

THE RELATIONSHIP BETWEEN PROFESSIONAL CARE ENVIRONMENTS,  
NURSE - RATED QUALITY OF CARE, SERVICE UTILIZATION AND  
FUNCTIONAL STATUS OF PATIENTS WITH HEART FAILURE RECEIVING  
MEDICARE CERTIFIED HOME HEALTH SERVICES

By

ELIZABETH KLEBER, MSN, RN

A Dissertation submitted to the

Graduate School - Newark

Rutgers, The State University of New Jersey

in partial fulfillment of the requirements

for the degree of

Doctor of Philosophy

Graduate Program in Nursing Research

written under the direction of

Linda Flynn, PhD, RN, FAAN

and approved by

---

---

---

---

Newark, New Jersey

May, 2014

© 2014

Elizabeth Kleber

ALL RIGHTS RESERVED

## ABSTRACT OF THE DISSERTATION

The Relationship between Professional Care Environments, Nurse-rated Quality of Care,  
Service Utilization, and Functional Status of Patients with Heart Failure Receiving  
Medicare Certified Home Health Services

By

ELIZABETH KLEBER, MSN, RN

Dissertation Director:

Linda Flynn, PhD, RN, FAAN

Heart failure (HF) is one of the leading causes of death and disability in the United States and it has grown to near-epidemic proportions. Among the costly sequela of HF are functional impairments. If not reversed, these functional limitations may lead to increased risk of hospitalization. Left untreated, functional impairments are a significant predictor of mortality among elderly persons living at home. Consequently, HF patients represent the largest group of patients receiving home health nursing services, and impaired functional status remains the most frequent predictor of home health need. The overarching conceptual framework for this study was the Nursing Organization and Outcomes Model (Aiken et al., 2002).

This study examined the relationship between nurse-rated quality of care, the nursing practice environment, service utilization and functional outcomes in patients receiving Medicare certified home health care services, as well as nurse practice environment, service utilization and nurse-rated quality of care in patients receiving Medicare certified home health care services.

Data were analyzed from 364 nurses working in 53 home health offices. Major findings indicate a correlation between a supportive care environment and nurse-rated quality of care. The number of occupational therapy visits provided was found to be associated with a decline in functional status at time of discharge from home health services. In addition, patient age was found to be negatively correlated with functional status at time of discharge from home health services. Findings also suggest a competent and supportive front line manager may contribute to nurse-rated quality of care, suggesting investment in nurse manager development may be beneficial to the organization.

## Table of Contents

ABSTRACT .....	ii
List of Tables.....	vi
List of Figures.....	vii
CHAPTER I.....	1
The Problem .....	1
<i>Discussion of the Problem</i> .....	1
<i>Statement of the Problem</i> .....	5
<i>Sub Problems</i> .....	5
<i>Definition of Terms</i> .....	6
<i>Delimitations</i> .....	7
<i>Significance of the Study</i> .....	11
CHAPTER II.....	14
Review of the Literature .....	14
<i>Leidy's Theoretical Framework of Functional Status</i> .....	14
<i>Aiken's Nursing Organizational and Outcomes Model</i> .....	16
<i>Practice Environment, Quality, and Patient Outcomes: Empirical Support</i> .....	17
<i>Anderson's Expanded Access Framework</i> .....	20
<i>Service Utilization and Patient Outcomes: Empirical Support</i> .....	22
<i>Hypotheses</i> .....	27
CHAPTER III .....	29
Methods .....	29
<i>The Research Setting</i> .....	29
<i>The Sample</i> .....	31
<i>Instruments and Measures</i> .....	33
<i>Procedure for Data Collection</i> .....	40
<i>Human Subjects Protection</i> .....	41
<i>Data Analysis Plan</i> .....	42
CHAPTER IV .....	45
Analysis of the Data .....	45

<i>Statistical Description of the Variables</i> .....	46
<i>Data Management</i> .....	51
<i>Results of Hypothesis Testing</i> .....	52
<i>Additional Findings</i> .....	56
 CHAPTER V.....	 62
Discussion of the Findings.....	62
<i>Nurse-rated Quality of Care and Functional Status</i> .....	63
<i>Nurse Practice Environment and Functional Status</i> .....	65
<i>Service Utilization and Functional Status</i> .....	65
<i>Nurse Practice Environment and Quality of Care</i> .....	66
<i>Service Utilization and Quality of Care</i> .....	67
<i>Limitations</i> .....	68
<i>Additional Findings</i> .....	70
 CHAPTER VI.....	 72
Summary, Conclusions, Implications, and Recommendations .....	72
<i>Summary</i> .....	72
<i>Conclusions</i> .....	75
<i>Implications for Nursing</i> .....	76
<i>Recommendations</i> .....	77
<i>References</i> .....	79
Appendices .....	85
Appendix A ADL Index Score .....	85
Appendix B Practice Environment Scale .....	86
Appendix C OASIS Functional Outcomes .....	88
Appendix D Nurse-rated Quality of Care .....	93
Appendix E Demographic Questionnaire .....	94
 Curriculum Vitae.....	 96

## List of Tables

Table 1 Nurse Demographics .....	47
Table 2 Patient Demographics .....	48
Table 3 Descriptive Statistics: Study Instruments .....	51
Table 4 Office Statistics .....	52
Table 5 Correlations: Study Variables .....	52
Table 6 Correlations: Service Utilization and ADL Change Score .....	55
Table 7 Correlations: Service Utilization and Quality .....	56
Table 8 Correlations: ADL Change Score and Service Utilization .....	58
Table 9 Predictors of Decline .....	58
Table 10 ADL Change Score: Improvement / Stabilization, Decline .....	59
Table 11 Coefficients: PES-NWI Subscales .....	60
Table 12 PES-NWI Subscales: Means .....	60
Table 13 Correlations: PES-NWI and Quality .....	61

## List of Figures

Figure 1 Nursing Organization and Outcomes Model (Aiken et al., 2002) .....	3, 16
Figure 2 The Expanded Access Framework (Aday & Awe, 1993) .....	21

## CHAPTER 1

### **The Problem**

Heart failure (HF) is one of the leading causes of death and disability in the United States (U.S.) (Matura, 2002). As a chronic illness, HF has grown to near-epidemic proportions in that over 5 million Americans have been diagnosed with the condition and more than 500,000 cases are newly diagnosed every year. HF, a condition with no known cure, accounts for approximately 1 million hospitalizations each year, 12–15 million outpatient visits, and more than 300,000 deaths. It is estimated that, in the U.S., total costs of care for patients with HF amount to \$28 billion per year, creating a national economic burden (Macabasco-O'Connell, Rasmusson, & Fiorini, 2006; NIH, 2010).

Among the costly sequela of HF are functional impairments. Patients with HF have been found to have poorer physical function than patients with other chronic conditions. If not reversed, these functional limitations may lead to increased risk of hospitalization or placement in a nursing home (Fried, Bradley, Williams & Tinetti, 2001; Madigan, 2008; Reiley & Howard, 1995). Moreover, Reiley and Howard (1995) found that untreated functional impairments are a significant predictor of mortality among elderly persons living at home. Consequently, HF patients represent the largest group of patients receiving home health nursing services, and impaired functional status remains the most frequent predictor of home health need (Ehrenberg, Ehnfors & Ekman, 2004).

The primary goal of nurses in caring for patients with chronic conditions, including patients with HF, is to maximize function in everyday life and to achieve and

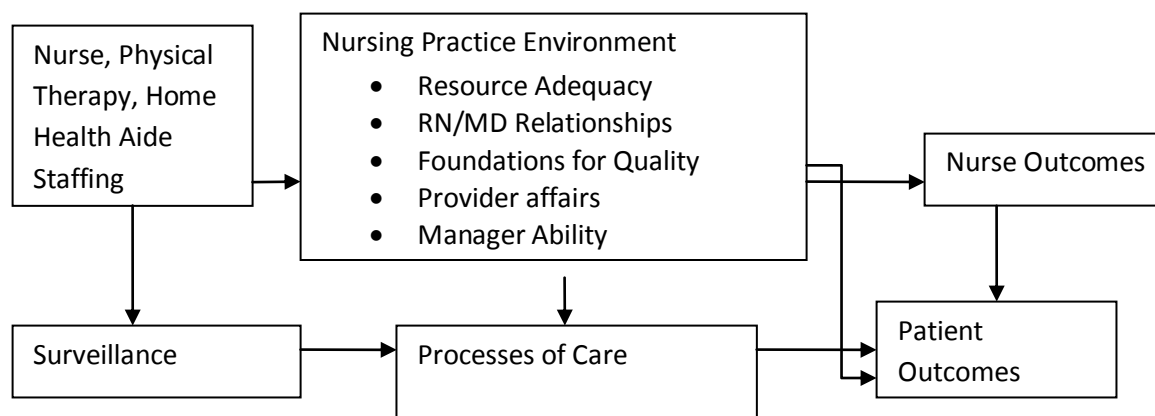
maintain the highest level of well-being. In patients with chronic disease, however, some functional losses are inevitable. Therefore, slowing the decline through functional improvement or maintenance of the current functional status is the goal of health care services (Sharpf & Madigan, 2010). Consequently, the Centers for Medicare and Medicaid Services (CMS) considers decline in functional status, in contradistinction to no improvement, to be an adverse event for the home care patient (Scharpf, Colabianchi, Madigan, Neuhauser, Peng, Feldman & Bridges, 2006).

Although home health care services are frequently multidisciplinary, the American Nurses Association Standards of Home Health Nursing Practice and CMS regulations clearly specify that it is the home health registered nurse (RN) who serves as the patient's case manager. These standards of practice state that it is the home health RN who is responsible for the holistic assessment of patient needs, development of the plan of care in consultation with the physician, referral for other needed services and disciplines, coordination of care among all disciplines involved in the patient's care, and the evaluation of the patients' outcomes of care (American Nurses Association, 2007; CMS, 2005).

Yet, despite the central role of the home health RN in developing and delivering a plan of care that maximizes patient outcomes, including functional status, there are disturbing variations in key outcomes of home health recipients, even after applying rigorous risk-adjustment models (Dey, Johnson, Pajerowski, Tanamor & Ward, 2011; Flynn, 2007a, Madigan, 2008). One theoretical framework that explains variations in patient outcomes is the Nursing Organization and Outcomes Model (Aiken, Clarke, &

Sloane, 2002). Derived from sociological theories of organizations and professions, this set of theoretical propositions posit that variations in organizational support for nursing directly result in variations in processes and quality of care, and ultimately, patient outcomes. The model explains that quality patient care and better patient outcomes are more likely to occur when nurses practice in organizations that create and sustain a supportive nursing practice environment. Thus, the model suggests positive relationships among organizational-level factors such as a supportive nursing practice environment, quality care processes, and patient outcomes (Figure 1). Using a single item that measures nurse-reported quality of patient care, a growing body of research indicates a significant and positive relationship between a supportive nursing work environment and nurse-rated quality care as an indicator of quality care processes (Aiken et al., 2002; Aiken, Clarke, Sloane, Lake, & Cheney, 2008; Bruyneel, Van Den Heede, Diya, Aiken, & Sermeus, 2009).

Figure1. Nursing Organization and Outcomes Model



The Nursing Organization and Outcomes Model asserts that the degree of surveillance, or a process by which nurses observe, monitor, and evaluate the patient's

status (Kutney-Lee, Lake, & Aiken, 2009) influences the quality of care and patient outcomes. This process is usually measured by RN staffing ratios in hospital settings where nursing is present around the clock. In home health, however, the number and frequency of RN visits to a patient's home, also referred to as nursing service utilization, serves as a better indicator of surveillance (Fagerstrom, Wikblad, & Nilsson, 2008; Martin, 2005). Also, in the home health arena, service utilization of other key members of the home health visiting team, such as physical therapists and home health aides, must be considered as factors that can influence patient outcomes (Adams, Corbett, & Michel, 2000; Piyabanditkul, 2003). Therefore, the construct of service utilization as a proxy for surveillance is more appropriate to the home health practice setting.

Although the tenets of the Nursing Organization and Outcomes Model were originally developed to explain relationships among the nursing practice environment, the quality of care processes, and patient outcomes in hospitals, the model's applicability to the home health practice setting has been established (Flynn & Deatrick, 2003; Flynn, Carryer, & Budge, 2005; Flynn, 2007b). There have been few, if any studies, however, that have tested the model's propositions using actual organizational-level measures and home health patient outcome data. Consequently, this proposed study will test, in a sample of HF patients who received home health nursing services, the relationships between the nursing work environment, quality of care, home health service utilization, and the patient outcome of functional status following an episode (maximum 60 days) of Medicare-certified home health care services.

### **Statement of the Problem**

What are the relationships among the nursing practice environment, nurse-rated quality of care, service utilization and functional status among HF patients that received Medicare-certified home health nursing services?

### **Sub-Problems**

1. Is nurse-rated quality of care positively related to improvement / stabilization in functional status among HF patients that received Medicare-certified home health services?
2. Is the nursing practice environment positively related to improvement / stabilization in functional status among HF patients that received Medicare-certified home health services?
3. Is service utilization (numbers of nursing, physical therapy, and home health aide visits per patient) positively related to improvement / stabilization in functional status among HF patients that received Medicare-certified home health services?
4. Is the nursing practice environment positively related to nurse-rated quality of care in home health service units?
5. Is service utilization related positively to nurse-rated quality of care in home health service units?
6. Does Nurse-rated quality of care mediate the relationship between the nurse practice environment, service utilization and rates of improvement / stabilization in functional status among HF patients that received Medicare-certified home health care?

### **Definition of Terms**

Functional status, for the purpose of this proposed study, is theoretically defined as the ability to independently perform activities of daily living (ADL) as per the OASIS assessment tool, including grooming, dressing upper body, dressing lower body, bathing, toileting, transfer, ambulation, and feeding/eating (Leidy, 1994). Functional status will be operationally defined as a summed score of the OASIS activities of daily living items using the ADL Index Score which provides a composite ADL score of OASIS functional items (Scharf & Madigan, 2010).

The composite score is measured at two time points, admission to home health care services (Admission Index Score) and discharge (Discharge Index Score). While each OASIS item has different levels of scoring, using a corrected Likert approach allows each item to be scored on the same scale of 0-1 (Sharf & Madigan, 2010). Scores are then totaled for a composite score of 0-8, with 0 indicating total independence and 8 indicating total dependence.

A Change Score in functional status from admission to discharge from home health services will be calculated by subtracting the start of care ADL Index Score from the ADL Index Score at discharge (maximum 60 days) from home health services (Sharpf & Madigan, 2010). Only patients who have had a home health episode of 60 days or less will be included in this study. A Change Score of zero or less indicates improvement / stabilization while a Change Score of greater than zero (positive score) indicates a decline. Therefore, improvement / stabilization in functional status will be operationally defined as Change Score of zero or less (negative score) and a decline in

functional status will be operationally defined as a Change Score of greater than zero (positive score).

The nursing practice environment is theoretically defined as the presence or absence of a set of organizational characteristics that facilitate professional nursing practice (Aiken et al., 2002). The nursing practice environment will be operationally defined as a score on the Practice Environment Scale of the Nursing Work Index (Lake, 2002).

Nurse reported quality of care is theoretically defined as RN report of unmet nursing care needs (Lucero, Lake & Aiken, 2009). Nurse-reported quality of patient care will be operationally defined as nurses' ratings of the quality of patient care provided by their home health unit, on a scale of poor (1) to excellent (4).

Service utilization is theoretically defined by the Health Services Utilization Model (Aday & Awe, 1997) as a patient's use of health services (Phillips, Morrison, Andersen, & Aday, 1998). Service utilization will be operationally defined by three separate indicators: (1) the number of RN visits, (2) physical therapy visits, (3) and home health aide visits to the patient's home over the episode of care, defined as a maximum of 60 days from admission to discharge.

### **Delimitations**

The parameters of the sample for this study include 1) men and women who received home health care services under the Medicare benefit; 2) who are between the ages of 65 and 84 years old; 3) who were admitted to home care services with a primary or secondary diagnosis of heart failure; 4) who speak English; 5) who have an ADL score

on admission of 7 or less, indicating the client is not totally dependent in ADLs; 6) who have a medication management score of 2 or less on OASIS item M2020, indicating good medication management; 7) who have none or minimal cognitive impairment as noted on OASIS item M1700 as a score of 1 or less; 8) who have no urinary incontinence noted on OASIS item M1610; and 9) have completed their home care episode and been discharged from services within 60 days of admission (minimum 5 days on service, maximum 60 days on service).

The above delimitations will control by design, the five consistent variables that have been identified in the literature as primary influencers of change in functional status: patient age, ADL score upon admission to home health care, medication management, cognitive functioning, and urinary incontinence (Hadley, Rabin, Epstein, Stein & Rimes, 2000; Kane, Chen, Finch, Blewett, Burns and Moskowitz, 2000; Keepnews, Capitman & Rosati, 2004; Scharpf & Madigan, 2010; Stuck, Walthert, Nikolaus, Bula, Hohman & Beck, 1999).

Scharpf and Madigan (2010) found age to be correlated with functional status, with those patients younger than 85 years of age showing the most improvement, and all age categories, including those over 85 years of age showing some improvement. Stuck et al. (1999) in their review of the literature, found that chronological age was an important factor in functional status outcomes in elderly people living in the community. They found an increase of risk of functional decline for every 10 years increase in age. In addition, Keepnews et al. (2004) found in their study of home health care patient outcomes, that age was negatively related to outcomes. They explain their thoughts that

the negative correlation between age and outcomes may be explained as the effects of aging on recovery time. Therefore, the sample will be delimited to patients between 65 and 84 years of age.

While the patient's baseline functional status has been mentioned as a factor in functional outcomes at discharge in multiple studies, Scharpf and Madigan (2010) looked at this in terms of ADL score on admission to home health care services. They found that functional capacity at admission to home health care was associated with functional capacity at discharge. They also found calculation of a change score to be a valid metric for quantifying change, in that it accounted for capacity on admission. Stuck et al. (1999), however, concluded that severe functional limitation at admission to home health care was a predictor of functional decline at discharge. Therefore, the sample will be delimited to patients who are not totally dependent in ADLs.

Medication management has been noted in the literature as an influencer of patient outcomes. Scharpf and Madigan (2010) found that patient ability to manage oral medications at admission to home health care was one of the most important clinical factors influencing change in ADL score at discharge. Therefore, the sample will be delimited to patients demonstrating good medication management as indicated by their medication management score on admission.

Cognition was noted by Scharpf and Madigan (2010) to impact functional outcomes in the patient with HF. The researchers found that better cognitive functioning at admission to home health care was associated with better functional outcomes at discharge. Keepnews et al. (2004) found that cognitive impairment on admission to home

health care was negatively related to outcomes at discharge. Additionally, Kane et al. (2000), in their study of the most appropriate post acute care settings for heart failure patients, including home health care, found that cognitive functioning influenced outcomes. To control for the effects of cognitive functioning on outcomes, the sample will be delimited to patients with minimal or no cognitive impairments.

Urinary incontinence has been noted in many studies as a contributing factor to functional decline (Keepnews et al., 2004; Scharpf & Madigan, 2010; Stuck et al., 1999). Scharpf et al. (2010) found a negative association between urinary incontinence at admission to home health care and a decline in functional status at discharge. Keepnews et al. (2004) also found that urinary incontinence on admission was negatively related to patient outcomes at discharge. To control for the influence of urinary incontinence on functional status, the sample will be limited to patients who do not demonstrate urinary incontinence on admission.

For patients with HF, functional status is a key indicator of a patient's ability to stay at home (Scharpf & Madigan, 2010). Leff, Burton, Mader, Naughton, Burl, Greenough, Guido and Steinwachs (2009) found that functional decline in hospitalized elders was associated with adverse events including nursing home placement. The goal of home health care is to return and / or maintain patients at their highest level of functioning. Thus, measuring the functional status of elderly patients with HF is important in assessing the effectiveness of home health care for this vulnerable Medicare population.

### **Significance of the Study**

This study will attempt to fill a gap in knowledge by analyzing the relationships among supportive nurse work environments, nurse reported quality of care, service utilization and the patient outcome of functional status. While many researchers have examined one or more of these factors in the hospital setting (Aiken, et al., 2008; Kalisch, Tshanem & Lee, 2011; Kutney-Lee, et al., 2009; Lucero, et al., 2009), few have explored their importance in the home care setting. In addition, the chronic progressive nature of HF may impose limits on the extent to which improvements in functional status are possible in this patient population, thereby creating a need for knowledge as to factors that can, at a minimum, stabilize functional status in this population.

CMS considers functional status a measurement of health care quality (Clauser & Bierman, 2003). Disability, as a result of functional status decline, has been associated with increased risk of mortality, institutionalization and service utilization and high resource use in the post acute period (Rozzini, Sabatini, Cassinadri, Boffelli, Ferri, Barbisoni, Frisoni & Trabucchi, 2005). For people living with chronic conditions such as HF, high quality care includes efforts to optimize functional status (Clauser & Bierman, 2003). Home Health agencies use functional status data to support clinical decision making, payment formulation, and quality improvement efforts (Clauser & Bierman, 2003). Davis, Iezzoni, Phillips, Reiley, Coffman & Safran (1995) found that measures of physical functioning, including ADLs, were often an equally important predictor of in-hospital mortality as physiologic parameters. In hospitalized patients, a dependent bathing capability was shown to be a significant indicator of mortality overall and

ambulation was found to be a significant predictor of mortality 30 days after hospital admission for heart failure (Davis, et al., 1995). In elderly patients, impairment in functional status is considered a significant predictor of poor outcomes (Rozzini, et al., 2005). Functional status information routinely recorded by nurses can be very important for predicting imminent death (Davis, et al., 1995).

Research has shown that organizations providing support for nursing practice experience increased rates of positive patient outcomes (Flynn, 2007). This increased organizational support for nursing practice directly enhances the processes of quality of care, promoting superior nurse and patient outcomes (Flynn, 2007b). Aiken, et al. (2008) found that Magnet hospitals were the best example of work environments supportive of professional nursing practice. Flynn, et al. (2005) found that home health care nurses, like hospital nurses, value magnetic practice environments and that magnetic, or supportive practice environments, exhibit characteristics associated with positive patient outcomes.

Time spent on nursing care activities affect quality of care (Lucero, et al., 2009). Nursing care can be thought of as a home health care surveillance function in early detection of deterioration in a patient's health status (Lucero, et al., 2009). Nurse-reported quality of care is associated with improved patient outcomes. Characteristics of the practice environment influence delivery of quality patient care which influences the delivery of high quality care processes, leading to superior patient outcomes (Flynn, 2008). Variations in nursing care quality have been shown to reflect differences in hospital care environments (Lucero, et al, 2009). Indicators of poor care quality, such as

omitted nursing care has been shown to negatively affect patient outcomes (Kalisch, et al., 2011).

Under the current reimbursement system for home health care, it is important that clinicians ensure that effective service utilization is not compromised due to potential financial implications. The risks associated with underutilization as well as overutilization of services are high. Home health agencies must assure that all disciplines are used effectively and efficiently without compromising the needs of the patient (Anemaet, Krulish, Lindstrom, Herr & Carr, 2004). Service utilization, and its resulting clinical surveillance and response, has been associated with positive patient outcomes (Flynn, 2007a). Nurses represent a key mechanism of patient surveillance in the home care setting. Clarke and Aiken (2003) state that nurses are essential to the prevention and early detection of adverse patient events. Kutney-Lee, et al. (2009) state that better patient outcomes are often achieved through effective surveillance by nurses via their role of monitoring, evaluating, and acting upon emerging indicators of change in patient status. Functional indicators, such as ADL status, provide knowledge of patient's risk status and may identify the need for closer surveillance and monitoring in patients with chronic conditions such as HF (Davis, et al., 1995).

## CHAPTER 2

### **Review of the Literature**

This research will examine the relationships among the nurse practice environment, service utilization, nurse reported quality of care and functional status in patients who received Medicare certified home health care. Theoretical and empirical literature related to these relationships will be presented in this chapter. First, theoretical literature concerning the dependent variable, functional status, will be presented. Second, theoretical literature relevant to the nurse practice environment and quality of care will be presented. Next, empirical literature regarding the relationships among the nursing practice environment, quality of care, and patient outcomes will be presented. Lastly, theoretical literature concerning service utilization, as well as empirical support for the relationship between service utilization and the patient outcome of functional status will be presented.

### **Leidy's Theoretical Framework of Functional Status**

Leidy (1994) provides an analytical framework in which to evaluate functional status and the key dimensions that lie within functional status, including functional performance. Leidy defines functional performance as activities that people actually do in the normal course of their lives to meet basic needs and maintain health and well being, including activities of daily living (ADLs) (Leidy, 1994; Whitcomb, 2011). Leidy defines functional status as a multidimensional concept, characterized by a host of contributing factors, with functional performance as the physical component in her framework. This

physical component of functional status consists of activities of daily living that are motivated by bodily needs, such as eating, dressing, and bathing (Leidy, 1994).

Leidy states that higher levels of functional status can be attained by enhancing an individual's functional repertoire, the skills an individual uses to meet basic needs, fulfill usual roles and maintain health and well-being (Leidy, 1994). One's functional repertoire is the guiding principle for their ultimate ability to maintain or improve their functional status. While Leidy states both functional performance and functional repertoire are embedded within social and cultural context, she also states human beings make independent decisions to perform functional tasks. The value an individual places on an activity or task is an important part of performance (Leidy, 1994). Leidy also addresses homebound dependency as a factor that may alter functional repertoire and therefore affect functional performance (Leidy, 1994). She further explains that in patients with chronic disease processes, exposure to stressors often cause an individual to experience functional decline and ultimately reduced performance (Leidy, 1994). Leidy's framework suggests that nurses who have a better understanding of the functional status of their patients have the ability to implement interventions that are more effective and evaluate outcomes more appropriately (Leidy, 1994).

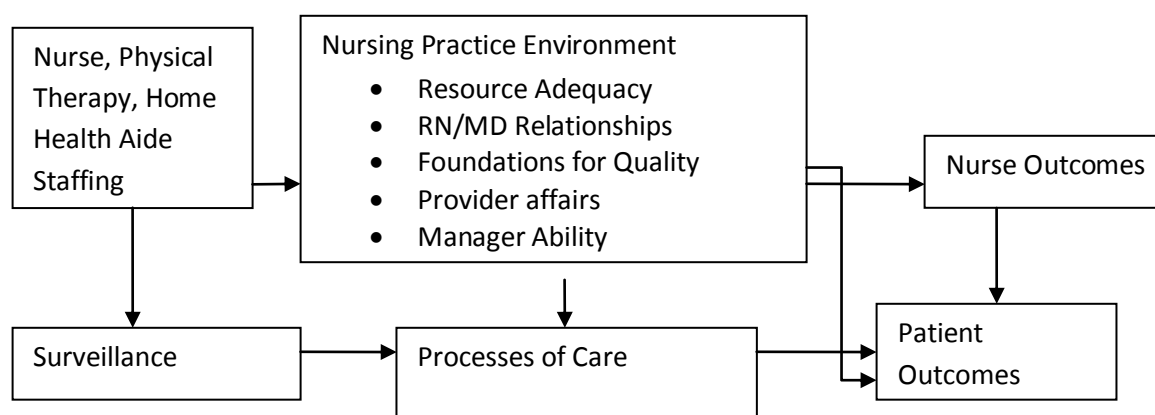
Using her framework to examine patient perception of functional status, Leidy and Haase (1999) found that among patients with COPD, the physical changes experienced with chronic disease were linked to motivation to perform activities of daily living, a measure of functional status. Among the many factors contributing to decline in functional status in the participants were a combination of impaired provider-patient

connectedness, less community support, i.e. health service utilization, and poor self care practices (Leidy & Haase, 1999). Therefore, according to Leidy's framework, a positive relationship between provider-connectedness and functional status and service utilization and functional status is posited. It is therefore important, while looking at functional status in the home health care setting, to examine the effect of factors, including service utilization, quality of care, and nurse practice environment that may contribute to functional status as a patient outcome.

### **Aiken's Nursing Organization and Outcomes Model**

Expanding on Donabedian's model of Structure, Process and Outcomes, Aiken's (2002) Nursing Organization and Outcomes Model (Figure 1) suggests that the structural factors of RN staffing levels and attributes of the practice environment each uniquely impact the quality and adequacy of nursing care processes. She further states that nursing care processes directly affect patient outcomes. Moreover, Aiken asserts that surveillance, or the home health proxy of service utilization influences both nurse and patient outcomes through care processes.

Figure 1. Nursing Organization and Outcomes Model



Aiken, et al. (2002) proposes that nurses constitute an ongoing surveillance system in hospitals for early detection of patient problems, and that this early detection is facilitated by organizational support for nursing care. They state that once a problem has been identified, it is organizational features that determine how quickly interventions are put in place (Aiken, et al, 2002). Also, they found that while higher nurse staffing ratios positively influence patient outcomes, poor practice environments can negate this effect (Aiken, Cimiotti, Sloane, Smith, Flynn, & Neff, 2011). This theoretical model of the nurse practice environment helps explain the dynamics involved in organizational factors, quality processes and patient outcomes such as functional status.

### **Practice Environment, Quality, and Patient Outcomes: Empirical Support**

The Nursing Practice Environment is endorsed by the National Quality Forum (NQF) as a system-centered indicator of the structural quality of nursing care across patient care settings (National Quality Forum, 2007). Hamilton, Eschiti, Hernandez, and Neill (2007) found that hospitals with better nurse work environments achieve better patient outcomes, shorter lengths of stay, and higher nurse and patient satisfaction than other hospitals. They found that organization of care has an important effect on patient outcomes. Aiken, et al. (2008) found that better nurse care environments are associated with better patient outcomes. Mitchell and Shortell (1997) found that patient care units with better organizational structure and process are more likely to retain experienced nurses and thus maintain a level of expertise necessary for optimal patient outcomes.

In examining the effect of the hospital environment on nurse and patient outcomes, Aiken, et al. (2008) sought to clarify whether better nurse work environments were

associated with patient and nurse outcomes, independent of nurse staffing and education. To do this, they studied 168 adult acute care hospitals in Pennsylvania in 1999. The hospitals included were those that reported 100 or more surgical discharges of a specific nature, had structural characteristics reported in the American Hospital Association (AHA) Annual Survey or Pennsylvania Department of Health Hospital Questionnaire, and had sufficient nurse responses to produce reliable results. In 1999, questionnaires were mailed to the homes of 50% of nurses registered to practice in Pennsylvania. A sample of over 40,000 nurses was obtained. Patient data was obtained for 232,342 patients who underwent general surgical, orthopedic, or vascular procedures in the given timeframe using discharge abstract data. Hospital structural data were obtained from the AHA Annual Survey and the Pennsylvania Department of Health Hospital Survey. Nurse staffing was measured as the mean number of patients assigned to nurses on their last shift. The Practice Environment Scale of the Nursing Work Index (PES-NWI; Lake, 2002) was used to measure the nurse work environment. Based on scoring, hospitals were classified as having better, mixed, or poor care environments. Nurse outcomes measured included job satisfaction, burnout, and intent to leave their job. To measure patient outcomes, patient deaths within 30 days of admission for patients undergoing common surgical procedures were analyzed. Findings showed that nurse report of poor or fair quality of care was twice as high in hospitals with poor care environments. In addition, higher proportions of nurses working in hospitals with poor and mixed environments were unlikely to recommend their hospital to a family member (OR .55). Rating of care environment was also shown to have an effect on intention to leave (OR .87). The odds

on nurses reporting concern with care quality were between 42% and 69% lower in hospitals with better care environments than poor ones. This study also found that the likelihood of patients dying within 30 days of admission was 14% lower in hospitals with better care environments. Findings from this study indicate that the number of patient deaths annually can be lowered by improving nurse work environments (Aiken, et al., 2008).

The effects of hospital nurse staffing and the nurse work environment on patient outcomes were among the relationships examined in a sample of 1,262,120 inpatients from 665 adult acute care hospitals located across four U.S. states (Aiken, et al., 2011). As a measure of the nurse work environment, a total of 39,038 RNs completed the PES-NWI. Scores on the PES-NWI were aggregated to the hospital level to create a facility-level score for each of the 665 hospitals in the study. Findings from logistic regression models indicate that with or without adjusting for RN staffing and education, better nurse work environments were significantly associated with lower odds of patient mortality,  $OR = 0.93$  (0.89-0.94),  $p < .0001$ , and failure-to-rescue,  $OR = 0.95$  (0.93-0.98),  $p < .0001$ . Thus, better nurse work environments reduced odds on mortality by 5% to 7% respectively.

Flynn (2007b) tested the Nursing Organization and Outcomes Model in the home health setting by investigating the relationships among the nurse work environment, nurse-assessed quality of care, and nurse-reported adverse patient events in a sample of 137 RNs working in Medicare certified home health agencies. Findings indicated that nurses' ratings of their work environments were significantly associated with quality of

care ( $r = .31$ ,  $p = .001$ ), as well as the frequency of reported adverse patient events including medication errors ( $r = -.22$ ,  $p < .01$ ), uncontrolled pain ( $r = -.30$ ,  $p = .000$ ), and lack of preparation for discharge from home health care ( $r = -.35$ ,  $p = .000$ ). A limitation of this study, however, is that patient outcomes were reported by nurses.

In summary, studies testing the Nursing Organizations and Outcomes Model have supported the positive association between supportive nursing work environments, quality nursing care processes, and positive patient outcomes. This line of inquiry has been extended in the home health setting and provided some additional support for the Model. There are few, if any studies, however, that have investigated these relationships in home health care using actual patient data to measure outcomes. This proposed study would address that significant gap in the empirical literature.

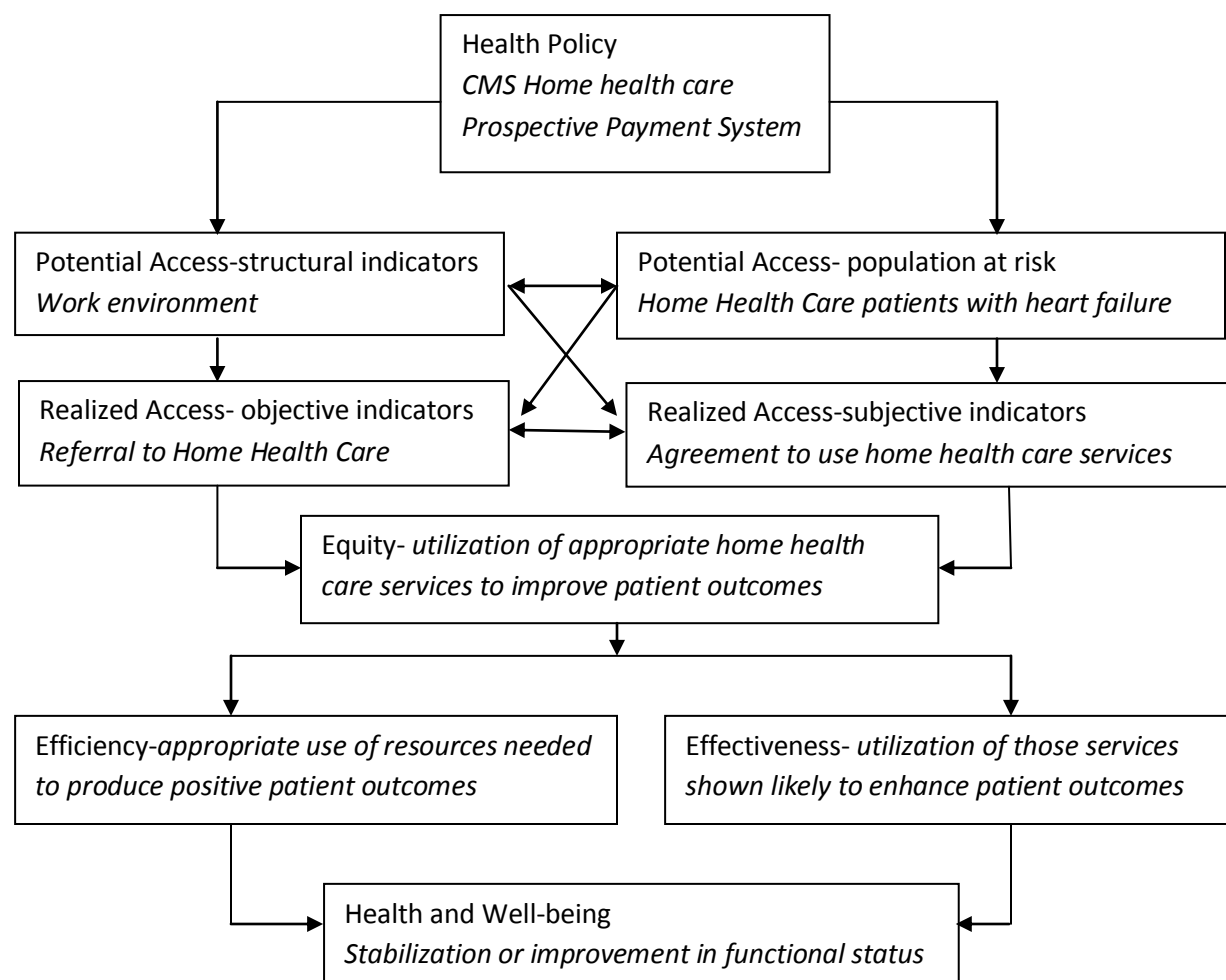
### **Anderson's Expanded Access Framework**

Anderson's Behavioral Model of Health Services Utilization was first introduced in the late 1960s (Anderson & Newman, 1973). The original framework was developed by examining correlates from various sciences, including sociology, psychology, economics, and medicine. In developing his original model, Anderson examined the role of social context in individual's use of health care. In the years since, the model has been refined to examine a variety of factors effecting health care utilization.

In 1980, Aday and Anderson developed the Access Framework based on Anderson's original behavioral model. This model attempted to examine the importance of empirical predictors affecting access to medical care (Aday & Anderson, 1981). In 1993, the model was revised to build upon, extend and modify the focus of the Access

Framework. The Expanded Access Framework, like the Access Framework, describes a use-to-need approach to measuring equity. In Anderson's original model, health status is viewed as a predictor of health service utilization. In the Expanded Access Framework, health status is viewed as an outcome of the medical-care seeking process. The Framework examines access to medical care in the context of the following question: "What types of medical care does it make the most sense to enhance utilization of since those services are most likely to be effective in improving health" (Aday & Awe in Gochman, 1997). The application of the Framework to the research questions investigated in this proposed study is illustrated in Figure 2.

Figure 2. The Expanded Access Framework



This re-conceptualization of Anderson's original model is focused on enhancing the health and quality of life of individuals by providing access to specific medical care services. The goal of the enhanced access model is the provision of equitable access to medical care to achieve health and well-being. The model recognizes the impact of health policy factors contributing to potential access to medical care. These factors include potential access and realized access. Potential access is broken down into structural and process indicators, with structural indicators reflected in the work environment and process indicators reflecting characteristics of the individual accessing care. Realized access refers to both utilization of health services and satisfaction with, and agreement to use the services provided. In the expanded access model, potential access indicators and realized access indicators interact to promote equity. Equity (fair distribution of health services) is then attained through the use of those services shown to be effective in promoting health and well-being as well as using those services efficiently. Equity, or the utilization of appropriate health care services, is proposed to ultimately lead to positive patient outcomes.

### **Service Utilization and Patient Outcomes: Empirical Support**

Proctor, Morrow-Howell, Li and Dore (2000) examined the adequacy of home care services for elderly patients diagnosed with HF. This prospective design study looked at patient perception of adequacy of formal and informal assistance in meeting needs related to functional activities of living and ultimately rehospitalization. The study sample consisted of 253 participants discharged from a large Midwestern hospital with a diagnosis of HF. Patients gave consent for participation prior to discharge from the

hospital. HF was chosen as a diagnosis criteria as it is a chronic disease that is associated with limitations in functional status and it is the most common diagnosis for home health care patients (Proctor, et al., 2000). There were three inclusion criteria for this study: 1) a diagnosis of HF, 2) the patient was seen by a social worker during their hospital stay and 3) the patient was elderly and discharged back to the community setting. The major independent variable of interest in the study was adequacy of care, defined as the type and amount of formal and informal service received in each of 14 activity areas, including ADLs and IADLs. The authors looked at quantity and quality ratings of services. Logistic regression was used to analyze the effect of care adequacy. Findings indicate that elderly patients diagnosed with HF who reported receiving less than adequate homecare service utilization were more likely to be readmitted to the hospital during the first 2 weeks after discharge. The findings support the theorized relationship between adequate and inadequate service utilization and poor patient outcomes (Proctor et al., 2000).

In a 2008 study focused on home health care use and patient outcomes, Madigan (2008) looked at outcomes of care for HF patients receiving home health services. In this study, outcomes of care included hospitalization, resource use and functional status. The purpose of the study was to describe the HF population receiving home health care services and examine outcomes. Data for the study was taken from the 2003 Outcomes and Assessment Information Set (OASIS) from CMS. This data set is collected and submitted by all home health agencies providing Medicare certified home health care. The study sample consisted of 145,191 home health patients with a primary diagnosis of

HF (ICD-9 codes 428-428.9) who were admitted to a new start of care episode. A patient level change score was used to calculate change in functional status from start of care to discharge, with higher scores indicating more dependency. The mean change score for ADLs was -0.50 (SD= 0.87, range -5.72 to 6.22) and for IADL it was -0.57 (SD= 0.84, range -4.22 to 3.27) (Madigan, 2008). The study found that although HF patients overall had an improvement in functional status, the improvement was modest with up to one fifth of patients having no change in functional status. A major limitation of this study, however, was the lack of precise service utilization data; the number of home visits to patients, by discipline, were not included as variables in this study. The results do suggest that for patients with HF, the provision of home health care does promote some improvement in functional status (Madigan, 2008).

Nakatani and Shimanouchi (2004) examined care management factors and their affect on client outcomes in home care. Patient outcome measures used in this study included improvement of care items on the care plan based on needs, functional independence level (functional status) and patient satisfaction. Care items were defined as items typically found in the plan of care and categorized as care burden, hygiene, housekeeping, health maintenance, will, eating, fall prevention, dementia, excretion and ADLs. Improvement in care items was used to measure patient outcomes. Looking at amount of service, 55.3% of patients used less than 50% of their allowable home care services based on maximum reimbursement for the first 3 months (Nakatani & Shimanouchi, 2004). The patient care plan was categorized into 11 areas of need (care items) that were based on the identified needs of more than 50% of the patients. More

than 80% of these patients had an identified need related to ADLs (Nakatani & Shimanouchi, 2004). The Functional Independence Measure (FIM) was used to measure functional status in the sample population. With this tool, a higher score indicates a higher level of independence. The tool was administered at three time points: admission to home care, at 3 months and again at 6 months. The sample population included 97 patients and 30 care managers. Questionnaires were administered to clients and care managers as a pair. Care managers were asked about the patient's change in functional status, while the patients were asked about satisfaction. The amount of home care service was categorized according to use and maximum allowable reimbursed use. If a patient were eligible for a certain amount of services but only received half the amount, they were categorized as 50% use. Results of the study showed that all of the FIM item scores declined at 3 months. Those ADL items that were significantly lower included bathing, bowel management and mobility to tub / shower ( $p < 0.05$ ) (Nakatani & Shimanouchi, 2004). Findings from this study indicate that improvement in patient outcomes, including care items such as ADLs, were significantly related to the amount of home care service received (regression coefficient 0.166,  $p < 0.05$ ). The results support the theorized relationship between service utilization and patient outcomes.

Adams, et al. (2000) examined the effect of service utilization on home health care patients in rural settings. Using OASIS data collected from four home health agencies located in small towns surrounded by rural areas, they sought to determine the association between home health service utilization and patient outcomes over an episode of home health care. The sample for this descriptive correlation design study included

1,704 adult patient episodes of care. Five outcome measures were examined, including ambulation, bathing, management of oral medications, frequency of pain interfering with activity and dyspnea. Two scores were used for the outcomes measures: improvement and stabilization. Change was measured from start of care to discharge. Service utilization measures included length of stay (LOS) and number of visits by each discipline. Length of stay was defined as the number of days from start of care up to and including the last visit date. Number of visits per discipline was counted for the episode of care. Findings showed that the most frequent visit type was nursing, followed by home health aide and physical therapy (Adams, et al., 2000). The average LOS was 42.3 days. Logistic regression was used to determine whether patient outcomes were predicted by service utilization. LOS was found to be positively associated with improvement in bathing ( $r = 0.06, p = 0.01$ ) and dyspnea ( $r = 0.07, p = 0.01$ ). The number of RN visits were negatively associated with stabilization in ambulation ( $r = -0.06, p = 0.04$ ), bathing ( $r = -0.04, p = 0.05$ ) and self management of medications ( $r = -0.10, p = 0.01$ ). The number of PT visits were positively associated with stabilization in ambulation ( $r = 0.05, p = 0.04$ ). Home health aide visits were not significantly associated with any of the patient outcomes (Adams, et al., 2000). Findings suggest that some indicators of service utilization are associated with improved patient outcomes. Results indicated, however, that higher numbers of RN visits were associated with deterioration in some outcomes, including ambulation, bathing and medications. One possible explanation noted by the authors was that this study looked at all adult patients regardless of diagnosis. Another explanation may be that nursing visits are scheduled reactively rather than proactively.

The authors recommend that further research look at disease specific outcomes rather than general outcomes (Adams, et al., 2000).

In summary, empirical evidence for service utilization in the home health care setting indicates a connection between overall home health care services and patient outcomes, including functional status. These studies provide at least partial support for the theorized positive relationship between service utilization and patient outcomes. Since some contradictory findings exist, there appears to be a general consensus among authors that more research is needed to explicate the factors affecting patient outcomes in home health care.

### **Hypothesis**

In this examination of functional status outcomes in HF patients receiving home health care services, the following hypotheses were investigated:

1. Nurse-rated quality of care is positively related to rates of improvement / stabilization in functional status among HF patients that received Medicare-certified home health care.
2. The nursing practice environment is positively related to rates of improvement / stabilization in functional status among HF patients that received Medicare-certified home health care.
3. Service utilization (numbers of nursing, physical therapy, and home health aide visits per patient) is positively related to rates of improvement / stabilization in functional status among HF patients that received Medicare-certified home health care.

4. The nursing practice environment is positively related to nurse-rated quality of care on home health service units.
5. Service utilization is positively related to nurse-rated quality of care on home health service units.
6. Nurse-rated quality of care will mediate the relationship between the nurse practice environment, service utilization and rates of improvement / stabilization in functional status among HF patients that received Medicare-certified home health care.

## CHAPTER 3

### **Methods**

This chapter will describe the research design for this study including the research setting, sampling methods and sample, the instruments, the procedure for data collection and analysis. This study used a descriptive, correlational research design to investigate the relationships among nurse practice environment, nurse reported quality of care, service utilization and functional outcomes in patients with HF receiving home health services in the home health setting. All study variables were aggregated to the unit, or office, level prior to analyses.

### **Research Setting**

This study was conducted in a multi-site Medicare-certified home care organization. This organization is one of the largest home care providers in the U.S. Founded in 1975, the company is for profit and family-owned. Services are provided to clients in 26 states, with over 200 service and support offices that employ more than 18,000 RNs, Licensed Practical Nurses (LPN), Physical Therapists (PT), Occupational Therapists (OT), Speech Language Pathologists (SLP), Medical Social Workers (MSW), and Home Health Aides (HHA). The focus of Medicare-certified home health services is on the provision of highly skilled, intermittent health services to homebound clients using a team of RNs, LPNs, PTs, OTs, SLPs, MSWs, and HHAs.

For purposes of this study of organizational-level variables, Medicare-certified home health offices comprised the unit of analysis. The RN staff and patients of the participating offices comprised the sample populations. Patient-level data was obtained

using a convenience sample of de-identified patient records from 53 individual service offices within the organization that are located on the East Coast and in the Mid-West of the United States. These locations were chosen as these offices were easily accessible to the researcher if the need to be on-site had arisen.

De-identified OASIS data was extracted from records of those patients who met the inclusion criteria. The OASIS data was obtained from the agency's electronic reporting system, HomeCare HomeBase. The data team employed by the home care organization exported the de-identified data from the HomeCare HomeBase into an Excel file, which was made available to the primary investigator (P.I.).

The P.I. lead the collection of anonymous data from staff registered nurses at each of the 53 offices, with packets provided to the staff for completion and return to the primary investigator. An onsite study liaison was selected by the P.I. from each office to coordinate packet distribution. The packets included a cover letter, the PES-NWI, demographic questionnaire, the quality care item, and an addressed, stamped envelope for return. There was no coding or any identifiers in the packet or among the collected data that could link responses with the nurse respondents. The cover letter contained the instructions for completion of the study, and an explanation of rights of study participants, including the nurse's right to not complete the survey. The investigator provided a webinar training session for the designated liaison in each office to inform them of how to distribute the packets and how to maintain anonymity of the survey packets.

### **The Sample**

A total of 53 home health offices comprised the office sample (all of which are designated as urban by the Metropolitan Statistical Area criteria), which is the unit of analysis. Data collected from RNs employed as staff home health care nurses in the 53 offices were aggregated to the office level to construct office-level metrics of study variables. De-identified patient data from records of patients who received home health services that were provided by the offices in the sample were likewise aggregated to the office level in that the patient data was used to construct the percentage of patients from each office whose functional status stabilized or improved following a completed episode of home health services.

### **Nurse Sample**

To assure an adequate number of responses for office-level data, the investigator obtained the number of RNs employed by each service office and sent the corresponding number of packets to the designated liaison person at each office who had received training on administration of the packets. Each office received an information sheet for posting in a common area describing the study purpose and contact information for the investigator. All RNs whose position was that of staff nurse and whose role included the provision of home nursing visits were invited to participate. A nurse sample of 364 was obtained. Office-level response rates ranged from 20% (1 office) to 100% (21 offices) with a mean office-level response rate of 76% (SD = 23), a median of 75% and a mode of 100%.

## **Patient Sample**

Data were collected on 4,146 Medicare beneficiaries who received home health services between July 1, 2011 and December 31, 2012 (date of episode completion) from offices in the study sample. This number was easily attainable given the overall number of patients with a heart failure diagnosis admitted annually to the Medicare Home Health Agency meeting the delimitation criteria. With 3 predictor variables and 9 items being delimited in the analysis, with a standard of 10 – 15 patients per item, this sample was sufficient, reflecting the number of patients meeting delimitation criteria. Inclusion criteria was as follows: 1) patients between 65 and 84 years of age with a primary or secondary diagnosis of HF (based on ICD code 428); 2) who have been receiving home health services under their Medicare benefit for a minimum of 5 days ; 3) who have an ADL score on admission of 7 or less; 4) who have a medication management score of 2 or less on OASIS item M2020; 5) who have none or minimal cognitive impairment as noted on OASIS item M1700 as a score of 1 or less, and 6) who have no urinary incontinence noted on OASIS item M1610.

A power analysis was performed based upon results from a study using similar models and similar instruments, in which the standardized betas ranged from 0.2 -0.3 (Kim, Capezuti, Boltz & Fairchild, 2009). In this study, 192 RNs working at 3 hospitals served as the sample, with individual responses aggregated to the hospital level. For the current study, responses and explanatory variables were averaged over offices, with the office being the unit of analysis. In order to detect a desired effect size of 0.45 with a two sided test of 0.05 significance and 0.90 power, 49 offices was estimated to be sufficient

as the target sample for this study (Brown, Brauner, Chan, Gutierrez, Herson, Lovato, Polsley & Venier, 2000). In comparison to the aforementioned study, the current study looked at a final sample of 364 RNs working in 53 offices.

## **Instruments and Measures**

### **ADL Index Change Score**

The ADL Index Change Score is derived from OASIS data. OASIS has been evaluated for internal consistency and validity and has been shown to be reliable, with a Chronbach's coefficient alpha of 0.88 and higher for ADL admission and discharge data. While there is limited evidence on the validity of the tool, the functional status items on OASIS have been found to correlate highly with the Katz assessment (Katz, Ford, Moskowitz, Jackson & Jaffe, 1963). Assessment of functional status at both admission and discharge is conducted by either an RN or a Physical Therapist. All clinicians receive a formal on-line OASIS training with competency assessment once during their employment, with annual updates provided via on-line education program (s). It is not guaranteed that the same clinician will do both the admission and discharge assessment.

The ADL Index Change Score provides a composite ADL score of OASIS functional items, including grooming, dressing upper and lower body, bathing, toileting, transferring, ambulation and feeding / eating. The composite score is measured at two time points, admission to home health care services (Admission Index Score) and discharge (Discharge Index Score). While each OASIS item has different levels of scoring, using a corrected Likert approach allows each item to be scored on the same scale of 0-1. Scores are then totaled for a composite score of 0-8, with 0 indicating total

independence and 8 indicating total dependence. To arrive at the ADL Index Change Score, the baseline ADL Index Score is subtracted from the discharge score. First, a trichotomous change score was calculated. The trichotomous measure technique allows for categorizing the outcome measure into three categories: 0 = no change in functional status; 1 = improvement in functional status; 2 = decline in functional status. Change scores were then re-coded as a dichotomous measure. The dichotomous measure technique allows for categorizing the outcome into two categories: improved or no change (stabilized) versus declined. For the purposes of this study, values on a dichotomized ADL change score indicate: 1 = improved or stabilized functional status; 2 = decline in functional status. The percentage of sample patients from each office who had improvement / no change in functional status was calculated as the dependent variable.

Scharpf and Madigan (2010) examined CMS data from 95,948 Medicare beneficiaries with a primary diagnosis of HF. Supporting the validity of the ADL Index Change Score, they found, consistent with previous research that used other measures of functional status (Katz, et al., 1963; Scharpf, Colabianchi, Madigan, Neuhauser, Peng, Feldman & Bridges, 2006), that bathing and dressing scores were the biggest contributors to functional status scores. They also found, consistent with prior research using other functional status measures, that 70% of the home health care patients with HF improved their functional status during home health care services. The authors suggest that use of the ADL Index Change Score is a valid measure from which to compute a trichotomous or dichotomous measure of change in functional status and may be helpful at the

individual and agency level by giving a “snapshot” of performance and directing performance improvement activities.

In summary, reliability of OASIS items for functional status measurement has been shown. Validity of OASIS functional status items correlate highly with the Katz Index of ADL tool (Katz, Ford, Moskowitz, Jackson & Jaffe, 1963). The ADL Change Index Score computed to a dichotomous measure of change is considered to be valid and reliable for use in patients with HF receiving home health care services (Scharpf & Madigan, 2010).

### **Practice Environment Scale**

The Practice Environment Scale-Nursing Work Index (PES-NWI; Lake, 2002) was developed from the original 65 item Nursing Work Index (NWI) survey. The purpose of developing this 31 item tool was twofold: 1) to develop a psychometrically sound scale with empirically derived subscales and 2) to provide reference values for the original Magnet hospitals from which the NWI was developed. The goal of the PES-NWI development was to create and sustain practice environments that facilitate professional nursing practice, enhance the quality of patient care and improved outcomes for both nurses and patients (Lake, 2002). The NWI was used as a basis for the development of subscales which represent five distinct domains of the nursing practice environment as described in the Nursing Organization and Outcomes Model: nurse participation in hospital affairs, nursing foundations for quality of care, nurse manager ability, leadership and support of nurses, staffing and resource adequacy and collegial nurse-physician relations. Nursing practice environment, according to Lake, is defined as the

organizational characteristics of a work setting that facilitate or constrain professional nursing practice (Lake, 2002).

In development of the PES-NWI, data was used from two previous nursing studies. The first study surveyed a random sample of 2,299 nurses from 16 Magnet hospitals and 8 non-Magnet hospitals. The second data set used was from a study examining a modified NWI survey and was comprised of responses from 11,636 staff nurses working in Pennsylvania hospitals. In order to evaluate the PES-NWI development, first the NWI items were reviewed and a subset of items for analysis was selected based on the definition of the nurse practice environment discussed earlier. Next, exploratory factor analysis was used to identify the subscales representing various domains of the nursing practice environment. Finally, reliability, validity and generalizability testing was performed. In preparation for analysis, a mean score for each of the subscales was calculated for each individual nurse respondent. A composite score was created as the mean of the five subscales. A mean score for each item and for each subscale was calculated for each hospital.

In summary, in development of the PES-NWI, 31 items were retained for inclusion in the five subscales. The subscales, as well as the composite score exhibited high reliability at both the individual and hospital levels. At the individual level, internal consistency was high ( $\alpha \geq .80$ ), except for the collegial nurse-physician relations subscale in which it was moderate ( $\alpha = .71$ ) (Lake, 2002). The reliability of the hospital level measures had an average inter-item correlation of .64 - .91 (Lake, 2002). Validity of the subscales was supported by the significantly higher mean scores of the nurses in the

Magnet hospitals compared with those in the non-Magnet hospitals (Lake, 2002). Thus, reliability and validity of PES-NWI subscale has been established in samples of hospital nurses.

The validity and reliability of the PES-NWI has been demonstrated in a variety of non-hospital settings. Flynn, Dickson, & Moles (2007) established the validity of the PES-NWI in a sample of 250 RNs practicing in 83 New Jersey nursing homes. As an index of validity, a minimum of 80% of nursing home RNs indicated that each of the 31 items were important to the support of their professional practice. As indicators of internal consistency reliability, the Cronbach alpha of the composite score was reported as .95 in a sample of 340 nursing home RNs; subscales likewise demonstrated excellent reliability with alphas ranging from .83 - .89 (Flynn, Liang, Dickson, & Aiken, 2010). Similarly, a Cronbach alpha of .94 was reported in a sample of 422 RNs practicing in outpatient hemodialysis units (Flynn, Thomas-Hawkins, & Clarke, 2009).

Importantly, the validity of the PES-NWI was repeatedly demonstrated in samples of U.S. home care and district nurses in New Zealand (Flynn, 2003; Flynn, Carryer, & Budge, 2005; Flynn & Deatruck, 2003). Using qualitative techniques to establish validity, the characteristics of the practice environment described in a sample of 58 home health RNs as essential to the support of professional practice were consistent with those depicted by the 31 items of the PES-NWI (Flynn & Deatruck, 2003). Similarly, a minimum of 80% of a sample of 403 U.S. home health RNs indicated that each of the 31 items were important to the support of their professional practice (Flynn, Carryer, &

Budge, 2005). Demonstrating good reliability, a Cronbach alpha of .84% was reported in a sample of 137 U.S. home health care nurses (Flynn, 2007).

For this study, a Cronbach's alpha was computed to assess internal consistency reliability for the 31 item PES-NWI. Good reliability was shown with a Cronbach's alpha of .947.

### **Nurse-Rated Quality of Care**

Sochalski (2004), using a conceptual framework derived from Donabedian's structure-process-outcomes model of quality, examined the effect of nurse staffing on the quality of nursing care in a sample of 8,670 licensed RNs in Pennsylvania. For the study, quality of nursing care was assessed by one survey item asking "In general, how would you describe the quality of nursing care delivered to patients on your unit on your last shift?" Respondents were offered a four category answer to this question: poor, fair, good, excellent. This one question was shown to be strongly associated with patient outcomes offering a reasonable appraisal of overall quality of care (Sochalski, 2004). Findings demonstrate a correlation between quality of care and patient safety ( $r = .348$ ,  $p < 0.001$ ), and quality of care and tasks undone ( $r = 0.634$ ,  $p < 0.001$ ; Sochalski, 2004).

This item was also used to measure nurse-rated quality of care in a sample of 137 RNs working as staff nurses in Medicare-certified home health agencies (Flynn, 2008). Supporting the validity of the item as a metric of nurse-rated quality of care, quality was significantly and inversely associated with nurses' ratings of patients' lack of preparation

for discharge ( $r = -.372$ ,  $p = <.01$ ), and was inversely and significantly associated with odds on nurses' intending to leave their jobs,  $O.R. = .33$  (.17, .64),  $p = .001$ .

A study of the effects of the hospital environment on patient and nurse outcomes by Aiken, et al. (2008) measured nurse perception of quality of care using the quality item. The sample used for this study was taken from a 1999 survey using a 50% random sample of RNs residing in and practicing in Pennsylvania. In this study, Nurses' responses to the quality of care question were aggregated to the hospital level and linked with patient mortality data. Patient care environments were measured using the PES-NWI, with subscale scores calculated for all hospitals. Based on responses, hospitals were classified as having "better", "mixed", and "poor" care environments. Using mixed modeling methods to assess the effects of better versus mixed or mixed versus poor care environments on nurse reported quality of care, the survey found that the percentage of nurses who reported quality of care as poor or fair was twice as high in hospitals with poor care environments ( $OR = 0.62$ ,  $p < .01$ ). Nurse report of concern with quality of care was found to be between 42% and 69% lower for nurses working in better care environments as opposed to hospitals with poor care environments.

Findings from these studies support the validity of the quality of care item. It has consistently been associated with theoretically relevant variables in the theoretically anticipated direction.

### **Service Utilization**

Service utilization information will be collected using the HomeCare HomeBase scheduling module. This module provides data on patient home visits, including dates of

planned visits, completed visits and missed visits (as well as reason for missing), duration of visit, discipline visit, and clinician who performed the visit.

The Demographics Questionnaire was developed for this study. It is designed to collect data from nurse respondents such as age, gender, race, current position within the home health office and level of educational preparation.

### **Procedure for Data Collection**

Using a modified Drop - off Survey method (Salant & Dillman, 1994), nurse data was collected from the participants via a survey packet sent to each of the participating offices. The Drop - off survey method involved giving the survey packets to a designated individual (study liaison) at each office for distribution to nurse participants. In this modified version, the packets were mailed to a designated person for distribution to all eligible RNs in the offices. Participants received a study packet containing (1) a detailed cover letter explaining the study and the importance of a response; (2) the Practice Environment Scale; (3) the demographic form; (4) and the item assessing nurse-reported quality care. Nurse responses are anonymous. The only identifier was a code indicating the office site. There was no information or codes that could identify nurse respondents. Respondents were asked to complete the survey and return it to the investigator in the pre-addressed stamped envelope provided.

Following the authors' recommendations for follow-up of Drop – off surveys, reminder emails were sent to the offices for posting at weeks 1 through 3 post initial introduction of the survey packets. At week 4, a notice was sent for posting with the proposed end date for data collection. As many of the offices did not send back a

sufficient number of completed survey packets (> 60%) within the initial expected time frame of 1 month post initiation of the survey, the data collection period was extended until the desired number of responses was received or the offices refused continued participation (whichever came first). Following completion of data collection, a response rate was calculated for each office, and for the nurse sample as a whole.

### **Human Subjects Protection**

Prior to data collection, this study was approved by the Institutional Review Board of Rutgers, The State University of New Jersey to ensure that the rights of human subjects were protected. There was no more than minimal risk to subjects participating in this research where the magnitude of harm or discomfort anticipated were not greater, in and of themselves, than those ordinarily encountered in daily life. Research packets containing questionnaires were mailed to the participants' office along with a letter explaining the purpose of the study. In the letter, participants were informed that participation in the study involved no risk, was anonymous, and voluntary. They were also informed that their completion of the questionnaires would serve as their consent to participate. Potential participants were given the name and contact information of the investigator, as well as the contact information for the Rutgers University Institutional Review Board (IRB).

Data collected from this study were entered into the SPSS, Version 21 (SPSS, 2012) statistical software package, which was installed on the P.I.'s desk-top computer. The computer was password protected. Computer files were backed up onto a USB drive and the USB drive was maintained in a locked cabinet. Only the investigator had access

to the cabinet. Data collected from this study that is published or presented will be reported only as grouped data, and participants and offices will not be identified by name. Computer files will be deleted and the USB drive will be destroyed after completion of the research study and the 3 year mandatory IRB data maintenance period and the returned surveys will be shredded.

### **Data Analysis Plan**

Descriptive statistics were used to analyze the demographic characteristics of the nurse sample and patient sample. The characteristics for the nurse sample included age, gender, race / ethnicity, years of nursing experience, years of home health experience and highest educational preparation. Demographic frequencies and descriptive analyses conducted within the patient sample included age, duration of home health care services, and disciplines providing services. Pearson's rank correlation were conducted in nurse-level and patient-level data to examine the interrelationships between demographic and study variables. In the nurse sample, Pearson's rank correlation was conducted to examine interrelationships between nurses' ratings of the practice environment and nurse-rated quality of care.

### **Patient-Level Dataset: Calculation of the ADL Change Score**

Following the method used by Sharpf and Madigan (2010), an ADL Change Score was calculated using a "Corrected Likert Score" for each of the ratings on the eight OASIS items that assess ADL functioning (Grooming, Dress Upper Body, Dress Lower Body, Bathing, Toileting, Transferring, Ambulation, and Feeding). The OASIS rating on each of these items was contained within the de-identified patient dataset

obtained from the home care organization. The sample for this dataset consisted of 4,146 home care recipients as previously described. The Corrected Likert Score was calculated for each patient in the sample by dividing the patient's rating on the item by the highest possible rating for that item. For example, a patient who was assessed a score of 3 on Transferring, which has a rating scale of 0-5, would have a calculated Corrected Likert Score of 0.6 for Transferring (3/5). A table of Corrected Likert Scores is presented in Appendix A. This table contains the corresponding corrected Likert score for each of the 8 ADL items based on the OASIS assessment score. To obtain the ADL Index score, the 8 ADL corrected Likert scores were added to arrive at a single score between 0-8, with 0 indicating total independence with ADLs and 8 indicating total dependence. A variable representing the Corrected Likert Score for each of the eight ADL items was computed in the patient database.

Following the computation of Corrected Likert Scores (CLS), the CLS for each of the eight ADL items was summed to create a Total Function Status Score (TFSS) for each patient. The TFSS for the baseline or admission OASIS assessment was labeled as the Admission Index Score; the TFSS for the discharge OASIS assessment was labeled the Discharge Index Score. Both Admission and Discharge Indices were computed as variables in the patient database. The values of the Admission and Discharge Indices can range from 0 to 8 with lower scores indicating higher functionality.

Next, the ADL Index Change Score was computed by subtracting the Admission Index Score from the Discharge Index Score. The scores were then dichotomized with 1 = improved or stabilized functional status; 2 = decline in functional status. Finally, the

percentage of patients in each of the 53 offices that improved or experienced no change (stabilization) was calculated and copied into the office-level dataset.

### **Nurse-Level Dataset**

The key variables of the nurse-level dataset including the composite score and subscale scores of the PES-NWI and nurses' ratings of the quality of care provided by their agency office were aggregated to the office level, using the Aggregation function available in SPSS. The aggregation value for these variables was calculated as the mean for each office. Additionally, nurse education levels were also aggregated to the office-level. The aggregation value for this variable was the percentage of staff RNs who hold a BSN degree or higher.

### **Office-Level Dataset**

The aggregated patient and nurse datasets were merged to create the office level, or analytic dataset, for this study. Data were linked by office code. The office-level dataset consisted of key study variables that had been aggregated to the office level. These variables include aggregated scores on the PES-NWI (office mean), Nurse-Rated Quality of Care (office mean), Level of Nurse Education (percent of RNs in office with BSN or higher), and the percent of patients who either stabilized or improved in functional status as indicated by the dichotomized ADL Index Change Score. Correlations among these aggregated study variables were computed and examined for multicollinearity. Ordinary Least Squares multiple regression models were estimated to test the study hypotheses.

## Chapter 4

### **Analysis of the Data**

The purpose of this study was to 1) explore the nature of the relationship among the nursing practice environment, nurse-rated quality of care, service utilization and functional status among HF patients that received Medicare-certified home health nursing services and 2) to explore the relationship between service utilization, nursing practice environment and nurse rated quality of care in home health service units. Nurse data were collected by surveying 364 home health RNs from one national home health care agency using the 31 items comprising the PES-NWI and 1 item in which nurse respondents rated the quality of care provided by their home care organization. The demographics questionnaire, developed for this study, was used to collect data from nurse respondents such as age, gender, race, current position within the home health office and level of educational preparation. Thus, the nurse sample data set was comprised of nurse-level data, including a unique code that linked each nurse respondent to the specified office, from the 53 office sample, in which the nurse was employed.

Patient level data were collected using a convenience sample of de-identified patient records from each of the 53 service offices within the organization that comprised the office sample. Using the organization's electronic medical record, HomeCare HomeBase, de-identified OASIS data were extracted from records of those patients who met the inclusion criteria. Data were collected on 4,146 Medicare beneficiaries. Service utilization information was collected using the HomeCare HomeBase scheduling module. Data on patient home visits, including disciplines providing services, number of visits by

discipline, and total number of visits provided during the episode of care were obtained. Thus, the patient data set was comprised of patient-level data including a code that linked each patient to one of the 53 offices from which they received care. The management and analysis of these data are presented in this chapter.

### **Statistical Description of the Variables**

A descriptive analysis of the nurse-level demographic data was conducted to describe the nurse sample characteristics. The variables included years worked in home health care, years worked in present position, highest nursing degree earned, highest degree earned in a field other than nursing, age, year first licensed as a registered nurse, gender, and race / ethnicity (see Table 1). Of the nurses surveyed, 26.9% were licensed 10 yrs or less, 23.9% were licensed between 11 and 20 years, and 39% were licensed over 20 years (10.2% of the respondents did not answer this question). In addition, 19.8% held an Associate degree and 19.5% held a Baccalaureate degree in a field other than nursing.

The second set of data that was subjected to descriptive analysis was the characteristics and outcomes of the patient's home health episode, as contained in the patient-level data set. These variables included service utilization and improvement / stabilization in functional status (see Table 2). The Statistical Package for the Social Sciences (SPSS) version 21.0 for Windows (SPSS, 2012) was used to analyze the data. The criterion for statistical significance was set at  $p < .05$ .

Table 1

*Nurse Demographics & Characteristics*

VARIABLE	n	%
<b>Years worked in home health care</b>		
<1 yr	16	4.4
1-5 yr	159	43.7
6-10yr	61	16.8
11-20 yr	79	21.7
>20yr	26	7.1
Not identified	23	6.3
<b>Years worked in present position</b>		
<1yr	81	22.3
1-5yr	208	57.1
6-10yr	32	8.8
11-20yr	17	4.7
>20 yr	2	0.5
Not identified	24	6.6
<b>Age</b>		
24-30 y/o	29	8
31-40 y/o	79	21.7
41-50 y/o	93	25.6
50- 60 y/o	90	24.7
> 60 y/o	38	10.4
Not identified	35	9.6
<b>Highest nursing degree earned</b>		
Associate degree/diploma	189	51.9
Baccalaureate degree	136	37.4
Masters degree	17	4.7
Not identified	22	6
<b>Gender</b>		
Female	333	91.5
Male	10	2.7
Not identified	21	5.8
<b>Race/ ethnicity</b>		
White	285	78.3
Black or African American	18	5.0
Hispanic/ Latino	11	3.0
Asian or Pacific Islander	4	1.1
Other	4	1.1
Not identified	42	11.5

Table 2

*Descriptive Characteristics of Patient Episode*

VARIABLE	n	%
<b>Service Utilization</b>		
<b>Total Visits</b>		
5-10	1192	28.8
11-20	1611	38.8
21-30	820	19.8
31-40	328	7.9
41-50	132	3.2
>50	63	1.5
<b>Nurse visits</b>		
1-5	944	24.5
6-10	1948	50.5
11-20	923	23.9
21-30	35	0.9
30-40	4	0.1
40-50	2	0.05
<b>Physical Therapy visits</b>		
1-5	1140	34.2
6-10	1453	43.5
11-20	732	21.9
21-24	12	0.4
<b>Home Health Aide visits</b>		
1-5	339	45.5
6-10	226	30.3
11-20	174	23.3
21-24	6	0.8
<b>Functional Status</b>		
Improved/ Stabilized	2940	70.9
Declined	1206	29.1

The quality of the nurse-level and patient-level data sets was assessed, any missing data were determined to be missing at random, and the distribution of the key variables was examined for variability, skewness and kurtosis using SPSS (see Table 3).

The histogram for the PES-NWI revealed that the PES-NWI composite scores are

normally distributed. Descriptive statistics for the PES-NWI composite score note a positive skew (.128, SE .333) with a negative kurtosis (-.416, SE .656). The confidence interval was 2.92- 3.05. According to Fischer's Measure of Skewness (Munro, 2005), a z-score can be calculated by dividing the measure of skewness by the standard error for skewness. Z-scores that fall between +1.96 and - 1.96 are normally distributed. Using this calculation, the z-score for the PES-NWI composite score was .384, providing no evidence against a normal distribution.

Descriptive statistics computed in SPSS for the nurse-rated quality of care question note a negative skew (-.228, SE .333) and a negative kurtosis (-.341, SE .656). The confidence interval was 3.30- 3.50. Using Fisher's Measure of Skewness, the z-score for the nurse-rated quality of care question was -.685, providing no evidence against a normal distribution.

The assumptions underlying regression analysis were examined. A visual inspection of histograms, skew and kurtosis were consistent with normal distributions, suggesting that the assumptions of linearity and homogeneity of variance have been met. The assumption of homoscedasticity was supported through fairly equal distribution of residuals on a scatterplot.

Within the patient-level data set, the ADL Index Change Score was calculated. As discussed previously, the ADL Index Change Score provides a composite ADL score of OASIS functional items. The composite score is measured at two time points, admission to home health care services (Admission Index Score) and discharge (Discharge Index Score). While each OASIS item has different levels of scoring, using a corrected Likert

approach allows each item to be scored on the same scale of 0-1. Scores are then totaled for a composite score of 0-8, with 0 indicating total independence and 8 indicating total dependence. To arrive at the ADL Index Change Score, the baseline ADL Index Score is subtracted from the discharge score. As mentioned previously, The ADL Change Index Score was initially calculated as a continuous variable, then computed into a dichotomous variable (improved/ stabilized vs. decline), It was then aggregated to the office level as a percentage of improved/ stabilized. According to Sharf & Madigan (2010), either a dichotomous or trichotomous score can be used to measure patient outcome. In the trichotomous measure, the three outcomes are defined as improved, stabilized or declined. In the dichotomous measure, the outcomes are defined as stabilized / improved and declined. According to Sharf and Madigan (2010), the trichotomous measure is preferred as it better identifies patient decline and improvement. As CMS recognizes stabilization or improvement as a positive end outcome measure for HF patients in the home health setting, the dichotomous index was chosen to provide the percentage of positive (stabilized/ improved) vs. negative outcomes (decline). The percentage of sample patients from each office who had no change or improvement in functional status was then calculated to provide an office-level outcome variable.

The descriptive statistics related to the no change / improvement variable are presented in Table 3. Of note is the variation of the outcome variable, ADL Index Change Score Percent Stabilized / Improved. The SD of 16% is reflective of the wide differences in patient outcomes in the various offices surveyed. In the future, it would be beneficial to look deeper at specific variables that may be affecting these values.

Table 3

*Descriptive Statistics of Key Study Variables*

	PES	Nurse-rated Quality of Care	ADL Index Change Score: Percent Stabilize / Improve
N	53	53	53
Mean	2.98	3.39	66.2
Median	2.98	3.40	66.67
Std. Deviation	.256	.366	16.01
Skewness	.128	-.228	.049
Std. Error of Skewness	.333	.333	.327
Kurtosis	-.416	-.341	-1.155
Std. Error of Kurtosis	.656	.656	.644
Range	1.11	1.50	63.6

PES, Practice Environment Scale (composite score); Nurse-rated Quality of Care question; ADL Index Change Score

**Data Management**

Following the descriptive analyses, all study variables from the nurse-level data set and the patient-level data set were aggregated to the office level. Office-level data from the two data sets were then merged to create the analytic data set ( $n = 53$ ) used to test study hypotheses. Office level descriptive statistics were then computed and are presented in Table 4. Pearson product-moment correlations between study variables were analyzed and presented in table 5.

Table 4

*Office-level Descriptive Statistics*

	Quality	PES- NWI Composite	RN MD relations	Resource Adequacy	Manager Ability	Foundations for Quality	Provider affairs
N	53	53	53	53	53	53	53
Mean	3.3966	2.9849	2.8589	2.9368	3.1851	3.1013	2.8425
Median	3.4000	2.9880	2.8889	2.9688	3.1818	3.1000	2.8558
Std. Deviation	.36112	.25208	.28210	.36881	.31298	.26595	.27379
Skewness	-.266	.103	-.674	-.212	-.212	-.181	.153
Std. Error of Skewness	.327	.327	.327	.327	.327	.327	.327
Kurtosis	-.274	-.359	.968	-.173	.129	-.297	-.321
Std. Error of Kurtosis	.644	.644	.644	.644	.644	.644	.644

Table 5

*Correlations among Study Variables*

	ADL Change Index Percent Stable /Improved	Quality mean	PES Composite mean
Percent stable / improved	1	-.204	.019
Quality of Care	-.204	1	.525**
PES Composite	.019	.525**	1
Total visits	-.032	-.091	-.150
Total HHA visits	-.127	-.109	-.301*
Total SN visits	.092	-.016	-.120
Total Therapy visits	-.079	.003	-1.00

\* indicates  $p < .05$  (2 tailed)\*\* indicates  $p < .01$  (2 tailed)**Hypothesis 1**

The first hypothesis was developed based on Aiken's, et. al (2002) conceptual framework proposing that the quality of processes of care are positively associated with

patient outcomes. Hypothesis one stated that nurse-rated quality of care is positively related to rates of improvement / stabilization in functional status among HF patients that received Medicare-certified home health care. A Pearson product-moment correlation was obtained by testing the hypothesized relationship between nurse-rated quality of care and the percent of patients who improved / stabilized in functional status. Bivariate correlation indicates there is no significant relationship between nurse-rated quality of care and percent of HF patients' improvement / stabilization in functional status ( $r = -.204$ ,  $p = .14$ ). Therefore, hypothesis one is not supported and nurse-rated quality of care will not be retained as a predictor variable in any subsequent linear regression models testing the effects of study variables on rates of HF patients' improvement / stabilization in functional status.

## **Hypothesis 2**

The second hypothesis developed based on Aiken's, et. al (2002) conceptual framework proposing that the nurses' ratings of their practice environment is associated with positive patient outcomes. Hypothesis two stated that the nursing practice environment is positively related to the percent of patients experiencing improvement / stabilization in functional status among HF patients that received Medicare-certified home health care. Initial analysis conducted a Pearson product-moment correlation to test the hypothesized relationship between the nurse practice environment and the percent of patients who improved / stabilized in functional status. Bivariate correlation indicates there is no significant relationship between the nursing practice environment and percent of HF patients' improvement / stabilization in functional status ( $r = .019$ ,  $p = .894$ ).

Therefore, hypothesis two is not supported and the nursing practice environment will not be retained as a predictor variable in any subsequent linear regression or mediation models investigating the effects of study variables on percent of HF patients' improvement / stabilization in functional status.

### **Hypothesis 3**

The third hypothesis developed was based on Anderson's model (1993) that proposed that service utilization is associated with positive patient outcomes. Hypothesis three stated that service utilization (numbers of nursing, therapy, and home health aide visits per patient) is positively related to percent of improvement / stabilization in functional status among HF patients that received Medicare-certified home health care. Bivariate correlation, computed via Pearson product-moment correlation, indicates no significant association between service utilization by discipline or total number of visits provided and percent of improvement / stabilization in functional status among HF patients that received Medicare-certified home health care. Thus, hypothesis three is not supported and service utilization will not be retained as a predictor variable in any subsequent linear regression or mediation models investigating the effects of study variables on rates of HF patients' improvement / stabilization in functional status.

Table 6

*Correlations: Service Utilization and ADL Change Index*

	ADL Change Index Percent Stable / Improved	p value
Total Visits	-.032	.820
Skilled Nursing Visits	.092	.514
Therapy Visits	-.079	.576
Home Health Aide Visits	-.127	.375

#### **Hypothesis 4**

The fourth hypothesis developed based on Aiken's, et. al (2002) conceptual framework proposes that the nursing practice environment is positively associated with quality care processes. Hypothesis four states that the nursing practice environment is positively related to nurse-rated quality of care provided by home health service offices. A Pearson product-moment correlation was obtained by testing the hypothesized relationship between nurse practice environment and nurse-rated quality of care. The findings did support, as theorized, that nurse practice environment is related to nurse-rated quality of care ( $r = .525$ ,  $p = .000$ ). Therefore, hypothesis four was supported.

#### **Hypothesis 5**

The fifth hypothesis developed based on the conceptual frameworks discussed in chapter two states that service utilization is positively related to nurse-rated quality of care on home health service units. A Pearson product-moment correlation was obtained by testing the hypothesized relationship between service utilization and nurse-rated quality of care. Findings indicate that this relationship was not supported.

Table 7

*Correlations: Service Utilization and Nurse-rated Quality of Care*

	Nurse-rated Quality of Care	p value
Total Visits	-.091	.517
Nursing Visits	-.016	.908
Therapy Visits	.003	.984
Home Health Aide Visits	-.109	.448

### **Hypothesis 6**

The sixth hypothesis was developed based on Aiken's, et. al (2002) conceptual framework proposing that the quality of processes of care are positively associated with patient outcomes. Hypothesis six stated that nurse-rated quality of care will mediate the relationship between the (1) nursing practice environment, (2) service utilization and the dependent variable of rates of improvement / stabilization in functional status among HF patients that received Medicare-certified home health care. Findings indicate, however, that there was no significant association between nurse-rated quality of care and rates of improvement/stabilization in functional status. Therefore, mediation testing was not appropriate and hypothesis six was not supported.

### **Additional Findings**

#### **Patient-Level Data**

The sample consisted of 4,146 Medicare beneficiaries admitted for home health services and who had a primary or secondary diagnosis of HF. Demographics of the patient sample has been previously described in this Chapter (see Table 2).

Descriptive statistics related to ADL Index Change Scores for specific ADLs were computed from the patient-level data. As described in Chapter Two, a negative ADL Index Change Score indicates an improvement in functional status, and a positive ADL Index Change Score indicates decline in functional status. Bathing was the ADL for which the highest percentage of patients demonstrated improvement (27%), followed by the ADL of toilette transfer (21.5%).

The patient-level data set was then analyzed to determine the relationships among discipline-specific service utilization (total number of PT, OT, Home Health Aide, and Skilled Nursing visits, and the overall change in functional status (patient-level ADL Index Change Score) at the time of discharge from home care services. As described by Sharpf and Madigan (2010), a patient may improve in a specific ADL but decline in another during their episode of care. Therefore, the composite ADL Index Change Score computed as described in Chapter three is the best indicator of overall change in functional status.

Bivariate correlation analysis (Table 8) indicates that the total number of visits provided by PT, OT, and Skilled Nursing were positively associated with the composite ADL Index Change Score, indicating that higher numbers of visits provided (service utilization) were associated with lower functional status at the time of discharge. It is important to note that while these associations were significant the correlation coefficients were relatively low, indicating the relationships are weak. There was no association between the number of HHA visits and change in functional status.

To determine which discipline utilization (number of discipline-specific visits) was most associated with functional status, an Ordinary Least Squares regression model was estimated ( $F = 4.38$ ,  $p = .004$ ), explaining less than 1% of the variance in functional status change. Results also indicate that in this model, the total number of OT visits was the only significant predictor of functional status as measured by the Change Score at the time of discharge ( $\beta = .066$ ,  $p = .000$ ; Table 9), and indicated a negative effect. The only patient demographic variable that was associated with ADL Index Change Score was patient age ( $r = 0.064$ ,  $p = .000$ ). The model was re-estimated, controlling for patient age; the total number of OT visits remained the only significant predictor in the adjusted model ( $\beta = .064$ ,  $p = .024$ ), indicating that more OT visits was associated with a decline in functional status.

Table 8

*Correlations between Service Utilization and ADL Index Change Score*

	ADL Index Change Score	p value
Physical Therapy Visits	.099	.000
Occupational Therapy Visits	.085	.000
Skilled Nursing Visits	.049	.000
Home Health Aide Visits	.047	.202

Table 9

*Predictors of ADL Change Score Unadjusted for Age*

	Beta	SE	p value
Physical Therapy Visits	.026	.008	.358
Occupational Therapy Visits	.066	.010	.019
Nursing Visits	.017	.008	.502

For ease of clinical interpretation, an Analysis of Variance was conducted to compare mean age, length of stay, and discipline-specific service utilization between those patients whose functional status improved/stabilized and those whose functional status declined. Findings indicate that patients who declined in functional status during their home health care episode were significantly older, had a significantly higher mean numbers of PT, OT, and HHA visits and longer lengths of stay on service (See Table 10).

Table 10

*Comparison of Means between Patients Declining versus Improve/Stable*

	Improvement / Stabilization in Functional Status	Decline in Functional Status	F	p value
Age	80.1 yrs	81.6 yrs	19.5	.000
LOS	36.4 days	38.3 days	14.6	.000
Nursing Visits	8.2	8.5	44.2	.110
Physical Therapy Visits	7.2	7.9	24.0	.000
Occupational Therapy Visits	4.7	5.1	6.3	.012
Home Health Aide Visits	6.8	7.6	4.2	.040

Although the difference in means between the two groups of patients was statistically significant, the differences were relatively small. For example, the average age of patients who declined in functional status was 81.6 years compared to 80.1 years of age. Likewise, those patients who declined in functional status received approximately 1 more PT visit and 1 more OT visit during their episode of care compared to those patients who improved or stabilized. There was no significant difference in number of skilled nursing visits between the two groups of patients.

### Nurse-Level Data

Additional analyses were conducted to determine variables associated with individual nurses' ratings of the quality of care provided by their agency. There were no significant relationships between nurses' demographic variables and their ratings of quality of care (Table 11). Several nurse characteristics however, were inversely associated with their perceptions of their practice environments (Table 12) including age, the number of years in their present position, and their level of education.

Table 11

*Correlations: Nurse Demographics and Ratings of Quality Care*

	Nurse-Rated Quality of Care	p value
Years in Home Health	.000	.995
Years in Present Position	-.027	.622
Highest Nursing Degree	-.022	.682
Age	-.072	.196

Table 12

*Correlations: Nurse Demographics and Perceptions of Practice Environment*

	Perception of Nurse Work Environment	p value
Years in Home Health	-.031	.565
Years in Present Position	-.121	.026
Nursing Degree	-.123	.023
Age	-.137	.013

As in the aggregated data, nurses' ratings of their practice environment were positively associated with their ratings of quality of care. In fact, all five subscales of the PES- NWI were significantly associated with quality of care. Ordinary Least Squares regression analysis indicated that three of the five subscales explained 25% of the

variance in quality ( $F = 23.80$ ,  $p = .000$ ), with a Competent and Supportive Manager having the strongest association.

Table 13

*Effects of Practice Environment Characteristics on Quality of Care*

PES Subscales	Beta	SE	p value
Nurse Participation in Agency Affairs	-.116	.089	.132
Nursing Foundations for Quality of Care	.215	.125	.017
Nurse Manager Ability, Leadership, Support of Nurses	.266	.087	.001
Staffing and Resource Adequacy	.174	.073	.010
Collegial Nurse-Physician Relations	-.005	.066	.930

## Chapter V

### **Discussion of the Findings**

The purpose of this study was to examine the relationships among 1) nurse-rated quality of care, the nurse practice environment, service utilization and functional status among HF patients receiving Medicare certified home health care; and 2) the nurse practice environment, service utilization and nurse-rated quality of care. The Nursing Organization and Outcomes Model (Aiken, 2002) was the overall conceptual framework for the theoretical relationships proposed in this study. Similar to the findings of Sharpf and Madigan (2010), a total of 70% of the patients in this study experienced an improvement or stabilization in their functional status.

Leidy (1994) posits that nurses who have a better understanding of the functional status of their patients have the ability to implement interventions that are more effective and evaluate outcomes more appropriately. Aiken further suggests that nursing care processes directly affect patient outcomes (Aiken, 2002). Therefore, based on the theoretical and empirical literature, a positive relationship between nurse-rated quality of care and improvement / stabilization in functional status among HF patients receiving Medicare certified home health care was hypothesized.

Leidy (1994) theorizes a positive relationship between provider-connectedness and functional status. Aiken, et al. (2008) found that better nurse practice environments are associated with better patient outcomes. Therefore, based on the theoretical and empirical literature reviewed, a positive relationship between the nurse practice

environment and improvement / stabilization in functional status among HF patients receiving Medicare certified home health care was hypothesized.

Leidy and Haase (1999) posit a positive relationship between service utilization and functional status. Aiken theorizes a positive relationship between surveillance, a proxy for service utilization, and positive patient outcomes (Aiken, 2002). Therefore, based on review of the theoretical and empirical literature, a positive relationship between service utilization and rates of improvement / stabilization in functional status among HF patients receiving Medicare certified home health care was hypothesized.

Aiken (2002) theorizes that attributes of the nurse practice environment uniquely impact the quality of nursing care processes. Aiken, et al., (2008) found that nurse report of poor or fair quality of care was twice as high in hospitals with poor care environments. Therefore, based on the theoretical and empirical literature, a positive relationship between the nurse practice environment and nurse-rated quality of care was hypothesized.

According to Aiken, et al., (2002) higher nurse staffing ratios positively influence patient outcomes. Aday and Awe (1997) propose that utilization of appropriate health care services ultimately leads to positive patient outcomes, including well-being and efficient use of services. Therefore, based on the theoretical and empirical literature reviewed, a positive relationship between service utilization and nurse-rated quality of care was hypothesized.

### **Nurse- rated Quality of Care and Improvement / Stabilization in Functional Status**

Hypothesis one stated that higher nurse-rated quality of care on home health service units is related to higher rates of stabilization / improvement in functional status

among HF patients who received Medicare certified home health care. Neither the hypothesis nor the theoretical proposition from which it was derived were supported by the data. This finding is not consistent with the findings of previous research (Mitchell & Shortell, 1997; Aiken, et al., 2008).

A possible explanation may be related to a disconnect between the care provided and improvement/stabilization in functional status. In this study, patients who declined in functional status, on average, actually received a similar number of skilled nursing visits and slightly more therapy visits than did patients who improved or stabilized. This could be interpreted to mean that despite the clinicians' best efforts, some patients still experience a decline in functional status that may be unrelated to the quality of their care or service provision. It may also suggest that poorer patient performance triggered an intensified nursing intervention. According to Iezzone (2012), patient characteristics as well as the processes of care are key predictors of patient outcomes. Iezzone (2012) further warns that a failure to quantify the impact of a care process on outcomes may, in fact, be due to an unmeasured patient characteristic or set of characteristics. While many patient characteristics were measured in this study, including age, ADL scores, diagnosis of HF, urinary continence, cognitive impairment and medication management status upon admit to home health, other important patient characteristics such as ethnicity, gender and co-morbidities were not measured due to limitation of information made available by the agency surveyed. Further research is needed to determine those patient characteristics that are predictive of a decline in functional status so that investigations relative to this outcome can be effectively risk-adjusted.

### **Nurse Practice Environment and Improvement / Stabilization in Functional Status**

Hypothesis two stated that a more supportive nurse work environment is related to higher rates of stabilization / improvement in functional status among HF patients who received Medicare certified home health care. Neither the hypothesis nor the theoretical proposition from which it was derived were supported by the data. This finding is not consistent with the findings of previous research (Leidy, 1994; Aiken, 2002; Hamilton, et al., 2007; Flynn, 2007b; Aiken, et al., 2008; Aiken, et al., 2011).

A possible explanation is, again, that there may some patient characteristics not measured or controlled in this study that influence functional status at the time of discharge regardless of the supportiveness of the practice environment or the quality of care received (Iezzone (2012).

### **Service Utilization and Improvement / Stabilization in Functional Status**

Hypothesis three stated that increased service utilization (total visits, home health aide visits, skilled nursing visits and total therapy visits) is related to higher rates of stabilization / improvement in functional status among HF patients who received Medicare certified home health care. According to findings, neither the hypothesis nor the theoretical proposition from which it was derived was supported by the data. This finding is not consistent with the findings of previous research (Aday & Awe, 1997; Proctor, et al., 2000; Madigan, 2008; Nakatani & Shimanouchi, 2004). This finding is also contrary to Anderson's model (1993) that proposed that service utilization is associated with positive patient outcomes.

A possible explanation is that according to Leidy (1994), exposure to stressors often causes an individual to experience functional decline and ultimately reduced performance. Leidy and Haase (1999) further posit that a combination of provider-patient connectedness and less community support contribute to functional decline. Patient stressors, provider-connectedness, and community support such as that from neighbors, family, and friends were not measured in this study. As mentioned earlier, patient characteristics measured in this study included age, ADL scores and diagnosis of HF, as well as key factors known to influence functional status in patients with HF: urinary continence status, cognitive impairment and medication management status upon admit to home health. Moreover, in the home health setting, clinicians tend to base the number of home visits provided on assessment of client status, with more visits provided to those patients who appear to be declining in function. This would explain the significant but inverse relationship between average number of therapy visits and the percent of patients who declined in functional status.

### **Nurse Practice Environment and Nurse-rated Quality of Care**

Hypothesis four stated that a more supportive nurse practice environment is related to higher nurse-rated quality of care on home health service units. Both the hypothesis and the theoretical proposition from which it was derived were supported by the data. This hypothesis was from the theoretical literature that states a positive relationship between a supportive nurse practice environment and a higher level of nurse reported quality of care (Aiken, 2002). This finding is consistent with findings of previous research (National Quality Forum, 2007; Lake, 2002; Flynn, 2007b).

Nurse practice environment was measured using the PES-NWI (Lake, 2002) and nurse-rated quality of care was measured using one survey item asking “In general, how would you describe the quality of care delivered to patients on your unit on your last shift” (Sochalski, 2004). The strength of this relationship was strong and the probability was high, minimizing the chance of type 1 error. This finding, supporting a positive relationship between a supportive nurse practice environment and nurse-rated quality of care, indicates that the underlying theory serves as a supportive explanation for the relationship.

### **Service Utilization and Nurse-rated Quality of Care**

Hypothesis five stated that increased service utilization is related to higher nurse-rated quality of care on home health service units. Neither the hypothesis nor the theoretical proposition from which it was derived was supported by the data. This finding is not consistent with the findings of previous research (Aday & Awe, 1997; Proctor, et al., 2000).

A possible explanation for this may be that it is not increased service utilization but rather using the appropriate services that is more effective in promoting quality of care in the home health setting. Theory states that equity (fair distribution of health services) is attained through use of those services shown to be effective in promoting health and well-being as well as using those services efficiently (Aday & Awe, 1997). Equity, they propose, will ultimately lead to positive patient outcomes. Aiken (2002) theorizes that the level of nurse surveillance in the hospital setting impacts quality and adequacy of nursing care processes. Therefore, examination of the content of a home

health care visit for patients with heart failure, rather than the number of home health visits, may prove beneficial in increasing quality of care.

### **Limitations of Study Methods**

There were some considerations in the collection of the study data that may have contributed to findings that did not support the theoretical propositions. Final sample size was not optimal, with 53 of 60 offices participating in the study. Participation of the study offices was voluntary. Due to informal company policy, the decision to participate was left up to the office Director. This may have eliminated some offices with practice environments that were less than supportive. In addition, office Directors who chose to participate may not have been supportive of the nurses returning the study packets if they did have concerns about the practice environment. In the future, it would be beneficial to have the survey administered on-site by the researcher in a controlled environment.

The use of OASIS for obtaining patient data was a concern in this study. While this method of data collection is mandated by CMS for Medicare-certified Home Health agencies, there is limited information on the validity of the data as the administration of the survey items by field clinicians raises concerns about capturing the intent of the items (Sharf & Madigan, 2010).

Another limitation involves aggregation of nurse and patient level data to the office level. Although consistent with the organizational-level theory of Aiken that informed the study, the link between the care received by a specific patient and the outcomes of a specific patient is lost when care processes and outcomes are aggregated to

an organizational level. A re-analysis of the patient/nurse level data using a multi-level modeling statistical approach is suggested for further research.

As described in Chapter three, patient characteristics that have been found in previous studies to influence changes in functional status following an episode of home health care were controlled via delimitations in the patient sample. There may, however, patient characteristics that influence changes in functional status that have not been identified and therefore not controlled. Due to patient confidentiality concerns, the home health agency surveyed for this study was not able to provide richer patient characteristics, such as gender and ethnicity. Due to the limitations of OASIS data, patient characteristics such as co-morbidities, severity of illness, social support, and family involvement were not available, which may have contributed more valuable outcome information. Therefore, the lack of effective risk-adjustment models are identified as a probable limitation of this study.

Yet another concern is the poor retention rate and lack of tenure of the nursing staff within the offices. The overall retention rate of employees (defined as staying with the company for at least 6 months) was 79% for 2012, with much variation among offices (46.2%- 100%). The majority of the nurses surveyed averaged less than 5 years of employment with the company (79%). This low retention rate and subsequent lack of tenure may have contributed to inconsistent evaluation of the patient and the practice environment.

## **Additional Findings**

### **Quality of Care**

A Supportive Work Environment (PES-NWI composite score) was significantly correlated with nurse-rated quality of care, with all 5 subscales of the PES-NWI being significantly correlated with nurse-rated quality of care. Entering all 5 subscale scores in a regression model, the following work environment characteristics emerge as significant predictors of nurse-rated quality of care, explaining 25% of the variance in quality:

- Manager's Ability:  $B = .266, p = .001$
- Foundations for Quality:  $B = .215, p = .017$
- Staffing /Resource Adequacy:  $B = .174, p = .010$

These findings indicate that a competent and supportive front line manager is the largest contributor to nurse-reported quality of care. This is not surprising, in that the field nurses (staff nurses) in home health spend the majority of the day alone in the field visiting patients. It is the manager who serves as the nurse's advisor, resource allocator, and communication link between the field nurse and other members of the team (Ellenbecker, Porrell, Samia, Byleckie, & Milburn, 2008; Flynn & Deatruck, 2003; Flynn, 2005).

Therefore, based on these findings, manager development may be an area in which the home health organization should invest resources. Of note is the finding that approximately 13% of the respondents had poor ratings (2.5 or less) of their front line manager, indicating opportunity for improvement in this key area.

### **Supportive Practice Environment**

Approximately 14% of nurse respondents had unfavorable perceptions of their practice environment (scores of 2.5 or less; Lake & Friese, 2006) indicating that home health administrators should work to improve practice environments in home health agencies. Findings further indicate that the following nurse demographics are inversely related to perceptions of the practice environment:

- Years worked in present position
- Nurse level of education
- Age

It appears that the more educated, experienced, and older nurses are more critical of their practice environment. One possible explanation is that older, more experienced, and more highly educated nurses are more aware of the organizational characteristics that they need to support their practice, whereas, less experienced and less educated nurses may be more focused on improving their own clinical skills (Buerhaus, Staiger & Auerbach, 2000).

## Chapter VI

### **Summary, Conclusions, Implications and Recommendations**

#### **Summary**

The purpose of this study was to examine the relationships among the nursing practice environment, nurse-rated quality of care, service utilization and functional status in patients with heart failure receiving Medicare-certified home health services. The Nursing Organization and Outcomes Model (Aiken, et al., 2002) was used as the conceptual framework for testing the theoretical relationships in this study. In this study, improvement/ stabilization of functional status (the ability to independently perform ADLs) was conceptualized as an indicator of positive patient outcomes (Aiken, et al., 2002; Leidy, 1994). A supportive nursing practice environment was theoretically defined as the presence or absence of a set of organizational characteristics that facilitate professional nursing practice (Aiken, et al., 2002). Theory posits a positive relationship between supportive nursing practice environments and positive patient outcomes (Aiken, et al., 2002). Empirical literature supports this theoretical relationship (Aiken, et al., 2008; Aiken, et al., 2011; Flynn, 2007; Hamilton, et al., 2007).

Nurse-rated quality of care was theoretically defined as RN report of unmet nursing care needs (Lucero, et al., 2009). Theory supports a positive relationship between a professional care environment and nurse-rated quality of care (Aiken, et al., 2002). Theory also suggests a positive relationship between nurse-rated quality of care and positive patient outcomes (Aiken, et al., 2002; Sochalski, 2004). This relationship is

supported by the empirical literature (Aiken, et al., 2008; Flynn, 2007; Mitchell & Shortell, 1997).

Service utilization was theoretically defined as a patient's use of health service (Aday & Awe, 1997). Theory suggests a positive relationship between nurse-rated quality of care and service utilization (Aiken, et al., 2002; Aday & Awe, 1997). This proposed relationship is supported by empirical literature (Aiken, et al., 2008; Aiken, et al., 2011). In addition, Aday and Awe (1997) theorize that service utilization is positively related to patient outcomes. They explain that equity (fair distribution of health services) is attained through using health services efficiently, and that equity ultimately leads to positive patient outcomes. This proposed relationship is supported by empirical literature (Proctor, et al., 2000; Madigan, 2008; Nakatani & Shimanouchi, 2004).

Therefore, based on the theoretical and empirical review of the literature, the following hypotheses were derived: a positive relationship between nurse-rated quality of care and rates of improvement / stabilization in functional status; a positive relationship between a supportive nursing practice environment and rates of improvement / stabilization in functional status; a positive relationship between service utilization (numbers of nursing, physical therapy, and home health aide visits per patient) and rates of improvement / stabilization in functional status; a positive relationship between a supportive nursing practice environment and nurse-rated quality of care; and a positive relationship between service utilization and nurse-rated quality of care.

Participants were recruited from 53 service offices of a multi-site Medicare-certified home care organization. The RN staff and patients of the participating offices,

located on the east coast and in the mid-west of the United States, comprised the sample populations. The nurse sample studied was delimited to Staff RNs who made home visits to patients. The final convenience sample for the nurse population consisted of 364 participants from 53 service offices. Criteria for the patient sample studied included: 65-84 years of age; primary or secondary diagnosis of HF; Medicare beneficiary; on home health service for at least 5 days; ADL score of 7 or less and medication management score of 2 or less on admission to home health; minimal cognitive impairment and no urinary incontinence noted on admission to home health. The final patient sample consisted of 4146 participants.

Data were collected using the following instruments: (1) Practice Environment Scale (PES-NWI; Lake 2002); (2) Nurse-rated Quality of Care question (Sochalski, 2004). De-identified patient data was provided by the Home Health Care agency and collected through the electronic medical record system.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 21 for Windows (SPSS, Inc., 2012). Alpha coefficients were calculated for the research instrument: The PES-NWI (Lake, 2002), .947, and the PES-NWI including the Nurse-Rated Quality of Care question (Sochalski, 2004), .948. Descriptive and correlation statistics were also obtained on the data. Pearson product-moment correlation was used to test each of the hypotheses. The directional hypotheses in this study were tested using a one-tailed test of significance and the level of significance at which the research hypotheses were accepted was set at .05.

The first hypothesis, which stated nurse-rated quality of care is positively related to rates of improvement / stabilization in functional status, was not supported. The second hypothesis, which stated the nursing practice environment is positively related to rates of improvement / stabilization in functional status, was not supported. The third hypothesis, which stated service utilization (numbers of nursing, physical therapy, and home health aide visits per patient) is positively related to rates of improvement / stabilization in functional status, was not supported. The fourth hypothesis, which stated the nursing practice environment is positively related to nurse-rated quality of care, was supported. The fifth hypothesis, which stated service utilization is positively related to nurse-rated quality of care was not supported.

### **Conclusions**

The findings of this study do not support the theoretical relationships among the nursing practice environment, service utilization, and functional status in a sample of patients with heart failure receiving Medicare-certified home health services. While the relationship between nurse-rated quality of care and service utilization was not supported, a positive relationship between practice environment and nurse-rated quality of care was supported.

All five subscales of the PES-NWI were found to be significantly correlated to nurse-rated quality, suggesting a supportive work environment is a predictor of nurse-rated quality of care. A competent and supportive front line manager was the largest contributor to nurse-rated quality of care, suggesting investment in nurse manager development may be beneficial to the organization.

### **Implications for Nursing**

By testing theory, this study helps to enhance awareness of the implications of a supportive nurse practice environment; a system centered indicator of the structural quality of nursing care across patient care settings (National Quality Forum, 2007). Aiken, et al. (2002) explains that quality patient care and better patient outcomes are more likely to occur when nurses practice in organizations that create and sustain a supportive nursing practice environment. In order for nurses to create and sustain supportive practice environments, nurses must first begin by generating and testing theories through empirical research and thus, make a significant contribution to nursing theory and science.

The American Nurses Association states that the home health RN is central to developing and implementing a plan of care that maximizes patient outcomes of home health recipients. Aiken et al. (2002) explains that variations in organizational support for nursing practice directly result in variations in processes and quality of care, and ultimately, patient outcomes. Moreover, Aiken, et al., suggests that better patient outcomes are more likely to occur when nurses practice in organizations that create and sustain a supportive nursing practice environment. Therefore, the relationship among diverse variables in the work environment must be considered in improving nursing practice environments.

The theoretical proposition that was supported by the data, a positive relationship between nurse-rated quality of care and a supportive nurse work environment, implies that nurse leaders have a responsibility to promote practice environments that support

good nursing practice, and, ultimately positive patient outcomes. While this study found no significant relationship between nurse practice environment, service utilization and functional status, as well as no relationship between service utilization and nurse-rated quality of care, it did not demonstrate an absence of these relationships. As previously stated, patient characteristics that were not identified, measured, nor controlled in this study may account for the lack of quantification of these relationships. Therefore, nurses have an obligation to further investigate these variables in the home health setting and use the findings to enhance the home health practice environment.

### **Recommendations**

Based on the findings of this study, specific areas for future study may include:

1. Use more objective measures, rather than nurse-report, to measure quality of nursing care and compare the findings to those of the current study.
2. Extend the analyses to include multi-level modeling of a merged nurse-level and patient-level data set.
3. Replicate this study in different home health agencies and compare the findings to those of the current study.
4. Replicate this study with a different chronic care population (i.e. COPD) and compare the findings to the findings of this study.
5. Replicate this study using a richer set of patient characteristics to examine their effect on patient outcomes, including; social support in the home, length of stay in other post acute settings prior to home health admit, duration of home health

episode, New York Heart Association classification (severity of illness), and co-morbidities.

6. Conduct a qualitative study using participant observation to examine other factors in the home health practice environment that nurses find supportive of good practice.
7. Conduct a qualitative study to investigate factors in the home that support stabilization / improvement in functional status outcomes for patients with HF.

The current study tested the theoretical relationships among professional care environments, nurse-rated quality of care, service utilization and functional status among patients with heart failure receiving Medicare-certified home health services. Given the findings of this study, further research is needed to identify variables in the home health practice environment that contribute to functional status improvement / stabilization in patients with heart failure. Additionally, it is equally important to identify any additional patient characteristics that affect functional status outcomes so that those characteristics may be isolated and controlled in future studies.

## References

- Adams, C., Corbett, C. & Michel, Y. (2000). Service utilization and outcomes in rural home health agencies. *Outcomes Management for Nursing Practice*, 4(2), 63-68.
- Aday, L. & Anderson, R. (1981). Equity of access to medical care: a conceptual and empirical overview. *Medical Care*, 19, 4-27.
- Aday, L. & Awe, W. (1997). Health Service Utilization Models. In Gochman (Ed.), *Handbook of Health Behavior research, Volume 1 Determinants of Health Behavior: Personal and Social*. New York: Plenum Publishing Corporation.
- Aiken, L., Cimiotti, J., Sloane, D., Smith, H., Flynn, L., & Neff, D. (2011). Effects of nurse staffing and nurse education on patient deaths in hospitals with different nurse work environments. *Medical Care*, 00 (00). Retrieved from [www.lww-medicalcare.com](http://www.lww-medicalcare.com)
- Aiken, L., Clarke, S. & Sloane, D. (2002). Hospital staffing, organization and quality of care: cross-national findings. *Nursing Outlook*, 50, 187-194.
- Aiken, L., Clarke, S., Sloane, D., Lake, E. & Cheney, T. (2008). Effects of hospital care environment on patient mortality and nurse outcomes. *The Journal of Nursing Administration*, 38(5), 223-229.
- American Nurses Association (2007). *Home health nursing: scope and standards of practice*. Silver Springs: Nurses Books. Org.
- Anderson, R. & Newman, J. (1973). Societal and individual determinants of medical utilization in the United States. *Milbank Memorial Fund Quarterly, Health and Society*, 51 (1), 95-124.
- Anemaet, W., Krulish, L., Lindstron, K., Herr, R. & Carr, M. (2004). Evaluating physical therapy utilization under PPS. *Home Healthcare Nurse*, 22(8), 549-561.
- Brown, B., Brauner, C., Chan, A., Gutierrez, D., Herson, J., Lovato, J., Polsley, J. & Venier, J. (2000). *DST plan Version 4.2: Calculations for Sample Size and Related Problems*. The University of Texas MD Anderson Cancer Center: Houston, Texas.
- Bruyneel, L., Van den Heede, K., Diya, L., Aiken, L. & Sermeus, W. (2009). Predictive validity of the international hospital outcomes study questionnaire: an RN4CAST pilot study. *Journal of Nursing Scholarship*, 41:2, 202-210.

- Buerhaus, P., Staiger, D.O., & Auerbach, D. (2000). Implications of the aging Registered Nurse workforce. *Journal of the American Medical Association*, 283 (22), 2948-2954.
- Chen, Q., Kane, R. & Finch, M. (2000). The cost effectiveness of post-acute care for elderly Medicare beneficiaries. *Inquiry*, 37, 359-375.
- Clarke, S. & Aiken, L. (2003). Failure to rescue. *American Journal of Nursing*, 103(1), 42-47.
- Clauser, S. & Bierman, A. (2003). Significance of functional status data for payment and quality. *Health Care Financing Review*, 24(3), 1-12.
- CMS (2005). State Operations Manual. Guide to surveyors: home health agencies. Centers for Medicare and Medicaid Services  
([http://www.cms.gov/manuals/Downloads/som107ap\\_b\\_hha.pdf](http://www.cms.gov/manuals/Downloads/som107ap_b_hha.pdf))
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*, 2<sup>nd</sup> edition. USA: Lawrence Erlbaum Associates, Publishers.
- Davis, R., Iezzoni, L., Phillips, R., Reiley, P., Coffman, G. & Safran, C. (1995). Predicting in-hospital mortality, the importance of functional status information. *Medical Care*, 33(9), 906-921.
- Dey, J.G., Johnson, M., Pajerowski, W., Tanamor, M., Ward, A. (2011). Home health study report. L&M Policy Research. Retrieved from  
[https://www.cms.gov/HomeHealthPPS/Downloads/HHPPS\\_LiteratureReview.pdf](https://www.cms.gov/HomeHealthPPS/Downloads/HHPPS_LiteratureReview.pdf)
- Doorden, A. (1998). *Research survival guide*. Philadelphia, PA: Lippincott.
- Ehrenberg, A., Ehnfors, M. & Ekman, I. (2004). Older patients with chronic heart failure within Swedish community health care: a record review of nursing assessments and interventions. *Journal of Clinical Nursing*, 13, 90-96.
- Ellenbecker, C.H., Porrell, F.W., Samia, L., Byleckie, J.J., & Milburn, M. (2008). Predictors of home healthcare nurse retention. *Journal of Nursing Scholarship*, 40(2), 151-160.
- Fagerstrom, L., Wikblad, A., & Nilsson, J. (2008). An integrative research review of preventative home visits among older people – is an individual health resource perspective a vision or reality. *Scandinavian Journal of Caring Science*, 23; 558-568.

- Flynn, L. (2005). The importance of work environment: Evidence-based strategies for enhancing nurse retention. *Home Healthcare Nurse*, 23(6), 367-371.
- Flynn, L. (2007a). Discharged from home health: A quiet threat to patient safety? *Home Healthcare Nurse*, 25(3), 184-190.
- Flynn, L. (2007b). Extending work environment research into home health settings. *Western Journal of Nursing Research*, 29(2), 200-212.
- Flynn, L. (2008). Workload, quality of care and job satisfaction in home health nurses. In G. Dickson & L. Flynn (Eds.), *Nursing policy research: turning evidenced-based research into health policy*. New York: Springer Publishing.
- Flynn, L., Carryer, J. & Budge, C. (2005). Organizational attributes valued by hospital, home care, and district nurses in the United States and New Zealand. *Journal of Nursing Scholarship*, 37(1), 67-72.
- Flynn, L. & Deatrick, J. (2003). Home care nurses' descriptions of important agency attributes. *Journal of Nursing Scholarship*, 35(4), 385-390.
- Flynn, L., Dickson, G., & Moles, D. (2007). Enhancing the nursing workplace. *Provider*, 33(11), 35-39.
- Flynn, L., Liang, Y., Dickson, G., & Aiken, L. (2010). Effects of nursing practice environments on quality outcomes in nursing homes. *Journal of the American Geriatric Society (JAGS)*, 58(12), 2401-2406.
- Flynn, L., Thomas-Hawkins, C., & Clarke, S.P. (2009). Organizational traits, care processes, and burnout among chronic hemodialysis nurses. *Western Journal of Nursing Research*, 31(5), 569-582.
- Fried, T., Bradley, E., Williams, C. & Tinetti, M. (2001). Functional disability and health care expenditures for older persons. *Archives of Internal Medicine*, 161, 2602-2607.
- Hadley, J., Rabin, D., Epstein, A., Stein, S. & Rimes, C. (2000). Posthospitalization home health care use and changes in functional status in a Medicare population. *Medical Care*, 38(5), 494-507.
- Hamilton, P., Eschiti, V., Hernandez, K. & Neill, D. (2007). Differences between weekend and weekday nurse work environments and patient outcomes, a focus group approach to model testing. *Journal of Perinatal and Neonatal Nursing*, 21(4), 331-341.

- Iezzoni, L.I. (2012). *Risk adjustment for measuring health care outcomes* (4<sup>th</sup> Edition). Health Administration Press: Chicago.
- Kalisch, B., Tshanem, D., & Lee, H. (2011). Does missed nursing care predict job satisfaction? *Journal of Healthcare Management*, 56 (2), 117-131.
- Kane, R., Chen, Q., Finch, M., Blewett, L., Burns, R. & Moskowitz, M. (2000). The optimal outcomes of post-hospital care under Medicare. *Health Services Research*, 35(3), 615-661.
- Katz, S., Ford, A., Moskowitz, R., Jackson, B. & Jaffe, M. (1963). Studies of illness in the aged. *Journal of the American Medical Association*, 185(12), 914-919.
- Keepnews, D., Capitman, J. & Rosati, R. (2004). Measuring patient-level clinical outcomes of home health care. *Journal of Nursing Scholarship*, 36(1), 79-85.
- Kim, H., Capezuti, E., Boltz, M. & Fairchild, S. (2009). The nursing practice environment and nurse perceived quality of geriatric care in hospitals. *Western Journal of Nursing Research*, 31(4), 480-495.
- Kutney Lee, A., Lake, E. & Aiken, L. (2009). Development of the hospital nurse surveillance capacity profile. *Research in Nursing & Health*, 32, 217-228.
- Lake, E. (2002). Development of the practice environment scale of the nursing work index. *Research in Nursing and Health*, 25, 176-188.
- Lake, E. & Friese, C. (2006). Variations in nursing practice environments. *Nursing Research*, 55 (1), 1-9.
- Leff, B., Burton, L., Mader, S., Naughton, B., Burl, J., Greenough, W., Guido, S. & Steinwachs, D. (2009). Comparison of functional outcomes associated with hospital at home care and traditional acute hospital care. *Journal of the American Geriatrics Society*, 57, 273-278.
- Leidy, N. (1994). Functional status and the forward progress of merry-go-rounds: toward a coherent analytical framework. *Nursing Research*, 43(4), 196-202.
- Leidy, N. & Haase, J. (1999). Functional status from the patient's perspective: the challenge of preserving personal integrity. *Research in Nursing and Health*, 22, 67-77.
- Lucero, R., Lake, E. & Aiken, L. (2009). Variations in nursing care quality across hospitals. *Journal of Advanced Nursing*, 65(11), 2299-2310.

- Macabasco-O'Connell, A., Rasmusson, K. & Fiorini, D. (2006). Heart failure update 2006: integrating the latest guidelines into clinical practice. *Progress in Cardiovascular Nursing*, Winter, 39-43.
- Madigan, E. (2008). People with heart failure and home health care resource use and outcomes, *The Journal of Nursing and Healthcare of Chronic Illnesses*, 17 (7b), 253-259.
- Martin, K. (2005). *The Omaha system: A key to practice, documentation, and information management*. Omaha: Health Connections Press.
- Matura, L (2002). Review of current guidelines for the treatment of chronic heart failure. *The Internet Journal of Advanced Nursing Practice*, 5(1). Accessed November 29, 2011 on-line at <http://www.ispub.com80/journal/the-internet-journal-of-advanced-nursing-practice/volume-5-number-1/review-of-current-guidelines-for-the-treatment-of-chronic-heart-failure.html>
- Mitchell, P. & Shortell, S. (1997). Adverse outcomes and variations in organization of care delivery. *Medical Care*, 35(11), NS19-NS32.
- Munro, B. (2005). *Statistical methods for healthcare research* (5<sup>th</sup> ed.). Philadelphia: Lippincott, Williams & Wilkins.
- Nakatani, H. & Shimanouchi, S. (2004). Factors in care management affecting client outcomes in home care. *Nursing and Health Sciences*, 6, 239-246.
- National Quality Forum (2007). *Nursing performance measurement and reporting: a status report*. Issue Brief No. 5, 1-4.
- NIH (2010). What is heart failure? Accessed November 29, 2011 on-line at <http://www.nhlbi.nih.gov/health/health-topics/topics/hf/>
- Phillips, K.A., Morrison, K.R., Andersen, R., & Aday, L.A. (1998). Understanding the context of healthcare utilization: assessing environmental and provider-related variables in the behavioral model of utilization. *Health Services Research*, 33(3), 571-596.
- Piyabanditkul, L. (2003). *Relationship between home health service utilization and functional status of Medicare patients with heart failure*. Doctoral Dissertation, University of Kentucky.
- Polit, D. (1996). *Data analysis & statistics for nursing research*. Stamford: Appleton & Lange.

- Proctor, E., Morrow-Howell, N., Li, H. & Dore, P. (2000). Adequacy of home care and hospital readmission for elderly congestive heart failure patients. *Health and Social Work*, 25(2), 87-96.
- Reiley, P. & Howard, E. (1995). Predicting hospital length of stay in elderly patients with congestive heart failure. *Nursing Economics*, 13(4), 210-216.
- Rozzini, R., Sabatini, T., Cassinadri, A., Bofelli, S., Ferri, M., Barbisoni, P., Frisoni, G. & Trabucchi, M. (2005). Relationship between functional loss before hospital admission and mortality in elderly persons with medical illness. *Journal of Gerontology*, 60A(0), 1180-1183.
- Salant, P. & Dillman, D. (1994). *How to conduct your own survey*. New York, NY: John Wiley & Sons, Inc.
- Scharpf, T., Colabianchi, N., Madigan, E., Neuhauser, D., Peng, T., Feldman, P. & Bridges, J. (2006). Functional status decline as a measure of adverse events in home health care: an observational study. *BMC Health Services Research*, 6, 162-172.
- Scharpf, T. & Madigan, E. (2010). Functional status outcome measures in home health care patients with heart failure. *Home Health Care Services Quarterly*, 29(4), 155-170.
- Shaughnessy, P., Hittle, D., Crisler, K., Powell, M., Richard, A., Kramer, A., Schlenker, R., Steiner, J., Donelan-McCall, N., Beaudry, J., Mulvey-Lawlor, K. & Engle, K. (2002). Improving patient outcomes of home health care: findings from two demonstration trials of outcome-based quality improvement. *Journal of the American Geriatric Society*, 50, 1354-1364.
- Sochalski, J. (2004). Is more better? The relationship between nurse staffing and the quality of nursing care in hospitals. *Medical Care*, 42(2), II-67- II-73.
- SPSS Inc. (2012). *SPSS 21.0 Statistical Package Base Application*.
- Stuck, A., Walther, J., Nikolaus, T., Bula, C., Hohmann, C. & Beck, J. (1999). Risk factors for functional status decline in community-living elderly people: a systematic literature review. *Social Science & Medicine*, 48, 445-469.
- Warshawsky, N. & Havens, D. (2010). Global use of the practice environment scale of the nursing work index. *Nursing Research*, 60(1), 17-31.
- Whitcomb, J. (2011). Functional status versus quality of life, where does the evidence lead us? *Advances in Nursing Science*, 34(2), 97-105.

## Appendix A

### ADL Index Score

0= total independence

8= total dependence

Add scores for individual items to obtain index score

ADL	Range	Score 0	Score 1	Score 2	Score 3	Score 4	Score 5	Score 6
Grooming	0-3	0	0.33	0.67	1			
Dress upper	0-3	0	0.33	0.67	1			
Dress lower	0-3	0	0.33	0.67	1			
Toileting	0-4	0	0.25	0.5	0.75	1		
Transfer	0-5	0	0.2	0.4	0.6	0.8	1	
Feeding/eating	0-5	0	0.2	0.4	0.6	0.8	1	
Bathing	0-6	0	0.16	0.33	0.5	0.67	0.83	1
Ambulation	0-6	0	0.16	0.33	0.5	0.67	0.83	1

*Scharpf, T. & Madigan, E. (2010). Functional status outcome measures in home health care patients with heart failure. Home Health Services Quarterly, 29(4), 155-170.*

## Appendix B

**Practice Environment Scale**

For each item, please indicate the extent to which you agree that the item is PRESENT IN YOUR CURRENT JOB. Indicate your degree of agreement by circling the appropriate number.

		Strongly Agree	Agree	Disagree	Strongly Disagree
1	Adequate support services allow me to spend time with my patients	1	2	3	4
2	Physicians and nurses have good working relationships	1	2	3	4
3	A supervisory staff that is supportive of nurses	1	2	3	4
4	Active staff development or continuing education programs for nurses	1	2	3	4
5	Career development/clinical ladder opportunity	1	2	3	4
6	Opportunity for staff nurses to participate in policy decisions	1	2	3	4
7	Supervisors use mistakes as learning opportunities, not criticism	1	2	3	4
8	Enough time and opportunity to discuss patient care problems with other nurses	1	2	3	4
9	Enough registered nurses to provide quality care	1	2	3	4
10	A nurse manager who is a good manager and leader	1	2	3	4
11	A chief nursing officer who is highly visible and accessible to staff	1	2	3	4
12	Enough staff to get the work done	1	2	3	4
13	Praise and recognition for a job well done	1	2	3	4
14	High standards of nursing care are expected by the administration	1	2	3	4
15	A chief nursing officer equal in power and authority to other top-level agency executives	1	2	3	4
16	A lot of team work between nurses and physicians	1	2	3	4
17	Opportunities for advancement	1	2	3	4

18	A clear philosophy of nursing that pervades the patient care environment	1	2	3	4
19	Working with nurses who are clinically competent	1	2	3	4
20	A nurse manager who backs up the nursing staff in decision making, even if the conflict is with a physician	1	2	3	4
21	Administration that listens and responds to employee concerns	1	2	3	4
22	An active quality assurance program	1	2	3	4
23	Staff nurses are involved in the internal governance of the agency (e.g. practice and policy committees)	1	2	3	4
24	Collaboration (joint practice) between nurses and physicians	1	2	3	4
25	A preceptor program for newly hired RNs	1	2	3	4
26	Nursing care is based on a nursing, rather than a medical, model	1	2	3	4
27	Staff nurses have the opportunity to serve on agency and nursing committees	1	2	3	4
28	Nursing administration consult with staff on daily problems and procedures	1	2	3	4
29	Written, up-to-date nursing care plans for all patients	1	2	3	4
30	Patient care assignments that foster continuity of care, i.e., the same nurse cares for the patient from one day to the next	1	2	3	4
31	Use of nursing diagnoses	1	2	3	4

*Lake, E. (2002). Development of the practice environment scale of the nursing work index. Research in Nursing & Health, 25(3), 176-188.*

## Appendix C

**OASIS Functional Outcomes**

<b>OASIS-C item</b>	<b>Definition</b>	<b>Answer options</b>
M1800-Grooming	Current ability to tend safely to personal hygiene needs (i.e. washing face and hands, hair care, shaving or make up, teeth or denture care, fingernail care).	<ol style="list-style-type: none"> <li>0. Able to groom self unaided, with or without the use of assistive devices or adaptive methods.</li> <li>1. Grooming utensils must be placed within reach before able to complete grooming activities.</li> <li>2. Someone must assist the patient to groom self.</li> <li>3. Patient depends entirely upon someone else for grooming needs.</li> </ol>
M1810-Dress Upper Body	Current ability to dress upper body safely (with or without dressing aids) including under garments, pullovers, front-opening shirts and blouses, managing zippers, buttons and snaps.	<ol style="list-style-type: none"> <li>0. Able to get clothes out of closets and drawers, put them on and remove them from the upper body without assistance.</li> <li>1. Able to dress upper body without assistance if clothing is laid out or handed to the patient.</li> <li>2. Someone must help the patient put on upper body clothing.</li> <li>3. Patient depends entirely upon another person to dress the upper body.</li> </ol>
M1820-Dress Lower Body	Current ability to dress lower body safely (with or without dressing aids) including undergarments, slacks or nylons, shoes.	<ol style="list-style-type: none"> <li>0. Able to obtain, put on, and remove clothing and shoes without assistance.</li> <li>1. Able to dress lower body without assistance if clothing and shoes are laid out or handed to the patient.</li> <li>2. Someone must help the patient put on</li> </ol>

		<p>undergarments, slacks, socks or nylons, and shoes.</p> <p>3. Patient depends entirely upon another person to dress lower body.</p>
M1830-Bathing	<p>Current ability to wash entire body safely. Excludes grooming (washing face, washing hands and shampooing hair).</p>	<p>0. Able to bathe self in shower or tub independently, including getting in and out of tub/shower.</p> <p>1. With the use of devices, is able to bathe self in shower or tub independently, including getting in and out of tub/shower.</p> <p>2. Able to bathe in shower or tub with the intermittent assistance of another person: (a) for intermittent supervision or encouragement or reminders; or (b) to get in or out of the shower or tub; or (c) for washing difficult to reach areas.</p> <p>3. Able to participate in bathing self in shower or tub, but requires presence of another person throughout the bath for assistance or supervision.</p> <p>4. Unable to use the shower or tub, but able to bathe self independently with or without the use of devices at the sink, in chair, or on commode.</p> <p>5. Unable to use the shower or tub, but able to participate in bathing self in bed, at the sink, in bedside chair, or on</p>

		<p>commode, with the assistance or supervision of another person throughout the bath.</p> <p>6. Unable to participate effectively in bathing and is bathed totally by another person.</p>
M1840-Toileting Transferring	Current ability to get to and from the toilet or bedside commode safely and transfer on and off toilet/commode	<p>0. Able to get to and from the toilet and transfer independently with or without a device.</p> <p>1. When reminded, assisted or supervised by another person, able to get to and from the toilet and transfer.</p> <p>2. Unable to get to and from the toilet but is able to use a bedside commode (with or without assistance).</p> <p>3. Unable to get to and from the toilet or bedside commode but is able to use a bedpan/urinal independently.</p> <p>4. Is totally dependent in toileting.</p>
M1850-Transferring	Current ability to move safely from bed to chair, or ability to turn and position self in bed if patient is bedfast.	<p>0. Able to independently transfer.</p> <p>1. Able to transfer with minimal human assistance or with use of assistive device.</p> <p>2. Able to bear weight and pivot during the transfer process but unable to transfer self.</p> <p>3. Unable to transfer self and is unable to bear weight or pivot when transferred by another person.</p>

		<ul style="list-style-type: none"> <li>4. Bedfast, unable to transfer but is able to turn and position self in bed.</li> <li>5. Bedfast, unable to transfer and is unable to turn and position self.</li> </ul>
M1860- Ambulation/Locomotion	Current ability to walk safely, once in a standing position, or use a wheelchair, once in a seated position, on a variety of surfaces.	<ul style="list-style-type: none"> <li>0. Able to independently walk on even and uneven surfaces and negotiate stairs with or without railings (i.e. needs no human assistance or assistive device)</li> <li>1. With the use of a one handed device (e.g. cane, single crutch, hemi-walker), able to independently walk on even and uneven surfaces and negotiate stairs with or without railings.</li> <li>2. Requires use of a two handed device (e.g. walker or crutches) to walk alone on a level surface and/or requires human supervision or assistance to negotiate stairs or steps on uneven surfaces.</li> <li>3. Able to walk only with the supervision or assistance of another person at all times.</li> <li>4. Chairfast, unable to ambulate but is able to wheel self independently.</li> <li>5. Chairfast, unable to ambulate and is unable to wheel self.</li> <li>6. Bedfast, unable to ambulate or be up in a chair.</li> </ul>
M1870- Feeding or	Current ability to feed self	<ul style="list-style-type: none"> <li>0. Able to independently</li> </ul>

Eating	<p>meals and snacks safely.</p> <p>Note: this only refers to the process of eating, chewing, and swallowing, not preparing the food to be eaten.</p>	<p>feed self.</p> <ol style="list-style-type: none"> <li>1. Able to feed self independently but requires (a) meal set-up; or (b) intermittent assistance or supervision from another person; or (c) a liquid, pureed or ground meat diet.</li> <li>2. Unable to feed self and must be assisted or supervised throughout the meal/snack.</li> <li>3. Able to take in nutrients orally and receives supplemental nutrients through a nasogastric tube or gastronomy.</li> <li>4. Unable to take in nutrients orally and is fed nutrients through a nasogastric tube or gastronomy.</li> <li>5. Unable to take in nutrients orally or by tube feeding.</li> </ol>
--------	--	--

Centers for Medicare & Medicaid Services (2009). Outcome and assessment information set (OASIS-C). OMB #0938-0760.

## Appendix D

**Nurse-Rated Quality of Care**

The question below is being used to assess your perception of the quality of nursing care provided by your home health care office on the last day you worked. Please indicate your answer by circling the appropriate number.

	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Excellent</b>
In general, how would you describe the quality of nursing care delivered to patients in your home health care office on the last day you worked?	1	2	3	4

*Sochalski, J. (2004). Is more better? The relationship between nurse staffing and the quality of nursing care in hospitals. Medical Care, 42(2 suppl), II-67 - II-73.*

## Appendix E

**Demographic Questionnaire**

This section asks general questions about you and your background. Please circle the correct response, or fill in the blank.

1. Which of the following best describes your current position?
  - a) Field nurse
  - b) Clinical manager
  - c) Nurse educator
  - d) Other: (specify)\_\_\_\_\_
2. How many years have you worked in home health care? \_\_\_\_\_
3. How long have you worked in your present position? \_\_\_\_\_
4. Please indicate the highest nursing degree that you have earned:
  - a) Associate degree/diploma
  - b) Baccalaureate degree
  - c) Masters degree
  - d) Doctorate
5. Please indicate the highest degree that you have earned in a field other than nursing:
  - a) Associate degree/diploma
  - b) Baccalaureate degree
  - c) Masters degree

d) Doctorate

e) None

6. What is your current age? \_\_\_\_\_

7. In what year were you first licensed as an RN? \_\_\_\_\_

8. What is your gender?

a) Female

b) Male

9. What is your race/ethnicity? \_\_\_\_\_

Curriculum Vitae  
Elizabeth J. Kleber, MSN, RN  
June 5, 1964 Princeton, New Jersey

### **Education**

- South Brunswick High School: Diploma, 1982
- Princeton Medical Center, Princeton, New Jersey: Licensed Practical Nurse, 1985
- Middlesex County College, Edison, New Jersey: Associate in Applied Science in Nursing, 1989
- Kean University, Union, New Jersey: Bachelor of Science in Nursing, 1993
- Kean University, Union, New Jersey: Master of Science in Nursing, 2001
- Rutgers the State University of New Jersey: PhD in Nursing Research, September 2006- present.

### **Professional Experience**

Robert Wood Johnson University Hospital (RWJUH): 1987 to 2010

- CCU (05/91 to 02/95), Homecare (02/95 to 11/99), Outcomes Manager (11/99 to 1/01), Nursing Education Specialist (1/01 to 7/06), Coordinator, Cardiac Catheterization (7/06- 4/07), Administrative Director, Homecare Services (4/07- 1/09), Administrative Director, Case Management (12/08- 9/8/10)

Bayada Home Health Care: 2010 to present

- Manager, Home Health Clinical Leadership ( 9/10- 12/14), Director, Home Health Clinical Leadership (1/14- present)

### **Publications**

Jasovsky, D., Dornan, L., Geisler, L., Douglas, P., Bernard, A., Kleber, E. (2005). Magnet Demographic Data: Creating an on-line system to streamline the process. *Journal of Nursing Administration*. 35 (11), 490-496.

Sanzero-Eller, L., Kleber, E., Wang, S.L. (2003). Self Reported Research Knowledge, Attitudes, and Practice of Health Professionals. *Nursing Outlook*. 51 (4), 165-170.