The Relationship of Organizational Variables and Patient Outcomes in a Home Healthcare Setting

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ABSTRACT

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Financial and regulatory changes in home healthcare pose a tremendous challenge to achieve patient outcomes that are sensitive to nursing care and patient satisfaction. This study described the relationship of patient, nurse, and agency characteristics, nursing care processes, nurses’ understanding of their roles, nurses’ decision-making, and patient outcomes. Research questions investigated the relationship among selected variables and patient outcomes, and whether the relationship differed based on agency ownership and location.

In a convenience sample of 43 agencies components, 205 nurses reported their perceptions of their roles, decision-making, care processes, and patient outcomes, and 325 patients completed satisfaction surveys. Demographic information about nurses and patients was also collected.

Findings indicated that nurses’ understanding of their role, length of employment, and agency ownership were related to nurses’ decision-making. Nurses employed by corporate agencies interacted more with supervisors and used more rules for nursing practice than nurses employed by state agencies.

Nurses reported that 80% of patient outcomes were achieved and patients reported 92% satisfaction with care. Differences in patient outcomes or patient satisfaction were not related to agency ownership or location. Thus patients in the study received good care
and were very satisfied no matter which agency provided the care whether in a rural or urban area. When all dimensions of nursing care processes and nurses’ decision-making were analyzed, the resulting model accounted for 39% of patient satisfaction and 29% of nurses’ perceptions of patient outcomes.

Findings identified a method of combining the dimensions of nurses’ decision-making to fit the dimensions of nursing care processes. Three combinations emerged that produce the best outcomes: 1) when care was complex, nurses consulted with supervisors, 2) when patients had varying medical diagnoses, nurses used rules to guide decisions, and 3) when patients needed close monitoring, nurses collaborated with peers. Home healthcare managers may use this method of tailoring nurses’ decision-making strategies to fit the nursing care processes to improve patient outcomes.
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CHAPTER I

Introduction

Registered nurses are the embodiment of home healthcare. Medicare regulations define home healthcare as the part-time or intermittent skilled nursing services and other therapeutic services provided on a visiting basis in a patient’s home. While not every home health agency is required to accept Medicare patients, many home health agencies seek Medicare certification to be able to provide a broad range of services and to demonstrate a degree of quality to the general public. To qualify as a Medicare provider, a home health agency must retain a registered nurse on the board that develops the home healthcare agency policies, and a physician or registered nurse must supervise the home health services (Medicare Home Health Agency Manual, 1993). Registered nurses, thus, are responsible for providing patient care as well as maintaining high quality home healthcare outcomes.

Home healthcare nurses work with colleagues from other disciplines as a patient care team to provide patient care in their homes (Harris, 1999b; McHugh et al., 1996). Nurses take a leadership role in the patient care team. In home healthcare, the registered nurse is often the patient’s care manager. As care manager, the nurse facilitates the activities of home healthcare team members. Although the team members are not all present in the patient’s home at the same time, team members coordinate their care to attain and maintain high quality patient outcomes.
As managers of the home healthcare team, nurses use a variety of theories and concepts to guide their practice. Management theory, sociotechnical theory and role theory are a few of the theories that can provide a way to understand the important relationships among organizational variables associated with patient outcomes.

Management theory suggests that technology, organizational structure, technology/structure fit, ownership status, and location of the home health agency are key variables that influence outcomes (Alexander & Bauerschmidt, 1987; Alexander & Randolph, 1985; Anderson & McDaniel, 1999; Donabedian, 1988; Leys, 1998; Zinn & Mor, 1998). “Sociotechnical system theory defines technology in terms of inputs” (Fox, 1995, p. 98). In home healthcare, the patient is the input. Thus, nursing technology can be defined as the process nursing personnel employ to change the status of an individual from a patient to a discharged person (Alexander, 1996).

In the sociotechnical system theory, social structure comprises the organization of work roles (Alexander & Bauerschmidt, 1987; Fox, 1995). In home healthcare nursing, organizational structure represents the collaboration, coordination, power, reporting relationships between workers and allocation of work responsibilities on the home healthcare team (Marrelli & Hilliard, 1998).

The main premise of sociotechnical system theory is that for a quality result to occur, congruence between the technology and structure of an organization must exist (Fox, 1995). This congruence is known as the technology/structure fit. For nursing, the nursing technology/organizational structure fit is an important determinant of patient outcomes (Alexander & Bauerschmidt, 1987).
Role theory suggests that role clarity is an important concept related to how nurses understand their role that can influence patient outcomes (Glisson & Hemmelgarn, 1998; Rizzo, House, & Litzman, 1970). Role clarity is defined as low levels of role conflict and role ambiguity (Kroposki, Murdaugh, Tavakolis, & Parsons, 1999). Furthermore, role clarity may influence nurses' decision making and, ultimately, organizational structure in the home healthcare setting.

Nurses are employed by home healthcare agencies and are influenced by the agency’s purpose and mission statement derived from its ownership status. Although ownership status of a healthcare agency has been studied in relation to patient outcomes in hospitals (Baker et al., 2000) and long term care settings (Brannon, Mor, Zinn, & Davis, 1998), little is known about the relationship of home healthcare agency ownership to either nursing technology or organizational structure which, in turn, are related to patient outcomes. In South Carolina, the Department of Health and Environmental Control classifies its licensed home healthcare agencies as corporate, church, non-profit, county (hospital-based), or state (South Carolina Department of Health and Environmental Control, 2000).

Attainment of quality outcomes in home healthcare is a national concern. Home health care is provided in both rural and urban settings. Studies show that rural populations have limited access to organized health care in general and home healthcare in particular. Even before the Balanced Budget Amendment of 1997 mandated cutbacks in home healthcare (Harris, 1998), Pierce and Luikert (1997) lamented the lack of healthcare in rural communities. Cogdon and Magilvy (1995) found that home health in rural areas changed in recent years. Few studies have been conducted on home health
outcomes in rural areas (Cogdon & Magilvy; Magilvy, Brown, & Dydyn, 1988; Magilvy, & Lakomy, 1991). Resources in rural counties may be limited. Thus, the location of the home healthcare agency is an important variable to consider when studying home healthcare.

Because the patient is the focus of patient care measures in home health agencies, this study examined the influence of selected organizational variables on patient outcomes. Nurses and patients perceive patient outcomes, or the results of care, differently (Eriksen, 1995).

For the nurse, the outcome can be defined as the change in the patient's condition from a person requiring care to a person no longer requiring nursing care (Alexander, 1996). Patient outcomes that are sensitive to nursing care represent the improved or maintained health status of a patient that results from nursing care (Marrelli & Hilliard, 1998). Patient outcomes that result from nursing care are important because these outcomes reflect the practice standards of the nursing profession and can be used to evaluate the effectiveness of the performance and quality of nursing practice (Johnson & Maas, 1997). Nurses who wish to improve clinical practice are interested in outcomes that are sensitive to nursing care (Crawford, Taylor, Seipert, & Lush, 1996; Peters, 1995). By examining patient outcomes that are a result of nursing care, managers can provide timely feedback to nurses delivering care and can use these data to learn and improve clinical practice (Bauman, 1991).

For the patient, satisfaction with care is an important outcome (Ford, Bach, & Fottler, 1997). Patient satisfaction can be defined as the patient's perceptions of care received compared to the care the patient expects. Expectations of care are the patient's
beliefs formed by patient's characteristics and experiences in previous encounters with
the characteristics and behaviors of health care providers (Westra et al., 1995, Eriksen,
1995).

In home healthcare, nurses usually refer to these individuals as "clients" to
reflect the holistic care that is provided. However, since Medicare guidelines refer to the
individuals as "patients", this study called individuals cared for in their homes patients
(Medicare Home Health Agency Manual, 1993). However, this convention does not
preclude using definitions and instruments that use "clients" as the label for those
individuals receiving care.

Assessing the influence of the connection between nursing technology and
organizational structure on patient outcomes is a high research priority for nursing
because knowledge of these variables will help nursing managers and administrators
develop strategies to improve the quality of patient care (Humphrey, 1999; Lynn,
Layman, & Richard, 1999). Researchers have demonstrated a link between nursing
technology and structure with the quality of care in acute care hospitals and nursing
homes (Alexander & Bauerschmidt, 1987; Anderson & McDaniel, 1992; Mark &
Hagenmueller, 1994). Others demonstrated the link between technology and structure
with community health nurse satisfaction (Cumbey & Alexander, 1998). Another setting
that remains is a study of the links between the nursing technology/organizational
structure fit and patient outcomes in the home health setting. In addition, this study
investigated the linkages between role clarity and organizational structure, and the
linkages among agency ownership, location, nursing technology, organizational
structure and patient outcomes.
Purpose

The first purpose of this cross-sectional, descriptive study was to assess the relationship of patient, nurse, agency characteristics, nursing technology and organizational structure. Secondly, this study investigated the best nursing technology/organizational structure fit to predict patient outcomes in home healthcare agencies in rural and urban counties in South Carolina. The predictor variables were nursing technology, role clarity, organizational structure, and the nursing technology/organizational structure fit. The outcome variables are nurses’ perceptions of patient outcomes that are sensitive to nursing care and patient satisfaction.

The research questions examined the relationship of patient and agency characteristics and nursing technology, the relationship of nurse characteristics and agency characteristics and role clarity and organizational structure. The research questions investigated the differences in nursing technology, organizational structure and patient outcomes based on agency ownership and location. Finally, the research questions explored the best fit between nursing technology and organizational structure to predict patient outcomes that are sensitive to nursing care and patient satisfaction in home health agencies across South Carolina.

Significance of Outcomes Research in Home Healthcare

In home healthcare, outcomes research is important to many stakeholders such as the patient and family, the providers of care, the home healthcare agency, third party payers, and the community (Huber & Oermann, 1999). This study examined patient outcomes from the perspectives of the nurses providing the care and the patients receiving the care. From the perspective of nurses, patient outcomes provide a way to...
demonstrate nurses’ contribution to the patient’s health state (Maas & Head, 1998). From the perspective of the patient and their families, the achievement of desirable outcomes meets their expectations of satisfaction with a healthcare delivery system (Cook, 1997). A better understanding of organizational variables that influence patient outcomes is important because nurse managers can change organizational factors to improve the delivery of patient care. Once the nurse manager knows the nurses’ perceptions of the organizational variables, the manager can make decisions to adjust working conditions. Some adaptations may be to clarify the nurses’ roles, improve nursing processes, or change reporting relationships to improve patient outcomes.

The organizational variables in this study were chosen because nurses can use this knowledge to make adjustments that improve care within the agency. For example, nurse managers could develop policies and procedures to facilitate standardized approaches to patient conditions. A second strategy could be to plan meetings to facilitate peer communication to resolve patient care problems. A third approach could be to design a communication system to improve nurse-to-supervisor communication about patient care issues.

While an understanding of the inter-organizational factors that effect the delivery of nursing care is the focus of this study, nurses must also be aware of external factors influencing home healthcare nursing. Legislation has had a profound impact on home healthcare nursing. A historical perspective of home healthcare legislation is essential to understanding some of the role stresses and changes encountered by home healthcare nurses.
Background of Legislation Influencing Home Healthcare Nursing

Home health nursing is a central intervention encompassing a patient-nurse encounter in the patient's home (Byrd, 1995; Cogdon & Magilvy, 1995; Wilson, 1993). Home health services function “to restore, improve, or maintain the health status of persons who are under the care of their attending physician and who are confined to their places of residence because of illness or injury” (South Carolina Department of Health and Environmental Control, 1975, p. 1). The ability of nurses to provide health care in the home, especially for the poor, has changed over the years based on other’s willingness to pay for the service. Nurses who practice in the home setting are challenged to resolve conflicts that arise between the agency goals and the family goals (Coffman, 1997). Agency goals are often related to funding sources.

In the 1800s, home health nursing for the poor was funded by charitable societies such as the Ladies Benevolent Society (LBS) of Charleston. Insurance companies, such as Metropolitan Life Insurance Company, funded home health visits in the early 1900s. When differences developed between the LBS goals and the Metropolitan Life Insurance Company goals, the LBS home health service ended the contract and its ability to serve the poor declined to the levels served fifty years earlier (Wilkerson, 1992).

The Metropolitan Life Insurance Company, American Red Cross, and the South Carolina Tuberculosis Association promoted and expanded public health nursing in South Carolina in the early 1900s. However, by the 1930s federal and state cutbacks caused the public health department services to decline (Alford, 1992; Burchett, 1996).
In the United States before 1945, one-fourth of the 685 home health agencies were public health agencies. The funding sources for home health agencies varied by region within the United States. In the South, the majority of home health agencies were official agencies rather than visiting nurse associations (Ryder, Smith, & Elkin, 1969). In South Carolina, lack of state and local funding severely limited the availability of home healthcare (Burchett, 1996).

In 1965, Congress passed Medicare providing the motivation to increase home health coverage to Medicare-eligible patients. In South Carolina, the two private visiting nurse agencies decided not to participate but the 46 county health departments chose to become Medicare certified. In 1970, the South Carolina General Assembly passed a law authorizing county health departments to collect fees for home health services. Thus, home health became available to South Carolina citizens on a sliding scale basis (Burchett, 1996; Dantzler, 1974).

With the advent of Medicare, the federal government exerted a significant influence on home healthcare. When Medicare legislation was passed, Congress intended to improve access to care and to decrease the use of institutionalization. In 1965, home healthcare was promoted as an inexpensive alternative to hospitalization and nursing home care. Medicare patients discharged from hospitals could qualify for 100 days of home care on a fee-for-service basis (Conley & Walker, 1998; Tahan, 1999).

In the 1970s, several laws were passed to more tightly regulate health care but home healthcare grew. In 1980, the Omnibus Reconciliation Act expanded the benefits of Medicare, removed the three-day hospitalization requirement for home health, and
permitted for-profit home health agencies to become Medicare-certified. Throughout the 1980s, Congress passed legislation that put restrictions on hospital care and promoted home healthcare. Tahan (1999) claimed that these legislative events and regulations both promoted and curbed instances of fraud and abuse in the home healthcare industry.

During the 1990s home healthcare was ignored in the attempt to control health care costs. Between 1989 and 1993, home healthcare grew at 23% annually and accounted for 6% of non-acute care spending in the United States (Schwartz, 1998). Policy makers and Congress continued to be concerned about rising medical costs even as home healthcare agencies proliferated and their costs spiraled upward.

Research showed that changing from cost-based reimbursement to predetermined rates for Medicare home healthcare visits would not lead to large savings for the Medicare program. However, these changes would not increase costs to Medicare or adversely affect patients or their caregivers (Brown et al., 1997). In 1995, home healthcare agencies increased from 1,300 in 1987 to 2,360 (Harris, 1996). In 1996, Medicare's spending for home healthcare rose from $3.5 billion in 1990 to $17 billion. In 1997, approximately 3.7 million Medicare recipients received home healthcare annually (Zaldivar, 1997).

In 1997, the Balanced Budget Act (BBA) changed the funding for home healthcare. The BBA revised the eligibility criteria for patients receiving home healthcare, required all Medicare certified home health agencies to post a surety bond, and changed the payment system from fee-for-service to an interim payment system (Conley & Walker, 1998; Harris, 1998; Harris, 1999a; Milone-Nuzzo, 1998; Tahan, 1999).
Despite intense lobbying from the home healthcare association, nurses, and patients to delay the implementation of the interim payment system and subsequent prospective payment system (HCAA Update, 1999; Stewart, 1998; Stoker, 1999), the prospective payment system was implemented as scheduled on October 1, 2000. Home healthcare agencies developed strategies to cope with the resulting cutbacks and layoffs (Marcus, 1998; Schutzmann, 1999; Waters, 1999).

Today, home health nurses function in an uncertain environment. They must provide excellent care to patients in their own homes while providing adequate documentation for reimbursement from third party payers (Cogdon & Magilvy, 1995). Inadequate documentation puts the home health agency at risk for insolvency. These environmental stresses may influence providing quality patient care and the resulting patient outcomes.

These rapid legislative changes influencing home healthcare create a need to examine the organizational variables that influence the patient outcomes (Jitramontree, 2000). Financial and regulatory changes challenge the home healthcare managers to examine variables associated with quality care. Thus, as patients receive a greater proportion of care in the home setting, home healthcare managers must adjust the delivery of care to ensure quality patient outcomes and patient satisfaction.

Concerned Americans seek to remove barriers to quality healthcare delivered in all settings. One concern is providing high quality home healthcare in rural areas. Research comparing the interplay of nursing technology and organizational structure to patient outcomes in both urban and rural counties will give the scientific rationale for making recommendations to improve the attainment of quality home healthcare.
Concepts of Interest

The predictor concepts of interest are nursing technology, role clarity, organizational structure, the nursing technology/organizational structure fit, and the ownership status and location of the agency. The dependent variables are the nurses’ perception of patient outcomes that are sensitive to nursing care and patient satisfaction.

Nursing Technology

“Technology is human innovation in action. It involves the generation of knowledge and processes to develop systems that solve problems and extend human capabilities” (International Technology Education Association, 1996, p.16). Technology “extends people’s abilities to modify the natural world” (p. 28).

Technology, as defined by management theorists, represents the actions or task responsibilities of personnel performed on raw material to alter the raw material in the desired fashion; the equipment, supplies, physical material to provide a service; knowledge used to provide the service or operate the equipment; or a set of procedures aimed at changing the physical, psychological, social, or cultural attributes of people to transform them from a given status to a new status (Fottler, Hernandez, & Joiner, 1988; Hall, 1999; Hasenfeld, 1983; Hodge, Anthony, & Gales, 1996; Perrow, 1967). In health care, patients are the raw materials who receive care. Defining technology in a service organization poses a particular challenge because of the uncertain, unpredictable, and variable nature of the technology involved (Hodge et al.). In social science research, the technology refers to the total knowledge, skills, and techniques used in a work setting (Hall, 1999; Pasmore, Francis, Haldeman, & Shani, 1982).
Technology is the total of all the work done by a group of people to accomplish the goals of the group. Using a management perspective, nursing technology is defined as the nursing care processes used to transform an individual from the status of a patient to a person no longer needing nursing care (Alexander, 1996; Alexander & Kroposki, 2001b). In home health nursing, the nursing care process (nursing technology) transforms the homebound person under physician’s care who has a skilled nursing need to a person whose home healthcare goals are met. Once the patient’s goals are met the patient is discharged from the care of the home healthcare agency.

This study considered several variables that may be related to nursing technology such as patient characteristics and agency characteristics. Patient characteristics may be related to nursing technology because nursing care is provided based on patient needs and the age of the patient. Patient needs and age are two patient characteristics that were gathered. Other patient characteristics such as medical diagnosis and objective health status that may be related to nursing technology but these were not gathered because of limited resources. Agency ownership status and location were gathered. These agency characteristics may be related to nursing technology because of the richness or paucity of resources available to the agency.

**Role Clarity**

Low levels of role ambiguity and role conflict characterize role clarity. Role conflict results from the incompatibility between the nurses’ expected behaviors in the job and the nurses’ professional values, time, resources, and capabilities. Role ambiguity is a result of inadequate information about how to perform the job properly.
Role clarity is an important component of organizational structure and has been shown to be related to patient outcomes (Glisson & Hemmelgarn, 1998).

**Organizational structure**

The concept of organizational structure comprises the occupational roles of home healthcare nurses. Organizational structure determines whether a worker views the outcome as his or her responsibility (Fox, 1995). In addition to examining the relationship of role clarity to organizational structure several other structural components were investigated: types of decision-making strategies used by nurses, nurses characteristics, and agency characteristics. Nurses’ decision-making included making determinations based on interactions with their supervisor, through interactions with their peers, or by following established policies and procedures (Alexander, 1996; Bellen, 1997). The current study investigated specific nurse characteristics such as age, tenure in the home healthcare agency, and education. Another predictor of organizational structure included the agency characteristics of ownership and location.

**Nursing Technology/Organizational Structure Fit**

The nursing technology/organizational structure fit is the match between specified dimensions of nursing technology and organizational structure (Alexander & Randolph, 1985). Findings of nursing research have suggested that the nursing technology/organizational structure fit is a better predictor of an effective nursing unit than either the level of nursing technology or level of organizational structure alone (Alexander, 1996).
Agency Ownership

Home healthcare agencies in South Carolina are classified as church, county, corporation, non-profit, or state. Each ownership type has a different culture. Employees work together differently in each of these cultures because of the availability of resources. The financial and human resources that are available to corporations are rarely available to non-profit agencies. The goal of the corporation is to make a profit for the shareholders. Non-profit agencies show a greater sensitivity to constituents who make up the organization and are concerned about people getting along (King, 2000). Public agencies may have restrictions that are different from those experienced by nonprofit agencies and corporations.

In South Carolina, the Department of Health and Environmental Control operates home health agencies in each county. The Department of Health and Environmental Control is the governmental agency that licenses, regulates, and enforces the law in all home healthcare agencies (South Carolina Department of Health and Environmental Control, 2000). Thus, in South Carolina, in some counties, state run home healthcare agencies compete for patients with church, corporate, county, and nonprofit home healthcare agencies.

Geographical Location

Patient and home healthcare units are located in both rural and urban counties. Definitions of rural and urban are not clear. Rural counties differ from urban counties on the basis of population number, values of the residents, and physical differences of the place (Krout, 1986). These differences may lead to different levels of home healthcare demand and different levels of access to services. For purposes of this study, the
definition used for rural and urban was determined by U. S. Census Bureau data that identifies Metropolitan Statistical Areas (U. S. Bureau of the Census, 1997). If a county is located in a Metropolitan Statistical Area (MSA), the county is designated as a non-rural (urban) county. Counties located outside an MSA are designated as rural. Using this designation, South Carolina contains 30 rural counties and 16 urban counties. Using this categorization, census data shows that 45% of the population of the state lives in rural counties and 55% of the population of the state lives in urban counties (Jordan, 1997, personal communication).

Patient Outcomes

Outcomes are the results that “occur after a process is carried out or interventions have been implemented” (Bellen, 1997, p. 207), which is consistent with the definition suggested by Alexander (1996). Positive patient outcomes represent the basic reason for providing care. Patient outcomes were assessed from both the nurses’ and the patients’ perspectives.

Nurses assess the achievement of patient outcomes that are specific to the interventions implemented by nurses. Patient outcomes are defined as outcomes achieved by patients that are attributable to the contributions of nurses to patient care (Brooten & Naylor, 1995, Jones, Jennings, Moritz, & Moss, 1997; Oermann & Huber, 1999).

Secondly, patients’ perceptions of their satisfaction with care is an important outcome variable (American Nurses Association, 1995; Ford, et al., 1997). Patient satisfaction can be defined as the patient’s evaluation of the process, structure, and outcomes of care (Reeder & Chen, 1990), which is consistent with the definitions
suggested by Westra et al. (1995) and Eriksen (1995) that patient satisfaction is the
patient's perceptions of care received compared to the nursing care the patient expects.
Patient satisfaction with role performance of nurses gives useful information to nurse
managers about the quality of care being provided by home healthcare nurses and has
implications for improving the delivery of care.

Since all of healthcare is facing continuous change (Parsons, Murdaugh, &
O’Rourke, 1998), nurses can use the results of this study to understand their influence
on patient outcomes. The findings will be important to consumers, payers, accreditors,
and regulatory agencies. Changes in health care funding and regulations in home health
have accelerated the need to study nurses’ influence on patient outcomes.

Assumptions
These are some assumptions made while conducting this study:

- Registered nurses are the majority of the home healthcare managers.
- Patient care is defined as nursing care provided by the home healthcare nurses in a
  patient’s home.
- Nurses’ perceptions of nursing technology and organizational structure are proxies
  for important patient care team variables.
- Nurses’ perception of the level of outcomes is a measure of patient care outcomes.
- Patient satisfaction with care is a reflection of the care received during interaction
  with the home healthcare nurses.
- Technology in home healthcare remains the same in the short run but may change
  over the long run and in response to regulatory changes.
• In the short run, home health care managers have more influence on organizational structure than on technology.

• Quality patient care is a desirable outcome in home healthcare.

Summary

Nursing technology, role clarity, organizational structure of groups of nurses are important organizational variables that may predict patient outcomes. Knowledge of how to adjust these variables may give the nurse manager a way to improve patient outcomes despite the legislative and financial pressures in home healthcare.
CHAPTER II
Review of the Literature

Home health leaders point to the need for research to improve or maintain quality patient outcomes in home health care (Bellen, 1997; Harris, 1996; Ruane & Ruane, 1997). While home healthcare is an important setting for nursing practice, little information is available in the literature to describe the relationship between home healthcare organization and patient outcomes (Zinn & Mor, 1998). Selected variables representing nursing care processes and organizational structure as well as the ownership and geographic location of the home healthcare agency are important factors that have been shown to influence outcomes. The literature review describes selected studies about the organizational variables that have been conducted in healthcare and in home healthcare.

The first section presents research related to organizational variables that influence patient outcomes. These variables are nursing care processes (nursing technology), role clarity (nurses’ understanding of their role), nurses’ decision-making (organizational structure), and the nursing technology/organizational structure fit of the nursing work-group. The second section describes research associated with agency variables, specifically ownership type and location of the provision of healthcare. The third section describes the research about two important patient outcome indicators in home healthcare: nurse-sensitive patient outcomes and patient satisfaction with nursing
care. The chapter concludes with a description of the conceptual framework, relationships of the research variables, and the relational statements used in this study.

Organizational Variables

In this section, research is presented about what is known and the gaps in knowledge concerning the organizational variables that influence patient outcomes in home healthcare settings. Organizational variables included nursing care processes (nursing technology), role clarity (nurses' understanding of their role), nurses' decision-making (organizational structure, and the nursing technology /organizational structure fit. These variables are important because of their association with each other and the association of nursing technology/ organizational structure fit to quality patient care. One measure of quality patient care is patient outcomes. In the long run, nursing care process (nursing technology) is relatively inflexible whereas nurses’ decision-making (organizational structure) is more amenable to change (Alexander & Kroposki, 2001b). By knowing the nurses’ decision-making (organizational structure), the manager of patient care can improve patient outcomes by adjusting nurses’ decision-making to correspond to the nursing processes to improve the quality of care.

Nursing Care Processes (Nursing Technology)

According to management theorists, technology “consists of the tools, techniques, devices, artifacts, methods, configurations, procedures, and knowledge used by organizational members to acquire inputs, transform inputs into outputs and provide outputs or services to clients of customers. In the sociotechnical systems perspective, choices about such things as how the technology is laid out are as important as choices about which technologies to use, since the layout and type of technology both affect how humans feel about their work, and consequently how well they perform it” (Pasmore, 1988, p. 56).
Using this management perspective, researchers have defined nursing technology as the caring processes performed by nurses (Alexander, 1993; Alexander & Kroposki, 2001b; Jones & Alexander, 1993; Mark, Sayler, & Smith, 1996). From the nursing perspective, nursing technology changes a patient’s health status from a patient to a person no longer needing nursing care (Alexander, 1996, Alexander & Kroposki, 2001b). Within the nursing domain, nursing technology is conceptualized as nursing processes, equipment, and the extension of the nurse as a caring person (Alexander, 1996; Loscin, 1995; Schoenhofer & Boykin, 1998; Smith, 1995).

Nursing technology in healthcare. Several studies provide support to differentiate nursing units on the basis of nursing technology (Leatt & Schneck, 1981; Mark & Hagenmueller, 1994; Overton Schneck, & Hazlett, 1977). In a study conducted to describe nursing technology, Overton et al. (1977) analyzed the responses of nurses on seven types of nursing units in hospitals. Five randomly selected nurses on each of 71 nursing units in hospitals completed a 34-item questionnaire. A factor analysis of the responses showed that three independent factors describe technology on units in hospitals. The researchers labeled the factors uncertainty, instability and variability. The researchers found significant differences in technology among some nursing units. The study demonstrated a way to measure the attributes of nursing technology in hospitals and other settings.

Leatt and Schneck (1981) replicated the study of Overton et al. (1977) by measuring nursing technology on 157 units in 24 hospitals. Nurses on nine different types of hospital units completed a 21-item questionnaire. Factor analysis of the responses verified that nursing technology had three factors: instability, uncertainty, and
variability. Thus, the findings provided evidence that the measurement instrument had a high degree of construct validity. The authors suggested that the instrument is a quick method to obtain the level of nursing technology on patient care units.

Alexander and Randolph (1985) demonstrated the relationship of the technology structure fit to patient outcomes in a study of 27 patient care units in three acute care hospitals. In the study, technology was measured on the three dimensions: instability, variability, and uncertainty. Instability (I) refers to the extent to which the nurses’ practice fluctuates because of the patients’ conditions. Variability (V) refers to the different types of patients and the different types of tasks that are required based on patient needs. Uncertainty (U) is the extent to which the nurses’ work is difficult to understand and complex (Alexander & Randolph, 1985). These dimensions of technology are particularly important for home healthcare nurses who find that patients are being discharged earlier from the hospital to home care. Many of the patients have multiple medical conditions and limited resources that must be addressed in addition to the admitting diagnosis.

Mark and Hagenmueller (1994) described the relationship of technology and the environment of intensive care units. Registered nurses with at least three months experience in nine types of intensive care units completed questionnaires about nursing technology. Factor analysis of the responses yielded two factors (task immediacy and task similarity) for nursing technology in intensive care units. The factor of task immediacy contained items previously labeled instability and uncertainty, and the factor labeled task similarity contained items previously labeled variability. The authors note that the instrument was adapted for use in intensive care which may account for some of
the differences in the factor analysis results. Despite these findings, the results showed that significant differences existed among some units based on the technology factors.

Alexander (1996) evaluated nursing technology and organizational structure on 12 nursing units in a psychiatric hospital over a 3-month period. The findings of the study provided support for her assumption that “in the short run, technology on nursing units is constant” (p. 50). This finding is important because it provides direction to nurse managers to make an effort to change the structure rather than technology on nursing units.

Alexander and Kroposki (2001b) further explored the concept of nursing technology from a management perspective. They compared the nursing technology on 14 nursing units ten years apart. The results indicated that some dimensions of nursing technology on some nursing units change over time. This finding suggests that nurse managers should periodically reassess nursing technology before making management changes.

Nursing technology in home healthcare. Few studies describe the nursing technology associated nursing in the home health setting (Alexander, Thomas, & Cumbey, 1993). One reason may be that nursing researchers rarely use management theories to describe the work of nurses. The work of nurses is usually called nursing processes, not nursing technology.

Nursing technology has been studied by researchers in home health under the name of the work of nursing, nursing care processes, resource consumption, resource utilization (Fortinsky & Madigan, 1997; Hays, 1992; Hays, Willborn, & Lopez, 1997; Peters, 1988; Robinson et al., 1999). Peters (1988) developed the Community Health
Intensity Rating Scale (CHIRS) to capture patient characteristics as well as nursing interventions. The CHIRS "reflects the intellectual aspects of nursing as well as the performance of discrete nursing tasks" (Hays, 1992, p. 139). Using the CHIRS, Hays et al. (1997) were able to differentiate between the nursing requirements of public health nursing clients and home health clients. However, the CHIRS is used primarily to predict need for individualized nursing care. The CHIRS is not useful to compare how nursing technology and structure fit together to produce desired nursing unit based patient outcomes.

Alexander, Thomas, and Cumbey (1993) examined nursing technology in the home healthcare setting. They found that nursing technology for home care had a moderate degree of instability, variability, and uncertainty. When home health technology scores were compared to nursing technology scores from acute care (Alexander & Randolph, 1985), psychiatric care units (Alexander, 1990), long-term care (Alexander 1992), and clinics (Cumbey & Alexander, 1993), home healthcare technology was similar to nursing technology found in clinics (Alexander, 1993). These findings are important to the current study because of the impact of recent legislative changes that make a re-evaluation of the level of nursing technology essential.

In a study to examine the relationship between home healthcare resource consumption and patient outcomes, Fortinsky and Madigan (1997) conducted a prospective cohort design study of 201 patients in ten home health agencies in one state. The researchers conceptualized resource consumption as the total number of home visits received by the patient, cost per visit, and length of stay. The findings suggested that resource consumption patterns were similar for patients who improved or declined in
clinical and functional health. Using these criteria, the researchers found that “the level of resource consumption does not have much influence on improving outcomes” (p. 70-71).

Nursing researchers continue to try to clearly describe the work of nurses. In a study to describe nursing care processes, Robinson et al. (1999) performed secondary data analysis of nursing care processes provided to men who were recovering from a radical prostatectomy. Thirty-two men were randomly assigned to a group to receive home healthcare visits by master's prepared nurses knowledgeable about the care needs of older postoperative cancer patients. The charts of the patients were analyzed to determine what nursing interventions the patients had received. The findings suggested that the home health nursing processes centered on teaching patients and caregivers about managing symptoms, performing procedures, developing a working relationship with the health care team, and grieving the loss of the pre-surgery state. The researchers concluded that the patients were still in the crisis phase of the post-operative period and that additional visits would be required to help transition the patient to the chronic illness phase of recovery. A study limitation was the examination of the nursing processes involved with only one medical diagnosis, radical prostatectomy, and did not address the majority of patients seen in home healthcare.

The current study examined the nursing care processes (nursing technology) for patients with a variety of conditions. Furthermore, the study investigated the percentage of time nurses use for various care processes along the dimensions of instability, variability, and uncertainty.
Nurses Understanding of their Role (Role Clarity)

In classic role theory, individuals should have a specific set of tasks or position responsibilities to perform effectively on the job. Role conflict is an incongruent relationship between the expectations and the individual's professional values, resources, time, and abilities. Role ambiguity is the consequence of inadequate information to perform work correctly (Rizzo et al., 1970). Role clarity is a desirable attribute of nurses in which they experience low levels of role conflict and role ambiguity (Kroposki et al., 1999).

Nurses' understanding of their role (role clarity) begins during their basic nursing education and continues as nurses' work in various settings. Nurses' roles are seen as changing with new roles emerging as a result of the changes in healthcare environment (Johnson, Friend, & MacDonald, 1997). Nurses' perceptions of conflict and ambiguity about their expected behaviors in home health are important because these perceptions can influence the decisions nurses make.

Role clarity in healthcare. Although the contribution of role clarity to job satisfaction among hospital nurses is well documented (Decker, 1997; Kroposki et al., 1999; Sowell & Alexander, 1989), little has been done to link role clarity to organizational structure. In a descriptive study of role conflict and ambiguity among 100 registered nurses in an urban hospital, Sowell and Alexander (1989) found that both role conflict and role ambiguity were inversely related to job satisfaction. Nurses working in intensive care areas perceived a higher level of role conflict and role ambiguity. The researchers suggested that nurses experience greater role conflict and role ambiguity when they are "routinely expected to make life-and-death decisions in their daily work"
but are not given the authority to make such decisions” (p. 31). The authors suggested further investigation of nurses’ role conflict and role ambiguity in other settings.

In a descriptive study in an urban hospital, Decker (1997) examined role relations of 376 nurses to determine to what extent role relations influenced job satisfaction. The occupational role relations that were studied were: relations with the head nurse, relations with peers, relations with the physician, and relations with other departments. The findings suggested that occupational role relations were the important predictors of job satisfaction.

The levels of role conflict and role ambiguity in 688 nursing staff members employed in a hospital about to undergo reengineering were investigated in a cross-sectional descriptive study. The findings suggested that registered nurses had higher levels of role conflict and role ambiguity than non-registered nurses. Furthermore, role clarity was shown to be a predictor of organizational commitment and job satisfaction (Kroposki et al., 1999). Although the current study included only registered nurses, nurses understanding of their role is an important variable to consider as an influence on nurses’ decision-making.

None of these studies examined the relationship of nurses’ understanding of their roles (role clarity) to their decision-making (organizational structure). The current study sought to identify the link between nurses’ understanding of their role (role clarity) and nurses’ decision-making (organizational structure) in home healthcare.

**Role clarity in home healthcare.** Several studies have attempted to describe role issues of home healthcare nurses. Recent studies of new and experienced home health
nurses showed that role issues are a concern among home healthcare nurses (Glisson & Hemmelgarn, 1998; Laffery, Dickenson, & Diem, 1997; Murray, 1998a; 1998b).

Laffery et al. (1997) stated that a great deal of confusion continues about the role of community health nurses. The researchers conducted a study of 43 staff community health nurses practicing in home healthcare, public health nursing, combined public health and home healthcare, and special programs. The findings of the research suggested that a common core role exists among home health nurses, public health nurses, and combined public health and home healthcare nurses while each of these roles had some unique characteristics.

In a qualitative study using a phenomenological design, 25 baccalaureate prepared nurses described their transition from hospital nursing to home health nursing. The nurses identified four groups of stresses “1) dealing with limited access to peer support and equipment, 2) feeling isolated because of decreased opportunities for professional interaction, 3) relinquishing traditional nursing responsibilities to families or other caretakers, and 4) documenting for reimbursement” (Murray, 1998a, p. 58). These findings provided support for the conclusion that roles of home healthcare nurses are unique.

In a cross-sectional study using qualitative methodology, Murray (1998b) evaluated the extent to which home healthcare nurses understood their roles. Participants in the study were 75 nurses employed in 63 home healthcare agencies for less than 24 months. These nurses previously worked in hospital nursing units. Findings suggested that within two years of employment in the home healthcare agency the nurses still had only a moderate understanding of their new role. The researcher
contended that "although nurses employed in both (hospital and home health) settings provide nursing care, their daily routines are quite different in terms of the roles and responsibilities they perform" (p. 288). This finding was important in providing evidence that home healthcare is a distinct nursing role that may not be entirely clear to the practicing home healthcare nurses.

In a quasi-experimental study lasting three years, researchers assessed the effects of organizational factors including role conflict on children's service agencies. The researchers studied both organizational factors and interorganizational coordination factors in services provided to 250 children by 32 public children's service offices in 24 counties in Tennessee. The findings indicated that organizational factors (including role clarity) are the primary predictors of positive service outcomes and a significant predictor of service quality. The patient outcome indicator was the children's improved psychosocial functioning. These findings were important because role clarity and other organizational structure factors, rather than interorganization coordination factors, were more predictive of positive outcomes (Glisson & Hemmelgarn, 1998). This research is important to the proposed study because it links role clarity to patient outcomes in a community setting.

None of these studies described the relationship of home healthcare nurses' perceptions of role conflict and role ambiguity to nurses' decision-making. To fill the gap in knowledge, the current study investigated the relationship of role clarity to organizational structure. In other words, the contribution of nurses' understanding of their role (role clarity) to nurses' decision-making (organizational structure) was studied.
Nurses’ Decision-making (Organizational Structure)

Organizational structure can be defined as the “allocation of work roles and administrative mechanisms to control work activities” (Alexander, 1996, p. 43). Organizational structure is the way nurses decide how to accomplish nursing care processes. Robbins (1990) described organizational structure as consisting of various dimensions: such as complexity, centralization, and formalization. Much research has been conducted to understand various components of organizational structure in various nursing settings (Alexander, 1996; Allred et al., 1995; Anderson & McDaniel, 1992; 1999). Nurses’ decision-making, organizational size, mission, communication and control structures, managed care, integrated delivery systems, nurses roles, interrelatedness of the staff, and the use of multidisciplinary staff are considered organizational structure components that influence outcomes (Anderson & McDaniel, 1999; Barr, 1995; Barter, Graves, Phoon, & Corder, 1995; Mass & Mulford, 1989; Schweikhart & Smith-Daniels, 1996).

Based on a study of 27 nursing units in three acute care hospitals, Alexander and Randolph (1985) described the important organizational structure components on a nursing unit vertical participation (VP), horizontal participation (HP), and formalization. VP refers to the extent to which supervisors and nursing personnel consult together concerning nursing care and decisions. HP is the degree to which nursing personnel are involved with peers in decision-making and in defining nursing care. Formalization is the extent to which rules, procedures, and instructions regarding care issues and decision-making exist and are used. Investigation of these dimensions is particularly important for home healthcare nurses because of the differences between

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their practice and the practice of acute care nurses. For example, interaction with the supervisors and peers is conducted mainly by telephone instead of face-to-face interaction, and procedures for home health may be less well developed for home healthcare than in an acute care setting.

Organizational structure in healthcare. Anderson and McDaniel (1992) conducted an exploratory study of 14 “effective” nursing homes. The researchers attested to the theory that an effective nursing unit is one in which a certain relationship occurs between the nursing technology and organizational structure. The findings of the study suggested that when nursing staff perceives the environment as changing, decentralization, high participation, and greater use of professional nurses are desirable organizational structure components.

Allred and colleagues (1995) investigated other dimensions of structure, namely role differentiation, task coordination, decentralization, and participation in decision-making. This descriptive study was conducted at a 517-bed academic health center. A total of 75 randomly selected nurses returned questionnaires that measured task differentiation, task coordination, decentralization, decision participation and perceived environmental uncertainty. Findings of this study supported the idea that participation in decision-making is an important determinant in patient outcomes.

Alexander (1996) conducted a quasi-experimental study to test the effects of changing the organizational structure on six psychiatric nursing units. The researcher assessed the organizational structure on the patient care units and determined whether the organizational structure was appropriate for the nursing technology of that unit. While the control units had no further contact from the researcher, the researcher
conducted a series of meetings to assist head nurses of the experimental group to make changes in the nurses’ decision-making ability on the experimental units. Specific changes such as restructuring the work situation, increasing meetings, and developing written protocols were implemented on the experimental units. These changes resulted in an organizational structure that more closely fit the nursing care processes on the experimental units. Anecdotal remarks of the nurse manager provided support for the findings and improved outcomes. The author suggested that further investigation is needed to determine the relationship of nurses’ decision-making and nursing care processes and outcomes in a variety of patient care settings.

Anderson and McDaniel (1999) conducted a study to examine the relationship between registered nurses' participation in decision-making and patient outcomes in nursing homes. The researchers controlled for patient variables that might influence outcomes, and were able to examine the effect of the structure characteristic on decision-making. A total of 190 nursing homes responded to the survey. From these 190, the researchers “created two groups, those in the 80th percentile or above and those in the 20th percentile or below in terms of their scores for improvement in resident outcomes” (p. 10). The findings provided evidence that nurses’ participation in decision-making is associated with improvements in patient outcomes without increasing the cost of care. The researchers stated that “this research makes an important contribution to management knowledge because it links a management process to improvements in care outcomes thereby providing new avenues through which managers can improve quality” (p. 13).
Organizational structure in home healthcare. Few studies have examined the
dimensions and components of organizational structure in the home healthcare setting
(Dansky, Brannon, & Wangsness, 1994; Zinn & Mor, 1998). One reason may be that
home healthcare nurses provide patient care in multiple locations. This spatial
differentiation makes the organizational structure of the home healthcare nursing unit
more complex than a hospital nursing unit. Spatial differentiation makes it more
difficult for decision makers to gather information and to communicate with each other
(Robbins, 1990).

Dansky et al. (1994) conducted a descriptive study of organizational structure
variables that influenced patient satisfaction in 13 Medicare certified, not-for-profit
home healthcare agencies in Pennsylvania and Ohio. The components of organizational
structure that were included in the study included: education level of the nursing staff,
tenure at the agency, percentage of full-time and part-time workers, continuing
education, wages, and benefits. Responses from 696 useable patient satisfaction surveys
provided evidence that the home healthcare nurses prepared at the baccalaureate level
and those working full time were associated with higher levels of patient satisfaction.
The current study included education level and tenure in the agency to describe the
sample of nurses.

In an integrated literature review to explore the relationship of organizational
structure to outcomes in ambulatory practices, hospitals, nursing homes, and home
healthcare agencies, Zinn and Mor (1998) examined research published from 1976 to
1998. These studies examined organizational structure components including payer mix
(five studies), staffing ratios (8 studies), years of physician experience (6 studies), years
of nurse experience (1 study), continuing education (1 study), primary care specialization (1 study) ownership (9 studies) teaching affiliation (9 studies), size (14 studies), volume (15 studies), procedures (5 studies), job descriptions of interdisciplinary team members (4 studies), and decision-making (7 studies). The researchers concluded that information is inadequate to explain the relationship of home healthcare structure to outcomes.

Nursing Technology/Organizational Structure Fit

"Theorists have proposed that the fit between the technology of an organization and its structure can be linked to organizational effectiveness" (Alexander & Bauerschmidt, 1987, p.1). Technostructural fit is defined as the absolute difference between specific dimensions of nursing technology and organizational structure (Alexander & Randolph, 1985).

Nursing technology/organizational structure fit in healthcare. In a study conducted "to determine whether a simplified measure of fit between technology and structure would relate to quality of care in nursing subunits" (p. 845), Alexander and Randolph (1985) surveyed 151 nurses on 27 nursing units in acute care hospitals. The researchers concluded that the fit between the dimensions of nursing technology (instability, variability, uncertainty) and the dimensions of organizational structure (vertical participation, horizontal participation, formalization) is a better predictor of performance than when the dimensions of nursing technology or organizational structure were considered individually. This finding forms the foundational framework for the current study.
Alexander and Bauerschmidt (1987) further studied the use of the technostructural model to predict the effectiveness of patient care units based on the fit between nursing technology and organizational structure. The researchers found “that the fit between variability and horizontal participation” is significant (p. 7). The connotation of this finding is that wide variation in the patient’s medical diagnosis should be matched with a high degree of peer interaction for decision-making. This relationship should be investigated in the home healthcare setting where peer interaction for clinical decision-making is minimized by the factors of time and distance. A second finding that “the fit between uncertainty and formalization (is) significant” (p. 7) is also important for home healthcare nurses. This finding implies that when the patient’s condition is highly complex, a need for policies and procedures exists to produce good outcomes. The relationship between uncertainty and formalization should be examined because home healthcare is becoming increasingly complex as patients are experiencing shorter in-patient lengths of stay. The current study examined the relationship of dimensions of the nursing technology and organizational structure, and how the nursing technology/organizational structure fit influences patient outcomes in home healthcare.

**Nursing technology/organizational structure fit in home healthcare.** No quantitative studies have been found that examine the technostructural fit in home health. Using qualitative methodology, Ellenbecker and Warren (1998) conducted a descriptive study with 16 home health nurses using six focus groups to identify how the changes in the home healthcare industry have influenced nursing practice and the quality of home healthcare services. Analysis of the data suggested that the nurses had concern for the changes in patient population and the home health care nurses response. The
nurses stated that they have observed changes in their home healthcare patient population. Patients had increased levels of acuity and need, social isolation, ethnic diversity, and advanced age. The nurses reported that they responded to these patient changes by a "growth in perfecting clinical skills, in communicating with other health care providers, in assertiveness, and in self-direction" (p. 537).

By comparing the findings of the Ellenbecker and Warren's (1998) study to Alexander and Randolph's (1985) findings, one can see the similarity of the characteristics of nursing technology on the dimensions of variability, instability, and uncertainty. Furthermore, the nurses reported that they responded to the changes in technology by adapting their communication and decision-making that are major components of organizational structure. The findings of the Ellenbecker and Warren study supported Alexander and Randolph's contention that quality nursing care is a result of the technostructural fit. As the acuity, need, and variability increased, the nurses studied by Ellenbecker and Warren adjusted their communication and decision-making to adapt to the changing situation. Ellenbecker and Warren suggested that home healthcare agencies should employ policies "to support home care providers in the services they provide, rather than to unduly burden them" (p. 539). This approach was similar to Alexander and Randolph's claim that the manager has the responsibility to make changes to organizational structure consistent with the technology if unit performance is to be high. Thus the current study examined the nursing technology/organizational structure fit in groups of nurses in home healthcare.
Agency Variables

Home healthcare nurses may experience different nursing technology and organizational structure because they work in different agencies. As employees, nurses support the agency’s mission. The mission of the agency may vary according to the ownership status and the rural or urban location of the agency.

Ownership Status

Agency ownership is an organizational structure variable of interest in research. Studies have found that ownership status is a factor in patient outcomes in hospitals and nursing homes (Burns & Whorley, 1991; Kelly & Hellinger, 1986; Kruzich, Clinton, & Kelber, 1992; Mor, Branco, & Fogel, 1995; Spector & Takada, 1991; Zinn, Aaronson, & Rosko, 1993). However, “little research has been published comparing the quality of care provided by proprietary versus nonprofit (home healthcare) agencies” (Zinn & Mor, 1998, p. 368).

Dansky et al. (1994) conducted a descriptive study of 13 Medicare certified, not-for-profit home healthcare agencies in Pennsylvania and Ohio. Although all home healthcare agencies were not-for-profit, some were hospital based and others were independent home healthcare agencies. Only one item on a patient satisfaction scale indicated a significant difference. The authors concluded that patients cared for by independent home health agencies were more satisfied with their ability to reach the on call nurse than patients of the hospital based agencies. The current study investigated the relationship of ownership type to nurses’ decision-making (organizational structure) and nursing technology.
Geographical Location

Home healthcare nurses may encounter different nursing technology and organizational structure based on the geographic location of the agency in which they work. Studies have shown that rural residents have a unique attitude towards health and illness (Byrd, 1998; Cogdon & Magilvy, 1995; Conley & Burman, 1997; Denham, 1999; Schultz, 1997). Further studies have shown that residents in urban and rural areas may use home health services differently (Altman & Walden, 1993; Cheh & Phillips, 1993; Dansky & Dirani, 1998; Duncan, Coward, & Gilbert, 1997; Earle & Burman, 1998; Gaumer, 1989; Heckman, Somlai, Kalichman, Frazoi, & Kelly, 1998; Johnson, Weinert, & Richardson, 1998; Kenney, 1993; Kenney & Dubay, 1990; Mauser & Miller, 1994; Mueller, Kashinath, & Boilesen, 1998; Shi, Samuels, Cochran, Glover, & Singh, 1998).

The geographical area in which patient care is delivered may influence the decisions that nurses make (Weinert, & Burman, 1994). Although the results are not consistent as to the effect of location on patient care, the studies may give insight into the influence of rural location on the practice of nursing in South Carolina, a basically rural state.

Attitudes of rural residents toward health. In an ethnographic study of 250 people in eight geographically and culturally diverse communities in rural Colorado, Cogdon and Magilvy (1995) sought to describe home health care for frail older adults from the perspective of those providing the care and those receiving the care. The researchers found that nurses in rural areas traditionally spent more time and effort with homebound patients because the nurse “views the community as part of her family, with
strong ties and relationships” (p. 21). Nurses did not refuse care when the patient could not pay and nurses often made visits that were not reimbursed.

Schultz (1997) studied 41 rural residents and 40 urban residents of Maine to assess and evaluate the match of formal and informal resources with care needs during the 21 days at home following hospital discharge. Schultz found that rural participants identified more needs than their urban counterparts.

Conley and Burman (1997) used a qualitative design to determine the informational needs of rural caregivers and how that information was obtained. The researchers interviewed 14 Wyoming residents who had been primary caregivers for a family member who had died within 12 months. The researchers found that rural residents were assertive and self-reliant. The residents tended to use informal communication rather than written information to meet their need for information during the time their family member was dying. The causes of death included heart disease, cancer, and kidney failure. The caregivers requested information from physicians, nurses, and pharmacists, in that order. The patients were most satisfied with the information they received from the nurses.

Byrd (1998) accompanied an experienced home health nurse on 53 visits over the course of eight months in rural New England. The purpose of the study was to describe the process of home visiting and to identify potential influencing factors and attendant consequences. Byrd found that the nurse provided care that was described as admiring, familiar, trusting, supporting, reassuring, validating, and exchanging. The nurse visited families with children who had special needs. These children were acutely ill, chronically ill, or foster children. Following her study, Byrd questioned the adequacy
of a funding system that focuses on illness care when the recipients of this nurses’ care benefited from the home visits.

**Barriers to healthcare in rural areas.** Studies showed that residents needing health care in rural areas perceived barriers to obtaining health care. Researchers have identified barriers such as distance, inclement weather, feeling too ill to travel, inconvenience, lack of provider availability, and lack of social support (Altman & Walden, 1993; Cheh & Phillips, 1993; Dansky & Dirani, 1998; Duncan et al., 1997; Earle & Burman, 1998; Gaumer, 1989; Heckman et al., 1998; Johnson et al., 1998; Kenney, 1993; Kenney & Dubay, 1990; Mauser & Miller, 1994; Mueller et al., 1998).

Duncan et al. (1997) examined whether older adults living in rural areas who were admitted to nursing homes are younger and healthier than their urban counterparts. Admission to a nursing home was interpreted as a healthcare system failure to provide care in a non-institutionalized setting. The study did not find a difference between urban and rural residents. The researchers suggested that access to rural community based projects and home healthcare in rural areas may have improved in recent years. The findings of this study have implications for the current study because home health outcomes for patients in urban and rural areas may be similar because of increased use of home healthcare in rural areas.

Dansky and Dirani (1998) investigated whether diabetic patients’ use of hospitals, physician office visits, or home health services differed by geographical location. A retrospective study of 6,698 Medicare beneficiaries found that diabetic patients in the most rural areas reported fewer visits to physicians’ offices and more home visits than diabetic patients in urban areas. The findings of this study supported
the findings of other research (Mauser & Miller, 1994; Mueller et al., 1998) indicating that rural residents use home health more than their urban counterparts. On the other hand, researchers (Altman & Walden, 1993; Cheh & Phillips, 1993; Gaumer, 1989; Kenney & Dubay, 1990) found that rural residents had the same number or fewer home health visits than their urban counterparts. Thus, the research is inconclusive about the use of home healthcare based on geographical location.

Earle and Burman (1998) examined how mothers in rural areas perceive well-child care. The researchers interviewed 21 women in two Wyoming counties. The women identified the characteristics of well-child care. The informants identified nine benefits of well childcare and five barriers to well-child care. These barriers included financial, inconvenience, lack of provider availability, and lack of knowledge about the well-child clinic schedule. This study has implications because the participants identified perceived barriers to health care in rural areas that may be important factors in the current study.

Heckman et al. (1998) compared the psychosocial profiles of rural and urban people living with HIV disease. The researchers found that of the 276 people who responded to their study rural people had lower satisfaction with life, more loneliness, and less social support than their urban counterparts.

Johnson et al. (1998) conducted a study to identify the factors that influence the use of cardiac rehabilitation services by rural residents. Only 72 of the 254 adults who had experienced a cardiac event attended some portion of the rehabilitation program, and only 43 completed the full 36-week program. The most common reasons given for
not completing the program were distance, inclement weather, lack of insurance, lack of importance, and feeling too ill.

Denham (1999) conducted a series of ethnographic studies to examine how rural Appalachian families from southeastern Ohio define and practice family health in their own households. Using qualitative methods, Denham found family health was a "dynamic, complex concept more greatly influenced by multidimensional household variables, member interactions and the cultural context than by individual member's occasional medical encounters" (p. 131). In the second study, Denham examined the family's response to the medical services provided by a hospice service during the last days of a family member. The third study examined how economically disadvantaged families defined family health. Denham's studies found that the mothers were the primary health care resource for the families. The mothers consulted with the extended family before seeking medical care. A second finding was that knowledge was not enough to predict health behaviors. The third finding was that family values, belief, and tradition were greater influences of health routines and daily practices of family health than economic factors. This study is important because the rural home health nurse who provides care must take into account the family's values, beliefs, and traditions to provide quality patient outcomes and a high level of patient satisfaction.

Home health nursing in rural areas provided a solution that allows patients to receive adequate care while preserving their independence and sense of family. Some factors that may effect home care in rural setting include the narrowing eligibility requirements, the long distances home health personnel must travel, and the limited
number of qualified nurses in that community (Magilvy et al., 1988; Magilvy & Lakomy, 1991; Pierce & Luikert, 1997).

These studies show a lack of agreement as to whether access to healthcare is equal in rural and urban areas. Furthermore, researchers demonstrated that rural residents perceive health, and the barriers to healthcare, differently from urban residents. Home healthcare in rural areas may fill a need for patients who perceive barriers to healthcare.

Comparison of home healthcare in rural and urban areas. Few studies have compared the difference in home healthcare outcomes for residents of rural and urban areas. Dansky et al. (1994) conducted a descriptive study of 13 home healthcare agencies in Pennsylvania and Ohio. Five of the agencies served patients in rural areas, three served patients in urban areas, and five served both rural and urban patients. Although location was recorded as a variable, no difference in patient satisfaction among the agencies providing care to patients in various locations was reported.

In a study comparing rural and urban home health agencies, Adams and Short (1999) sought the answer to the question “Does rural versus urban locale influence patient outcomes?” (p. 26). The study considered whether patients improved and/or stabilized on five outcome measures: ambulation, bathing, oral medication, pain, and dyspnea. The findings suggested that rural patients improved and/or stabilized on the five outcomes and fewer rural patients failed to improve or deteriorated than their urban counterparts. Although locale predicted less than 1% of the variance in each of the five outcomes, the authors suggested that “perhaps nurse-patient relationships translate into care patterns that achieved better outcomes for rural patients” (p. 31).
Past rural versus urban comparisons have importance for the proposed study because rural and urban home health agencies may influence nurses’ decision making. For example, fewer health care services are available in rural areas. Home healthcare nurses may not have the referral resources that urban home healthcare nurses have. The current study examined the influence location had on the nurses’ decision making.

In summary, findings of studies about urban and rural differences in home health care are inconclusive. Policy makers are concerned with improving patient outcomes for all people (Jones et al, 1997), particularly in rural areas. This study investigated the differences in nursing technology and organizational structure, and patient outcomes in rural and urban areas.

Patient Outcomes in Home Healthcare

This section reviews the nursing literature related to patient outcomes in home health care. The selected patient outcomes for home healthcare in the current study are patient outcomes that are sensitive to nursing care and patient satisfaction. Patient outcomes are not just one expectation of the provision of health care, but rather patient outcomes are the main reason for providing health care. By measuring home health outcomes, health care providers will learn more about effectiveness, provide a basis for decision-making on which patients benefit from home care, and identify ways to improve the effectiveness of home care (Joint Commission on Accreditation of Healthcare Organizations, 1995; Peters, 1995; Shaunessy et al., 1994).

General Outcomes for Home Healthcare

After studying the results of 27 home and community care demonstration projects published between 1959 and 1989, Weisert, Cready, and Pawelak (1988)
concluded that home health care did not provide patients with significant measurable outcomes such as longer life, better functioning, or less restricted activity days. Weissert (1994) concluded that “home care produces minimal measurable outcome benefits; it costs more than it saves, it lacks a clear purpose in light of its minimal outcomes and efficiency benefits; it is not targeted to subgroups for whom level and mix of inputs can be weighed against outcomes benefits” (p. 264). Weissert suggested that “(home healthcare) advocates need to first figure out who should get it, how much they should get, and what the care is supposed to accomplish” (p. 264). The government, through Medicare funding, has regulated who will receive home care, and how much they will receive.

Pierce (1997) analyzed the nursing literature from 1974 to 1996 to identify the nursing-sensitive outcomes in acute care and found a real need to further study the processes and structures that result in the best outcomes. Pierce found that nursing literature suggested that what a nurse does “plays a key role in both health outcomes and client satisfaction” (p. 63). Thus in the proposed study, nurses’ understanding of their role, nurses’ decision making, and nursing care processes will be examined as to their influence on patient outcomes in home healthcare.

**Nurse-Sensitive Patient Outcomes in Home Healthcare**

Nurses in home healthcare strive to achieve positive patient outcomes that are a result of nursing care. In an attempt to measure client outcomes that are sensitive to nursing care in the home, nurses have developed outcomes tools and procedures (Feldman & Richard, 1988; Keating, 1988). Keating (1988) created an instrument to measure the health status of home health patients who received care from certified home
instrument based on nursing diagnosis statements. Shaughnessy, Crisler, and Schlenker
(1995) developed an outcome instrument that measures a patient's health status change
between two points in time. None of these classification instruments adequately
describes the patient outcomes for a group of nurses working together to provide patient
care.

Using the Outcomes Assessment and Information Set (OASIS) data, Harris
(1996) studied 45 patients to identify the characteristics of patients who returned to a
hospital after being admitted to home care. The researchers developed the study to
provide a baseline to improve patient outcomes. Harris found that the home health
patients who returned to the hospital were older and sicker than the average patient seen
by the home health agency. She concluded that the older, sicker patients were
experiencing body system breakdown. No evidence was found that the patients were
treated ineffectively. Harris suggested that the actual patient's improved of health status
may not be the only outcome measure to evaluate the effectiveness of nursing care
processes in home healthcare. Thus, nursing must articulate other outcomes, such as
symptom management or understanding of health conditions as measures to evaluate
nursing care.

More recently, Adams, Wilson, Haney, and Short (1998) studied patient
outcomes across six home health agencies. The findings showed that the improvement
scores for the patients did not change significantly from the baseline scores after a year
of care. The authors questioned the appropriateness of data-driven quality improvement
model for patients referred to a home health agency. The authors speculated that the
patients may not have improved because the “home health services authorized to permit improvement were inadequate” (p. 400).

Alexander and Kroposki (1999) attempted to address the nursing issues involved in the question: what is community nursing care, including home healthcare, supposed to accomplish? Finding the existing instruments inadequate to measure patient outcomes that are sensitive to nursing care (Kroposki & Alexander, 1998), the researchers conducted a Delphi study to determine the outcomes judged by community health nurses to their practice. After searching the community health literature for important items to community health nurses, the researchers conducted a series of focus groups to discussed the kinds of client health care outcomes used in their practice, how client outcomes differed from nurse outcomes, which kinds of outcomes should be included in an outcomes inventory, the impact nursing has on client outcomes, and how community health outcomes differed from those in the hospital setting. Once a list of community health outcomes was generated, a panel of community health experts reviewed the list of items for clarity. Subsequently, the list was sent to community health nurses in six health districts across one state. The nurses were asked to indicate the level of importance of each item. In a second round, the nurses were given the mean score of the other nurses as to the level of importance and asked to again indicate the level of importance of the item. Following a factor analysis of the responses, nurses in the third round were asked to respond to a two-part questionnaire. In part 1, the nurses were asked whether the item was correctly placed in one of four domains, and in part 2 the nurses were asked to judge how well the patients and nurses in their agency were achieving the outcomes. As a result of statistical analysis, a 48 items instrument, the
Community Health Nursing Inventory (CHNOI), was specifically developed to measure nursing agency effectiveness in community health settings. The four domains of the scale included the patient’s physiological components of care, the patient’s psychosocial components of care, the nursing intervention/implementation components of care, and the environmental/community safety components of care. The result of this study was the development of a valid, concise instrument that measures nurses’ perceptions of the level of care being delivered by their unit or program in the community (Alexander & Kroposki). The current study used the CHNOI to measure patient outcomes in home healthcare.

**Patient Satisfaction with Nursing Care in Home Healthcare**

Consistent with Westra et al.’s (1995) definition, patient satisfaction with nursing care can also be defined as a patient’s assessment of the patient’s expectations of nursing care compared to the patient’s perception of the nurse’s behaviors or characteristics. Thus, patient satisfaction is the congruence between patient’s expectations of the nurse and the patient’s actual experience with the nurses’ behaviors or characteristics. “While nurses’ behaviors/characteristics best fit with what the ‘consumer’ is looking for in a service and form the basis for the patients’ satisfaction for nursing care, some judgment regarding the technical quality of nursing care is inferred from the manner in which care is delivered” (Eriksen, 1995, p. 71).

According to Eriksen’s (1995) concept analysis of patient satisfaction with nursing care, critical attributes are reliability, assurance, tangibles, responsiveness, empathy, and information giving. Chang (1997) analyzed 53 nursing studies that measured patient satisfaction with nursing care. Of the 13 instruments published to
measure adult medical-surgical patient satisfaction with nursing care in a hospital setting, only the SERVQUAL scale developed by Parasuraman, Zeithaml, and Berry (1988), includes all the critical attributes described by Eriksen (Scardina, 1994). However, the SERVQUAL may be inappropriate for use with ill patients because patients must score a large number of items.

Fewer studies of patient satisfaction with nursing care in home health nursing were found. Most of the studies were conducted to develop or validate an instrument to measure patient satisfaction with home healthcare (Reeder & Chen, 1990; Twardon & Gartner, 1991; Westra et al., 1995). Zimmer, Groth-Junker, and McCusker (1985) reported patient satisfaction with a home health care team focusing on satisfaction with physician care. Dansky et al. (1994) investigated the influence of organizational variables on patient satisfaction and Naylor et al., (1999) investigated patients’ satisfaction with home care after hospitalization. These studies will be discussed in chronological order of publication.

In a randomized controlled study (Zimmer et al., 1985), a home health care team was made up of a master’s degree medical nurse practitioner, a medical social worker, and a physician. The researchers analyzed the results of 57 patients and 67 caregivers in the team group, and 47 patients and 65 caregivers in the control group. The findings indicated both patient and caregiver satisfaction increased over time. Furthermore, the caregivers in the team group were more satisfied than the caregivers in the control group at three and six months. A significant difference in satisfaction was found between the caregivers. The researchers reported that many explanations for this finding included the
attributes of a certain physician associated with the study and the fact that home visits were made by the physician.

Reeder and Chen (1990) developed an instrument to measure patient satisfaction in home healthcare. A convenience sample of 48 mainly elderly clients selected by the home healthcare agency administrator based on the patient’s willingness and ability to respond were asked to complete a 35-item questionnaire. The instrument consisted of 21 positively and 14 negatively worded items. The instrument included patient’s evaluation of nurse behaviors using a nursing process framework. Of the 42 patients who returned the survey, only 37 responses were used for analysis because of missing data. The items were scored on a 5-point Likert scale and Cronbach’s alpha was reported at .93. Results were negatively skewed, with a mean score of 4.36. The authors suggested that three items be removed because of redundancy and that the new item be tested with a larger sample. No further published articles using this instrument were found.

Twardon and Gartner (1991) conducted a descriptive study using a 13-item telephone questionnaire to survey 32 randomly selected patients who were recently discharged from a home healthcare agency. The purpose of the study was to examine patient satisfaction with nursing care. The findings of this study showed that the patients surveyed were 100% satisfied with overall nursing care, the primary nurse’s attention to concerns, communication with physician and other healthcare providers, and the ability to contact the primary nurse when needed. Scores of teaching care of the patient and teaching healthcare needs were 94% and 91% respectively and 78% of the patients surveyed could name their primary care nurse. Study limitations included the use of one agency, small sample size, and no report of instrument reliability.
Dansky et al. (1994) investigated the influence of human resource management practices on patient satisfaction in home healthcare. Surveys were mailed to 2,055 patients in thirteen home health agencies in Pennsylvania and Ohio. Five agencies were rural, five agencies were urban, and three were mixed (urban and rural). The researchers analyzed 696 usable surveys (response rate of 38%). Further analysis showed that no significant differences between the respondents and non-respondents. An item was added to the survey to note whether the patient or caregiver completed the survey because previous research (Walker & Restuccia, 1984) showed that caregivers rated satisfaction more negatively than patients. Additional findings from Dansky et al. suggested that agency ownership influenced one item on the patient satisfaction instrument and agencies with a higher percentage of baccalaureate prepared registered nurses scored higher patient satisfaction scores in several items. Thus, this study provided evidence that agency ownership and educational preparation of the nurses have an effect on patient satisfaction. The current study collected data on agency ownership and educational preparation of the nurses.

The patient satisfaction instrument used by Dansky et al. (1994) included 13 questions specific to home healthcare nurses’ behaviors (instruction, interpersonal relations, procedures, and pain management). Each item was scored using a 5-point Likert scale (strongly agree to strongly disagree). All responses were positively worded. An overall satisfaction with nursing care question was scored on a scale of 1-10 (extremely dissatisfied to extremely satisfied). The authors adapted a widely used hospital patient survey for use in home health. The authors stated that the hospital patient survey had been validated cross numerous samples. However, the authors did
not report any of the psychometric properties of the adapted instrument. Although the instrument is brief and specific to nursing behaviors, neither specific reliability nor scoring information for this instrument was reported.

Westra et al. (1995) conducted a correlational descriptive study to investigate the reliability and validity of a home care client satisfaction instrument (HCCSI). Findings suggested that the resulting instrument, the Home Care Client Satisfaction Instrument-Revised (HCCSI-R), which consisted of 12 neutrally worded items scored on a 5 point Likert scale, had adequate validity and reliability for use with patients receiving home healthcare. The HCCSI-R was used in the current study because the instrument was specifically developed for use with elderly patients in home care, is brief, and has documented validity and reliability.

Naylor et al. (1999) investigated the effectiveness of an intervention provided by advanced practice nurses (APN). This study compared the effectiveness APN to traditional home healthcare. Patient satisfaction was investigated as one outcome measure. The authors used an investigator developed patient satisfaction instrument but did not report its psychometric properties. The findings suggested that patients were satisfied with both traditional and APN care. The authors concluded, “the skewed distribution of patient satisfaction scores suggests the need for more sensitive items” (p. 620).

The studies of patient satisfaction suggest that patient satisfaction is an important outcome in home healthcare. A variety of instruments have been developed to measure patient satisfaction with nursing care as well as home healthcare. Although patients tend to be satisfied with nursing care, scores on the instruments with

52
documented validity and reliability indicate enough variability to provide direction for practice changes to improve nursing care.

Conceptual Framework

The conceptual framework guiding this study incorporates concepts from general system theory (von Bertalanffy, 1960), role theory (Rizzo et al, 1970), contingency theory (Burns & Stalker, 1961; Lawrence & Lorsch, 1967; Woodward, 1965), and technostructural fit theory (Alexander & Bauerschmidt, 1987; Alexander & Randolph, 1985; Pasmore, 1988). Outcome concepts are derived from the quality health outcomes model (Mitchell, Ferketich, & Jennings, 1998). Figure 1 shows the model to examine the complex relationships among the organizational variables and patient outcomes.

Theories

From general system theory (von Bertalanffy, 1968) the concepts of input, throughput, and output underpin the conceptual framework. Input consists of a home healthcare patient with a skilled need, and factors that influence the provision of care such as agency variables, nursing technology, and organizational structure variables including role clarity and the characteristics of nurses providing the care. Throughput includes the nursing technology/organizational structure fit, in other words, how the dimensions of nursing technology (instability, variability, and uncertainty) fit together with the dimensions of organizational structure (vertical participation, horizontal participation, and formalization). Output consists of the accomplishment of patient outcomes that are sensitive to nursing care and patient satisfaction.
Figure 1. Conceptual Framework Showing the Relationship of Patient, Nurse, and Agency Characteristics, Nursing Technology, Role Clarity, Organizational Structure, the Nursing Technology/Organizational Structure Fit, and Patient Outcomes
Classic role theory provides the concepts of role, role conflict, role ambiguity, and role clarity. Role theory characterizes a role as a set of expected behaviors. When an individual perception of behavior does not agree with what is expected, the individual may experience role conflict. Likewise, when an individual does not have enough information to perform the assigned task, role ambiguity may be the result (Rizzo et al., 1970). A desirable attribute for nurses is role clarity that is defined as low levels of role conflict and role ambiguity (Kroposki et al., 1999).

Contingency theory posits that organizational structure must take the work to be accomplished (technology) into account (Burns & Stalker, 1961; Lawrence & Lorsch, 1967; Woodward, 1965). Effective nurses must develop organizational structures that fit nursing care processes. Using contingency theory, Alexander and Randolph (1985) and Alexander and Bauerschmidt (1987) demonstrated that the organizational structure must match the nursing technology to achieve high quality outcomes. Because they argued that structure must fit the existing technology, they referred to their framework as technostructural fit theory. Using technostructural fit theory, nursing staff members are more likely to achieve high quality outcomes if nurses’ decision-making (organizational structure) matches the nursing care processes (nursing technology) required for patient care. In home healthcare, the crucial outcomes are patient centered. In summary, the outcomes of home healthcare nursing result from the appropriate technostructural fit (Alexander & Bauerschmidt; Alexander & Randolph).

“Most of the work done by the nursing profession in relation to outcome identification and categorization and the development of cardinal measures has been derived from literature reviews and practical experience rather than research or..."
conceptual frameworks" (Johnson & Maas, 1997, p. 5). First used to evaluate the quality of medical care, Donabedian's (1966) model of linking structure, process, and outcome adapted for use in nursing, has been most recently by Mitchell et al. (1998). Their quality health outcomes model proposes that "outcomes measures should be results of care structures and processes that integrate functional, social, psychological, physical, and physiologic aspects of people's experience in health and illness" (Mitchell et al. (p. 45).

**Relationship of Variables**

The predictor variables are patient characteristics, nurse characteristics, agency characteristics, nursing care processes, role clarity, nurses' decision-making and nursing technology/organizational structure fit. The outcomes variables are nurses' perceptions of patient outcomes that are sensitive to nursing care and patient satisfaction.

Patient characteristics included the patient's age and patient's perception of the type of service provided by the nurse. Patient's age is related to nursing care processes. To determine the type of service provided by the nurse, the patient indicated whether the nurse provided teaching or a technical skill such as giving an injection or changing dressing. Agency characteristics that were collected were ownership and location.

Nursing technology is defined as the nursing care processes or task behaviors performed by nurses to change the patient’s status to a discharged patient (Alexander, 1996). Nursing technology is operationalized by scores on the three dimensions: Instability (I), Variability (V), and Uncertainty (U) on the Nursing Technology Instrument (NTI) (Leatt & Schneck, 1981) and adapted for use in home healthcare (Alexander et al., 1993).
Nurses’ characteristics are associated with the organizational structure and the patients’ characteristics are associated with nursing technology. Nurses’ characteristics included age, gender, length of time since initial licensure as a registered nurse, education level, tenure in home health, tenure in the home healthcare agency, full-time or part-time status, and the number of home visits and telephone calls to patients.

Nurses’ understanding of their role (role clarity) is defined as low levels of role conflict and role ambiguity (Kroposki et al., 1999). Role clarity is operationalized by low levels of role conflict and role ambiguity as measured by the Nursing Index of Role Conflict and Role Ambiguity (NIRCA) (Sowell & Alexander, 1989).

Organizational structure is defined as the degree of flexibility of relationships among home healthcare nurses that enables the accomplishment of nursing care (Cumbey & Alexander, 1998). One aspect of organizational structure is nurses’ decision-making. Nurses’ decision-making is operationalized by the Alexander Structure Instrument (ASI) that measures nurses’ participation in organizational decision making on three dimensions: vertical participation (VP), horizontal participation (HP), and formalization (F) (Alexander, 1986).

The nursing technology/organizational structure fit is the interaction of the nursing care processes necessary to change the patient’s status and the decision-making home healthcare nurses use to accomplish this work. The nursing technology/organizational structure fit is determined by the absolute value difference of selected subscale scores on the NTI and ASI (Alexander & Bauerschmidt, 1987; Alexander & Mark, 1990; Alexander & Randolph, 1985).
Patient outcomes are the results experienced by patients “after a process is carried out or interventions have been implemented” (Bellen, 1997, p.207). Patient outcomes were assessed using outcomes sensitive to nursing care and patient satisfaction. Outcomes sensitive to nursing care are the behaviors achieved after a client receives care from a nurse (Alexander & Kroposki, 1999). Patient outcomes that were sensitive to nursing care were operationalized by the CHNOI (Alexander & Kroposki, 2001a). Patient satisfaction is the comparison between the patient’s expectations of care and the perceptions of care received. Patient satisfaction was operationalized by the score on the HHCSI-R (Westra et al., 1995).

Research Questions

This study sought answers to these research questions to describe the relationship of the variables identified in the conceptual framework.

Relationship of patient characteristics and the dimensions of nursing technology:

1. What is the relationship of patient age and the dimensions of nursing technology (I, V, U)?

2. What is the relationship of the patient’s skilled need and the dimensions of nursing technology (I, V, U)?

Relationship of agency characteristics and the dimensions of nursing technology:

3. Does a significant difference exist in the dimensions of nursing technology (I, V, U) based on agency ownership type?

4. Does a significant difference exist in the dimensions of nursing technology (I, V, U) based on rural or urban location?
Relationship of nurses’ role clarity and the dimensions of organizational structure:

5. What is the relationship of role conflict and the dimensions of organizational structure (VP, HP, F)?

6. What is the relationship of role ambiguity and the dimensions of organizational structure (VP, HP, F)?

Relationship of nurse characteristics and the dimensions of organizational structure:

7. What is the relationship of nurses’ age and the dimensions of organizational structure (VP, HP, F)?

8. What is the relationship of nurses’ education and the dimensions of organizational structure (VP, HP, F)?

9. What is the relationship of nurses’ experience in nursing and the dimensions of organizational structure (VP, HP, F)?

10. What are the relationship of nurses’ tenure in the agency and the dimensions of organizational structure (VP, HP, F)?

11. What is the relationship of number of nurses’ visits per week and the dimensions of organizational structure (VP, HP, F)?

12. What is the relationship of number of nurses’ calls per week and the dimensions of organizational structure (VP, HP, F)?

Relationship of agency characteristics and organizational structure:

13. Does a significant difference exist in the dimensions of organizational structure (VP, HP, F) based on agency ownership type?

14. Does a significant difference exist in the dimensions of organizational structure (VP, HP, F) based on rural or urban location? (t-test)
Relationship of nursing technology/organizational structure fit and patient outcomes

15. What combination of the dimensions of nursing technology and organizational structure predicts nurses’ perceptions of patient outcomes?

16. What combination of the dimensions of nursing technology and organizational structure predicts patient satisfaction?

Relational Statements

Nursing Technology

• Patient age and the nursing skill required are associated with the nursing care processes.

• Agency ownership type is related to nursing care processes (nursing technology).

• Location of where care is provided is related to nursing care processes.

• Nursing care processes (nursing technology) have three dimensions: instability, variability, and uncertainty.

Organizational structure

• Role clarity of home healthcare nurses is related to nurses’ decision-making.

• Home healthcare nurses’ age, education, experience in nursing, tenure in the agency, number of visits per week, and number of calls per week is associated with nurses’ decision-making.

• Agency ownership type is related to nurses’ decision-making (organizational structure).

• Location of where care is provided is associated with nurses’ decision-making.
• Nurses' decision-making (organizational structure) has three dimensions: vertical participation, horizontal participation, and formalization.

**Patient Outcomes**

• Nursing technology/organization structure fit is the match between the dimensions of nursing technology and organization structure.

• Nursing technology/organizational structure fit is related to nurses’ perceptions of patient outcomes that are sensitive to nursing care.

• Nursing technology/organizational structure fit is related to patient satisfaction.

• High levels of patient outcomes are associated with an ideal nursing technology/organizational structure fit.

• High levels of patient satisfaction are associated with an ideal nursing technology/organizational structure fit.

**Summary**

Chapter 2 presented a review of the relevant literature about the organizational variables of interest and patient outcomes. A conceptual framework based on concepts derived from management theory, sociotechnical theory, and role theory were introduced. The chapter included the research questions and relational statements that guided the study.
CHAPTER III

Methodology

A descriptive study was conducted to describe the relationships of organizational variables and patient outcomes in home healthcare. This section describes the design, setting, sample, instruments, and procedures for collecting and analyzing the data. Procedures for protection of human subjects and limitations of the study are included.

Study Design

This cross-sectional study used a descriptive, correlational design. The design contained nonequivalent groups of home healthcare nurses and patients in home healthcare agencies of varying ownership types in urban and rural counties in South Carolina.

Setting and Sample

This study was conducted in Medicare certified, licensed home healthcare agencies from varying ownership types in urban and rural counties in South Carolina. The study used a convenience sample of agencies, nurses who worked in the participating agencies, and patients cared for by nurses in these agencies.

Agencies

The researcher contacted all Medicare certified home healthcare agencies that met the inclusion criteria. Inclusion criteria for the home healthcare agency were that
the agency was licensed by the state, was Medicare certified, and accepted clients not restricted to one group of clients such as in a group home, only terminally ill patients, or obstetric clients at the time the letter of invitation was sent.

Of the 87 home health agencies listed in the March 23, 2000 list of South Carolina Department of Health and Environmental Control licensed home health agencies, 76 met inclusion criteria. Thus, 76 Medicare certified home health agencies that did not serve a special population (hospice, peri-natal, restricted to clients from a specific nursing home) were contacted. Of these eligible agencies, the administrators of eight corporate, one county, four non-profit and eight state owned district home health agencies expressed interest in the study. The 21 agencies that expressed interest in participating represented 28% of the home health agencies in the state that met eligibility criteria.

Once the study was begun, the directors of nursing of three agencies would not schedule a time and date for data collection because they stated that the nursing staff was experiencing a “high work load” and the nurses were “too busy” to participate. In addition, one agency merged with another agency prior to data collection. Thus, a total of 17 agencies participated representing a response rate of 22% of the agencies initially contacted and 81% of the agencies that expressed an interest a year earlier.

Unit of Analysis

The unit of analysis was the “agency component” which was defined as the home health agency nurses, grouped by county. Nurses in agencies that expressed interest represented 61 agency components. Thus, the final sample of 43 agency components represented a 71% response rate. Table 1 presents the agencies that
Table 1

Home Health Agencies that Expressed Interest, Ownership Type, and Counties Served by the Agency, and Agency Components that Participated

<table>
<thead>
<tr>
<th>Agencies expressing interest</th>
<th>Agency Ownership Type</th>
<th>Expected Number of Counties Served by the Agency</th>
<th>Number of Agency Components that Participated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>non-profit</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>state</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>state</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>state</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>state</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>corporate</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>corporate</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>corporate</td>
<td>2</td>
<td>0*</td>
</tr>
<tr>
<td>9</td>
<td>corporate</td>
<td>2</td>
<td>0*</td>
</tr>
<tr>
<td>10</td>
<td>corporate</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>11</td>
<td>state</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>non-profit</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>13</td>
<td>corporate</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>county</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>state</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>non-profit</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>17</td>
<td>corporate</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>non-profit</td>
<td>3</td>
<td>0 this agency merged with agency #16</td>
</tr>
<tr>
<td>19</td>
<td>corporate</td>
<td>4</td>
<td>0*</td>
</tr>
<tr>
<td>20</td>
<td>state</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>21</td>
<td>state</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>total</td>
<td></td>
<td>61 AC expected</td>
<td>43 AC participated</td>
</tr>
</tbody>
</table>

*The director of nursing stated that nurses were too busy to participate.

expressed an interest in the study, the agency ownership, and the number of counties served by nurses in the agency (agency components). Table 2 shows the response rate for nurses and patients for each agency component in the study.
Table 2

Nurse and Patient Response Rate and Location of Each Agency Component (AC)

<table>
<thead>
<tr>
<th>Agency Component #</th>
<th>Location</th>
<th># of nurse surveys distributed</th>
<th>nurse surveys returned</th>
<th>response rate of nurses (%)</th>
<th># of patient surveys given to nurses</th>
<th>patient surveys returned</th>
<th>response rate of patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>urban</td>
<td>3</td>
<td>3</td>
<td>100</td>
<td>20</td>
<td>2</td>
<td>5.00</td>
</tr>
<tr>
<td>2</td>
<td>urban</td>
<td>2</td>
<td>2</td>
<td>100</td>
<td>20</td>
<td>1</td>
<td>5.00</td>
</tr>
<tr>
<td>3</td>
<td>rural</td>
<td>3</td>
<td>3</td>
<td>100</td>
<td>20</td>
<td>1</td>
<td>5.00</td>
</tr>
<tr>
<td>4</td>
<td>urban</td>
<td>8</td>
<td>8</td>
<td>100*</td>
<td>100</td>
<td>19</td>
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</table>

( Table 2 continued on next page)

Forty-three agency components comprised the sample for this study and all had nurse responses, while five agency components did not have patient responses. A power analysis (Cohen, 1987) determined that 43 agency components were needed to achieve an $\alpha = 0.05$, $\beta = 0.80$, with an effect size (ETA-squared) of 0.35.
Table 2 (continued)

Nurse and Patient Response Rate and Location of Each Agency Component (AC)

<table>
<thead>
<tr>
<th>#</th>
<th>Location</th>
<th># of nurse surveys distributed</th>
<th>nurse surveys returned</th>
<th>response rate of nurses (%)</th>
<th># of patient surveys given to nurses</th>
<th>patient surveys returned</th>
<th>response rate of patients (%)</th>
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<td><strong>205</strong></td>
<td><strong>75</strong></td>
<td></td>
<td><strong>2050</strong></td>
<td><strong>325</strong></td>
<td><strong>15.90</strong></td>
</tr>
</tbody>
</table>

To obtain permission to conduct the study, the investigator requested a letter of support from the administrator of non-state agencies and the program consultant of the state owned home healthcare agencies. The investigator's letter requesting support and a sample letter of support are presented in Appendix A. Once the letters of support, the human subject's protection authorization from the university, and the letter of permission to conduct the study at the agency were obtained, the investigator contacted...
each collection site by telephone to obtain specific verbal approval of the nurse 
manager and to schedule a time for data collection.

Nurses

The study surveyed registered nurses employed for at least one month by the 
participating home healthcare agencies. All registered nurses employed by the 
participating home healthcare agencies were invited to complete surveys.

At the time of data collection, the investigator arrived at the site with 
refreshments for the staff. After introduction to the nursing staff, the investigator 
briefly explained the study and distributed nurse surveys to the staff nurses. The 
investigator encouraged nurses to complete the forms from the perspective of the 
nurses working together with a group of patients much like nurse on acute care unit 
work together. The investigator suggested that nurses answer the question to the best 
of their knowledge even if they did not directly provide the service but they knew 
other nurses in that home healthcare site did provide the care to patients requiring that 
care. Nurses were encouraged to answer all questions even though they were not sure 
of the answer.

The staff nurses completed the surveys and returned the surveys in envelopes 
to a box on a table in the room. The investigator stayed during the session and was 
available to clarify questions if posed by the nurses. Nurses took approximately 20 
minutes to complete the survey. If nurses at the site told he investigator that other 
nurses were unable to attend the meeting, the investigator left nurse surveys for the 
nurses to complete and return to the investigator in a postage paid envelope.
In response to a letter of inquiry sent prior to the start of data collection, the administrators of the corporate, county, and non-profit agencies, and nurse managers of the state owned agencies estimated that 443 nurses would participate in the study. The number of nurses was updated when the data collection dates were set with nurse managers at each agency component site. Thus, at the time of data collection, 275 nurses were expected at the sites.

Of the 209 nurses who returned surveys, four did not meet inclusion criteria of being a registered nurse employed for at least one month in the agency. One month was determined a sufficient time of employment to become familiar with the organizational variables of interest (Cumbey & Alexander, 1998). The surveys of three licensed practical nurses and one registered nurse employed less than one month were ineligible and their surveys were removed from the data files before analysis. Therefore, 205 surveys were used for the analysis. The response rate for nurses in each agency ranged between 29% and 100% with an average response rate of 75%.

Patients

All current patients or caregivers of current patients being cared for by the home healthcare agency’s nurses were eligible for inclusion in the survey. Inclusion criteria were that the patient or caregiver was able to respond to the questions in the survey in writing. A question on the survey asked whether the person completing the survey was the patient or a caregiver.

To maximize response rate, the investigator asked each nurse who participated in the study to distribute surveys to ten current patients when the nurse made a home visit (Reeder & Chen, 1990). Some nurses did not make home visits and asked not to
be given patient packets. One agency asked that nurses be given only five packets to keep within their caseload of only five patients.

To minimize selection bias, the investigator asked nurses to deliver the surveys to patients in the order of their visit schedule until all ten patient packets were distributed. A directions sheet (Appendix B) was given to each nurse who made home visits. The nurses were instructed to invite the next ten patients that they visited during the normal course of their home visit schedule to participate in the study. The investigator asked the nurses to verbally encourage the patient to complete the study and mail it in a stamped addressed envelope directly to the investigator. The nurses were told that if the patient or caregiver indicated that he or she would refuse to participate in the study, the nurses was to give the packet to the next patient on the home visit schedule until all the packets were distributed.

In an effort to estimate the patient’s rejection rate, the investigator instructed each nurse to keep count of the total number of patients that were approached to participate in the study and to report that number to the investigator by means of a stamped, self-addressed postcard coded with the agency code. Nurses from 17 different agency components from across a wide geographic area of the state returned postcards.

Of the 21 (10%) nurses who returned postcards, ten indicated that they distributed packets to the first ten patients they visited. Four nurses indicated that they distributed five packets, two nurses indicated that they distributed 6 packets, two nurses indicated that they distributed 7 packets. Three other nurses indicated that they asked 12, 14, and 17 patients before they distributed the allotted ten packets. Thus,
although few nurses chose to return a postcard, patients accepted the packets but did not return the survey to the investigator. Thus, the investigator concluded that the majority of the patients accepted the packet but many did not return the survey for other reasons.

In an effort to facilitate data collection, nurses were encouraged to begin distributing patient packets on their next scheduled visit. The majority of patient surveys were returned to the investigator within two weeks of the initial contact with the nurses. Ten patients per nurse were asked to participate. Of the 2,050 patient packets that were given to nurses to distribute, 325 patients returned surveys. Thus, the response rate for each agency ranged between 0% and 60% with an average response rate for patients of 15.9%

Instruments

Demographics

Demographic information about agencies. Seventy-six of the 87 Medicare certified, licensed home healthcare agencies included in the South Carolina Department of Health and Environmental Control Licensed Outpatient Facilities List were invited to participate. These home healthcare agencies met the inclusion criteria. The agencies were classified as corporate, county (hospital based), non-profit, state, or church. None of the church home healthcare agencies meet the inclusion criteria because their clientele were restricted to residents of specific group homes. The agency components were coded according to ownership type and county (South Carolina Department of Health and Environmental Control, 2000). The administrators of the
home healthcare agencies were asked to verify this information and to estimate the number of nurses employed by the agency by county.

Although South Carolina is classified as a rural state, several counties of the state can be classified as non-rural (urban) based on inclusion in a Metropolitan Statistical Area (MSA). The distinction between rural and urban can be determined by designating a county within a MSA as non-rural and counties outside an MSA as rural. Using this designation, in South Carolina 30 counties are classified as rural and 16 counties are classified as urban (U. S. Bureau of the Census, 1997). A coding sheet was used to match nurse and patient data for each agency component according to whether the care was provided in a rural or urban county.

**Demographic information about nurses.** All registered nurses were invited to complete a demographic information sheet. Information regarding age, gender, length of time since initial licensure as a registered nurse, education level, certification, tenure in home healthcare, tenure in the home healthcare agency, and full-time or part-time status were used to describe the sample. The county in which the nurse visits patients was used to determine the rural or urban nature of the agency component. The nurses were asked whether they had direct patient contact by making home visits or by telephone. All registered nurses in the agency were given the opportunity to complete the questionnaires. Factors such as age, education, tenure, number of patient contacts per week may influence nurses’ decision-making as shown in the conceptual framework. The demographic sheet for nurses is shown in Appendix C.

**Demographic information about patients.** Each patient or caregiver who completed the survey was asked information regarding patient’s age, length of time the
patient has received visits from the home healthcare agency nurses, and whether the
nurse provided teaching, performs a skill such as giving an injection, or both. The
information was used to describe the sample of patients. The patient characteristics
may have influenced the level of nursing technology as indicated in the conceptual
framework. The survey asked if the patient or caregiver completed the survey since
previous studies (Reeder & Chen, 1990) have indicated the responses may be different.
However, the patient may have been too ill to complete the survey. Therefore, in an
effort to increase the response rate the instructions indicated that either the patient or a
caregiver could complete the survey and demographic information. The demographic
sheet for patients is shown in Appendix D.

Variables

The variables that were examined included nursing technology, role clarity,
organizational structure, the nursing technology/organizational structure fit, agency
ownership and location, patient outcomes that were sensitive to nursing care, and
patient satisfaction. The title of the instrument operationalizing the concept, name of
the scales, number of items, psychometric properties and source of each instrument are
listed in Table 3. The responses from the individual nurses and patients are reported
here to appropriately discuss the psychometric properties of the individual nurse and
patient responses, rather than the aggregate scores from the agency components.
Appendices E-I contain copies of each of the instruments.

Nursing care processes (nursing technology). Nursing technology was
measured with the NTI, an 18 item, 5-point Likert-type scale questionnaire adapted for
home healthcare by Alexander et al. (1993) from an instrument originally developed
by Overton et al. (1977) and modified by Leatt and Schneck (1981). Nurses scored their perceived level of task behaviors. A low score suggested routine technology. A high score suggested the nurses perceive more complex levels of variability, instability, and uncertainty. Possible scores for each subscale range from 8 to 40 for instability (8 items), 3 to 15 for variability (3 items), and 7 to 35 for uncertainty (7 items). Items numbered 1, 5, 6, 7, 8, 9, 16, and 18 comprise the instability scale. The variability scale consists of items numbered 2, 14, and 15. The variability items are reversed scored. Items numbered 3, 4, 10, 11, 12, 13, and 17 are included in the uncertainty scale.

Content validity of the NTI was based on research of Leatt and Schneck (1981). In prior use of the instrument in the acute care, long term care and psychiatric care settings, factor analysis suggested three factors of nursing technology representing (1) instability, (2) variability, and (3) uncertainty (Alexander, 1990; 1992; Alexander & Randolph, 1985). In one study (Alexander et al., 1993), a factor analysis of 131 responses of home healthcare nurses and personal/community care aides suggested six factors explaining 63% of the variance. Factors 1 and 4 related to parts of the dimension of instability. Factors 2 represented the dimension of variability. Factors 3 and 5 captured parts of the dimension of uncertainty. Factor 6 related to the lack of use of IV’s and the presence of care planning for all patients. However, when a three-factor solution was forced, the three dimensions of technology were identifiable.

In the current study responses to the NTI were subjected to an exploratory factor analysis using squared multiple correlations as prior communality estimates.
Table 3

**Psychometric Properties of Instruments**

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<th>Subscale</th>
<th>Number of Items</th>
<th>Potential Range</th>
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<th>SD</th>
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</table>

\(^a\) n varies because of missing data

1 Nursing Technology Instrument (Alexander, Thomas, & Cumbey, 1993)
2 Nursing Index of Role Conflict and Ambiguity (Sowell & Alexander, 1989)
3 Alexander Structure Instrument (Alexander, 1986)
4 Community Health Nursing Outcomes Inventory (Alexander & Kroposki, 2001a).
5 Home Care Client Satisfaction Instrument - Revised © (Westra, et al., 1995)
The principal factor method was used to extract the factors, and this procedure was followed by a promax (oblique) rotation (Hatcher, 1994). A scree test suggested three meaningful factors, so only these factors were retained for rotation. The three factors accounted for 99.6% of the variance.

In interpreting the rotated factor pattern an item was said to load on a given factor if the factor loading was .35 or greater for that factor, and was less than .35 for the others. In addition, an item was said to load on a factor if a .20 difference existed between loadings of two factors. Using this criteria six items loaded on the first factor, which was labeled uncertainty. Three items loaded on the second factor labeled instability. Three items loaded on the third factor labeled variability. Six items (#1, 2, 3, 7, 10, and 11) did not load on any factor. Nursing technology items and corresponding factor loadings are presented in Table 4. The factor analysis using data from the current study partially supported the three original dimensions of nursing technology.

Using the three factor structure for the current study, the results were compared with the results of previous research (Alexander et al., 1993; Cumbey & Alexander, 1993) using the coefficient of congruence suggested by Armenakis, Field, and Wilmoth (1977), Bedeian, Armenakis, and Randolph (1988), and Teel and Verran (1991). The coefficient of congruence is a quantitative measure of the similarity of factor structures for different samples of subjects. The coefficient of congruence for the three technology dimensions is displayed in Table 5. Korth and Tucker (1975) suggested minimum values to interpret the significance of this coefficient. The minimum value, indicating significance, varies depending on the number of variables,
and was significant for three dimensions of technology indicating similarity of the factor structures in the current study and Cumbey and Alexander’s (1993) study. A possible explanation for the similarity of the current study’s results with the Cumbey and Alexander study’s results is that both were restricted to registered nurse participation who may have judged what they do similarly whereas, the Alexander study also included some personal/community healthcare aides who may have interpreted nursing technology differently. Thus, the NTI as developed by Alexander et al. (1993) was used to measure nursing technology along the dimensions of instability, variability, and uncertainty.

In previous research, the ranges of alpha coefficients were .60 to .90 for instability, .58 to .81 for variability, and .62 to .82 for uncertainty (Alexander, 1990; 1992; Alexander & Randolph, 1985; Cumbey & Alexander, 1993; 1998). In a study of 131 home healthcare nurses, and personal/community healthcare aides, the alpha coefficients were .60 for instability, .68 for variability, and .67 for uncertainty (Alexander et al., 1993).

In the current study, scale reliability was assessed by calculating coefficient alpha. Reliability estimates were .61 for instability, .62 for variability, and .61 for uncertainty. According to Polit and Hungler (1998) coefficients above .6 are probably sufficient for group-level comparisons. This study investigated group-level comparisons, the agency components in rural and urban counties. Since this study compared groups of nurses in agency components, the NTI demonstrated reliability to measure the three dimensions of nursing technology. Thus, the NTI, shown in
Table 4

NTI Items and Corresponding Factor Loadings from the Reference Structure Matrix

<table>
<thead>
<tr>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Item No.</th>
<th>Nursing Technology Instrument Items a</th>
</tr>
</thead>
<tbody>
<tr>
<td>.46</td>
<td>.01</td>
<td>.00</td>
<td>17</td>
<td>work changes based on condition or mood (U)</td>
</tr>
<tr>
<td>.44</td>
<td>-.03</td>
<td>.10</td>
<td>16</td>
<td>nsg care specialty is difficult to learn (I)</td>
</tr>
<tr>
<td>.44</td>
<td>.34</td>
<td>-.02</td>
<td>10</td>
<td>analysis of complex problems (U)</td>
</tr>
<tr>
<td>.41</td>
<td>.10</td>
<td>-.08</td>
<td>18</td>
<td>emergencies happen (I)</td>
</tr>
<tr>
<td>.41</td>
<td>.14</td>
<td>.08</td>
<td>4</td>
<td>complex problems (U)</td>
</tr>
<tr>
<td>.38</td>
<td>.18</td>
<td>-.13</td>
<td>9</td>
<td>skillful initiative of nursing (I)</td>
</tr>
<tr>
<td>.37</td>
<td>-.15</td>
<td>-.22</td>
<td>12</td>
<td>meet psychosocial needs (U)</td>
</tr>
<tr>
<td>.27</td>
<td>.13</td>
<td>-.06</td>
<td>3</td>
<td>detailed history from birth (U)</td>
</tr>
<tr>
<td>-.08</td>
<td>.55</td>
<td>-.04</td>
<td>5</td>
<td>technical procedures and tests (I)</td>
</tr>
<tr>
<td>-.07</td>
<td>.54</td>
<td>-.10</td>
<td>6</td>
<td>use of technical equipment (I)</td>
</tr>
<tr>
<td>.14</td>
<td>.37</td>
<td>.09</td>
<td>8</td>
<td>time pressure, critical condition (I)</td>
</tr>
<tr>
<td>.20</td>
<td>.32</td>
<td>.04</td>
<td>7</td>
<td>draw blood or IV (I)</td>
</tr>
<tr>
<td>.05</td>
<td>.26</td>
<td>.02</td>
<td>1</td>
<td>pt needs visit between scheduled visits (I)</td>
</tr>
<tr>
<td>.09</td>
<td>.12</td>
<td>.00</td>
<td>11</td>
<td>written goals for ind. care plan (U)</td>
</tr>
<tr>
<td>.11</td>
<td>-.08</td>
<td>.67</td>
<td>14</td>
<td>procedures are similar (V)</td>
</tr>
<tr>
<td>.05</td>
<td>-.06</td>
<td>.61</td>
<td>15</td>
<td>work repeats (V)</td>
</tr>
<tr>
<td>-.21</td>
<td>.04</td>
<td>.33</td>
<td>2</td>
<td>similar health problems (V)</td>
</tr>
<tr>
<td>.34</td>
<td>-.15</td>
<td>-.41</td>
<td>13</td>
<td>intuition rather than rules (U)</td>
</tr>
</tbody>
</table>

Note: n = 196

a I = instability, V = variability, and U = uncertainty (Alexander et al., 1993 scale)

Table 5

Coefficient of Congruence of NTI Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Study using home health nursing personnel a</th>
<th>Study using clinic and home health nurses b</th>
<th>Minimum Values c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instability</td>
<td>.53</td>
<td>.82</td>
<td>.62*</td>
</tr>
<tr>
<td>Variability</td>
<td>.38</td>
<td>.86</td>
<td>.43*</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>.81</td>
<td>.91</td>
<td>.81**</td>
</tr>
</tbody>
</table>

* significant congruence with results of one study
** significant congruence with results of both studies

a Alexander et al., 1993
b Cumbey & Alexander, 1993
c Korth & Tucker, 1975

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Appendix E, demonstrated adequate reliability for the current study.

**Nurses' understanding of their role (role clarity).** Role clarity was measured using the Nursing Index of Role Conflict and Role Ambiguity (NIRCA) (Sowell & Alexander, 1989). NIRCA is a 24-item questionnaire using a 5-point Likert-type scale. This instrument was adapted from the Nurse Stress Index (NSI) (Tagliacozzo & Vaughn, 1982) and the Role Conflict/Role Ambiguity Scale (Rizzo et al., 1970). The NIRCA contains two 12-item sub-scales: role conflict, measured by the odd numbered items, and role ambiguity, measured by the even numbered items. Possible scores on each sub-scale ranged between 12 and 60.

The validity of the NIRCA was established in several ways. To establish content validity, items on the NIRCA were modified from the items on the NSI developed by Tagliacozzo and Vaughn (1982). The NSI measured different types of perceived stress among hospital nurses. According to Tagliacozzo and Vaughn, the NSI measured stress related to job overload, role ambiguity, and role conflict found in Kahn's Job Tension Index. Tagliacozzo and Vaughn adapted the measures of job stress to reflect specific situations unique to nursing. Sowell (1983) further modified the NSI to specifically measure role conflict and role ambiguity. To establish concurrent validity, Sowell compared the individual items on the NIRCA to items on both the NSI and Rizzo et al.'s (1970) Role Conflict/Role Ambiguity scales. Sixteen out of 24 items on the NIRCA are adapted from the Nurse Stress Index. Eleven out of 24 items on the NIRCA are adapted from the Role Conflict/Role Ambiguity Scale. Sowell added some role ambiguity items and re-worded some of the role conflict
items. This modification improved the NIRCA making the instrument more specific to nurses and has equal numbers of items for role conflict and role ambiguity.

In the current study responses to the 24-item questionnaire were subjected to an exploratory factor analysis using squared multiple correlations as prior communality estimates. The principal factor method was used to extract the factors, and this procedure was followed by a promax (oblique) rotation (Hatcher, 1994). A scree test suggested two meaningful factors, so only these factors were retained for rotation. The two factors accounted for 79% of the variance.

In interpreting the rotated factor pattern an item was said to load on a given factor if the factor loading was .35 or greater for that factor, and was less than .35 for the other. In addition, an item was said to load on a factor if a .20 minimum difference existed between loadings on two factors. Using this criteria, fourteen items loaded on the first factor, which was labeled role ambiguity. Four items loaded on the second factor labeled role conflict. Six items did not load on either factor. NIRCA items and corresponding reference structure loading are presented in Table 6. The current factor analysis partially supported a two-factor solution.

In prior research, the reliability coefficients for the scales of the NIRCA ranged from .83 to .84 for the role conflict scale and between .83 and .88 on the role ambiguity scale. A reliability coefficient of .91 was obtained for the NIRCA total scale (Sowell & Alexander, 1989).
Table 6

NIRCA Items and Corresponding Factor Loadings from the Reference Structure Matrix

<table>
<thead>
<tr>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Item #</th>
<th>NIRCA Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.69</td>
<td>.11</td>
<td>20</td>
<td>explanations not clear &amp; concise</td>
</tr>
<tr>
<td>.63</td>
<td>.00</td>
<td>10</td>
<td>not certain about responsibility</td>
</tr>
<tr>
<td>.63</td>
<td>-.06</td>
<td>18</td>
<td>uncertain if performance meets expectations</td>
</tr>
<tr>
<td>.62</td>
<td>-.13</td>
<td>8</td>
<td>not know what supervisor thinks of you</td>
</tr>
<tr>
<td>.62</td>
<td>-.03</td>
<td>22</td>
<td>uncertain of responsibility to supervise unprofessional personnel</td>
</tr>
<tr>
<td>.61</td>
<td>-.02</td>
<td>14</td>
<td>vague directions and guidelines</td>
</tr>
<tr>
<td>.58</td>
<td>.02</td>
<td>9</td>
<td>do things against better judgment</td>
</tr>
<tr>
<td>.56</td>
<td>.06</td>
<td>16</td>
<td>do not know what peers expect</td>
</tr>
<tr>
<td>.49</td>
<td>.07</td>
<td>24</td>
<td>unsure if duties are completed correctly</td>
</tr>
<tr>
<td>.48</td>
<td>.12</td>
<td>21</td>
<td>admin., sup., &amp; MD issue contra. policies</td>
</tr>
<tr>
<td>.48</td>
<td>.17</td>
<td>12</td>
<td>unsure how decisions affect patient</td>
</tr>
<tr>
<td>.45</td>
<td>.14</td>
<td>4</td>
<td>lack of clear standards</td>
</tr>
<tr>
<td>.41</td>
<td>.09</td>
<td>2</td>
<td>unsure of authority</td>
</tr>
<tr>
<td>.41</td>
<td>.26</td>
<td>6</td>
<td>unsure if work contributes to unit</td>
</tr>
<tr>
<td>.32</td>
<td>.21</td>
<td>23</td>
<td>too much time with MD orders</td>
</tr>
<tr>
<td>.25</td>
<td>.21</td>
<td>13</td>
<td>the doctors you work with misunderstand</td>
</tr>
<tr>
<td>.21</td>
<td>.10</td>
<td>17</td>
<td>expectations for continuing education</td>
</tr>
<tr>
<td>-.09</td>
<td>.59</td>
<td>15</td>
<td>too much of your time is spent</td>
</tr>
<tr>
<td>-.12</td>
<td>.57</td>
<td>1</td>
<td>you have too heavy a workload</td>
</tr>
<tr>
<td>.14</td>
<td>.50</td>
<td>7</td>
<td>the amount of work you have to do</td>
</tr>
<tr>
<td>.05</td>
<td>.46</td>
<td>11</td>
<td>your work schedule interferes</td>
</tr>
<tr>
<td>.31</td>
<td>.33</td>
<td>3</td>
<td>you must meet conflicting demand</td>
</tr>
<tr>
<td>.10</td>
<td>.33</td>
<td>5</td>
<td>doctors do not consider</td>
</tr>
<tr>
<td>.23</td>
<td>.25</td>
<td>19</td>
<td>you cannot advance in your career w/o leaving pt care</td>
</tr>
</tbody>
</table>

Note: n = 204. "odd numbered indicated role conflict while even numbers indicted role ambiguity on the Sowell and Alexander scale.

In the present study, scale reliability was assessed by calculating coefficient alphas. Reliability estimates were .78 for role conflict and .89 for role ambiguity.

Thus the original scales of the NIRCA demonstrated adequate reliability for this study. The NIRCA is shown in Appendix F.
Nurses’ decision-making (organizational structure). The Alexander Structure Instrument (ASI) measured organization structure on three dimensions: vertical participation, horizontal participation and formalization. Nurses scored their perceived degree of interaction and clinical decision-making. A low score suggests less flexibility for nurses’ decision-making. A high score suggests the nurses perceive more flexibility to make clinical decision and interaction with their supervisors and peers.

Possible scores for each sub-scale range from 5 to 25 for vertical participation (5 items), 7 to 35 for horizontal participation (7 items), and 2 to 10 for formalization (2 items). The vertical participation subscale consists of items numbered 3, 4, 5, 6, and 7. The horizontal participation subscale includes items numbered 1, 2, 8, 9, 10, 11, and 13. The formalization subscale includes items numbered 12 and 14. Items 1, 2, 8, 9, 10, 11, 12, 13, and 14 are reverse scored.

The structure instrument was initially developed to determine the structure of a social welfare agency by Leifer and Huber (1977). Content validity was established by using items based on research of Leifer and Huber and adapted for nursing by Alexander (1986). In prior home healthcare research, Alexander et al. (1993) used factor and item analysis to verify four factors in the instrument. These factors represented (1) vertical participation, (2) formalization, and (3) voice/role in decision-making, and (4) feelings about decision-making with peers. These last two factors could be conceptually merged into one factor “horizontal participation” as suggested by Alexander and Randolph (1985). To further assess the validity of the ASI, Alexander et al. compared the findings in the home healthcare setting to the findings in other settings using the coefficient of congruence as suggested by Armenakis et al.
The coefficient of congruence examines the similarity of factor structures for different samples of subjects. Alexander et al. found that a "great deal of congruence" exists for the ASI among these samples. This finding supported the authors' contention that the ASI is a valid measure of the three dimensions of vertical participation, horizontal participation, and formalization. The ASI has demonstrated adequate content validity in the home healthcare setting.

In the current study, responses to the 14-item ASI were subjected to an exploratory factor analysis using squared multiple correlations as prior communality estimates. The principal factor method was used to extract the factors, and this procedure was followed by a promax (oblique) rotation (Hatcher, 1994). A scree test suggested three meaningful factors, so only these factors were retained for rotation.

In interpreting the rotated factor pattern an item was said to load on a given factor if the factor loading was .35 or greater for that factor, and was less than .35 for the other. In addition, an item was said to load on a factor if a .20 minimum difference existed between loadings on two factors. Using this criteria, four items loaded on the first factor, which was labeled vertical participation. Four items loaded on the second factor labeled formalization. One item loaded on the third factor labeled horizontal participation. Five items (# 1, 2, 3, 5, and 8) did not load on any factor. ASI items and corresponding reference structure loadings are presented in Table 7. The current factor analysis partially supported three dimensions of organizational structure.
Table 7

ASI Items and Corresponding Factor Loadings from the Reference Structure Matrix

<table>
<thead>
<tr>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Item #</th>
<th>ASI Items a</th>
</tr>
</thead>
<tbody>
<tr>
<td>.61</td>
<td>-.24</td>
<td>.05</td>
<td>10</td>
<td>do not share any influence with sup.(HP)</td>
</tr>
<tr>
<td>.57</td>
<td>-.08</td>
<td>-.01</td>
<td>11</td>
<td>sup makes decisions himself/herself (HP)</td>
</tr>
<tr>
<td>.50</td>
<td>.23</td>
<td>-.19</td>
<td>6</td>
<td>sup seeks advice before decisions (VP)</td>
</tr>
<tr>
<td>.46</td>
<td>-.01</td>
<td>.19</td>
<td>13</td>
<td>do not play active role making decisions (HP)</td>
</tr>
<tr>
<td>.31</td>
<td>.17</td>
<td>.22</td>
<td>2</td>
<td>people do not have voice in decisions (HP)</td>
</tr>
<tr>
<td>.23</td>
<td>.45</td>
<td>.09</td>
<td>4</td>
<td>enc. to make suggestions in decisions (VP)</td>
</tr>
<tr>
<td>.21</td>
<td>.43</td>
<td>-.03</td>
<td>7</td>
<td>people are involved in decision making (VP)</td>
</tr>
<tr>
<td>.31</td>
<td>.37</td>
<td>.00</td>
<td>5</td>
<td>enc to speak mind on job even if disagree (VP)</td>
</tr>
<tr>
<td>-.05</td>
<td>.19</td>
<td>-.04</td>
<td>3</td>
<td>individuals have say in making decisions (VP)</td>
</tr>
<tr>
<td>.09</td>
<td>-.51</td>
<td>-.08</td>
<td>14</td>
<td>rules are followed to make decisions (F)</td>
</tr>
<tr>
<td>.13</td>
<td>-.60</td>
<td>-.04</td>
<td>12</td>
<td>rules exist for handling problems (F)</td>
</tr>
<tr>
<td>.11</td>
<td>-.08</td>
<td>.39</td>
<td>9</td>
<td>check with sup before I do anything (HP)</td>
</tr>
<tr>
<td>-.07</td>
<td>.07</td>
<td>.31</td>
<td>1</td>
<td>not likely to express my feelings about job (HP)</td>
</tr>
<tr>
<td>.11</td>
<td>.06</td>
<td>.26</td>
<td>8</td>
<td>job not clearly defined (HP)</td>
</tr>
</tbody>
</table>

Note: n = 204

a VP = vertical participation; HP = horizontal participation; F = formalization on the Alexander (1986) scale

Using this three factor structure for the current study, the results were compared with the results of previous research (Alexander et al., 1993; Cumbey & Alexander, 1993) using the coefficient of congruence suggested by Armenakis et al. (1977), Bedeian et al. (1988), and Teel and Verran (1991). The coefficient of congruence, a quantitative measure of the similarity of factor structures for different samples of subjects, for the three structure dimensions is displayed in Table 8. The minimum values (Korth & Tucker, 1975) to interpret the significance of this coefficient are included in the table. The minimum value, indicating significance, varies depending on the number of variables, and were significant for two of the three
dimensions of organizational structure indicating similarity of at least two factor structures between the current study and the previous studies. Based on the results of the factor analysis and coefficient of congruence, the original scales of the ASI were used in this study to measure organizational structure along the dimensions of vertical participation, horizontal participation and formalization.

Table 8

Coefficient of Congruence of ASI Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Study using home health nursing personnel a</th>
<th>Study using clinic and home health nurses b</th>
<th>Minimum Values c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Participation</td>
<td>.74</td>
<td>.76</td>
<td>.90</td>
</tr>
<tr>
<td>Horizontal Participation</td>
<td>.74</td>
<td>.80</td>
<td>.63*</td>
</tr>
<tr>
<td>Formalization</td>
<td>.92</td>
<td>.83</td>
<td>.79*</td>
</tr>
</tbody>
</table>

* significant congruence with results of both studies
a Alexander et al., 1993
b Cumbey & Alexander, 1993
c Korth & Tucker, 1975

In previous research, the ranges of alpha coefficients were .67 to .84 for vertical participation, .30 to .73 for horizontal participation, and .48 to .74 for formalization (Alexander, 1990; Cumbey & Alexander, 1993). In home healthcare research, Alexander et al. (1993) found alpha coefficients for vertical participation was .83, for horizontal participation was .54, and for formalization was .64.

In the current study, scale reliability was assessed by calculating coefficient alphas. Reliability estimates were .77, .73, and .77 for vertical participation, horizontal participation, and formalization scales respectively. Thus the ASI, as conceived by
Alexander (1986), was used because the instrument measured the three dimensions of structure in the conceptual model and demonstrated adequate reliability for each dimension. The ASI is shown in Appendix G.

**Nursing technology/organizational structure fit.** The nursing technology/organizational structure fit is the interaction of the nursing care processes necessary to change the patient’s status and the decision-making home healthcare nurses use to accomplish this work. The nursing technology/organizational structure fit was determined by analyzing the scores for selected dimensions on the NTI and the ASI. All pairs between the dimensions of nursing technology and organizational structure were calculated. The resultant score for each pair of the technology-structure fit was calculated by using the absolute value of the difference between the technology and structure scores (Alexander & Bauerschmidt, 1987; Alexander & Mark, 1990; Alexander & Randolph, 1985).

**Agency ownership.** Home healthcare agencies were classified as county, corporation, non-profit, or state following the list of all home healthcare agencies in South Carolina. The administrator verified this information when the agency agreed to participate in the study.

**Geographic location.** Agency components (groups of nurses caring for patients in a county) were coded according to rural or urban location. Nurses’ and patients’ data were coded according to agency and county. Counties were categorized according to rural or urban designation.

**Patient outcomes.** The study measured nurses’ perceptions of patient outcomes sensitive to nursing care with the Community Health Nursing Outcomes Inventory

85
Nurses rated their perception of the achievement of nurse and patient outcomes by completing the CHNOI, a 48 item, 5-point Likert-type questionnaire. A low score suggests low outcomes achievement while a high score suggests the nurses perceive that most outcomes are achieved. Possible scores for the total scale ranged from 48 to 240. Possible scores for each subscale of the CHNOI ranged from 12 to 60 on the psychosocial components of client care (12 items), from 11 to 55 on the physiological components of client care sub-scale (11 items), from 15 to 75 on the nursing intervention/implementation components of client care sub-scale (15 items), and from 10 to 50 on the environmental/community components of client care (10 items). The psychosocial components of client care dimension include items numbered 16, 17, 18, 19, 20, 22, 41, 42, 44, 45, 47, and 48. The physiological components of client care subscale contain items numbered 7, 8, 10, 11, 12, 29, 30, 32, 34, 35, and 36. The nursing intervention/implementation components of client care dimension includes items 5, 9, 13, 14, 15, 21, 27, 31, 33, 37, 38, 39, 40, 43, and 46. The environmental/community components of client care dimension contain items numbered 1, 2, 3, 4, 6, 23, 24, 25, 26, and 28 (Alexander & Kroposki, 1999).

To establish content validity, a panel of master's and doctorally prepared community health nurses reviewed items suggested by practicing community health nurses. Based on their suggestions, items were modified and prepared in a consistent format. To further establish content validity, the authors conducted a three round Delphi study (Alexander & Kroposki, 1999).

To assess the construct validity of the CHNOI the authors performed a factor analysis that supported a four-factor solution. These factors were labeled 1) client’s
psychosocial components of care, 2) client’s physiological components of care, 3) nursing intervention/implementation components of care, and 4) environment/community safety components of care. The four factors explained 58% of the variance (Alexander & Kroposki, 1999).

The CHNOI has been assessed for validity among home healthcare nurses. Home healthcare nurses were represented in the focus group as well as in all rounds of the Delphi study. Furthermore, t-test comparisons of home healthcare nurses and clinic nurses in rounds two and three, indicated that home healthcare nurses and clinic nurses do not differ significantly when responding to the CHNOI (Alexander & Kroposki, 1999).

In the present study responses to the 48-item CHNOI were subjected to an exploratory factor analysis using squared multiple correlations as prior communality estimates. The principal factor method was used to extract the factors, and this procedure was followed by a promax (oblique) rotation (Hatcher, 1994). A scree test suggested four meaningful factors, so only these factors were retained for rotation. The factors accounted for 72% of the variance.

In interpreting the rotated factor pattern an item was said to load on a given factor if the factor loading was .35 or greater for that factor, and was less than .35 for the other. In addition, an item was said to load on a factor if a .20 minimum difference existed between loadings on two factors. Using this criteria, fourteen items loaded on the first factor, which was labeled the clients’ psychosocial components of care and ten items loaded on Factor 2 which was labeled nursing interventions/implementation components of care. Eight items loaded on Factor 3 labeled environmental/community...
components of care, and six items loaded on Factor 4 labeled the clients' physiological components of care. Ten items (#1, 5, 7, 13, 30, 31, 34, 35, 36, 40) did not load on any factors. CHNOI items and corresponding factor loadings are presented in Table 9. The factor analysis using data from the current study partially supported four dimensions of patient outcomes that are sensitive to nursing care.

Using this four factor structure for the current study, and the 47 items that were in the original data set, the results were compared with the results of previous research (Alexander & Kroposki, 2001a) using the coefficient of congruence suggested by Armenakis et al. (1977), Bedeian et al. (1988), and Teel and Verran (1991). The coefficient of congruence, a quantitative measure of the similarity of factor structures for different samples of subjects, for the four CHNOI dimensions is displayed in Table 10. The minimum values (Korth & Tucker, 1975) used to interpret the significance of this coefficient are included in the table. The minimum value, indicating significance, varies depending on the number of variables, and was significant for four dimensions of CHNOI indicating similarity between the current and the previous study.

Based on the results of the factor analysis and coefficient of congruence, the CHNOI, as developed by Alexander and Kroposki (2001a), was used in this study to measure patient outcomes that are sensitive to nursing care along four dimensions. The dimensions are the clients' psychosocial components of care, the clients' physiological components of care nursing interventions/implementation components of care, environmental/community components of care.
Table 9

CHNOI Items and Corresponding Factor Loadings from the Reference Structure Matrix

<table>
<thead>
<tr>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Item No.</th>
<th>Items a</th>
</tr>
</thead>
<tbody>
<tr>
<td>.60</td>
<td>-.09</td>
<td>.10</td>
<td>-.04</td>
<td>24</td>
<td>c b is in control of health outcomes (E)</td>
</tr>
<tr>
<td>.57</td>
<td>-.04</td>
<td>-.04</td>
<td>.15</td>
<td>42</td>
<td>c is motivated to part. in daily care (S)</td>
</tr>
<tr>
<td>.53</td>
<td>.03</td>
<td>.09</td>
<td>-.13</td>
<td>48</td>
<td>c has appropriate coping skills (S)</td>
</tr>
<tr>
<td>.52</td>
<td>-.24</td>
<td>-.05</td>
<td>.24</td>
<td>20</td>
<td>c has skills to care for self (S)</td>
</tr>
<tr>
<td>.50</td>
<td>-.02</td>
<td>.04</td>
<td>.24</td>
<td>41</td>
<td>c expresses understanding of physical problem (S)</td>
</tr>
<tr>
<td>.49</td>
<td>.21</td>
<td>.02</td>
<td>-.09</td>
<td>47</td>
<td>c comm. app. with fam. or cgver (S)</td>
</tr>
<tr>
<td>.49</td>
<td>.01</td>
<td>-.08</td>
<td>.04</td>
<td>19</td>
<td>family/patient caregivers are able to care for client independently (S)</td>
</tr>
<tr>
<td>.46</td>
<td>.01</td>
<td>.01</td>
<td>.02</td>
<td>17</td>
<td>c is motivated to part in activities (S)</td>
</tr>
<tr>
<td>.45</td>
<td>.02</td>
<td>-.16</td>
<td>.27</td>
<td>29</td>
<td>c verbalizes signs and symptoms of illness (P)</td>
</tr>
<tr>
<td>.43</td>
<td>.06</td>
<td>.14</td>
<td>.00</td>
<td>18</td>
<td>c is satisfied with situation (S)</td>
</tr>
<tr>
<td>.42</td>
<td>.20</td>
<td>-.01</td>
<td>-.01</td>
<td>45</td>
<td>c communicates (S)</td>
</tr>
<tr>
<td>.41</td>
<td>.09</td>
<td>.17</td>
<td>.15</td>
<td>44</td>
<td>c states injury from noncompliance (S)</td>
</tr>
<tr>
<td>.39</td>
<td>.24</td>
<td>.14</td>
<td>-.17</td>
<td>40</td>
<td>frequency of visits is app for care (N)</td>
</tr>
<tr>
<td>.36</td>
<td>.15</td>
<td>.06</td>
<td>-.05</td>
<td>16</td>
<td>c perf ADLs specific to own sit. (S)</td>
</tr>
<tr>
<td>.35</td>
<td>.05</td>
<td>-.11</td>
<td>.24</td>
<td>22</td>
<td>c communicates app with nurse (S)</td>
</tr>
<tr>
<td>.28</td>
<td>.16</td>
<td>-.03</td>
<td>.26</td>
<td>36</td>
<td>c demonstrates increased strength after exercise program (P)</td>
</tr>
<tr>
<td>-.07</td>
<td>.60</td>
<td>.05</td>
<td>.01</td>
<td>37</td>
<td>n c provides family focused care (N)</td>
</tr>
<tr>
<td>-.04</td>
<td>.54</td>
<td>.01</td>
<td>.05</td>
<td>33</td>
<td>n makes app. referrals to OT (N)</td>
</tr>
<tr>
<td>.04</td>
<td>.52</td>
<td>-.07</td>
<td>.02</td>
<td>27</td>
<td>n ensures services are available (N)</td>
</tr>
<tr>
<td>.07</td>
<td>.47</td>
<td>.01</td>
<td>-.01</td>
<td>46</td>
<td>n app manages client’s meds (N)</td>
</tr>
<tr>
<td>-.15</td>
<td>.40</td>
<td>.05</td>
<td>.31</td>
<td>9</td>
<td>n considers prior functioning (N)</td>
</tr>
<tr>
<td>.09</td>
<td>.35</td>
<td>.04</td>
<td>.08</td>
<td>38</td>
<td>cost of care is minimized (N)</td>
</tr>
<tr>
<td>.22</td>
<td>.35</td>
<td>.04</td>
<td>-.08</td>
<td>35</td>
<td>length of time between hospitalizations increases (P)</td>
</tr>
<tr>
<td>.23</td>
<td>.32</td>
<td>.12</td>
<td>.01</td>
<td>34</td>
<td>c b reached highest mobility (P)</td>
</tr>
</tbody>
</table>

a S = psychosocial, P = physiological, N = nursing intervention, E = environmental (Alexander & Kroposki, 1999).
b c = client;
c n = nurse

(Table 9 continued on next page)
Table 9 (continued)

**CHNOI Items and Corresponding Factor Loadings from the Reference Structure**

Matrix

<table>
<thead>
<tr>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Item No.</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>-.04</td>
<td>.28</td>
<td>-.03</td>
<td>.23</td>
<td>31</td>
<td>n is aware of limitations (N)</td>
</tr>
<tr>
<td>-.02</td>
<td>-.14</td>
<td>.83</td>
<td>.08</td>
<td>4</td>
<td>fetal mortality decreases (E)</td>
</tr>
<tr>
<td>-.06</td>
<td>-.08</td>
<td>.79</td>
<td>.11</td>
<td>6</td>
<td>infant mortality decreases (E)</td>
</tr>
<tr>
<td>-.09</td>
<td>-.03</td>
<td>.69</td>
<td>-.02</td>
<td>3</td>
<td>no unplanned pregnancies (E)</td>
</tr>
<tr>
<td>.01</td>
<td>.04</td>
<td>.61</td>
<td>.06</td>
<td>28</td>
<td>exposure to lead is min. for children (E)</td>
</tr>
<tr>
<td>-.03</td>
<td>.14</td>
<td>.56</td>
<td>-.02</td>
<td>2</td>
<td>toxins in home minimized (E)</td>
</tr>
<tr>
<td>.20</td>
<td>-.07</td>
<td>.52</td>
<td>.16</td>
<td>25</td>
<td>c received appropriate prenatal care (E)</td>
</tr>
<tr>
<td>.15</td>
<td>.01</td>
<td>.48</td>
<td>-.10</td>
<td>26</td>
<td>disease in community decreased (E)</td>
</tr>
<tr>
<td>.20</td>
<td>.05</td>
<td>.44</td>
<td>-.12</td>
<td>23</td>
<td>abuse ceased within home environ. (E)</td>
</tr>
<tr>
<td>.08</td>
<td>.14</td>
<td>.38</td>
<td>-.19</td>
<td>1</td>
<td>immunization appropriate for age (E)</td>
</tr>
<tr>
<td>-.18</td>
<td>.18</td>
<td>.25</td>
<td>.13</td>
<td>5</td>
<td>n works with community (N)</td>
</tr>
<tr>
<td>.11</td>
<td>.07</td>
<td>.18</td>
<td>.07</td>
<td>7</td>
<td>c vital signs stabilized (P)</td>
</tr>
<tr>
<td>-.03</td>
<td>.13</td>
<td>.02</td>
<td>.61</td>
<td>11</td>
<td>c states und. of home exercise prgm (P)</td>
</tr>
<tr>
<td>.08</td>
<td>.07</td>
<td>-.08</td>
<td>.60</td>
<td>12</td>
<td>c demo correct colostomy care (P)</td>
</tr>
<tr>
<td>.09</td>
<td>-.01</td>
<td>-.01</td>
<td>.57</td>
<td>8</td>
<td>c demo correct injection technique (P)</td>
</tr>
<tr>
<td>-.03</td>
<td>.09</td>
<td>.09</td>
<td>.49</td>
<td>10</td>
<td>c states manages pain (P)</td>
</tr>
<tr>
<td>.17</td>
<td>.17</td>
<td>.03</td>
<td>.41</td>
<td>32</td>
<td>c demonstrates increased endurance (P)</td>
</tr>
<tr>
<td>.07</td>
<td>.13</td>
<td>.22</td>
<td>.37</td>
<td>14</td>
<td>c states has necessary supplies (N)</td>
</tr>
<tr>
<td>.34</td>
<td>-.09</td>
<td>-.06</td>
<td>.35</td>
<td>30</td>
<td>c controls symptoms of constipation (P)</td>
</tr>
<tr>
<td>.25</td>
<td>.13</td>
<td>-.01</td>
<td>.29</td>
<td>13</td>
<td>c applies health skills learned (N)</td>
</tr>
</tbody>
</table>

Note: n = 151

*a S = psychosocial, P = physiological, N = nursing intervention,
E = environmental (Alexander & Kroposki, 1999).

b c = client

c n = nurse

In prior use (Alexander & Kroposki, 2001a), the alpha coefficients for each
dimension were reported. The psychosocial components of client care scale was .87,
the physiological components of client care scale was .87, the nursing intervention/
implementation components of client care scale was .88, and the environment/
Table 10

Coefficient of Congruence of CHNOI Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Study of community health nurses in clinic and home health settings a</th>
<th>Minimum Values b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychosocial Components of Care</td>
<td>.77</td>
<td>.58*</td>
</tr>
<tr>
<td>Physiological Components of Care</td>
<td>.79</td>
<td>.15*</td>
</tr>
<tr>
<td>Nursing Interventions/Implementation Components of Care</td>
<td>.88</td>
<td>.44*</td>
</tr>
<tr>
<td>Environmental/Community Safety Components of Care</td>
<td>.87</td>
<td>.29*</td>
</tr>
</tbody>
</table>

* all scores are higher than minimum values indicating significant congruence with results of previous study

a Alexander & Kroposki, 1999
b Korth & Tucker, 1975

Community components of client care scale was .73. Findings of an assessment of the test-retest reliability showed that correlations ranged from .60 to .87: environment/community safety components of care (.60), nursing intervention/implementation components of care (.66), client's psychosocial components of care (.77), and the client’s physiological components of care (.87). The total scale alpha coefficient was .93.

Scale reliability was assessed by calculating coefficient alphas. Reliability estimates were .90 for the client’s psychosocial components of care scale, .89 for the client’s physiological components of care scale, .86 for the nursing intervention/implementation components of care scale, and .86 for the environment/community safety components of care scale. The alpha coefficient for the total scale was .94.
Thus, the CHNOI demonstrated adequate reliability for use in this study. The CHNOI is shown in Appendix H.

Patient satisfaction was assessed using the Home Care Client Satisfaction Instrument-Revised (HCCSI-R) (Westra et al., 1995). The developers stated that the HCCSI-R is a one-dimensional scale with 12 items rated on a 5-point Likert scale and three items rated on a 10-point Likert scale. In this study, the scores for the 10 point items were converted to a 5 point scale (1&2=1; 3&4=2; 5&6=3; 7&8=4; 9&10=5). The total scores ranged from 15 to 75.

To establish content validity, Westra and colleagues (1995) developed the HCCSI-R by using statements from three valid patient satisfaction instruments: the Outpatient Satisfaction with Health Care Questionnaire (OSQ-37) (Hays, 1990), the Patient Satisfaction Instrument (PSI) developed by Risser (1975) and modified by Hinshaw and Atwood (1982), and the Client Satisfaction Survey (CSS) (Reeder & Chen, 1990). In an attempt to overcome the limitations of these classic instruments and to develop an instrument specific to home healthcare, several home healthcare experts in one home healthcare agency selected items from the three instruments. The resulting 33 items were formatted based on a modification of the OSQ-37. The resulting instrument was subjected to three pilot tests involving patients and home healthcare nurses which resulted in several modifications to the instrument.

To establish construct validity, the Westra et al. (1995) performed an item analysis procedure. The initial HCCSI was a 33-item instrument composed of six subscales: interpersonal relation, technical competence, financial aspects, access/convenience, continuity of care, and overall satisfaction. After reducing the
number of items, the authors stated that the “HCCSI-R should be considered a unidimensional scale because of its length” (Westra et al., 1995, p. 397). A visual inspection of the HCCSI-R shows that five of the six subscales are still represented by the remaining items. The only subscale that has been removed is the financial aspects subscale. The authors noted that the financial aspects items in the HCCSI had low correlations to the total scale score.

To assess the criterion-related validity of the HCCSI-R, Westra et al. (1995) compared the results of the pilot study to a single item. The authors noted that there was a “significant correlation between the items and likelihood of recommending services to others” (p. 398) and concluded that the instrument was a good measure of patient satisfaction.

In the current study, responses to the 15-item questionnaire were subjected to an exploratory factor analysis using squared multiple correlations as prior communality estimates. The principal factor method was used to extract the factors (Hatcher, 1994). In interpreting the factor pattern an item was said to load on a given factor if the factor loading was .35 or greater for that factor, and was less than .35 for the other. In addition, an item was said to load on a factor if a .20 minimum difference existed between loadings on two factors. Using this criteria, all fifteen items loaded on the first factor and the corresponding loadings are presented in Table 11.

Westra et al. (1995) reported the alpha coefficient for the total scale as .93. In a pilot study to assess the test-retest reliability of the HCCSI-R, twenty home healthcare patients were asked to complete the instrument at a two-week interval. The correlation of responses between Time 1 and Time 2 was .59 using a Spearman Rho. The
researchers anticipated this moderate correlation since the nature of patient satisfaction is dynamic. In this study the alpha coefficients were .95 for the total scale. Thus, the HCCSI-R had adequate validity, internal consistency reliability, and test-retest reliability for use in the current study.

Table 11

HCCSI-R Items and Corresponding Factor Loadings from the Factor Pattern

<table>
<thead>
<tr>
<th>Factor 1</th>
<th>Item No.</th>
<th>HCCSI-R Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.93</td>
<td>10</td>
<td>attention to concerns</td>
</tr>
<tr>
<td>.89</td>
<td>9</td>
<td>ability of agency to meet needs</td>
</tr>
<tr>
<td>.89</td>
<td>5</td>
<td>staff knowledge of health problems</td>
</tr>
<tr>
<td>.88</td>
<td>3</td>
<td>dependability of staff</td>
</tr>
<tr>
<td>.88</td>
<td>7</td>
<td>felt safe when care was provided</td>
</tr>
<tr>
<td>95</td>
<td>1</td>
<td>helpfulness of office staff</td>
</tr>
<tr>
<td>.88</td>
<td>2</td>
<td>attention to concerns</td>
</tr>
<tr>
<td>.88</td>
<td>4</td>
<td>respect shown to you</td>
</tr>
<tr>
<td>.87</td>
<td>6</td>
<td>have choices about care</td>
</tr>
<tr>
<td>.85</td>
<td>12</td>
<td>have same people consistently</td>
</tr>
<tr>
<td>.83</td>
<td>8</td>
<td>knowing who to contact with problems</td>
</tr>
<tr>
<td>.81</td>
<td>11</td>
<td>schedule care at times wanted</td>
</tr>
<tr>
<td>.49</td>
<td>13</td>
<td>agency meets expectations</td>
</tr>
<tr>
<td>.47</td>
<td>15</td>
<td>likely to recommend</td>
</tr>
<tr>
<td>.45</td>
<td>14</td>
<td>satisfied with overall care</td>
</tr>
</tbody>
</table>

Note: n = 310

Additional reasons for choosing the HCCSI-R for this study include design factors that are specific for use among older adults. The wording of the instrument was designed to reduce confusion by including only neutrally worded items rather than mixing negatively and positively worded items and takes about ten minutes to complete. The HCCSI-R is brief, allowing plenty of white space across two pages. The instrument scored a Flesch-Kincaid reading level of 8.5 years suggesting that the participation burden was minimal for patients in this study. The HCCSI-R is shown in Appendix I.
Data Collection Procedures

Once the agency agreed to participate and completed the review procedures, the investigator contacted the home healthcare administrator or director of nursing. The director of nursing contacted the nurse manager who arranged for a time and place for the nurses in the agency component to participate.

To encourage participation, the investigator visited each site at a time determined by the nurse manager. The investigator’s visit coincided with a time when the majority of the home healthcare nurses were at the home healthcare office. Recognizing that home healthcare nurses are under severe time constraints, the investigator followed suggestions that were shown to be effective in gaining the response among home healthcare nurses such as meeting with the nurses during a staff meeting and in the afternoon on Tuesday through Thursday (Madigan & Anderson, 1999). After explaining the study, the investigator gave a packet to each nurse. The packet included a letter of introduction (Appendix J), the instruments (Appendix E-H), a demographic sheet (Appendix C), and a postcard to request a copy of a final report, a pen, and a certificate of appreciation for participating in the study. The nurses indicated their agreement to participate by returning the questionnaire. To preserve confidentiality, nurses did not put their names on the questionnaires.

The investigator encouraged the nurses to complete the questionnaire immediately. Nurses who wished to complete the questionnaire at a later time received a stamped return envelope to mail the questionnaires directly to the researcher. Nurses who wished to take the questionnaires with them received a reminder postcard to encourage them to return the survey promptly. To increase response rate, the
investigator was willing to send a second survey if they contacted the investigator. No nurses followed through with this option. Nurses were asked to distribute packets to patients according to the procedure described in the sample selection section.

Each patient's packet contained a letter of introduction (Appendix K), the patient satisfaction survey (Appendix I), a demographic sheet (Appendix D), a postcard to request a copy of the final results, a pen, and a stamped, self-addressed return envelope. The letter of introduction to the patient explained the purpose of the study. By returning the questionnaire in a stamped envelope patients indicated their agreement to participate. To preserve confidentiality, patients did not put their names on the questionnaires and mailed the questionnaires directly to the investigator. If the patient wished to receive a final report of the study, the patient mailed a card with this request separately from the survey.

**Protection of Human Subjects**

Before collecting data, the investigator received written approval from the institutional review boards of the University of South Carolina and the Department of Health and Environmental Control. The investigator sought written approval from each home healthcare agency. Once the agency agreed to participate, the investigator followed the agency's procedure to obtain permission to conduct a study in the agency. A letter requesting approval and a sample letter of support are presented in Appendix A. The investigator and the nurse manager from each home healthcare agency discussed ways of accessing nurses and patients for inclusion in the study.

The investigator emphasized the voluntary nature of participation to all nurse participants. The investigator emphasized to nurses that their work situation was in no
way contingent on participation in the study. The nurses and patients received a letter of introduction describing the purpose of the study. Home healthcare nurses and patients could have withdrawn from the study at any time without penalty. The patient letter explained that receipt of services was in no way contingent on participation in the study. To preserve confidentiality, patients and nurses were instructed not to put their names on the questionnaires. The questionnaires were returned directly to the investigator. Return of completed questionnaires represented the participants’ consent to participate.

Data collection records were kept in a locked cabinet in the investigator’s office. Questionnaires had identification numbers of the agencies and no names were attached. Only the investigator had access to the names and addresses of participants who requested a final report. Only one patient requested a second questionnaire to replace the original one that was lost. Post cards with names and addresses of participants who requested copies of the final report were kept separately from the questionnaires and could not be associated with the questionnaires. In any report of the study, only group data were reported.

No physical risk to the participants was associated with this study. The nurses could have experienced a small risk of emotional burden when they answered questions about organizational issues. Occasionally nurses who were completing the surveys would comment about the relevance of the items but no one mentioned that completing the survey caused any stress.

Patients or their family members could have felt a small risk of emotional discomfort as they answered questions about their care. The investigator was not
present when the patient completed the patient satisfaction instrument. Patients were provided a clear space on the questionnaire to write any concerns they felt should be shared. Patients were also provided with the agency’s telephone number if they wished to communicate any concerns directly to the agency.

**Data Analysis Plan**

The unit of analysis was an agency component of groups of nurses providing care for patients in one county. When an agency provided care for patients in more than one county, each county group of nurses caring for patients in that county was considered a unit of analysis.

Survey results were analyzed using bivariate correlation, t test, ANOVA, and multiple regression analyses to examine the relationships among the organizational variables and the outcome variables. The organizational variables were measured on a five point ordinal scale allowing them to be treated as interval level variables during analysis. The instruments used to measure nursing technology, role clarity, and organizational structure are scales made up of several dimensions. The score for each dimension was found by summing the responses to the corresponding items to form continuous measures. The nursing technology/organizational structure fit was calculated by computing the absolute difference between the dimension totals. All nursing technology/organizational structure fit differences were computed between the three dimensions of nursing technology (instability, variability, and uncertainty) and the three dimensions of organizational structure (vertical participation, horizontal participation, and formalization) (Alexander & Bauerschmidt, 1987; Alexander & Randolph, 1985).
The outcome variables were nurses' perceptions of outcomes that are sensitive to nursing care and patient satisfaction. The score for each scale was found by summing the responses to the corresponding scale items to form continuous measures. The average response for each agency component was the value entered in the analysis. Multiple regression analysis was performed to examine the effects of the predictor variables on the outcome variables (Hatcher & Stepanski, 1994; Polit & Hungler, 1998). A list of the research questions and the statistical tests are shown in Table 12.

Table 12

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Statistical Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is the relationship of patients' age and the dimensions of nursing technology?</td>
<td>Pearson's correlation</td>
</tr>
<tr>
<td>a) What is the relationship of patients' age and instability?</td>
<td>coefficient</td>
</tr>
<tr>
<td>b) What is the relationship of patients' age and variability?</td>
<td></td>
</tr>
<tr>
<td>c) What is the relationship of patients' age and uncertainty?</td>
<td></td>
</tr>
<tr>
<td>2. What is the relation of patients' skilled need and the dimensions of nursing technology?</td>
<td>Pearson's correlation</td>
</tr>
<tr>
<td>a) What is the relation of patients' skilled need and instability?</td>
<td>coefficient</td>
</tr>
<tr>
<td>b) What is the relation of patients' skilled need and variability?</td>
<td></td>
</tr>
<tr>
<td>c) What is the relation of patients' skilled need and uncertainty?</td>
<td></td>
</tr>
</tbody>
</table>
3. Does a significant difference exist in the dimensions of nursing technology based on agency ownership type?  
   a) Does a significant difference in instability exist based on ownership type?  
   b) Does a significant difference in variability exist based on ownership type?  
   c) Does a significant difference in uncertainty exist based on ownership type?  

4. Does a significant difference exist in the dimensions of nursing technology based on rural or urban location?  
   a) Does a significant difference in instability exist based on rural or urban location?  
   b) Does a significant difference in variability exist based on rural or urban location?  
   c) Does a significant difference in uncertainty exist based on rural or urban location?  

5. What is the relationship of role conflict and the dimensions of organizational structure?  
   a) What is the relationship of role conflict and vertical participation?  
   b) What is the relationship of role conflict and horizontal participation?  

100
c) What is the relationship between role conflict and formalization?

6. What is the relationship of role ambiguity and the dimensions of organizational structure? Pearson's correlation coefficient

a) What is the relationship of role ambiguity and vertical participation?

b) What is the relationship of role ambiguity and horizontal participation?

c) What is the relationship of role ambiguity and formalization?

7. What is the relationship of nurses' age and dimensions of organizational structure? Pearson's correlation coefficient

a) What is the relationship of nurses' age and vertical participation?

b) What is the relationship of nurses' age and horizontal participation?

c) What is the relationship of nurses' age and formalization?

8. What is the relationship of nurses' education and dimensions of organizational structure? Pearson's correlation coefficient

a) What is the relationship of nurses' education and vertical participation?

b) What is the relationship of nurses' education and horizontal participation?
c) What is the relationship of nurses’ education and formalization?

9. What is the relationship of nurses’ experience in nursing and dimensions of organizational structure? Pearson’s correlation

a) What is the relationship of nurses’ experience in nursing and vertical participation? coefficient

b) What is the relationship of nurses’ experience in nursing and horizontal participation?

c) What is the relationship of nurses’ experience in nursing and formalization?

10. What is the relationship of nurses’ tenure in the agency and dimensions of organizational structure? Pearson’s correlation

a) What is the relationship of nurses’ tenure in the agency and vertical participation? coefficient

b) What is the relationship of nurses’ tenure in the agency and horizontal participation?

c) What is the relationship of nurses’ tenure in the agency and formalization?

11. What is the relationship of the number of nurses’ visits per week and dimensions of organizational structure? Pearson’s correlation

a) What is the relationship of the number of nurses’ visits per week and vertical participation?
b) What is the relationship of the number of nurses' visits per week and horizontal participation?

c) What is the relationship of the number of nurses' visits per week and formalization?

12. What is the relationship of the number of nurses' calls per week and dimensions of organizational structure? Pearson's correlation

a) What is the relationship of the number of nurses' calls per week and vertical participation?

b) What is the relationship of the number of nurses' calls per week and horizontal participation?

c) What is the relationship of the number of nurses' calls per week and formalization?

13. Does a significant difference exist in the dimensions of organizational structure based on agency ownership type? Analysis of variance

a) Does a significant difference in vertical participation exist based on ownership type?

b) Does a significant difference in horizontal participation exist based on ownership type?

c) Does a significant difference in formalization exist based on ownership type?

14. Does a significant difference exist in the dimensions of organizational structure based on rural or urban location? t test
a) Does a significant difference in vertical participation exist based on rural or urban location?

b) Does a significant difference in horizontal participation exist based rural or urban location?

c) Does a significant difference in formalization exist based on rural or urban location?

15. Which combination of the dimensions of nursing technology and organizational structure predicts nurses’ perceptions of patient outcomes?

16. Which combination of the dimensions of nursing technology and organizational structure predicts patient satisfaction?

Summary

Chapter 3 presented the methodology of the study, including the study design, description of the setting and sample, and unit of analysis. The demographics and the psychometric properties of the instruments were discussed. The data analysis plan was presented including a list of research questions and the tests used for each.
CHAPTER IV

Results of the Data Analysis

Chapter 4 presents the results of analysis of the study data. Descriptive, correlational, and multivariate statistics were performed on the collected data using the computer facilities of the University of South Carolina and the statistical package PC-SAS (PC/SAS Institute, 1989). The presentation of the data analysis is divided into the following sections: description of the sample, results of the instruments, answers to the research questions and post hoc analyses.

Description of the Sample

The convenience sample consisted of 43 home health agency components. An agency component consisted of a group of home healthcare nurses who cared for patients in a specific county. Located in 20 urban counties and 23 rural counties, the 43 agency components consisted of 11 agency components owned by corporations, eight agency components owned by nonprofit agencies, one county owned agency component, and 23 agency components owned by the state. Fifteen state agency components were located in rural counties compared to eight non-state agency components but the relationship of agency ownership and location was not statistically significant.

When analyzed as a group, nurses who met inclusion criteria and responded (n = 205) ranged in age from 25 to 74 years, with a mean age of 43.8 years (SD 9.7); the age distribution was bimodal with peaks at 28 and 47 years. The majority (96%) of nurses
were female. Only registered nurses were included in the study. Thirty-three (16.3%) held a diploma in nursing, 98 (48.5%) held an associates degree; 65 (32.2%) held a baccalaureate degree, five (2.5%) held a master’s degree, and one (0.5%) held a Ph.D. The nurses home health experience ranged from at least one month to 37 years with a mean of 9.3 years (SD = 6.4). While nurses reported making between zero and 60 visits per week with a mean of 17.85 (SD = 13.10), they also reported making between zero and 99 calls per week with a mean of 20.51 calls (SD = 16.68).

When nurses in state and non-state agencies were compared, both groups had similar nursing education. However, nurses who worked for the state owned agencies were older (r = .48, p < .05), were RNs longer (r = .62, p < .05), had more experience in home healthcare (r = .58, p < .05), and had a longer tenure with the agency (r = .67, p < .05). Nurses who worked for state agencies reported making fewer visits (r = -0.36, p < .05) and fewer telephone calls (r = -.033, p < .05).

Three hundred twenty five (n=325) individuals completed the patient satisfaction instrument but not all the surveys included complete demographic information. Of the 322 people who answered the question as to who filled out the questionnaire, 137 indicated that the patient was the respondent and 185 indicated that the caregiver was the respondent. When analyzed as a group, of the 323 patients who gave their age, patients’ ages ranged from less than one year to 99 years with a mean age of 70.5 years (SD = 18.62). Of the 299 patients who answered the question about length of service, the patients indicated that they received care from a nurse between one day to 40 years with a mean of 2.01 years (SD = 3.69 years). Patients judged that the level of care provided by a nurse by choosing from the words: teaching, performing a skill, or both.
The 318 respondents indicated that overall, 25% chose teaching, 23% chose performing a skill, and 52% chose both. Of the 320 individuals who answered whether the patient or caregiver completed the survey, 137 patients reported a slightly higher satisfaction score (M = 68.98, SD = 9.41) than the 183 caregivers (M = 68.48, SD = 8.57).

Results of the Instruments

The instruments measured nurses’ nursing technology, role clarity, organizational structure, patient outcomes that were sensitive to nursing care, and patient satisfaction. The instrument and its dimensions, number of items, means, and standard deviations from the 43 agency components are listed in Table 13.

To describe the characteristics of home healthcare as perceived by nurses and patients, an item analysis of each instrument was conducted to identify the highest and lowest scores. All scores are reported on a scale of one to five, with one being the lowest/worst and five being the highest/best.

The item analysis of the NTI showed that home healthcare nurses reported that while most patients had written goals for individualized nursing care plans (M = 4.76, SD = .72), the improvement of patients’ conditions depended upon the skillful initiative of nursing personnel (M = 3.75, SD = .93). On the other hand, nurses indicated that only a small number of patients needed a nursing visit between regularly scheduled visits (M = 1.83, SD = .91) and that few emergencies occurred (M = 1.88, SD = .77).

An item analysis of the NIRCA suggested that the nurses reported that often too much of their time was spent on paperwork (M = 4.27, SD = .87) and that they had too heavy a workload (M = 3.69, SD = .94). They rarely thought that they had to do things
on the job that were against their better judgment or personal values (M = 1.67, SD = .76), and rarely were uncertain about their job responsibilities (M = 1.67, SD = .77).

Table 13

Means and Standard Deviations of Instruments: Agency Component Results (N=43)

<table>
<thead>
<tr>
<th>Name</th>
<th>Dimensions</th>
<th>Number of Items</th>
<th>Range</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTI (total)</td>
<td></td>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>instability</td>
<td>8</td>
<td>16-26</td>
<td>21.15</td>
<td>2.53</td>
</tr>
<tr>
<td></td>
<td>variability</td>
<td>3</td>
<td>3-11</td>
<td>7.28</td>
<td>1.25</td>
</tr>
<tr>
<td></td>
<td>uncertainty</td>
<td>7</td>
<td>16-29</td>
<td>22.66</td>
<td>2.70</td>
</tr>
<tr>
<td>NICRA (total)</td>
<td>role conflict</td>
<td>12</td>
<td>26-44</td>
<td>33.76</td>
<td>4.71</td>
</tr>
<tr>
<td></td>
<td>role ambiguity</td>
<td>12</td>
<td>15-33</td>
<td>23.31</td>
<td>4.91</td>
</tr>
<tr>
<td>ASI (total)</td>
<td>vertical participation</td>
<td>5</td>
<td>12-25</td>
<td>17.32</td>
<td>2.87</td>
</tr>
<tr>
<td></td>
<td>horizontal participation</td>
<td>7</td>
<td>21-31</td>
<td>26.17</td>
<td>2.61</td>
</tr>
<tr>
<td></td>
<td>formalization</td>
<td>2</td>
<td>2-7</td>
<td>4.51</td>
<td>1.10</td>
</tr>
<tr>
<td>CHNOI (total)</td>
<td>psychosocial component</td>
<td>12</td>
<td>41-57</td>
<td>47.90</td>
<td>3.90</td>
</tr>
<tr>
<td></td>
<td>physiological component</td>
<td>11</td>
<td>41-55</td>
<td>46.61</td>
<td>2.94</td>
</tr>
<tr>
<td></td>
<td>nursing intervention/implementation component</td>
<td>15</td>
<td>55-75</td>
<td>64.89</td>
<td>3.97</td>
</tr>
<tr>
<td></td>
<td>environmental/community component</td>
<td>10</td>
<td>12-45</td>
<td>30.97</td>
<td>8.22</td>
</tr>
<tr>
<td>HCCSI-R (total)</td>
<td></td>
<td>15</td>
<td>51-75</td>
<td>68.58</td>
<td>4.63</td>
</tr>
</tbody>
</table>

An item analysis of the ASI indicated that many nurses believed that they were encouraged to make suggestions in decisions relevant to their work (M = 3.72, SD = 1.03). At the same time, nurses reported that there were many rules and procedures for handling most kinds of problems which arise in making decisions (M = 1.16, SD = ...
1.03) and the same rules and procedures were generally followed in making decisions
(M = 1.54, SD = 1.13). In the scoring of the ASI, the items concerning rule and
procedures were reverse scored. Thus a low score indicated that many rules and
procedures existed and were followed.

The item analysis of the four subscales of the CHNOI was conducted to
determine the highest and lowest outcome achievement for each subscale. In the
psychosocial subscale, nurses reported that while the patients performed activities of
daily living specific to their own situation (M = 4.23, SD = .69), patients did not have
the skills to care for themselves (M = 3.53, SD = .83). In the physiological subscale,
nurses felt that patients demonstrated correct injection technique (M = 4.49, SD = .71)
but patients were less able to control symptoms of constipation (M = 3.87, SD = .73). In
the nursing intervention/implementation subscale, nurses indicted that most nurses
completed an appropriate assessment (M = 4.68, SD = .56) but patients were less likely
to state that they had necessary food or supplies (M = 4.05, SD = .76). In the
environmental/community subscale, nurses believed that patients received
immunizations appropriate for their age (M = 3.79, SD = 1.16) but patients were less
likely to avoid an unplanned pregnancy (M = 3.09, SD = 1.36) because of their
interaction with the nurse. This last item was problematic for home healthcare nurses to
score because few patients in home healthcare are of childbearing age.

An item analysis of the HCCSI-R suggested that patients were most likely to
recommend the agency to others (M = 4.89, SD = .40) and were very satisfied with the
respect shown to patients by the staff (M = 4.62, SD = .80). Patients were least satisfied
with their having choices about their care (M = 4.44, SD = .84). In summary, this item
analysis was presented to describe some of the characteristics of home healthcare identified by nurses (n=205) and patients (n=325). Subsequent analysis is based on agency components (n=43), which were the units of analysis for the current study.

Answers to the Research Questions

Relationship of Patient Characteristics and the Dimensions of Nursing Technology

Research question #1 was “What is the relationship of the average age of patients in each agency component and the dimensions of nursing technology?” Specifically, what is the relationship of the average age of patients in each agency component and instability, what is the relationship of the average age of patients in each agency component and variability, and what is the relationship of the average age of patients in each agency component and uncertainty? Results were analyzed using a Pearson’s correlation coefficient. The analysis revealed significant relationships between the patients’ age and instability (r = .34, p < .05) and between the patients’ age and uncertainty (r = .52, p < .05). This analysis failed to reveal a significant relationship between the patient’s age and variability (r = -0.13, p = 0.45).

Research question #2 was “What is the relationship of the patient’s skilled need (teaching, technical skill, or both) and the dimensions of nursing technology?” Specifically, what is the relationship of the patients’ skilled need and instability, what is the relationship of the patients’ skilled need and variability, and what is the relationship of the patients’ skilled need and uncertainty? Results were analyzed using a Pearson correlation coefficient. This analysis failed to reveal a significant relationship between the patients’ skill level and instability (r = 0.24, p = .15), variability (r = 0.11, p = .50) or uncertainty (r = 0.06, p = .72).
Relationship of Agency Characteristics and the Dimensions of Nursing Technology

Research question #3 was “Does a significant difference exist in the dimensions of nursing technology based on agency ownership type (corporation, nonprofit, or state)?” Specifically, does a significant difference in instability exist based on ownership type, does a significant difference in variability exist based on ownership type, and does a significant difference in uncertainty exist based on ownership type? Results were analyzed using a one-way analysis of variance, between groups design. The analysis failed to reveal a significant effect for the type of ownership and instability, \( F(3, 42) = 0.73, p = .54 \), between ownership type and variability, \( F(3, 42) = 1.45, p = .24 \), or between ownership type and uncertainty, \( F(3, 42) = 0.35, p = .79 \). The sample means and standard deviations are displayed in Table 14, which shows that the four ownership types demonstrated similar scores on the dimensions of technology.

Table 14

Means and Standard Deviations of Nursing Technology Dimensions for Each Ownership Type (N=43)

<table>
<thead>
<tr>
<th>NTI Dimension</th>
<th>Ownership Type</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instability</td>
<td>Corporate (n=11)</td>
<td>21.71</td>
<td>3.39</td>
</tr>
<tr>
<td></td>
<td>County (n=1)</td>
<td>21.00</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Nonprofit (n=8)</td>
<td>21.91</td>
<td>1.61</td>
</tr>
<tr>
<td></td>
<td>State (n=23)</td>
<td>20.63</td>
<td>2.37</td>
</tr>
<tr>
<td>Variability</td>
<td>Corporate</td>
<td>6.64</td>
<td>1.64</td>
</tr>
<tr>
<td></td>
<td>County</td>
<td>8.16</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Nonprofit</td>
<td>7.53</td>
<td>0.51</td>
</tr>
<tr>
<td></td>
<td>State</td>
<td>7.47</td>
<td>1.17</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>Corporate (n=11)</td>
<td>23.35</td>
<td>2.80</td>
</tr>
<tr>
<td></td>
<td>County (n=1)</td>
<td>23.00</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Nonprofit (n=8)</td>
<td>22.17</td>
<td>3.43</td>
</tr>
<tr>
<td></td>
<td>State (n=23)</td>
<td>22.49</td>
<td>2.51</td>
</tr>
</tbody>
</table>
Research question #4 was “Does a significant difference exist in the dimensions of nursing technology based on rural or urban location? Specifically, does a significant difference in instability exist based on location, does a significant difference in variability exist based on location, does a significant difference in uncertainty exist based on location? The results were analyzed using an independent-samples t test. This analysis failed to reveal a significant difference between the rural and urban locations on each dimension of technology. The sample means standard deviations, t scores and the probability of t are displayed in Table 15, which shows that the agency components in rural and urban areas demonstrated similar scores on all three dimensions of technology.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Location</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instability</td>
<td>rural (n= 23)</td>
<td>20.83</td>
<td>2.55</td>
<td>-0.91</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td>urban (n=20)</td>
<td>21.53</td>
<td>2.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variability</td>
<td>rural (n= 23)</td>
<td>7.40</td>
<td>1.00</td>
<td>0.66</td>
<td>0.51</td>
</tr>
<tr>
<td></td>
<td>urban (n=20)</td>
<td>7.14</td>
<td>1.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncertainty</td>
<td>rural (n= 23)</td>
<td>22.82</td>
<td>2.85</td>
<td>0.42</td>
<td>0.68</td>
</tr>
<tr>
<td></td>
<td>urban (n=20)</td>
<td>22.48</td>
<td>2.59</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Relationship of Role Clarity and the Dimensions of Organizational Structure

Research question #5 and research question #6 were “What is the relationship of role conflict and the dimensions of organizational structure?” and “What is the
relationship of role ambiguity and the dimensions of organizational structure?"

Specifically, what is the relationship of role conflict, role ambiguity, and vertical participation, what is the relationship of role conflict, role ambiguity, and horizontal participation, and what is the relationship of role conflict, role ambiguity, and formalization? Results were analyzed using bivariate correlation. Means, standard deviations, and Pearson’s correlations appear in Table 16.

Table 16

Means, Standard Deviations, and Intercorrelations of Role Conflict, Role Ambiguity, and Organizational Structure Dimensions (N=43)

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Intercorrelations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>1. Role Conflict</td>
<td>33.78</td>
<td>4.71</td>
<td></td>
</tr>
<tr>
<td>2. Role Ambiguity</td>
<td>23.31</td>
<td>4.92</td>
<td>.65**</td>
</tr>
<tr>
<td>3. Vertical</td>
<td>17.32</td>
<td>2.87</td>
<td>-.32*</td>
</tr>
<tr>
<td>Participation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Horizontal</td>
<td>26.17</td>
<td>2.61</td>
<td>-.51**</td>
</tr>
<tr>
<td>Participation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Formalization</td>
<td>4.51</td>
<td>1.10</td>
<td>.37*</td>
</tr>
</tbody>
</table>

*p < .05
**p < .01

The bivariate correlations revealed that role conflict and role ambiguity were significantly related the dimensions of organizational structure. Role conflict was
negatively related to vertical participation ($r = -0.32, p < .05$) and horizontal participation ($r = -0.51, p < .05$), and positively related to formalization ($r = 0.37, p < .05$). Role ambiguity was related to negatively related to horizontal participation ($r = -0.67, p < .05$) and positively related to formalization ($r = 0.44, p < .05$). The correlation between role ambiguity and vertical participation was non-significant ($r = -0.25, p = 0.11$).

**Relationship of Nurse Characteristics and the Dimensions of Organizational Structure**

Research question #7 was “What is the relationship of average age of nurses in each agency component and the dimensions of organizational structure?” Specifically, what is the relationship of average age of nurses in each agency component and vertical participation, what is the relationship of average age of nurses in each agency component and horizontal participation, and what is the relationship of average age of nurses in each agency component and formalization? Results were analyzed using a Pearson correlation coefficient. The analysis failed to reveal a significant relationship between the average age of nurses in each agency component and vertical participation ($r = -0.10, p = 0.51$), between the average age of nurses in each agency component and horizontal participation ($r = -0.16, p = 0.31$), and between the average age of nurses in each agency component and formalization ($r = -0.02, p = 0.90$).

Research question #8 was “What is the relationship of average level of nurses’ education in the agency component and the dimensions of organizational structure?” Specifically, what is the relationship of average level of nurses’ education in the agency component and vertical participation, what is the relationship of average level of nurses’ education in the agency component and horizontal participation, and what is the
relationship of average level of nurses’ education in the agency component and formalization? Results were analyzed using a Pearson’s correlation coefficient. The analysis failed to reveal a significant relationship between the level of nurses’ education in each agency component and vertical participation ($r = 0.18, p = .24$), between the level of nurses’ education in each agency component and horizontal participation ($r = 0.15, p = .34$), and between the level of nurses’ education in each agency component and formalization ($r = -0.13, p = .38$).

Research Question #9 was “What is the relationship of nurse’s mean years of experience in nursing and the dimensions of organizational structure?” Specifically, what is the relationship of nurses’ years of experience in nursing and vertical participation, what is the relationship of nurses’ years of experience in nursing and horizontal participation, and what is the relationship of nurses’ years of experience in nursing and formalization? Results were analyzed using a Pearson’s correlation coefficient. The analysis failed to reveal a significant relationship between the nurses’ years of experience in nursing and vertical participation ($r = -0.25, p = .11$), between the nurses’ years of experience in nursing and horizontal participation ($r = -0.10, p = .50$), and between the nurses’ years of experience in nursing and formalization ($r = 0.10, p = .54$).

Research Question #10 was “What is the relationship of nurses’ mean tenure in the agency and the dimensions of organizational structure?” Specifically, what is the relationship of the nurses’ mean tenure in the agency and vertical participation, what is the relationship of the nurses’ mean tenure in the agency and horizontal participation, and what is the relationship of the nurses’ mean tenure in the agency and formalization?
Results were analyzed using a Pearson’s correlation coefficient. The analysis revealed a significant negative relationship between the nurses’ mean tenure in the agency and vertical participation ($r = -0.47$, $p < .05$). This analysis failed to reveal a significant relationship between the nurses’ mean tenure in the agency and horizontal participation ($r = -0.16$, $p = .30$) and the relationship between the nurses’ mean tenure in the agency and formalization ($r = 0.29$, $p = .06$).

Research question #11 was “What is the relationship of the average number of nurses’ visits per week in each agency component and the dimensions of organizational structure?” Specifically, what is the relationship of the average number of nurses’ visits per week in each agency component and vertical participation, what is the relationship of the average number of nurses’ visits per week in each agency component and horizontal participation, and what is the relationship of the average number of nurses’ visits per week in each agency component and formalization? Results were analyzed using a Pearson’s correlation coefficient. The analysis failed to reveal a significant relationship between the average number of nurses’ visits per week in each agency component and vertical participation ($r = 0.15$, $p = .34$), between the average number of nurses’ visits per week in each agency component and horizontal participation ($r = 0.19$, $p = .22$), and average number of nurses’ visits per week in each agency component and formalization ($r = -0.20$, $p = .19$).

Research question #12 was “What is the relationship of average number of nurses’ calls per week in each agency component and the dimensions of organizational structure?” Specifically, what is the relationship of average number of nurses’ calls per week and vertical participation, what is the relationship of average number of nurses’ calls per week and horizontal participation, and what is the relationship of average number of nurses’ calls per week and formalization?
calls per week and horizontal participation, and what is the relationship of average
number of nurses’ calls per week and formalization? Results were analyzed using a
Pearson’s correlation coefficient. The analysis failed to reveal a significant relationship
between the average number of nurses’ calls per week in each agency component and
vertical participation ($r = 0.09, p = .57$), between the average number of nurses’ calls per
week in each agency component and horizontal participation ($r = 0.07, p = .66$), and
average number of nurses’ calls per week in each agency component and formalization
($r = 0.01, p = .97$).

**Relationship of Agency Characteristics and the Dimensions of Organizational Structure**

Research question #13 was “Does a significant difference exist in the
dimensions of organizational structure based on agency ownership type ownership
(corporate, county, nonprofit, or state)? Specifically, does a significant difference in
vertical participation exist based on ownership type, does a significant difference in
horizontal participation exist based on ownership type, and does a significant difference
in formalization exist based on ownership type? Results were analyzed using a one-way
analysis of variance, between groups design. The analysis revealed a significant
relationship of type of ownership and vertical participation, $F(3, 39) = 4.79; p < .05$, and
between type of ownership and formalization, $F(3, 39) = 6.91, p < 0.05$. Tukey’s HSD
test showed that agency components owned by corporations scored significantly higher
on vertical participation than state owned agency components. No significant
differences with vertical participation were noted between nonprofit and corporate
agencies, or between nonprofit and state agencies. Furthermore, corporation agency
components scored significantly lower on formalization (i.e. more rules and
procedures) than either state or nonprofit agency components. No significant differences with horizontal participation were noted between non-profit and corporate, and non-profit and state agencies, \( F(3, 39) = 2.14, p = .11 \). The differences in the dimensions of organizational structure by ownership type are summarized in Table 17. The sample means and standard deviations of the dimensions of organizational structure for each ownership type are shown in Table 18.

Table 17

**ANOVA Summary Table to Describe the Difference in Organizational Structure**

<table>
<thead>
<tr>
<th>Dimensions by Ownership Type (N=43)</th>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Participation</td>
<td>Ownership Type</td>
<td>3</td>
<td>93.22</td>
<td>31.07</td>
<td>4.79*</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td>Within groups</td>
<td>39</td>
<td>253.06</td>
<td>6.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>42</td>
<td>346.28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontal Participation</td>
<td>Ownership Type</td>
<td>3</td>
<td>40.40</td>
<td>13.47</td>
<td>2.14</td>
<td>0.14</td>
</tr>
<tr>
<td></td>
<td>Within groups</td>
<td>39</td>
<td>245.92</td>
<td>6.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>42</td>
<td>286.32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formalization</td>
<td>Ownership Type</td>
<td>3</td>
<td>17.72</td>
<td>5.91</td>
<td>6.91*</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td>Within groups</td>
<td>39</td>
<td>33.34</td>
<td>0.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>42</td>
<td>51.07</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* \( p < .05 \)
Table 18

Means and Standard Deviations of Organizational Structure Dimensions for Each Ownership Type (N=43)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Ownership Type</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td>Corporate (n=11)</td>
<td>19.44</td>
<td>2.93</td>
</tr>
<tr>
<td></td>
<td>County (n=1)</td>
<td>20.67</td>
<td></td>
</tr>
<tr>
<td>Participation</td>
<td>Nonprofit (n=8)</td>
<td>17.43</td>
<td>2.51</td>
</tr>
<tr>
<td></td>
<td>State (n=23)</td>
<td>16.13</td>
<td>2.36</td>
</tr>
<tr>
<td>Horizontal</td>
<td>Corporate</td>
<td>27.70</td>
<td>2.37</td>
</tr>
<tr>
<td></td>
<td>County</td>
<td>27.50</td>
<td></td>
</tr>
<tr>
<td>Participation</td>
<td>Nonprofit</td>
<td>26.05</td>
<td>2.08</td>
</tr>
<tr>
<td></td>
<td>State</td>
<td>25.43</td>
<td>2.70</td>
</tr>
<tr>
<td>Formalization</td>
<td>Corporate (n=11)</td>
<td>3.60</td>
<td>0.91</td>
</tr>
<tr>
<td></td>
<td>County (n=1)</td>
<td>2.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nonprofit</td>
<td>4.88</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td>State (n=23)</td>
<td>4.9</td>
<td>0.98</td>
</tr>
</tbody>
</table>

Research question #14 was “Does a significant difference exist in the dimensions of organizational structure based on rural or urban location? Specifically does a significant difference in vertical participation exist based on rural or urban location, does a significant difference in horizontal participation exist based rural or urban location, and does a significant difference in formalization exist based on rural or urban location? The results were analyzed using an independent-samples t-test. This analysis failed to reveal a significant difference between the rural and urban locations on each dimension of organizational structure. The sample means standard deviations, t scores and the probability of t are displayed in Table 19, which shows that the agency components in rural and urban areas demonstrated similar scores on all three dimensions of organizational structure.
Relationship of Nursing Technology/Organizational Structure Fit and Patient Outcomes.

Research Question #15 was "Does any combination of the dimensions of nursing technology and organizational structure fit predict nurses’ perceptions of patient outcomes? Results were analyzed using multiple regression.

The CHNOI scores were regressed on the three dimensions of nursing technology (instability, variability, and uncertainty) and three dimensions of organizational structure.

Table 19
Summary Table to Describe the Difference in Organizational Structure Dimensions by Rural and Urban Location (N=43)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Location</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Participation</td>
<td>rural (n=23)</td>
<td>17.44</td>
<td>2.23</td>
<td>0.28</td>
<td>0.78</td>
</tr>
<tr>
<td></td>
<td>urban (n=20)</td>
<td>17.19</td>
<td>3.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontal Participation</td>
<td>rural (n=23)</td>
<td>26.49</td>
<td>2.41</td>
<td>0.86</td>
<td>0.39</td>
</tr>
<tr>
<td></td>
<td>urban (n=20)</td>
<td>25.80</td>
<td>2.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formalization</td>
<td>rural (n=23)</td>
<td>4.53</td>
<td>1.04</td>
<td>0.17</td>
<td>0.86</td>
</tr>
<tr>
<td></td>
<td>urban (n=20)</td>
<td>4.48</td>
<td>1.19</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

organizational structure (vertical participation, horizontal participation, and formalization). The equation containing vertical participation, horizontal participation, formalization, instability, variability, and uncertainty accounted for 29% of the variance in nurses’ perceptions of patient outcomes, \([F (6, 42) = 2.41, p =0.04]\), adjusted \(R^2 = .16\). Beta weights (standardized multiple regression coefficients) were then reviewed to
assess the relative importance of the six variables in the prediction of nurses’ perceptions of patient outcomes. Beta weights are presented in Table 20.

Table 20 shows that variability and uncertainty displayed significant beta weights. Variability demonstrated a larger beta weight at 0.45 (p < .05) while the beta weight for uncertainty was 0.40 (p < .05).

Table 20

**Beta Weights Obtained in Multiple Regression Analysis Predicting Nurses’ Perceptions of Patient Outcomes (N=43)**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Beta</th>
<th>t^b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instability</td>
<td>0.20</td>
<td>1.22</td>
</tr>
<tr>
<td>Variability</td>
<td>0.45</td>
<td>2.69*</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>0.40</td>
<td>2.33*</td>
</tr>
<tr>
<td>Vertical Participation</td>
<td>0.18</td>
<td>-0.65</td>
</tr>
<tr>
<td>Horizontal Participation</td>
<td>0.12</td>
<td>0.58</td>
</tr>
<tr>
<td>Formalization</td>
<td>0.17</td>
<td>-0.30</td>
</tr>
</tbody>
</table>

* p < .05

*a Beta weights are standardized multiple regression coefficients obtained when the CHNOI scores were regressed on instability, variability, uncertainty, vertical participation, horizontal participation, formalization.

^b For t tests that tested the significance of the beta weights df = 42.

Using multiple regression, the CHNOI scores were regressed on the three combinations of the dimensions of nursing technology (instability, variability, and
uncertainty) with the three dimensions of organizational structure (vertical participation, horizontal participation, and formalization). These combinations are shown in Table 21.

Using multiple regression analysis, Model 1 and Model 3 were not significant. Model #2 accounted for 23% of the variance in nurses' perceptions of patient outcomes, $[F (3, 42) = 3.98, p = 0.02]$, adjusted $R^2 = .18$. This equation is:

$$CHNOI = 171.69 - 0.62 |IN - HP| + 4.11 |VA - FO| + 1.81 |UN - VP|.$$ 

Table 21

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Nursing Technology/Organizational Structure Fit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(equal to the absolute difference between variables)</td>
</tr>
<tr>
<td>Model 1*</td>
<td>Instability - Vertical Participation $</td>
</tr>
<tr>
<td></td>
<td>Variability - Horizontal Participation $</td>
</tr>
<tr>
<td></td>
<td>Uncertainty - Formalization $</td>
</tr>
<tr>
<td>Model 2</td>
<td>Instability - Horizontal Participation $</td>
</tr>
<tr>
<td></td>
<td>Variability - Formalization $</td>
</tr>
<tr>
<td></td>
<td>Uncertainty - Vertical Participation $</td>
</tr>
<tr>
<td>Model 3</td>
<td>Instability - Formalization $</td>
</tr>
<tr>
<td></td>
<td>Variability - Vertical Participation $</td>
</tr>
<tr>
<td></td>
<td>Uncertainty - Horizontal Participation $</td>
</tr>
</tbody>
</table>


Beta weights (standardized multiple regression coefficients) were reviewed to assess the relative importance of the three variables in the prediction of nurses’
perceptions of patient outcomes. Beta weights are presented in Table 22. Thus, while the entire model was significant, the fit between variability and formalization and uncertainty and vertical participation individually contributed to the CHNOI outcome variable.

Table 22

**Beta Weights Obtained in Multiple Regression Analysis of the NT/OS Fits to Predict Nurses’ Perceptions of Patient Outcomes (N=43)**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Beta Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instability - Horizontal Participation</td>
<td>[IN-HP]</td>
</tr>
<tr>
<td>Variability - Formalization</td>
<td></td>
</tr>
<tr>
<td>Uncertainty - Vertical Participation</td>
<td>[UN-VP]</td>
</tr>
</tbody>
</table>

* denotes p < .05

Research question #16 was “Which combination of the dimensions of nursing technology and organizational structure predicts patient satisfaction? Using multiple regression, the patient satisfaction scores were regressed on the three dimensions of nursing technology (instability, variability, and uncertainty) and three dimensions of organizational structure (vertical participation, horizontal participation, and formalization). The equation containing vertical participation, horizontal participation, formalization, instability, variability, and uncertainty accounted for 34% of the variance in patient satisfaction, \( F (6, 37) = 2.7, p = .03 \), adjusted \( R^2 = .22 \). Beta weights (standardized multiple regression coefficients) were then reviewed to assess the relative
importance of the six variables in the prediction of patient satisfaction. Beta weights are presented in Table 23.

Table 23

**Beta Weights Obtained in Multiple Regression Analysis Predicting Patient Satisfaction (N=43)**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Beta</th>
<th>( t^a )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instability</td>
<td>0.25</td>
<td>1.38</td>
</tr>
<tr>
<td>Variability</td>
<td>0.41</td>
<td>2.39*</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>0.07</td>
<td>0.38</td>
</tr>
<tr>
<td>Vertical Participation</td>
<td>0.73</td>
<td>2.42*</td>
</tr>
<tr>
<td>Horizontal Participation</td>
<td>0.16</td>
<td>0.69</td>
</tr>
<tr>
<td>Formalization</td>
<td>0.63</td>
<td>2.35*</td>
</tr>
</tbody>
</table>

\( ^*p < .05 \)

\( ^a \) for \( t \) tests that tested the significance of the beta weights \( df = 37 \).

The table shows that variability, vertical participation and formalization displayed significant beta weights. Vertical participation demonstrated the largest beta weight at 0.73 (\( p < .05 \)), while the beta weight for formalization was 0.63 (\( p < .05 \)) and the beta weight for variability was 0.41 (\( p < .05 \)).

Using multiple regression, the patient satisfaction scores were regressed on the three combinations of the dimensions of nursing technology (instability, variability, and uncertainty) with the three dimensions of organizational structure (vertical participation, horizontal participation, and formalization). These combinations were displayed in
Table 21. The analysis failed to reveal a relationship between any of the combination models and patient satisfaction.

Post Hoc Analyses

Once the research questions were answered, several additional questions became apparent. First, were there significant differences in patient outcomes, as measured by the CHNOI subscales, by agency ownership (state vs. non-state)? Second, what was the relationship between nurse characteristics and patient satisfaction? Third, was there a significant difference in data collected before October, 2001 and after October 1, 2001? Fourth, what was the relationship between the patient outcomes, as measured by the CHNOI subscales, and patient satisfaction? The discussion in the following section addresses these questions.

Relationship of agency characteristics and patient outcomes that are sensitive to nursing care. Agency ownership was not related to patient satisfaction or nurses’ overall perception of patient outcomes sensitive to nursing care. Whether patients receive care from a corporate, nonprofit, county owned, or state owned agency, they perceived a high level of care. To answer the question “Is there a significant differences in patient outcomes that are sensitive to nursing care by agency ownership (state vs. non-state)?”, a t-test analysis was performed by examining the scores on the four CHNOI subscales. Of the four subscales, only one was significantly related to ownership status. Nurses employed by state owned agencies (n = 23) reported achieving a higher environmental/community components of care score (t = 0.44, p < .05) when compared to nurses employed by non-state (corporate, county, nonprofit) agencies (n = 20). This finding may be associated with the state agency’s home health programs’ close
association with the public health department and its concern for environmental and community aspects of care.

Location was not related to patient outcomes sensitive to nursing care. Whether home health patients live in either rural or in urban counties, they perceived a level of care that cannot be distinguished on location alone. The location and ownership of the participating agency components are shown in Table 24.

Table 24

<table>
<thead>
<tr>
<th>Ownership</th>
<th>Location</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rural</td>
<td>Urban</td>
</tr>
<tr>
<td>corporation</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>county</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>non-profit</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>state</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>total</td>
<td>22</td>
<td>21</td>
</tr>
</tbody>
</table>

Relationship of nurse characteristics and patient satisfaction. Even though the purpose of this study was to investigate organizational variables, exploration of the relationship of nurse characteristics directly with patient satisfaction seemed warranted. If relationships were found, the nurse administrators may be able to directly change the patient outcome of patient satisfaction by empowering the nurse. Pearson’s correlation coefficient indicated several demographic variables for nurses were related to patient satisfaction. Significant findings were only found with number of visits, and average length of time nurses were in home health and with the agency. The average number of visits nurses made was positively related to patient satisfaction ($r = 0.37$, $p < .05$). Thus, the more visits a patient received from the nurse, the higher the level of satisfaction.
The average number of the years the nurse spent in home healthcare was negatively correlated to patient satisfaction ($r = -0.46, p < .05$) and the average number of years the nurse worked for the agency was negatively correlated with patient satisfaction ($r = -0.39, p < .05$). Thus the longer nurses had worked in home health and for a particular agency, the less satisfied the patients were with that agency.

**Differences in data based on time of collection.** The timing of the data collection, June 2000 to March 2001, could have influenced the findings. In October 2000, the federal government mandated a change in payment for home healthcare from an interim payment system to prospective payment system (PPS). This transition may have influenced the responses of the nurses and patients who answered the questionnaire before October 1, 2000 and those who participated in the study after PPS was instituted in October 1, 2000. To determine if a significant difference in data collected before October, 2001 and after October 1, 2001 existed a Chi Square analysis of the responses from agency components where data were collected before October 1, 2000 ($n=22$) to the responses from agency components where data were collected after October 1, 2000 ($n=21$) was conducted. For purposes of this analysis, the agency component ownership types of county and nonprofit were combined into one type labeled “community”. Results indicated that more corporate and community agencies than state owned agencies participated in the study before October 1, 2000 than after October 1, 2000 ($\chi^2 = 12.962, p < .05$). Six of the 22 before October, 1, 2000 were state owned, while seventeen of the 21 were state owned.

The findings suggested no differences between the agencies components for age of patients, skill level of patients instability, variability, uncertainty, nurse visits, nurse visits
calls, age of nurses, nurses' education level, role conflict, role ambiguity, vertical participation, horizontal participation, formalization, agency location, number of patients responding to surveys, any of the nursing technology/organizational structure absolute difference scores, psychosocial components of care, physiological components of care, nursing interventions/ implementation components of care, patient satisfaction. Table 25 summarizes the other variables that showed statistically significant differences. The high number of years since RN licensure, high number of years in home healthcare, long tenure in the agency, high environmental score, and low number of nurses from agency completing the survey are very indicative of the picture of nurses employed by state-owned agency components.

Table 25

Means, Standard Deviations, and Test Statistic for Variables that Showed a Difference between Agencies where Data were Collected before and after October 1, 2000 (N=431

<table>
<thead>
<tr>
<th>Variable</th>
<th>before (n=22)</th>
<th>after (n=21)</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>RN years</td>
<td>14.7</td>
<td>20.73</td>
<td>-3.23*</td>
</tr>
<tr>
<td>HH years</td>
<td>7.10</td>
<td>12.34</td>
<td>-3.34*</td>
</tr>
<tr>
<td>tenue in agency</td>
<td>6.16</td>
<td>10.60</td>
<td>-2.96*</td>
</tr>
<tr>
<td>environmental score</td>
<td>28.52</td>
<td>33.55</td>
<td>-2.09*</td>
</tr>
<tr>
<td>CHNOI</td>
<td>185.65</td>
<td>194.95</td>
<td>-2.22*</td>
</tr>
<tr>
<td>Number of nurses responding to survey</td>
<td>6.14</td>
<td>3.33</td>
<td>2.93*</td>
</tr>
</tbody>
</table>

* p < .05

Whether the differences based on ownership types is due to the changes in the law or in other influences is difficult to determine since agencies were allowed to choose the date of data collection. Many nursing directors set a date, then rescheduled.
because their staff was busy with other tasks, such as learning computer programs in preparation for the PPS changes. Nurses in all types of agencies verbalized stress related to the changes they were experiencing at work.

**Relationship of patient outcomes that are sensitive to nursing care and patient satisfaction.** To further validate the patient outcome measures, further analysis of the relationship of nurses’ perceptions of patient outcomes, as measured by the subscales of the CHNOI, and patient satisfaction were examined using Pearson’s correlation coefficient. A significant relationship existed between psychosocial subscale and the total patient satisfaction score ($r = 0.34, p < 0.05$). Analysis failed to reveal significant relationships between other subscales of the CHNOI and patient satisfaction. This finding indicates that the more nurses meet the patient’s psychosocial needs, the more satisfaction the patients report.

**Summary**

Results of the analysis suggested that nursing technology is similar for all home healthcare agencies. Some differences in organizational structure existed between state-owned and non-state agency components. While patient outcomes are achieved by home healthcare agencies regardless of ownership type or location, state-owned agency components achieved environmental/community components of care at a higher level than non-state agency components. Finally, a model incorporating the dimensions of nursing technology and organizational structure demonstrated the relationship of these organizational variables and patient outcomes in home healthcare.
CHAPTER V

Discussion

In Chapter 5, the findings of the current study are interpreted and related to the literature and conceptual framework. The discussion of the findings is divided into the following sections: descriptive results, results related to research questions, significant relationships among the variables, limitations of the study, implications for future research, implications for nursing practice, and implications for theory development.

Descriptive Results

Between June 2000 and March 2001, 205 nurses responded to surveys that described the nurses’ understanding of their roles, nurses’ decision-making, nursing care processes, patient outcomes and 325 patients completed patient satisfaction surveys. The patients were cared for by the nurses at 43 agency components of the 198 agency components that met the eligibility criteria for this study. Located in 23 rural and 21 urban counties in South Carolina, the agency components were owned by corporations, a county, nonprofit organizations, and the state. Thus a representative cross-section of the home healthcare industry comprised the sample in this study. In each agency component, from 1 to 15 nurses completed surveys and from one to 21 patients completed surveys. In five agency components, no patients returned surveys. Although every effort was made to include each registered nurse at every site, some nurses were absent during the data collection visit. Despite reminders to the supervisors, few nurses
who were not present at the data collection session returned surveys left for them.

Between the time that data collection date was set and the actual data collection date, some nurses terminated employment with the agency. Two hundred five nurses (75%) of the anticipated number of nurses returned usable surveys.

Nurses distributed surveys to patients on routine home visits to encourage a high patient survey return. The total number of patients served by the agency was not collected and no method to assure that the nurses actually distributed the surveys was used. Three hundred twenty-five patients (15.9%) of the anticipated number of patients returned usable surveys. The patient's response rate was greater that the usual 10% return for mailed surveys but lower than the 87.5% response rate reported by Reeder and Chin (1990) who used nurses to distribute surveys to patients in their homes. The number of patients asked to participate may account for the difference in the response rate. Whereas Reeder and Chin used 48 patients selected by the administration of the home healthcare agency as being willing and able to complete the survey, this study asked nurses to distribute surveys to the next ten patients they encountered on a home visit. Thus response rate could have suffered because of the effort to decrease selection bias. A further explanation of the low response rate may have been the high number of agencies involved in the study. While Dansky et al. (1994) reported a response rate of 38% from five agencies, and Westra et al. (1995) reported a response rate of 45.5% from 20 agencies, the current study included 43 agency components from 21 different agencies. The broader scope of the current study may have been a factor in the low patient response rate. Other possible reasons for the response rate were suggested by the nurses who participated. The reasons included the high acuity of the patients, low
education level of the patients and caregivers, medical conditions such as blindness or paralysis, and no family or other caregivers in the home.

Results of Data Analysis

In this section, the results of the NTI, NIRCA, ASI, CHNOI, and HCCSI-R are discussed. The findings must be interpreted cautiously because of the low number of participants from each agency and the overall low number of agency components that chose to participate.

The results of the NTI suggested that, on the average, the nursing care processes required by patients had moderately low levels of instability and variability, and moderately high levels of uncertainty. The nurses reported that work techniques and practices were somewhat predictable, and the nursing care was basically the same because patients’ conditions did not vary greatly from patient to patient. The nurses believed that, to some extent, home healthcare nursing was difficult to understand and complex. This finding supported the findings of Alexander et al.’s (1993) study of home healthcare nurses. The findings provide further evidence to support Leatt and Schneck’s (1977) and Alexander and Randolph’s (1986) contention that nursing units can be differentiated on the basis of nursing technology. In the current study, the typical home healthcare agency component scored moderately low levels of instability and variability, and moderately high levels of uncertainty.

The results of the NIRCA showed that on average, home healthcare nurses in the study experienced a moderately low level of role conflict and a low level of role ambiguity. The average nurses’ experience in home health was 9.3 years with a standard deviation of 6.4 years. Therefore the low levels of role conflict and role ambiguity may
be indicative of the nurses’ experience in home health which supports Murray’s (1998b) contention that nurses employed in home healthcare for more than 2 years have a good understanding of their role. A second explanation is that the agencies that chose to participate made the decision to participate based on their nursing staff ability to add another stress in their already busy schedules. Several nurse administrators and nurse managers declined to allow the agency component to participate because “the nurses were too busy”. Therefore, the agencies components that participated may have had nurses who reported less conflict and ambiguity compared to nurses in other agency components at the time of data collection.

The results of the ASI indicated that, on the average, home healthcare nurses experienced high levels of vertical participation and horizontal participation, and low levels of formalization. Thus, nurses in the study reported their supervisors sought the nurses’ input for decision-making and consulted with them about job related tasks. Nurses believed the agency had a positive attitude toward the nurses’ involvement in decision-making and the definition of tasks. Finally, the nurses reported many rules and procedures existed to guide the nurses’ decision-making. These results suggest that high levels of interaction among nurses, supervisors, and peers, as well as guidance from many rules and procedures is the typical picture of nurses’ decision-making in the home healthcare setting.

The results of the CHNOI indicated that home healthcare nurses felt that, on average, 79% of patient outcomes were achieved. The CHNOI dimension achieving the highest score was nursing interventions/implementation subscale (83%). The area achieving the next highest scores were the patients’ physiological subscale (82%) and
the patients’ psychosocial subscale (75%). The lowest score was on the environmental/community subscale (52%). The findings sought to respond to Weissert et al.’s (1988) challenge to identify measurable outcomes which would benefit home healthcare patients. The results suggested that room for improvement exists in all aspects of patient care in the home healthcare setting. While findings from other studies (Adams et al. 1998; Shaughnessy et al., 1995) sought to compare patient outcomes between two points in time, the findings from this study could be used as a benchmark for the participating agencies and in future studies. The low sample size limits the generalizability of the findings for use in other agencies. However, the simplicity of design may encourage others to use the instruments to replicate the study for their agency. The advantage for using the results of this study is that the CHNOI is a brief assessment instrument which is easy to administer and interpret when compared to the Outcomes Assessment and Information Systems (OASIS) data now being collected in all home healthcare agencies as required by Medicare.

The results of the HCCSI-R indicate that the patients were very satisfied with their care. The positive findings supported previous studies of patient satisfaction of home healthcare (Dansky et al., 1994; Naylor et al., 1999; Reeder & Chen, 1990; Twardon & Gartner, 1991; Westra et al., 1995). Participants completing the patient satisfaction survey, who identified themselves as patients, indicated that they were slightly more satisfied with care than the caregivers who completed the survey. This result agrees with the finding of Walker and Restuccia (1984).
Significant Relationships

A conceptual framework derived from general system theory, role theory, and sociotechnical theory guided the current study. The significant relationships among the variables are summarized according to the major sections of general system theory. Input variables include patient, nurse, and agency characteristics, nursing technology dimensions, role clarity, and organizational structure dimensions. Throughput variables include the fit of organizational structure and nursing technology. Output variables include nurses' perception of patient outcomes that are sensitive to nursing care and patient satisfaction.

Input Variables

Relationship of patient characteristics and nursing technology (nursing care processes). While the patients' skill level was not related to dimensions of technology, a significant positive relationship existed between the patients' age and two dimensions of nursing technology: instability and uncertainty. As the patient's age increased, nurses perceived an increase in the need to monitor patient's conditions and their conditions became more complex. Figure 2 shows the relationship of age to nursing technology.

Nursing Technology Dimensions

\[
\begin{align*}
\text{Patient's age} & \quad \text{Instability} \\
& \quad \text{Uncertainty} \\
\text{Variability} & \\
\end{align*}
\]

\*+ = positive relationship \quad ** ns = non-significant relationship

Figure 2. Relationship of Patient's Age and Nursing Technology Dimensions.
Although nurse managers cannot change patient’s age or the fact that the patient’s medical condition is unstable or uncertain, the knowledge that these factors exist and the structural remedies to match these dimensions of nursing technology is important to achieve higher patient outcomes. Thus, as the population ages, the home healthcare nurse must prepare to care for patients’ increasing levels of instability. Therefore, new monitoring devices to detect changes in patient’s conditions need to be sought out and used. Furthermore, nurses must teach the patients, family members and caregivers to look for changes in the patient’s conditions to alert the nurses to deteriorating medical conditions and perhaps monitor more complex devices themselves.

Secondly, as patients’ age, their medical conditions become more uncertain. Uncertainty is the dimension of nursing technology in which the patient condition is complex and the nurse is unfamiliar with the treatment for the patient. The findings suggest that the patient outcomes are better when a nurse who finds a patient’s condition uncertain collaborates with the supervisor when making clinical decisions.

Nurse managers need to facilitate fast, efficient means of communication between nurse and supervisor. To improve patient outcomes, some home health agencies have differentiated their supervisory staff to provide a clinical supervisor to assist with clinical decisions during patient visits in addition to administrative supervisors who provide staff orientations and evaluations (Landry, Landry, & Herbert, 2001).

Relationship of agency characteristics and nursing technology. Neither agency component ownership nor location was significantly related to nursing technology
The three dimensions of nursing technology: the fluctuation of nursing care, the difficulty of nursing tasks, and the complexity of the care provided to home healthcare patients cannot be distinguished on the basis of ownership or location. This result supports the findings of Leatt and Schneck (1981) and Alexander and Randolph (1985) that suggested that nursing units can be distinguished on the basis of nursing technology. The finding that home health nursing technology did not vary based on ownership or location sets the stage for the hypothesis that once the nursing technology is known, the organizational structure dimensions can be fitted to the nursing technology dimensions to optimize patient outcomes (Alexander & Bauerschmidt, 1987).

**Relationship of role clarity and organizational structure.** This study assessed the relationship of role conflict and role ambiguity and nurses' decision-making. While previous studies (Decker, 1997; Kroposki et al., 1999; Sowell & Alexander, 1989) showed role conflict and role ambiguity were inversely related to job satisfaction among nurses working in hospitals, the current study found that role ambiguity was inversely related to vertical participation and horizontal participation and positively related to formalization. Thus, in a presence of a discrepancy between job expectations and their professional values, time and resources and inadequate information about job performance, nurses reported that the supervisors did not seek their input into work related decisions and believed that the attitude in the agency was not positive toward nurses’ involvement in decision-making and the definition of tasks. This finding supports the growing body of knowledge that role clarity is an influential factor for nurses’ decision-making.
The results indicated that both role conflict and role ambiguity were related to all dimensions of nurses' decision-making. While both role conflict and role ambiguity were inversely related to supervisor and peer interactions, role conflict and role ambiguity were positively related to fewer rules and procedures (see Figure 3).

<table>
<thead>
<tr>
<th>Role Clarity Dimensions</th>
<th>Organizational Structure Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role Conflict</td>
<td>Vertical Participation</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Role Ambiguity</td>
<td>Formalization (higher scores = fewer rules)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* - = negative relationship  ** + = positive relationship  *** ns = non-significant

Figure 3. Relationship of Role Clarity and Organizational Structure Dimensions.

Thus, when nurses are less clear about their roles, they interact less with their supervisors and peers. Conversely, as nurses' roles become more clear, nurses' interact more with supervisors and peers when making decision and their feeling that the agency values their input is enhanced. At the same time, more rules and procedures (low formalization scores) are associated with less conflict and ambiguity, whereas fewer rules and procedures are associated with higher feelings of role conflict and role ambiguity.
The finding that role ambiguity was negatively related to horizontal participation supported Murray’s (1998a) findings. She found that part of the stress of being a home healthcare nurse was that the role caused feelings of isolation due to fewer professional interactions. The findings of this study suggested that a nurse who does not have a clear understanding of the role is less likely to feel that attitude in the agency was positive toward the nurse’s involvement in decision-making. On the other hand, a nurse who has a clear understanding of the home healthcare nurse’s role, will more likely feel that the attitude in the agency was positive toward the nurse’s involvement in decision-making and the definition of tasks.

The findings failed to differentiate different levels of role ambiguity for nurses employed by the state and nurses employed by non-state agencies. This finding supported Lafferty et al. (1997) who found that a core role exists among home healthcare nurses and public health nurses. In South Carolina, nurses employed by the state owned agencies are public health nurses and nurse employed by non-state agencies do not consider themselves public health nurses.

The implication regarding the relationship of role clarity to organizational structure is that when nurse managers consider adjustments to organizational structure, they need to consider nurses’ level of role conflict and role ambiguity. Low levels of role conflict and role ambiguity (role clarity) may aid nurses in establishing and maintaining close relationships with supervisors and peers thus facilitating change. Clear job descriptions, adequate orientation and in-service education, and clear expectations will help to lower role conflict and role ambiguity thereby supporting role clarity conducive to good decision-making.
Relationship of nurse characteristics and organizational structure. While nurses’ age, educational level, experience as a nurse, number of home visits made, or number of patient calls made were not related to the dimensions of organizational structure, nurses’ tenure in the agency was negatively related to vertical participation. Results suggested that nurses, employed for a shorter time, regardless of agency ownership, were more likely to interact with their supervisors. Figure 4 shows this relationship that is intuitively appealing since nurses employed for a shorter length of time are more likely to interact with their supervisors for guidance.

<table>
<thead>
<tr>
<th>Nurse Characteristics</th>
<th>Organizational Structure Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenure</td>
<td>Vertical Participation</td>
</tr>
<tr>
<td></td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>Horizontal Participation</td>
</tr>
<tr>
<td></td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>Formalization</td>
</tr>
</tbody>
</table>

Figure 4. Relationship of Nurse Characteristics and Organizational Structure Dimensions.

This finding implies that newly hired nurses have a strong bond with their supervisor. This finding supports Murray’s (1998b) contention that home healthcare nurses take about two years to gain an understanding of the home healthcare nurses’ role. The finding supports the need for strong, formal and informal orientation program linking the newly hired nurse with the supervisor particularly over the first 24 months.

Relationship of agency characteristics and organizational structure. Agency ownership was positively related to vertical participation and formalization as shown in
Figure 5. Responses of nurses, employed by corporations or the county, were compared to responses of nurse employed by state and nonprofit agencies. Nurses who were employed by corporations and the county reported that their supervisors sought out the nurses for decision-making, consulted with the nurses concerning job related tasks, and more rules and procedures existed and were followed.

<table>
<thead>
<tr>
<th>Agency Characteristics</th>
<th>Organizational Structure Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership</td>
<td>Vertical Participation</td>
</tr>
<tr>
<td></td>
<td>Horizontal Participation</td>
</tr>
<tr>
<td></td>
<td>Formalization</td>
</tr>
</tbody>
</table>

Figure 5. Relationship of Agency Characteristics and Organizational Structure Dimensions.

The rural or urban location of the agency component was not significantly related to nurses' decision-making. This finding supported the conclusion of Dansky et al. (1994) and Adams and Short (1999) who found that location did not influence patient satisfaction and accounted for less than one percent of the variance in patient outcomes. A reason may be that the patients in these studies were already receiving home healthcare. Findings of other studies (Earle & Burman, 1998; Johnson et al., 1998) indicated that barriers to accessing healthcare was a problem in rural areas. However, barriers were not addressed in this study.
Throughput Variables

Relationship of nursing technology and organizational structure. The dimensions of nursing technology and the dimensions of organizational structure were matched to determine the best fit, as suggested by Alexander and Randolph (1985). The results of multiple regression analysis resulted in a model that matched uncertainty with vertical participation, variability with formalization, and instability with horizontal participation. The entire model was significant and accounted for 23% of the variance in nurses’ perceptions of patient outcomes that were sensitive to nursing care. The model suggested that patient outcomes in the home healthcare setting would be optimized when the absolute difference 1) between uncertainty and vertical participation were large, 2) between variability and formalization were large, and 3) between instability and horizontal participation were small.

Alexander and Bauerschmidt (1987) proposed that “nursing units with intermediate nursing technology produce the same quality of care irrespective of the structure for the delivery of care” (p. 3). Findings from the current study indicated that the mean score for instability was 21.15 (potential range 8 - 40), the mean score for variability was 7.28 (potential range 3 - 15), and the mean score for uncertainty was 22.66 (potential range 7 - 35). Thus, the home healthcare agency components scored in the intermediate level for each dimension of nursing technology. In addition, the findings indicted that nurses employed by corporations and the county reported different organizational structure than nurses employed by the state and non-profit agencies. Yet, the outcomes among agency components were not significantly different. Thus the
findings of the current study lend support to the hypothesis proposed by Alexander and Bauerschmidt.

Although the model was not identical to the one describing acute care units proposed by Alexander and Randolph (1987), the difference might be explained because the setting of the current study was restricted to home health rather than acute care or a variety of community settings. Another explanation may be that nursing technology has changed over time, perhaps as a result of legislative or fiscal constraints in the home healthcare industry. Nonetheless, the finding that the dimensions of nursing technology and the dimensions of organizational structure fit together to influence patient outcomes in home healthcare is significant with important implications for nursing. Based on knowledge of the intermediate level of technology, nurse managers can adjust organizational structure to increase the absolute difference between uncertainty and vertical participation and between variability and formalization, while minimizing the difference between instability and horizontal participation. Since nursing technology changes over time (Alexander & Kroposki, 2001b), nurse managers need to reassess nursing technology periodically (Alexander & Mark, 1990) and could make changes according to the NT/OS model that was shown to be significant in home healthcare.

Output Variables

Relationship of nursing technology dimensions, organizational structure dimensions, and patient outcomes. Using multiple regression analysis, the dimensions of nursing technology: instability, variability, uncertainty, and the dimensions of organizational structure: vertical participation, horizontal participation and formalization accounted for 29% of the variance in the nurses' perception of patient
outcomes that are sensitive to nursing care. Variability and uncertainty are most predictive of a high level of patient outcome achievement, as shown in Figure 6, but this total model was not significant.

![Figure 6. Relationship of Nursing Technology Dimensions, Organizational Structure Dimensions, and Patient Outcomes that are Sensitive to Nursing Care.](image)

This finding suggests that nurses perceive that patient outcomes are achieved when nurses engage in different tasks based on the varying needs of different patients and when patient care is difficult to understand and complex. This finding is difficult to interpret since nurses indicated that patients received the needed care.

Relationship of nursing technology/organizational structure fit and patient outcomes (CHNOI). The best combination of the dimensions of nursing technology/organizational structure to optimize patient outcomes that are sensitive to nursing care is shown in Figure 7. The model predicted 23% of the total variance in the CHNOI. The absolute difference between uncertainty and vertical participation and the absolute difference between variability and formalization were positively related to
Nursing Technology Dimensions:
- Instability (I)
- Variability (V)
- Uncertainty (U)

Organizational Structure Dimensions:
- Vertical Participation (VP)
- Formalization (F)
- Horizontal Participation (HP)

Figure 7. Model to Show the Relationship of Nursing Technology/Organizational Structure Fit and Patient Outcomes that are Sensitive to Nursing Care.

Patient outcomes. The absolute difference between instability and horizontal participation was negatively related to patient outcomes. These relationships can be interpreted to mean that 1) patient outcomes are best achieved when nurses engage in different tasks resulting from differences among patients (variability), the agency needs rules and procedures to guide nursing practice (formalization); 2) when nurses find that their work is complex and difficult to understand (uncertainty), they need to act independently (vertical participation); and 3) when nurses faced unpredictable fluctuations in work techniques and practice (instability), nurses are to be encouraged to be involved in decision-making and task definition with their peers (horizontal participation). Knowledge of the complex relationships of the dimensions of organizational structure and nursing technology may be useful for nurse managers who
wish to determine if ineffective combinations exist and gives direction as to the adjustments that need to be made to improve patient outcomes. The relationships between nursing technology and organizational structure may vary depending upon nursing practice setting. For example, the fit between the nursing technology dimensions and organizational structure dimensions differed in home healthcare settings when compared to findings of studies conducted in acute care settings (Alexander & Bauerschmidt, 1987). A further consideration is that nursing technology has been shown to change over time (Alexander & Kroposki, 2001b) and nurse managers need to reassess nursing technology regularly to adapt the organizational structure to maximize patient outcomes that are sensitive to nursing care.

**Relationship of dimensions of nursing technology, organizational structure and patient satisfaction (HCCSI-R).** When all dimensions of nursing technology and organizational structure are taken into consideration the resulting model explained 34% of the variance in patient satisfaction. Variability, vertical participation, and formalization were the best predictors of patient satisfaction. Thus, high levels of patient satisfaction were achieved when nurses engaged in a variety of tasks, nurses’ supervisors sought out the nurses’ input for decision-making and consulted with nurses concerning job related tasks, and nurses followed rules and procedures to guide their work. Figure 8 demonstrates the relationship of the nursing technology dimensions, organizational structure dimensions, and patient satisfaction. No significant findings were found with the fit variables and patient satisfaction.
Nursing Technology Dimensions:

- Instability
- Uncertainty
- Variability

Organizational Structure Dimensions

- Vertical Participation
- Horizontal Participation
- Formalization

Figure 8. Relationship of Nursing Technology Dimensions, Organizational Structure Dimensions, and Patient Satisfaction.

Relationship of agency characteristics and patient outcomes. Neither agency ownership nor location was related to patient satisfaction or patient outcomes. This finding needs to be viewed positively by patients and nurse managers. This result suggests patients receive comparable care independent of the area in which they live (rural versus urban) or the ownership of the agency through which they receive their care.

Results indicated that nurses employed by state agencies reported that environmental and community safety aspects of care were achieved more often than nurses who worked for non-state agencies. This finding is consistent with the public health concerns of the state owned agency. As all home health agencies seek to increase their market share, all home health agencies need to investigate ways to meet the
environmental/community safety needs and seek reimbursement for this service. For example, home health agencies could partner with industries to provide immunizations and health screenings at specific times during the year.

Relationship of nurse characteristics and patient satisfaction. The finding that the longer the nurses worked in home healthcare and the longer the nurses worked for an agency, the less patients were satisfied may indicate a level of burnout that the nurses are experiencing. The changes in home healthcare has changed the nurses’ expectations of the services they must provide, much of which has to do with increased documentation (Cogdon & Magilvy, 1995). Nurses reported a high level of role conflict associated with having to spend too much time on paperwork. The nurses’ dissatisfaction with the changes may be perceived by patients who report a lower level of satisfaction. Nurses, who have been newly employed in home health and are new to the agency, learn that documentation for reimbursement is a requirement of their new job, not a dramatic change from their previous practice. Thus the newer nurses may experience less conflict about the requirements for their job than the nurses who have been with the agency for many years.

Another possible explanation for this relationship is that nurses who have been employed for a long time were educated when certain nursing skills were not part of nursing curriculum. As patients return home from the hospital is a sicker state, the home health nurses are not educationally prepared to care for patients with such a high degree of acuity resulting in lower patient satisfaction scores, especially in the area of the nursing staff’s knowledge of the patient’s health problems. This finding has implications for further research. If patient dissatisfaction is the result of nurses’
dissatisfaction with the burden of documentation, the home health agency could take steps to streamline the documentation process, whereas if nurses need more education to provide a higher level of care or better patient education, the agency could provide continuing education classes for nurses.

**Differences in data based on time of collection.** Nurses at the agency sites expressed a concern that data collected before PPS was implemented on October 1, 2000 would be significantly different from data collected after that date. Although some significant differences were noted, the differences in high number of years since RN licensure, more experienced in home healthcare, employed longer in the agency, reported higher environmental/community safety scores on the CHNOI and fewer nurses responded at the collection site may be related to agency ownership rather than time. Since 74% of the state owned agency components participated in the study after October 1, 2000, the reason for the difference of the variables based on time of collection may very likely be a result of ownership status.

**Relationship of patient outcomes that are sensitive to nursing care and patient satisfaction.** The CHNOI measured the nurses’ perceptions of patient outcomes that are sensitive to nursing care in four dimensions: psychosocial, physiological, nursing intervention/implementation, and environmental/community components of care. The only dimension of the CHNOI that was related to patient satisfaction was the psychosocial components of care as shown in Figure 9.

This finding suggests that communication is extremely important. Both nurses and patients expect that lines of communication between them remain open and clear. When nurses met the communication and emotional needs of patients, patients reported
Patient Outcomes that are Sensitive to Nursing Care:

- Psychosocial Components of Care → Patient Satisfaction
- Physiological Components of Care → Patient Satisfaction
- Nursing Intervention/Implementation Components of Care → Patient Satisfaction
- Environmental/Community Components of Care

**Figure 9.** Relationship of Nurses’ Perceptions of Patient Outcomes Sensitive to Nursing Care and Patient Satisfaction.

High levels of satisfaction. On the other hand, when barriers to communication existed, patients were less satisfied with their care. Thus, meeting the patient’s psychosocial needs should be a priority for home healthcare nurses who wish to achieve high levels of patient satisfaction. The home healthcare variables that show a significant relationship to patient outcomes are shown in the final model in Figure 10.

Of note is the fact that agency ownership and location did not show a significant relationship to patient outcomes. For example, the rural or urban location of the agency did not have a significant impact on patient outcomes. An explanation for this finding may be that the study did not examine barriers to entry to the healthcare system in the rural area. The distribution of agency components that participated is a consideration. Whereas 76% of the non-state agency components were located in the urban areas, 68% of state-owned agency components were located in rural areas. Thus, the state-owned agency may serve as the primary home healthcare provider for rural residents who may not have access to a non-state home healthcare agency in their county.
Figure 10. NT/OS Model for Home Healthcare

Limitations of the Study

Several factors could have acted to influence the validity of the findings of this study. Convenience sampling could have been a source of bias because information about agencies, nurses, and patients who chose not to participate is unknown. A further limitation related to patient selection may have occurred because nurses distributed the patient satisfaction surveys. The investigator attempted to overcome this source of bias by instructing nurses to distribute the surveys sequentially but the investigator was not able to control the distribution of surveys. The study was limited in scope because of the
inclusion of registered nurses and patients. A team of healthcare providers whose functions overlap provides home healthcare. Other healthcare disciplines influence patient outcomes in home healthcare. However, resources prevented the exploration of the contributions of other home healthcare team members in this study.

Another limitation of the study was not including other variables known to influence patient outcomes. The patient’s level of independence, support system, and socioeconomic status are variables that may have influenced patient outcomes (Register, 1999). Other organizational variables, such as skill mix and funding rates were not included. The current study was restricted to the examination of variables that the nurse manager can influence such as policies, procedures, and reporting relationships with peers and supervisors within the home healthcare team.

Several external factors could have threatened the validity of the findings. For example, patients or caregivers had to read at least the eighth grade reading level to complete the questionnaire. This means of data collection was used rather than interviews in an effort to gain access to the sites as well as preserve confidentiality of the patients. The nurses also expressed concern about including patients who were blind and unable to read and living alone. Limited resources prevented the inclusion of these patients unless the nurse could think of a caregiver, relative or friend who was willing to complete the survey for the patient. Nurses who asked the investigator if they could write down the patient’s responses, were told that patients, family, or friends should complete the patient survey but if the patient asked the nurse specifically, the nurse could fill out the form. This action could have lead to bias. However, forbidding the nurse to participate when the patient requested and the nurse was willing could have set
up a situation of ill will between nurse and patients. Nurses were instructed to assist the
patients with the survey only if the patients asked them to do so and the nurses felt they
could spend the extra time with the patient to assist them. No method was used to
determine how many nurses completed surveys for patients. Thus bias may have been
introduced into the patient satisfaction survey.

A further limitation was the use of nurses’ perceptions of patient outcomes
rather than a more objective measure of patient outcomes. The most widely used
objective measure of patient outcomes in home health is OASIS. Designed as a
classification system, OASIS has just been adopted nationally to track patient outcomes
over time. Currently OASIS data are being collected by each home healthcare agency
for Medicare billing purposes. However, at the time of this study data were not available
for independent researchers.

A potential limitation of the study was that data were collected while PPS was
implemented. However, statistical analysis did not support that changes had a
significant impact on the results.

Conclusions: Implications for Future Research

Further research investigating the relationship of organizational variables and
patient outcomes is warranted. First, the study needs to be replicated using a larger
sample size and addressing the limitations of the current study. Secondly, an
implementation study could be designed to evaluate the effectiveness of the NT/OS
Model for Home Healthcare (Figure 11) to improve patient outcomes.

Study replication needs to include random sampling of home health agencies
over a larger geographic area, regionally or nationally to enhance the generalizability of
the findings. With a large sample, path analysis could be used to further clarify the relationships among the variables that influence patient outcomes. Telephone sampling or face to face interviews rather than distributed written surveys may increase the response rate of patients. While including other members of the healthcare team, such as physical therapists and home healthcare aides to more fully describe the picture of home healthcare and specific members’ contributions to patient outcomes, the study needs to include additional organizational variables, such as staffing mix and funding rates to address the fiscal constraints that may influence patient outcomes. In addition, patient variables, such as medical diagnoses, functional status on admission, socioeconomic status, funding source, such as Medicaid or private insurance, may influence patient outcomes. Therefore a study including these variables may be able to explain a larger percentage of the variance in patient outcomes.

Further refinement of the instruments could be conducted to improve their reliability and validity. Currently the instruments contain items that ask nurses to score by reflecting on their individual practice or the practice of nurses within their nursing unit. A study need to be conducted to assess differences when nurses score the items from the individual’s perspective as opposed to the perspective of nurses working as a group.

In addition to replicating the current study and reducing the limitations of the study, further research using the NT/OS Model for Home Healthcare needs to be initiated. The sample of agencies that participated in the current study could be randomly assigned to two groups. One group could serve as a control group and receive no further contact from the investigator for a year. The other group could work with the
investigator to institute changes in nurses' decision-making based on the results of the current study, using the NT/OS Model for Home Healthcare. After a year, patient outcomes for both groups could be assessed to determine if the intervention group improved their patient outcomes. The findings of this study could support or refute the use of the NT/OS Model for Home Healthcare.

Conclusions: Implications for Nursing Practice

Data collection at the unit level is important for benchmarking quality indicators to analyze patient care and to describe areas that need improvement. System-wide benchmarks provide the basis for improvement at the agency component level (Rudy, Lucke, Whitman, & Davidson, 2001). This study collected data at the unit level and the results provide a benchmark for analyzing home healthcare patient outcomes and ultimately, should lead to the improvement of patient care in the home setting.

Findings from this study show that sufficient variation in the results of the instruments existed to prompt nurse managers to use the information to compare the results of their agency component with the mean scores. The mean score can serve as a benchmark for improving patient care. When considering their level of patient outcomes and patient satisfaction as compared with other agency components, the nurse managers could determine if they should maintain or improve their level of achievement. If they wish to improve their patient outcomes, other findings from the study identified which variables to adjust to foster change.

Overall, nursing technology, or nursing care processes, were the same for all agency components but organizational structures varied according to ownership. Several factors that influenced organizational structure were identified. For example, role clarity

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(low levels of role conflict and role ambiguity) was identified as positively related to supervisor and peer communications. A clearer understanding of the nurses' role goes hand in hand with good communications with supervisors and peers. At the same time role clarity was related to a high number of rules and procedures to guide practice. Therefore by promoting collegial relationships among nurses with their supervisors and peers, and by developing rules and procedures that are used to guide practice, nurse managers can influence the nurses understanding of the home healthcare nurses role. Nurses who have a clear understanding of their role will be more likely to perceive a positive working relationship that ultimately can lead to better patient outcomes.

An important finding of this study is that by knowing the level of nursing technology and organizational structure, a nurse manager can then change the organizational structure to improve patient outcomes and patient satisfaction. The key is found in the equation: other variables - (the absolute value of instability - horizontal participation) + (the absolute value of uncertainty - vertical participation) + (the absolute value of variability - formalization) = optimal patient outcomes.

If the nurse manager wants to improve the outcome score, the nurse manager needs to look at the nursing technology dimension scores. The nurse manager should aim to minimize the absolute difference between the instability and horizontal participation scores, and maximize the absolute differences between the uncertainty and vertical participation score and between the variability and formalization score. This report can serve as a benchmark for the agency. The conceptual framework for this study shows managers how to improve patient outcomes by manipulating structural variables under their control. For example, nurse managers who participated in the study
now know the level of role ambiguity in their agency and can take measures to reduce ambiguity. Role ambiguity is related to peer relations (horizontal participation). Therefore nurse managers would then look for ways to increase interactions among home health nurses. For example, promoting formal and informal staff meetings to foster communication among nurses serves to decrease role ambiguity among nurses. Nurses would have a clearer understanding of their role and peer interaction would increase. Peer interaction is related to the nursing technology dimension of instability. Thus, as patients need closer monitoring because of unstable medical conditions, a high level of peer interaction needs to be fostered to improve patient outcomes. Therefore, a nurse manager who wishes to improve patient outcomes needs to consider all the dimensions of nursing technology and organizational structure. The nurse manager would develop ways to raise or lower the scores of the dimensions of organizational structure to best fit the level of nursing technology reported by the nurses in the specific agency component. An example of an agency report that could help nurse managers is shown in Table 26.
### Table 26.

**Example of Agency Report for Hypothetical Agency**

<table>
<thead>
<tr>
<th>Variables measured</th>
<th>Agency “X”</th>
<th>Range of scores from 43 agency components</th>
<th>Average score from 43 agency components</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHNOI¹</td>
<td>167</td>
<td>158 - 230</td>
<td>190</td>
</tr>
<tr>
<td>a) psychosocial</td>
<td>45</td>
<td>41 - 57</td>
<td>48</td>
</tr>
<tr>
<td>b) physiological</td>
<td>42</td>
<td>41 - 55</td>
<td>47</td>
</tr>
<tr>
<td>c) nursing interventions/implementation</td>
<td>61</td>
<td>55 - 75</td>
<td>65</td>
</tr>
<tr>
<td>d) environmental/community safety</td>
<td>20</td>
<td>12 - 45</td>
<td>31</td>
</tr>
<tr>
<td>Patient Satisfaction²</td>
<td>68</td>
<td>51 - 75</td>
<td>69</td>
</tr>
<tr>
<td>Role Conflict³</td>
<td>38</td>
<td>26 - 44</td>
<td>34</td>
</tr>
<tr>
<td>Role Ambiguity⁴</td>
<td>31</td>
<td>15 - 33</td>
<td>23</td>
</tr>
<tr>
<td>Instability⁵</td>
<td>24</td>
<td>16 - 26</td>
<td>21</td>
</tr>
<tr>
<td>Variability⁶</td>
<td>4</td>
<td>3 - 11</td>
<td>7</td>
</tr>
<tr>
<td>Uncertainty⁷</td>
<td>25</td>
<td>16 - 29</td>
<td>23</td>
</tr>
<tr>
<td>Vertical Participation⁸</td>
<td>22</td>
<td>12 - 25</td>
<td>17</td>
</tr>
<tr>
<td>Horizontal Participation⁹</td>
<td>29</td>
<td>21 - 31</td>
<td>26</td>
</tr>
<tr>
<td>Formalization¹⁰</td>
<td>3</td>
<td>2 - 6.5</td>
<td>4.5</td>
</tr>
</tbody>
</table>

1. Community Health Nursing Outcomes Inventory: nurses' perceptions of patient outcomes with four subscales: a) psychosocial components of client care, b) physiological components of client care, c) nursing interventions/implementation components of client care, and d) environmental/community safety components of client care.

2. Patient Satisfaction: patients' perceptions about home health agency and their care.

3. Role Conflict: the discrepancy between job expectations and professional values, time, and resources.


5. Instability: degree to which unpredictable fluctuations in work techniques and practice occur.

6. Variability: degree to which the nurses engage in different tasks resulting from differences among patients.

7. Uncertainty: degree to which work performed is difficult to understand and complex.

8. Vertical Participation: extent to which the nurses' superior seeks out the nurses' input for decision making and to what extent the nurses must consult with the superior concerning job related tasks.

9. Horizontal participation: extent to which the nurses feels that the attitude in the agency is positive toward the nurse's involvement in decision making and the definition of tasks.

10. Formalization: extent to which rules and procedures exist and are followed to govern the nurses' work (lower scores indicate more rules and procedures).
Conclusions: Implications for Theory Development

The central concern for nursing science is caring in the human experience (Newman, Sime, & Corcoran-Perry, 1991). The current study examined the care provided to patients in the home health setting as perceived by nurses and patients. The researcher used a conceptual framework to guide the research and to test the relationships between the predictor variables and the outcome variables. In keeping with general system theory (von Bertallafy, 1968) framework and incorporating concepts from role theory (Rizzo, House, & Lirtzman, 1970) and sociotechnical theory (Pasmore, 1988, Perrow, 1967; Woodward, 1965), a positivist approach was employed (Kerlinger, 2000) to analyze the data to explain, understand, predict, and, ultimately, improve home healthcare patient outcomes.

Theory development is based on a clear understanding of the concepts of interest (Walker & Avant, 1995). The phenomena of concern in this study were home healthcare and patient outcomes. Medicare stipulates that registered nurses must provide supervision and care in home healthcare. Specifically, the study sought to identify nurses' contribution to patient outcomes and patient satisfaction. The study was designed to describe the knowledge of nurses' understanding of their role, nurses' decision-making, nursing technology and patient outcomes that was previously investigated in other patient care settings (Alexander, 1989; Alexander & Bauerschmidt, 1987; Anderson & McDaniel, 1999, Cumbey, & Alexander, 1998, Mark, Sayler, & Smith, 1996; Sowell & Allred et al., 1995). The findings extended nursing knowledge by describing the current relationship of home healthcare and patient outcomes.
Findings suggested a method to improve patient outcomes by adjusting nurses’
decision-making to match more closely the nursing care processes employed by nurses
to meet patient needs in the home. Thus, results extend nursing knowledge by
exemplifying the contribution of nurses to home healthcare patient outcomes.

Summary

Home healthcare is the part of the health care system that has experienced rapid
expansion for over 35 years and is now facing drastic shrinkage due to legislative and
economic changes. Measurement of quality indicators is crucial to high quality health
delivery. This study provides the evidence to link organizational variables to nurses’
perceptions of patient outcomes that are sensitive to nursing care and patient satisfaction
in home healthcare. When the nurse managers assess the level of nursing technology
and adjust the organizational structure of the home health agency accordingly, patient
outcomes will improve.

Nurse managers, staff nurses, and patients expressed interest as evidenced by
232 requests for a final report. The participants who made the request looked forward to
a final report on the general outcomes of the study. Nurse managers were particularly
interested in comparing their agency results to the mean results of the other agency
components in the study.

High quality patient care is essential in home healthcare during an era when
funding changes have diminished the time nurses have to bring about positive patient
outcomes (Murray, 2001). As home healthcare contends with the prospective payment
system, home healthcare nurses may find the methods suggested by the results of this
study helpful to ensure good patient outcomes and high levels of patient satisfaction
while reducing cost. Knowledge of the current levels of nursing technology (nursing care processes) as well as current levels of patient outcomes and patient satisfaction may help nurses managers adjust the dimensions of organizational structure (nurses’ decision-making) to maintain or improve high quality home healthcare.
References


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Harris, M. D. (1999b). The nurse as the member of the home healthcare team. *Home Healthcare Nurse, 17*(6), 391-394.


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Investigator’s Letter Requesting a Letter of Support and Sample Letter of Support

Greenville, SC
March 18, 2000

Administrator
Address Block

Dear :

This is a follow-up to a letter I sent you last fall inviting your agency to participate in my dissertation study entitled "Influence of Home Healthcare Nurses on Patient Outcomes." Enclosed please find an executive summary that has more details about the study and copies of the surveys to be used in the study. The results of this study will have important implications for decision-making concerning delivery of home healthcare nursing services. Consideration of the relationships of the study variables can lead to the provision of cost-effective care and adjustments leading to improved patient outcomes.

In the study, I will ask home healthcare nurses to complete a survey that will take less than 45 minutes. I will ask the nurses to distribute the patient satisfaction survey (takes about 10 minutes to complete) and a stamped self-addressed envelopes to ten of their patients. Data will be collected after June 2000 and will remain confidential. I will provide to you the aggregated responses from your agency nurses and the responses from the patients soon after data collection. A final report of the study will be available upon completion of the study late in the year 2001.

At this time, I would like a letter of support on your letterhead that I can submit to the review board at the University of South Carolina, College of Nursing. I have enclosed a sample letter of support and a stamped self-addressed envelope. After receiving approval from the College of Nursing internal review board, I will submit the proposal to the appropriate office in your agency for approval before initiating data collection.

Feel free to contact me at by e-mail, or at my address if you have any questions or concerns regarding this request. Thank you for your consideration. I look forward receiving a letter of support in the enclosed envelope by March 31.

Sincerely yours,
Margaret Kroposki, MS, RN
Doctoral Candidate, University of South Carolina
Dear Mrs. Kroposki:

As Administrator of ________________, I wish to express strong support for your proposed dissertation research entitled "Influence of Home Healthcare Nurses on Patient Outcomes". I have reviewed the summary of the research proposal and the planned surveys. I am willing to invite home healthcare nurses and a sample of patients from the ________________ to participate in the study.

The findings from this research will furnish this agency with important information about the relationship of home healthcare nursing delivery to patient outcomes. These findings will provide a basis for decision-making that will lead to cost-effective patient care and improved patient outcomes.

We look forward to assisting you to conduct the study once approval is received from the appropriate internal review boards.

Sincerely,

Signature Block
Appendix B

Directions Given to Nurses who Distributed Patient Surveys

- Important findings from this study include the results of a patient satisfaction survey.
- To increase the response rate from patients, I am asking all nurses who make home visits to distribute ten surveys.
- Verbally encourage the patients to complete and mail the surveys back to me.
- To reduce selection bias in the study, please ask the next ten patients that you visit during the normal course of your home visit schedule to fill out a patient survey for the study.
- Either patient or caregiver can complete the form. The last question on the survey asks the patient or caregiver to check who completed the survey.
- If the patient, or caregiver, indicates that he or she will refuse to participate in the study, give the packet to the next patient on your schedule until all the packets are distributed.
- I would like to report the rate of patient refusal in my study.
- Therefore, when all the packets are distributed, please fill in the total number of patients you asked on the stamped, self-addressed postcard and mail it to me.
- Thank you for participating in the study by distributing these patient packets.
- Your efforts will help me describe home healthcare nurses’ relationship to patient outcomes.
Appendix C

Demographic Sheet for Nurses

To maintain anonymity, please do not put your name on this sheet. You will not be identified individually. Your agency will receive a report of the survey based on all responses of nurses and patients cared for by your agency. Information on this sheet will be reported as summary information in the final report.

Please answer these questions about yourself:

1. In what county is your home office located? ______________________
2. Do you make home visits or talk to patients on the telephone? Yes_ , No _
   If No, please skip to question 6.
3. In what county do the majority of your patients reside? __________
4. On average, how many home healthcare visits do you make in a week? _____
5. On average, how many telephone calls to patients do you make each week? __
6. How many years has it been since first receiving your RN license ______
7. How many years have you worked as a home healthcare nurse __________
8. How many years have you been employed by this agency _______________
9. Do you work full-time ______ or part time________
10. Check your highest level of education diploma __________
   associate degree __________
   bachelor's degree __________
   master's degree __________
   other (please specify) ______
11. If you are certified in any nursing specialty, please specify ______
12. What is your age? _______ and gender? ______

Comments about this survey:

Thank you for your participation.
Appendix D

Demographic Sheet for Patients

Please fill in the information:

1. In which county do you live? ________________

2. How old are you? ____________

3. How long have you been receiving home health visits from a nurse? _____

Please check all that apply to you:

When a home healthcare nurse visits, in addition to taking your blood pressure and assessing your condition, what does the nurse mainly do?

1. teach you about your condition __________

2. perform a special skill such as change a bandage, or give a medicine by injection __________

Who completed this form? _________patient or _________caregiver

Thank you for completing this survey. The results will provide the home health agency with information to give efficient high quality care.

Please mail the survey and this form to Margaret Kroposki in the stamped, self-addressed, envelope.

If you want to talk to a home healthcare agency representative about any concerns you have after completing this form please call this number _________(agency number)
Appendix E

Nursing Technology Questionnaire
(adapted from Alexander, Thomas, & Cumby, 1993; Leatt & Schneck, 1981)
The following questions measure perception about the nursing tasks in home health. When completing the questions, select the percentage category which is most representative of the percentage of time, patients, or work for which the question is true when caring for patients in their homes.

<table>
<thead>
<tr>
<th>Question</th>
<th>0-5%</th>
<th>6-25%</th>
<th>26-50%</th>
<th>51-75%</th>
<th>76-100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In your estimation, what percentage of patients need a nursing visit between a regularly scheduled visit? (I)*</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. How many of the patients would you say have similar health problems (or diagnoses)? (V) @</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. For some patients more than others it is important to know complete details of their previous health history. For how many of the patients is it critical that the nurse know a detailed history from birth to the present time? (U)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. What percentage of the patients have complex problems that are not well understood? (U)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. What percentage of the nursing personnel's work involves performing technical procedures and special tests? (I)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. What percentage of patients require the use of technical equipment (suctions, cardiac monitors, respirators, glucometers, PCA pumps, etc.)? (I)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. How many of the patients on any average day require the drawing of venous blood or an intravenous infusion? (I)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. In some programs there is a greater pressure to give nursing care quickly, because of patients' critical conditions or the volume of patients to be served. What percentage of the time is there a greater time pressure? (I)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. What percentage of the time does improvement in patients' conditions really have to depend upon the skillful initiative of nursing personnel? (I)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. How much of your work requires the analysis of complex problems? (U)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. For how many of the patients are there written goals for individualized nursing care plan? (U)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. What percentage of the nursing care is directed at meeting patients' socio-</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. What percentage of the nursing care relies upon nursing personnel's intuition rather than on set procedures or routines? (U)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. How many of the nursing care procedures are similar for most of the patients? (V) ®</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. What percentage of the decisions that nursing personnel make during their work are repeated from day to day? (V) ®</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. What percentage of new nursing personnel starting work would find the nursing care specialty difficult to learn? (I)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. How much of your work changes in direct response to changes in patients' conditions or moods? (U)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. Approximately how often do &quot;emergencies&quot; happen (i.e., when immediate nursing action must be taken in response to changes in patients' conditions)? (I)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

(I) = instability; (V) = variability; (U) = uncertainty; ® = reverse scored
Appendix F

Nurse Index of Role Conflict / Role Ambiguity (NIRCA) (Sowell & Alexander, 1989)

Everyone is occasionally bothered by things in their work. The following is a list of things that sometimes bother nurses. Please indicate how frequently you feel bothered by each of these feelings in your present position: Almost never (1), rarely (2), sometimes (3), often (4), or almost all the time (5).

Please read each statement carefully. Keep in mind that we are interested in how often you experience these feelings personally in the performance of your job. Additionally, please feel free to comment on any of the issues addressed by the statements in the space provided at the end of this questionnaire.

<table>
<thead>
<tr>
<th></th>
<th>Almost never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost all the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Feeling that you have too heavy a workload or that you are always under time pressure.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Feeling that you are unsure of your authority in carrying out the responsibilities of your job.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. Feeling you must meet conflicting demands of various people with which you work (such as nurse supervisors, physicians, and administrators).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. Feeling that there is a lack of clear standards and policies to guide you in your duties.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. Feeling that doctors do not consider your observations and suggestions to be important in determining patient care needs.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. Feeling that you are uncertain of how your work duties contribute to the overall accomplishment of your unit's goals and objectives.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. Feeling that the amount of work you have to do may interfere with how well it gets done.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. Not knowing what your supervisor thinks of you, and how she evaluates your performance.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. Feeling that you have to do things on your job that are against your better judgment or personal values.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. Feeling that you are not certain about your job responsibilities.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. Feeling that your work schedule interferes with your family or social life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td></td>
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<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>12. Feeling unsure of how your patient care decisions will affect the lives of seriously ill patients.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. Feeling that the doctors you work with misunderstand the role of nursing in patient care.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. Feeling that you work under vague directions and guidelines.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. Feeling that too much of your time is spent on paperwork.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. Feeling that you do not know just what people with which you work expect of you.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. Feeling that expectations for continuing professional education are increasingly demanding.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. Feeling uncertain that your job performance meets your supervisor's expectations.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19. Feeling that you cannot advance in your nursing career unless you leave direct patient care.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20. Feeling that explanations of work assignments are not clear and concise.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21. Feeling that administrators, supervisor, and doctors issue contradictory policy statements.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>22. Feeling uncertain of your responsibilities in supervising non-professional personnel.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23. Feeling that too much time is consumed by following medical orders rather than providing nursing care.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24. Feeling unsure that you have complete your job duties correctly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Note: odd numbered items = role conflict and even numbered items = role ambiguity.
Appendix G:

**Alexander Structure Instrument** (Alexander, 1986)

Directions: Circle the number in the category which is most representative of your decision-making. The term “superior” refers to that individual or group of individuals who is/are the immediate supervisor(s). These may be the team leader or nurse supervisor.

<table>
<thead>
<tr>
<th></th>
<th>Almost</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am not likely to express my feelings openly about my job. (HP) ®</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. In this work group most people do not have a voice in decision making. (HP) ®</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. Several individuals have a say in making decisions in my work group. (VP)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I am encouraged to make suggestions in decisions relevant to my work. (VP)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. I am encouraged to speak my mind on the job even if it means disagreeing with my superior. (VP)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. My superior often seeks out my advice before decisions are made. (VP)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. In my work there are many people involved in decision making. (VP)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. My job is not clearly defined. (HP) ®</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. I have to check with my superior before I do almost anything. (HP) ®</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I do not share any influence with my superior in making decisions. (HP) ®</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. The superior in this group usually makes the decision himself/herself. (HP) ®</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. There are rules and procedures for handling most kinds of problems which arise in making decisions. (F) ®</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. I do not play an active role in making most decisions in my work group. (HP) ®</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. The same rules and procedures are generally followed in making decisions. (F) ®</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

*(VP) = vertical participation; (HP) = horizontal participation; (F) = formalization; ® = reverse scored*
Appendix H

Community Health Nursing Outcomes Inventory (Alexander & Kroposki, 1999)

Directions: Circle the number to the right of each item to indicate the extent to which the outcomes achieved in the program/agency in which you work. Each item may not apply to every client, but consider every client who might be cared for in home health.

Please use the following scale for your responses:
Circle 1 if this outcome was never or almost never achieved.
Circle 2 if this outcome was seldom achieved.
Circle 3 if this outcome was sometimes achieved.
Circle 4 if this outcome was frequently achieved.
Circle 5 if this outcome was very often achieved.

<table>
<thead>
<tr>
<th>After a client receives nursing care from a home health nurse, the:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. client received immunizations appropriate for age. (E)</td>
<td>1</td>
<td>2</td>
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<td>4</td>
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</tr>
<tr>
<td>2. client's exposure to environmental toxins at home is minimized. (E)</td>
<td>1</td>
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</tr>
<tr>
<td>3. client has not had an unplanned pregnancy. (E)</td>
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<tr>
<td>4. the incidence of fetal mortality has decreased. (E)</td>
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</tr>
<tr>
<td>5. nurse works with the community while working with the client. (N)</td>
<td>1</td>
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</tr>
<tr>
<td>6. rate of infant mortality has decreased. (E)</td>
<td>1</td>
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<tr>
<td>7. client's vital signs have stabilized. (P)</td>
<td>1</td>
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</tr>
<tr>
<td>8. client demonstrates correct injection technique. (P)</td>
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</tr>
<tr>
<td>9. nurse considers patient's prior functioning. (N)</td>
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</tr>
<tr>
<td>10. client states s/he manages pain. (P)</td>
<td>1</td>
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</tr>
<tr>
<td>11. client states an understanding of a home exercise program. (P)</td>
<td>1</td>
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<tr>
<td>12. client demonstrates correct colostomy care. (P)</td>
<td>1</td>
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</tr>
<tr>
<td>13. client applies health care skills learned. (N)</td>
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</tr>
<tr>
<td>14. client states s/he has necessary food/supplies/care items. (N)</td>
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</tr>
<tr>
<td>15. nurse identifies goals/areas to jointly work with client. (N)</td>
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<tr>
<td>16. client performs activities of daily living specific to own situation. (S)</td>
<td>1</td>
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<tr>
<td>17. client is motivated to participate in activities. (S)</td>
<td>1</td>
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<tr>
<td>18. client is satisfied with current situation. (S)</td>
<td>1</td>
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<tr>
<td>19. family/primary care giver(s) are able to care for client independently. (S)</td>
<td>1</td>
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<tr>
<td>20. client has skills to care for self. (S)</td>
<td>1</td>
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</tr>
<tr>
<td>21. nurse makes appropriate referrals to support groups for client. (N)</td>
<td>1</td>
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<tr>
<td>22. client communicates appropriately with nurse. (S)</td>
<td>1</td>
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<tr>
<td>23. abuse has ceased within the client's home environment. (E)</td>
<td>1</td>
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<tr>
<td>24. client is in control of health outcomes. (E)</td>
<td>1</td>
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<tr>
<td>25. client has received appropriate pre-natal care. (E)</td>
<td>1</td>
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<tr>
<td>26. rate of disease in community has decreased. (E)</td>
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<tr>
<td>27. nurse ensures services/resources are available to the client. (N)</td>
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<tr>
<td>28. exposure to lead is minimized for small children. (E)</td>
<td>1</td>
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<tr>
<td>29. client verbalizes the signs and symptoms of an exacerbation of his/her illness. (P)</td>
<td>1</td>
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<tr>
<td>30. client controls symptoms of constipation. (P)</td>
<td>1</td>
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</tr>
<tr>
<td>31. nurse is aware of limitations of care due to unavailability of resources (N)</td>
<td>1</td>
<td>2</td>
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<tr>
<td>32. client demonstrates increased endurance after participating in a home exercise program. (P)</td>
<td>1</td>
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<tr>
<td>33. nurse makes appropriate referrals to the occupational therapist. (N)</td>
<td>1</td>
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<tr>
<td>34. client has reached highest level of mobility. (P)</td>
<td>1</td>
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<td>35. length of time between hospitalizations increases. (P)</td>
<td>1</td>
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<tr>
<td>36. client demonstrates increased strength after participating in a home exercise program. (P)</td>
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<tr>
<td>37. nurse provides family focused care. (N)</td>
<td>1</td>
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</tr>
<tr>
<td>38. cost of care is minimized for client and third party payer. (N)</td>
<td>1</td>
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<tr>
<td>39. nurse provides education that meets the client’s needs. (N)</td>
<td>1</td>
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<tr>
<td>40. frequency of nursing visits is appropriate for client care. (N)</td>
<td>1</td>
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<tr>
<td>41. client expresses an understanding of his/her physical problem. (S)</td>
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<tr>
<td>42. client is motivated to participate in daily care. (S)</td>
<td>1</td>
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<tr>
<td>43. nurse completes an appropriate assessment. (N)</td>
<td>1</td>
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<tr>
<td>44. client states understanding that an injury might result due to non-compliance. (S)</td>
<td>1</td>
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<tr>
<td>45. client communicates. (S)</td>
<td>1</td>
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<tr>
<td>46. nurse appropriately manages client’s medication. (N)</td>
<td>1</td>
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</tr>
<tr>
<td>47. client communicates appropriately with the family/primary caregiver(s). (S)</td>
<td>1</td>
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</tr>
<tr>
<td>48. client has appropriate coping skills. (S)</td>
<td>1</td>
<td>2</td>
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</tr>
</tbody>
</table>

S = client’s psychosocial components of care  
P = client’s physiologic components of care  
N = nursing intervention/implementation components of care  
E = environmental/community safety components of care
Appendix I

Home Care Client Satisfaction Instrument-Revised (HCCSI-R)©

(Westra, Cullen, Brody, Jump, Geanon, & Miland, 1995) (Author gave permission to use this instrument in this study.)

After each question, please circle one answer, which best represents how satisfied you are with that issue.

1. How satisfied are you with the helpfulness of the office staff?

2. How satisfied are you with the staff’s attention to your concerns?

3. How satisfied are you with the dependability of the staff?

4. How satisfied are you with the respect shown to you by the staff?

5. How satisfied are you with the staff’s knowledge of your health problems?

6. How satisfied are you with having choices about your care?

7. How satisfied are you with how safe you felt when care was provided?

8. How satisfied are you with knowing who to contact if you had a problem?

PLEASE TURN THE PAGE TO COMPLETE THE OTHER SIDE
9. How satisfied are you with the ability of the agency to meet your needs?


10. How satisfied are you with the staff's response to your concerns?


11. How satisfied are you with being able to schedule care at the times you wanted?


12. How satisfied are you with having the same people consistently?


13. Please circle a number from 1 to 10 that best represents how satisfied you were with the agency's ability to meet your expectations for care.

Very dissatisfied 1 2 3 4 5 6 7 8 9 10 Very satisfied

14. Please circle a number from 1 to 10 that best represents how satisfied you were with your overall care.

Very dissatisfied 1 2 3 4 5 6 7 8 9 10 Very satisfied

15. Please circle how likely are you to recommend to others the home care agency with 1= Definitely would not recommend and 10 = Absolutely would recommend it.

1 2 3 4 5 6 7 8 9 10

Do you have any other comments about the nursing care you received?
Appendix J

Letter of Introduction for Nurses

The Relationship of Home Healthcare and Patient Outcomes

I am working on my dissertation for a doctorate in nursing at the University of South Carolina. My research proposal aims to describe the relationship of nurses’ understanding of role, nursing care processes, and decision-making, and home healthcare patient outcomes in rural and urban counties in South Carolina. I am inviting all registered nurses who work in South Carolina home healthcare agencies that agree to complete this survey.

The survey will take approximately 45 minutes. The survey and instructions on how to complete it are included in this packet. If you choose to participate in the study, please complete the survey using the directions at the top of each section. You also have the opportunity to give comments and provide demographic data to help further assess nurses’ relationship of home healthcare and patient outcomes.

You are free to choose to participate in this study. You may experience some fatigue since the survey takes about 45 minutes to complete. You will not benefit directly from completing the survey but the knowledge gained through the survey will be helpful in describing the relationship of home healthcare and patient outcomes.

I hope that you will complete this survey right now. The pen is yours to keep whether or not you fill out the survey. If you choose to take the survey home, I will provide a stamped, self-addressed envelope to return the survey at your convenience. If you choose not to complete the survey immediately, please complete the enclosed post-card so that I may send you a reminder to return the survey. I will send these post cards out in a week as a reminder. If you wish to receive a report of the findings of this study, check the box on the postcard and return it separately from the survey.

You are free to withdraw consent at any time without prejudice to you. The answers that you provide will be analyzed together with other participants’ answers. Do not put your name on the survey. Your identity will be kept anonymous. During the study, the survey will be kept in the investigator’s office. When the study is complete, the surveys will be destroyed.

By returning the completed survey, you will indicate your consent to participate in this study. Please keep this letter. If you have any questions or want more information about the study, please feel free to contact me by phone: [redacted] or by mail at the College of Nursing, University of South Carolina, Columbia, SC [redacted].

After completing the survey, return it to me in the large envelope. Thank you for your help with this study.

Sincerely,
Margaret Kroposki, RN

This project has been reviewed and approved by the University of South Carolina, Internal Review Board [redacted].

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Appendix K

Letter of Introduction for Patients

The Relationship of Home Healthcare and Patient Outcomes

I am working on my doctoral degree in nursing at the University of South Carolina. My study aims to describe the relationship of home healthcare and patients outcomes. To help me in this study, I invite you to complete this patient satisfaction survey.

The survey will take approximately 10 minutes. If you choose to participate in my study, please follow the directions at the top of survey. At the end of the survey, there are a few questions that will help describe nurses’ relationship to patient outcomes. You can write any comments in the blank spaces.

You are free to choose to participate in this study. You may experience some fatigue since the survey takes about 10 minutes to complete. The enclosed pen is yours to keep whether or not you fill out the survey. You will not profit by completing the survey but your answers will help me describe the relationship of home healthcare and patient outcomes.

I hope that you will complete this survey. Please mail the survey to me in the stamped, self-addressed envelope. If you wish to receive a final report of my study, check the box on the postcard and mail it separately from the survey.

You are free to not participate at any time without any consequences or effect on your care. The answers that you provide will be analyzed together with other patients’ answers. Do not put your name on the survey. Your identity will be kept anonymous. During the study, I will keep the surveys in a locked file cabinet in my office. When the study is complete, I will destroy the surveys.

By returning the completed survey, you will indicate your consent to participate in this study. Please keep this letter. If you have any questions or want more information about the study, please feel free to contact me by phone: [redacted]; e-mail: [redacted] or by mail at the College of Nursing, University of South Carolina, Columbia, SC [redacted].

After completing the survey, return it to me in stamped, self-addressed envelope. Thank you for your help with my study.

Sincerely,
Margaret Kroposki, RN
Doctoral Candidate, College of Nursing
University of South Carolina

This project has been reviewed and approved by the University of South Carolina, Internal Review Board [redacted]