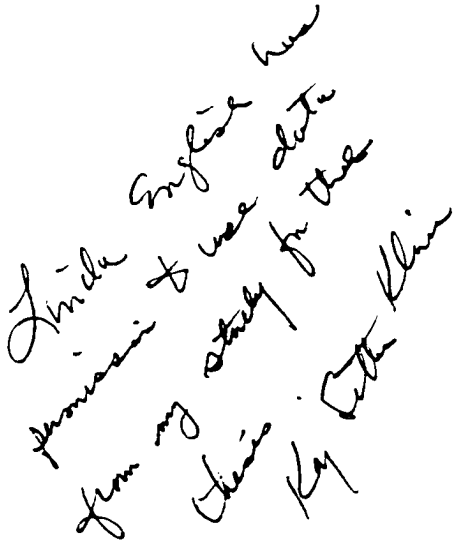
Dear Linda:

Your proposed project entitled **Relationship of Perceived Self-Efficacy of Disease Management and Hospital Utilization Among Heart Failure Patients** has been reviewed. It has been approved as a study, which is exempt from the regulations by section 46.101 of the Federal Register 46(16):8336, January 26, 1981.

Sincerely,

[redacted]

Paul Huizenga, Chair
Human Research Review Committee



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