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Determinants of functional status in chronically ill adults.

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DETERMINANTS OF FUNCTIONAL STATUS IN CHRONICALLY ILL ADULTS

by

MARY KATHRYN ROBINSON

A DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Science in Nursing
in the School of Nursing in The Graduate
School, The University of Alabama
at Birmingham

BIRMINGHAM, ALABAMA

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ABSTRACT OF DISSERTATION
GRADUATE SCHOOL, UNIVERSITY OF ALABAMA AT BIRMINGHAM

Degree	DSN	Major Subject	Adult Health Nursing

Name of Candidate Mary Kathryn Robinson

Title Determinants of Functional Status in Chronically Ill Adults

Individuals with chronic illnesses have major responsibilities for managing their own self-care so as to minimize illness complications and promote optimal physical and social functioning. Adult health nurses need to be able to assess the likelihood that clients will be able to manage their own care effectively at home, but predictive factors are largely unknown. This study examined the relationships among selected basic conditioning factors and self-care agency as identified by Orem (1991) and functional status in chronically ill adults. Additionally, the investigator aimed to determine which combination of study variables best predicts self-care agency and functional status in chronically ill adults.

Data were collected using two instruments. The Denyes Self-Care Agency Instrument (DSCAI-90) (Denyes, 1980) was used to gather information to measure basic conditioning factors and self-care agency. The Enforced Social Dependency Scale (ESDS) (McCorkle & Benoliel, 1981) was used to assess subjects' functional status. These instruments were administered to a convenience sample of 90 chronically ill adults with three medical diagnoses (diabetes mellitus [n = 30], essential hypertension [n = 30], and chronic obstructive pulmonary disease [n = 30]). Thirty-two (32) women and 58 men participated in the study. All of the subjects had been diagnosed for at least 1 year, could read and speak English, and had no current psychiatric diagnosis. Ages ranged from 28 to 81 years.

Descriptive statistics were used to describe the sample. Various measures of association were calculated to answer the study's research questions.

Analysis of data revealed a statistically significant relationship between educational level, a measure of the sociocultural basic conditioning factor, and self-care agency (r = .30, p = .005). No significant findings emerged in this sample for age, sex, and health state as they related to self-care agency. Of the variables in the study, sex and health state were the best predictors of functional status. These variables accounted for 14% of the variance in functional status.

Abstract Approved by: Committee Chairman Judy Holcombe

Program Director Elizabeth Stullenbarger

Date 9/25/95 Dean of Graduate School John Haden

DEDICATION

This work is dedicated to my husband, Frank, who endured summers during which I was rarely present and the times that life events caused inertia in my progress toward this goal. He gave me the courage to persist. Without his support and encouragement, I could never have completed this work.

I also dedicate this effort to the memory of two significant role models and supporters in my life--my mother and my mother-in-law. Both of these women demonstrated that one can accomplish any goal if the will and determination are strong. Their belief in me and my ability to be successful was consistent and firm. Their lessons of persistence and determination are always with me and were instrumental in my reaching this goal. I will always be grateful to them for the lessons they have taught me and for their faith in me.

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And to my colleagues and friends in my work setting, surely you have earned this degree too! For all the times you took on my work; protected me from work-related problems; helped me find journal articles; gave me time off to read, think, and write; and helped me get computer access for data analysis; and for many other acts of kindness and support, I will never be able to repay you. I

am privileged to work with such a caring group of administrators, faculty, and staff. Thanks to each of you.

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I gratefully acknowledge the faculty of the School of Nursing at the University of Alabama at Birmingham for their dedication to providing a quality educational program in a way that makes it accessible to working professional nurses. Without the commitment you made to make the summers option possible, I could not have completed this program. I know how hard you work to make opportunities available for me, and I appreciate those efforts.

Finally, I acknowledge the time taken by my research subjects to participate in this study. I respect them greatly for their willingness to share about themselves in order to advance the science of nursing and the education of this nurse.

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CHAPTER I

Introduction

Throughout history, as changes have occurred in the intellectual, social, economic, and cultural fabric of society, the component structures comprising that society have been required to adjust their modes of operation accordingly. Today, the American health care system, and professional nursing within it, is involved in another cycle of these adjustments (Braun, 1987).

From the early settlement of the United States until the late 1800s, most health care was delivered in the home. Although some of this care was provided by health care professionals, the vast majority was given by the individuals involved or their families. Hospitals were not viewed as sites of choice for receiving health care by either the rich or the poor (Kelly, 1981).

Early in the 20th century, health care delivery patterns began to change. Societal changes that directly affected the health of the public and its access and need for a different form of health care included:

1. an increasingly mobile population characterized by smaller nuclear families and more limited family and community support systems;

2. rapid development of advanced technologies for diagnosis and treatment, which were expensive and required trained personnel for their use, thus creating a need for centralization of resources;

> 3. development of hospitalization insurance plans which made the new technologies economically feasible and resulted in a rapid growth of the hospital industry; and
>
> 4. growth of labor unions which became strong enough to gain hospitalization insurance as a part of employees' benefits, which made this expanding system available to the average worker. (Pickett & Hanlon, 1990, p. 88-89)

Unfortunately, many of the current major health problems in America today are not amenable to the technologies that proliferated and were practiced so successfully in the health care system during the last 50 years (Braun, 1987). In fact, advances in technology have contributed to increasing numbers of chronically ill adults. Adults who, in the past, would have succumbed to conditions, such as chronic renal failure, are now being discharged with markedly increased needs for sophisticated technical dialysis care. Additionally, more people are living longer, with an accompanying rise in the prevalence of chronic illnesses. For example, adults 65 years of age and older comprise 13% of the U.S. population. It is anticipated that by the year 2010, older Americans will account for 20% of the population or one of every five Americans (Shippee-Rice & Mahoney, 1992). Dennis (1990) reported that 40% of individuals over 65 years old and 60% of those over 85 years of age have one or more chronic health problems. Many of these problems are associated with altered functional status (Zola, 1990).

Modern technologies have been ineffective in preventing conditions, such as strokes, diabetes mellitus, chronic obstructive pulmonary disease, rheumatoid arthritis, essential hypertension, and cirrhosis of the liver (Hahn & Teutsch, 1989).

As a result, the health care of people with a variety of chronic illnesses is consuming increasing proportions of health resources (Woods, Haberman, & Packard, 1993). Most frequently these resources, human and financial, are expended on inpatient care due to complications arising from uncontrolled disease (Leese, 1992). Significant costs accrue to the nonhospitalized chronically ill as well. For example, data from the National Health Interview Survey showed that from 1970 to 1980 larger proportions of people were affected by chronic conditions that limited their activities and functional ability and reported more activity limitations per capita (Rice & La Plante, 1992). Rice and La Plante (1992) reported that, of 223 million noninstitutionalized persons in 1980, 36 million, or 16.2%, reported limitations of activity due to chronic conditions. Total health care expenditures for all noninstitutionalized persons amounted to $153.9 billion, or $691 per person. The 187 million people with no activity limitations incurred $90.9 billion, or $486 per capita, while expenditures for persons with one chronic condition amounted to $1,620, over three times the amount spent for persons with no activity limitations.

Considerable savings to society could be gained if individuals are helped to engage in more aggressive self-care activities (Clark et al., 1991). Ways to test this premise are beginning to be reported in the scientific literature. One study was recently reported in which the objective was to determine the effectiveness of a home hypertension monitoring and management program in reducing costs while maintaining blood pressure control. Four hundred thirty (430) patients with uncomplicated hypertension were randomly assigned to either the Usual Care (UC) or the Home BP (HBP) group. Home BP patients were taught to measure their own blood pressures and return the readings by mail. HBP patients made 1.2 fewer hypertension-related office visits than the UC group during the study year. Mean adjusted costs for physician and laboratory services and telephone calls was 29% less for the HBP group. Blood pressure control in men was better in the HBP group and was equally good in both groups of females. Patient satisfaction levels with self-monitoring and management were equal to those who were monitored in physicians' offices (Soghikian et al., 1992).

Professional nurses traditionally have been prepared to help people maximize their functional abilities regardless of the physical condition involved. For people with chronic illnesses, where cure of disease is not the focus, nurses can become increasingly significant care providers by helping clients maximize their skills in self-monitoring and management of their disease processes, because nurses are frequently the principal health care professionals responsible for teaching individuals about their disease and treatment management (Dodd & Dibble, 1993). As demonstrated in the hypertension study described above, this type of care may be cost effective and satisfying for the clients as well.

Statement of the Problem

A major problem to be addressed in today's health care delivery system is chronic illness (Forsyth, Delaney, & Gresham, 1984; Maraldo, 1989). Attention to chronic diseases in the United States has increased as their incidences, mortality, and use of health care resources have increased. For example, in 1900, tuberculosis, diphtheria, influenza, pneumonia, and several infectious gastrointestinal conditions accounted for 38.3% of mortality. In 1986, those same conditions accounted for 3.6% of mortality. On the other hand, in 1900, cardiovascular and renal diseases, cancer, diabetes, and cirrhosis accounted for 25% of mortality; by 1986 the percentages had risen to 72% (Hahn & Teutsch, 1989). Holyroyd and Creer (1986) addressed the growing problem of chronic illness in another way. They reported that, in 1946, 30% of the United States population had a chronic illness, whereas the percentage of those with chronic illness in 1986 was 75 to 80%. Hamberg, Elliott, and Parron (1982) reported that chronic disease had increased at least 205% in the previous 70 years, in large part because of learned lifestyle behavior patterns.

Despite the dramatic shift in the type of conditions causing illness, disability, or death, there has been little corresponding change in the American health care system. The focus of medical care continues to be on acute care and crisis intervention. A refocusing is needed, which will again emphasize the importance of self-care. This is particularly true with chronically ill individuals, whose self-care management, including lifestyle modifications, is critical to avoidance or delay of symptom progression or exacerbation (Gaut & Kiekhefer, 1988).

Professional nursing has the potential to contribute in substantial ways to improving the care of chronically ill adults. In order to respond effectively, nurses must take advantage of their historically documented concern for facilitating self-care and independence in clients. Because most chronic illness care occurs on an ambulatory basis, its overall effectiveness is directly related to the extent to which the person engages in self-care activities (Connelly, 1987). According to Leidy (1994), how people care for themselves is often the origin and axis of nursing care and the criterion for evaluating success, and there is a real need for nurses to better understand this phenomenon. Nurses come from a position of strength due to their long-standing experience in this area and can thus provide overall health care system leadership as the system adjusts its priorities and methods of care (Kalisch & Kalisch, 1986). Nurses can become even more effective in supporting clients' self-care activities if they understand the complexities of the factors that determine self-care abilities.

Orem's self-care model provides a structure for viewing clients as self-care agents and for identifying factors affecting self-care abilities at given points in time (Orem, 1971, 1980, 1985, 1991). Orem (1991) identified 10 factors, which were labeled basic conditioning factors, that are believed to affect an individual's ability to engage in self-care. One of the factors identified was health state factors. By this inclusion, Orem emphasized that alterations in one's health state may bring about conditions that make it difficult to optimally or adequately care for oneself. In Orem's terminology, an altered health state may decrease an individual's self-care agency. Thus, Orem's self-care deficit theory provides nurses with a framework for analyzing problems that may arise when performing self-care practices as a result of a variety of factors, including illness states. The self-care model can be particularly useful in looking at problems that result from a chronic illness, since self-care is such an integral part of management of these disease processes.

Statement of Purpose

Therefore, the purposes of this study are to examine the relationships among selected basic conditioning factors, self-care agency, and functional status in chronically ill adults and to determine which combination of study variables best predicts self-care agency and functional status in chronically ill adults.

Research Questions

1. Is there a linear relationship between self-care agency and each of the following basic conditioning factor variables: age, sex, health state, and sociocultural factors?

2. What linear combination of basic conditioning factor variables (age, sex, health state, and sociocultural factors) best predicts self-care agency?

3. Is there a linear relationship between functional status and each of the following variables: age, sex, health state, sociocultural factors, and self-care agency?

4. What linear combination of variables of age, sex, health state, sociocultural factors, and self-care agency best predicts functional status?

Significance of the Study

Identification of variables that determine the functional status of chronically ill adults is particularly relevant to professional nursing practice today. If nurses are to provide appropriate assistance to chronically ill individuals in maintaining and promoting their optimal functioning, they need to be able to identify the factors most likely to be interfering with the ability to perform self-care. Because self-care will not be forthcoming unless self-care agency is developed, operational, and adequate, it seems exceedingly important to study in detail this component of the model. A thorough understanding of self-care agency provides the rational basis for making judgments about existing or projected deficits and selecting appropriate methods of helping, including the diagnosing and prescribing of nursing systems (Orem, 1985). Because basic conditioning factors have been proposed as determinants of the value of self-care agency at given points in time, the relationships between basic conditioning factors and self-care agency warrant study as well.

Knowledge gained from this study could increase professional nurses' understanding of the most significant predictors of functional status of an increasingly large segment of society. Additionally, findings could provide a basis for designing interventions specifically aimed at increasing the clients' levels of self-care agency and/or altering some of the basic conditioning factors that are adversely affecting functional status. The findings will also provide additional data to validate Orem's theoretical formulations, which will add to the scientific body of nursing knowledge (Fawcett, 1989).

Conceptual Framework

The conceptual framework to be used in guiding this study is derived from Orem's self-care deficit theory (Orem, 1971, 1980, 1985, 1991). In particular, the constructs, self-care agency and basic conditioning factors, will be examined as they relate to the chronically ill adult.

Orem's Self-Care Model

Basic to Orem's Self-Care Model is the contention that persons have the ability for self-care, a goal-directed activity that is learned. Self-care is defined by Orem (1985) as:

> . . . action directed by individuals to themselves or their environments to regulate their own functioning and development in the interest of sustaining life, maintaining or restoring integrated functioning under stable or changing environmental conditions, and maintaining or bringing about a condition of well-being. (p. 31)

Orem states that people have three types of needs that are met through self-care activities. These needs are termed self-care requisites and are categorized according to universal and developmental requirements as well as requirements arising from health deviations (Orem, 1985).

Therapeutic self-care demand refers to all self-care actions required to meet the three types of self-care requisites. The values for this demand vary throughout life. An individual's capability to meet these demands is termed self-care agency. This construct has been particularly well defined in a paper by Orem and Taylor (1986) as:

> . . . a complex capability of maturing and mature individuals to (1) determine the presence and characteristics of specific requirements for regulating their own functioning and development, including prevention and amelioration of disease processes and injuries (identification and particularization of self-care requisites); (2) make judgments and decisions about what to do; and (3) perform care measures to meet specific self-care requisites in time and over time. (p. 52)

Thus, propositions in Orem's theory of self-care deficit state that self-care agency is necessary for self-care to occur (Orem, 1991).

Self-care agency is influenced by basic conditioning factors. Orem identified 10 such factors:

> age, gender, health state, developmental state, sociocultural orientation, health care system factors, family system factors, patterns of living, including activities regularly engaged in, environmental factors, and resource availability and adequacy. (Orem, 1991, p. 136)

Basic conditioning factors may be grouped into three categories: (a) factors descriptive of the individuals themselves, (b) factors that relate these individuals to their families and sociocultural groups, and (c) factors that relate them to conditions and circumstances of living within their broader environments (Orem, 1991).

Factors descriptive of individuals include age, gender, and developmental state. Factors that locate persons within their family constellations and sociocultural groups are described by Orem as family system factors and sociocultural orientations. Factors that describe individuals in relation to their worlds of existence include health state, health care system factors, patterns of living, environmental factors, and resource availability and adequacy (Orem, 1991).

In explaining the relationship of basic conditioning factors and self-care agency, the Nursing Development Conference Group (NDCG, 1979) stated that basic conditioning factors are determinants of the stage of development of self-care agency. The NDCG went on to say that the relationship was one of functional dependence and that "formulation of laws expressing such relations could contribute substantially to the structuring of nursing knowledge and the advance of nursing science" (p. 172). Orem (1991) reiterated this belief when explicating the need to describe relationships among basic conditioning factors identified within self-care theory and to explore the possibility of other factors that have not been discovered.

When the need for self-care exceeds the individual's ability to provide self-care (self-care agency), a self-care deficit exists. This deficit constitutes a need for nursing care. Orem considers nursing to be a creative, helping service, whose primary concern is the individual's need for development and maintenance of adequate self-care agency to meet the self-care needs existing at that time (Orem & Taylor, 1986). Orem (1971) further states that it is this concern for each individual's need for self-care action that distinguishes nursing from other health care professions, and that nursing's effectiveness can be measured by the extent to which it accomplishes and promotes self-care (Orem, 1985).

Definitions of Terms

Conceptual and operational definition of terms to be used in this study are as follows:

Adult--An individual 21 years of age or older with a chronic illness that has been diagnosed for at least 1 year.

Adult self-care agency--The potential of the adult to engage in self-care actions (Orem, 1991). Operationally, adult self-care agency will be defined as the summated score on Denyes' Self-Care Agency Instrument (DSCAI-90) (Gast et al., 1989).

Basic conditioning factors--Factors internal or external to individuals that affect their abilities to engage in self-care or affect the kind and amount of self-care required (Orem, 1991). Operationally, basic conditioning factors will be measured by responses to a six-item addendum to the DSCAI-90, which includes questions about age, sex, sociocultural factors, and health state.

Chronic illness--A condition characterized by insidious onset and uncertain prognosis, progression, and responsiveness to treatment; that is ongoing or recurring over time; and that requires repeated interaction with health care providers over months or years (Robinson, 1989). Operationally, chronic illness will be defined as diagnosis of diabetes mellitus, essential hypertension, or chronic obstructive pulmonary disease as identified by a physician in subject's health record.

Functional status--An individual's ability to perform activities of daily living (eating, dressing, walking, traveling, bathing, and toileting), usual household and work roles, social and recreational activities, and communication with others in a coherent manner. Operationally, functional status will be measured by the total score on the Enforced Social Dependency Scale (ESDS) (McCorkle & Benoliel, 1981).

Health state--The basic conditioning factor, described by Orem (1991) that determines the appropriate focus for health care and the desired health outcomes. Operationally, health state will be defined as the presence or absence of one of three selected chronic illnesses: diabetes mellitus, essential hypertension, or chronic obstructive pulmonary disease.

Sociocultural factors--One of Orem's (1991) basic conditioning factors, which includes education, occupation, occupational or other life experiences, and resources currently or potentially available to affect self-care agency. Operationally, sociocultural factors will be measured by the subjects' stated educational levels (years of formal education completed) and stated annual family incomes.

Assumptions

Any conceptualization of health, well-being, or functional integrity is related to a point of view about human beings. Nurses may view humans in a variety of ways but generally the emphasis is placed on the unity of human beings and on the individuality or personhood of people. In this view, humans become fully functioning persons as they mature and work to achieve their human potentials. This process involves a "striving by individuals to achieve the potential of their natural endowments for physical and rational functioning" (Orem, 1991, p. 185). A part of this development includes the view of individuals as responsible for themselves and with responsibilities to help others. Thus, the deliberate engagement in actions to develop or redevelop self-care is an integral part of the normal process of growth and maturation, and individuals continually work to achieve this personal regulation of their own functioning within their existing potentials (Orem, 1991).

As an outgrowth of this developmental view of people, the following assumptions pertinent to this study are made: In general, (a) people value self-care, (b) self-care agency exists, and (c) self-care agency can be measured.

Limitations

Limitations identified in this study are related to the design and method of data collection.

1. The settings for data collection were not randomly selected. Both clinic populations do represent both local and referred patients, however, which broadens geographic, social, and cultural diversity and helps to address this limitation.

2. Subjects for data collection were not randomly selected. Therefore, findings from this study may not be representative of the population as a whole.

3. Data were obtained by self-report and thus represent only what subjects were willing to report. Responses may be influenced by perceived social desirability of a given response.

4. This study was designed as a cross-sectional study. Because of this, changes in self-care agency and functional status over time cannot be examined.

5. Use of the Veterans Administration (VA) outpatient clinics for data collection led to a disproportionate number of males in the study with regard to the general population.

Summary

The background for the study and statements of the purposes and significance of the study have been presented. Research questions were formulated and the conceptual framework that guided the development of the study were described. Assumptions underlying the study were delineated.

CHAPTER II

Review of the Literature

A review of the literature that relates to two of Orem's constructs, basic conditioning factors and self-care agency, and to functional status in the chronically ill adult is presented.

Self-Care Agency and Basic Conditioning Factors

Since the first edition of Orem's (1971) description of the self-care nursing model, empirical investigation of its veracity has been ongoing. Numerous master's theses and doctoral dissertations have used Orem's model as a guide. Topics addressed ranged from instrument development to clinical and curriculum studies. Relatively few studies, however, have addressed the self-care agency or basic conditioning factors components of the model.

Studies using adult populations have tended to focus on self-care behaviors on the part of clients with specific health problems. For example, Dodd (1982, 1983) examined the relationship between side effects experienced from cancer chemotherapy and the initiation of self-care behaviors. The marked discrepancy between the variables was attributed to lack of information from physicians and nurses and patients' limited knowledge of self-care measures. Classes on side-effect management improved this finding. Patients receiving classes reported initiating more self-care behaviors and with a higher degree of effectiveness than patients who did not have this instruction. Informed patients also initiated self-care behaviors before side effects became persistent and severe.

Nine studies with adult subjects were located that related directly either to self-care agency and/or basic conditioning factors. Chang, Uman, Linn, Ware, and Kane (1985) examined selected components of nurse practitioners' care in relation to intent to adhere to a plan of care (part of self-care agency). Characteristics of nursing encounters, such as technical quality, psychosocial concern, and patient participation in decision making, were depicted on videotapes. The videotapes were randomly selected and shown to 26 elderly women visiting an urban nutrition center. High psychosocial care was the only component that was significantly related to intent to adhere to a plan of care. More significant to adherence, however, were personal characteristics of the subjects, such as marital status, religion, social network, perceived importance of the encounter, and prior satisfaction with health care received. This research, then, supports Orem's propositions about the importance of basic conditioning factors as determinants of self-care agency.

Braun (1987) used a modification of Denyes' (1980) instrument to measure the construct of self-care agency in a sample of 278 employed adults who had access to a health promotion program in their workplace. Both gender and chronological age were significantly related to self-care agency, while marital status and formal education level did not bear a significant relationship. Braun recommended additional investigation of the saliency of components of self-care agency across the lifespan.

Rhodes, Watson, and Hanson (1988) conducted a descriptive study to examine the relationship between self-reported symptoms (a component of the health state basic conditioning factor) and self-care agency as perceived by patients receiving cancer chemotherapy. Findings identified tiredness and weakness as symptoms most affecting the ability to perform self-care. Thus, a relationship was suggested between self-care agency and health state.

Hanucharurnkul (1989) explored the hypothesis that self-care could be predicted jointly by social support and the selected basic conditioning factors of age, marital status, socioeconomic status, living arrangements, and stage and site of cancer. The population was a group of 112 adults receiving radiotherapy for cervical or head/neck cancer. Socioeconomic status and social support were determined to be significant predictors of self-care, whereas stage and site of cancer seemed to predict self-care indirectly through social support. Age was not found to be a significant variable in this study. Although self-care agency was not included as a study variable, if one operates from Orem's proposition that self-care agency must be present and operational in order for self-care to occur, then this research has relevance for the study of self-care agency as well.

Beauchesne (1989) examined the relationship between social support and the self-care agency of mothers of developmentally disabled children. Results indicated a significant direct relationship between functional social support and self-care agency. None of the basic conditioning factors were explicitly analyzed in this study.

In reporting on a study of the congruence between nurse and client perceptions of the client's self-care agency, Ward-Griffin and Bramwell (1990) stated that they found no significant relationship between age or sex and the appraisal of self-care agency in a sample of 40 elderly adult clients. They postulated that this finding may resemble Hanucharurnkul's (1989) findings because both studies examined mostly older adults, whereas significant findings related to age and self-care agency have been reported with adolescents and middle-aged adults. They proposed that, perhaps as one grows older, age and gender are not as influential to one's ability to perform self-care. They also identified that use of different measurement tools in many of these studies may account for the differences in findings. This study used the Appraisal of Self-Care Agency Scale (Evers et al., 1986).

More recently, McDermott (1993) examined the relationship between learned helplessness and self-care agency with a sample of 309 healthy working adults. In the analysis, the investigator also looked at differences in the two major variables based on age and gender, two variables identified by Orem as basic conditioning factors. Also examined were relationships between income and education, factors that Orem would include as measures of sociocultural factors, another basic conditioning factor. None of the correlations met the criteria for medium effect size, as suggested by Cohen (1977, cited in Hansen & Bickel, 1985), $r = .30$ with $p < .05$. The instrument used to measure self-care agency in this study was Hanson and Bickel's Perception of Self-Care Agency Questionnaire (Hanson & Bickel, 1985).

Ailinger and Dear (1993) tested five hypotheses related to basic conditioning factors and self-care agency with a study sample of 60 adults with a diagnosis of rheumatoid arthritis. Using Kearney and Fleisher's (1979) Exercise of Self-Care Agency instrument, the investigators found that age was not significantly related to self-care agency, whereas educational level, $r = 0.11$, $p = .04$) and the duration of illness, ($r= -0.25$, $p= .04$), were significantly related in this study group. The investigators recommended further development of measures of self-care agency and that more comprehensive measures of health state be developed. They further recommended that researchers should attempt to address all the conditioning factors in a single study.

As a part of their research program to study cancer patients using Orem's self-care deficit yheory, Dodd and Dibble (1993) investigated 127 adults with cancer who were beginning chemotherapy to determine predictors of self-care in that population. Among the variables studied were self-care agency and the basic conditioning factor of sociocultural considerations, measured in this study by educational level. Other basic conditioning factors analyzed were health state, family system factors, and age. Health states was measured using a functional status instrument and family system factors were measured by a social support instrument. The researchers found that health state, family system factors, and years of education accounted for 38% of the variance in self-care. Age was a nonsignificant predictor of self-care, a finding consistent with Hancharurnkul (1989) and Ward-Griffin and Bramwell (1990).

Only one power component of self-care agency contributed to the prediction of self-care. The ability to maintain attention and exercise requisite vigilance with respect to self and internal conditions explained an additional 9% of the total variance in self-care. Kearney and Fleisher's (1979) Exercise of Self-Care Agency instrument was used to measure self-care agency in this study.

Although the theory of self-care is applicable to all persons, available literature has only recently applied the framework to children. Orem (1985) did not identify infants, children, or adolescents as capable of primary self-care. Rather, Orem proposed that parents or other adults should be responsible for the child's self-care needs. However, a transition in thinking has gradually occurred that recognizes the potential of children for self-care. Several studies reflect this change in thinking. For example, Kruckenberg (1982) used Kearney and Fleisher's (1979) instrument to compare exercise of self-care agency among physically disabled and healthy 10 to 16 year olds. Subjects were matched for age, sex, school district, and grade, which are measures of basic conditioning factors. In addition, subjects' mothers' reports of self-care agency were studied. Significant differences were found between mother and child measures of self-care agency in the healthy group but not in the disabled group. The basic conditioning factors studied were found to be significantly related to self-care agency.

Stullenbarger (1984) found gender differences in school-aged children's self-report of taking action to meet universal self-care requisites. Q sort methodology was used. Recommendations to study self-care agency as related to age and developmental level were made. Thus, this study also provided support for the relationship between basic conditioning factors and self-care and possibly to self-care agency.

Moore (1987) revised DSCAI, which was originally designed for use with adolescents, for use with 92 fifth-grade students. The purpose of the study was to determine whether or not assertiveness training and first-aid instruction would improve autonomy and self-care agency. The subjects were divided into four treatment groups with Group 1 (n = 24) receiving assertion training, Group 2 (n = 22) receiving first-aid instruction only, Group 3 (n = 23) receiving both types of instruction, and Group 4 (n = 23) serving as a control group. The latter group viewed science films but received no health education content.

Self-care agency was found to increase only in the group receiving first-aid instruction. This finding may indicate that health education interventions may improve children's self-care agency. Gender was the only basic conditioning factor tested. No significant differences were found between gender and either autonomy or self-care agency. Age was a control variable in this study.

In a more recent study, Moore (1993) examined Orem's proposed relationships among self-care performance, basic conditioning factors, self-care agency, and dependent-care agent performance in 414 children in Grades 4 through 12, ages 9 through 18 years. The basic conditioning factors of age, sex, sociocultural factors (as measured by socioeconomic status, living situation, and ethnic group), and health state were examined using a demographic questionnaire. Self-care agency was measured by DSCAI (Denyes, 1980). The relationship between basic conditioning factors and self-care performance was examined using regression analysis. All study variables representing Orem's basic conditioning factors were included in the regression model. This approach was selected because Orem did not prioritize the factors. The noncontinuous variables of gender, living situation, and ethnic group were coded as dummy variables and tested in blocks.

Findings were that age, gender, socioeconomic status, living situation, ethnic group, and health state accounted for 19% of the variance in self-care performance, Multiple $R = .42$, $p < .001$. Age and health state were shown to predict self-care performance significantly. When self-care agency was added to the regression model, 36% of the variance in self-care performance was explained. In all analyses, gender, socioeconomic status, living situation, and ethnic group failed to predict self-care performance significantly. Moore (1993) concluded that more comprehensive measurement of basic conditioning factors might have yielded an explanation of a greater percentage of the variables.

Gaut and Kiekhefer (1988) evaluated the reliability and validity of Denyes' instrument for use with chronically ill adolescents. A descriptive, cross-sectional study was designed using a convenience sample of 51 adolescents, ages 11-20, having asthma ($\underline{n} = 19$), diabetes ($\underline{n} = 16$), and convulsive disorders ($\underline{n} = 16$). Construct and concurrent validities were supported. Gender and health state significantly affected self-care agency in this study.

Monsen (1988) studied autonomy, coping, and self-care agency in healthy adolescents and in adolescents with spina bifida. Negligible contributions to self-care agency were attributed to basic conditioning factors included in this study (age, gender, developmental state, and sociocultural considerations).

Denyes (1988) reported an analysis of five previously completed nursing studies, which had been conducted using the adolescents as study subjects and using Denyes' instruments to measure health status, self-care agency, and self-care. The studies analyzed also measured selected basic conditioning factors, including the presence or absence of health problems. The 369 adolescents in the aggregate sample represented both males and females and included healthy as well as chronically ill subjects. Subjects were diverse in age (12-20) and sociocultural status. With this aggregate data, Denyes found a significant correlation between presence or absence of health problems and self-care agency, $\underline{r} = .12$, $\underline{p} = .018$. The only other basic conditioning factor that correlated significantly with self-care agency was the number of siblings, $r = -.13$, $p < .05$. Self-care agency levels were higher in adolescents who had fewer siblings.

The ability of the presence or absence of health problems and number of siblings to predict self-care agency and to determine the relative strength of each factor was then explored by stepwise multiple regression analysis. Hierarchical regression analysis was not used because there was no theoretical basis for ordering of the basic conditioning factors. Both health problems, $\beta = .121$, $p < .05$, and number of siblings, $\beta = -.113$, $p < .05$, were significant predictors of self-care agency. However, less than 3% of the variance in self-care agency was accounted for by these basic conditioning factors. Denyes stated that this finding was partially explained by the fact that several of the basic conditioning factors identified by Orem were not available for inclusion in the analysis.

McCaleb and Edgil (1994) described the self-care practices of healthy adolescents and ascertained relationships among self-care practices, self-concept, and selected basic conditioning factors. Age, gender, developmental status, health state, sociocultural characteristics (father's and mother's educational levels and occupation, participation in school lunch program, and church attendance), and family characteristics (configuration of household members, number of siblings, and birth order) were selected as the conditioning factors significant to this study. Zero order correlations and stepwise multiple regression analyses were conducted. Race, church attendance, and participation in the school lunch program, along with self-concept, constituted the best model, accounting for 26% of the variance in self-care practice.

In summary, research focused on the relationship between basic conditioning factors and self-care agency is limited and yields conflicting results. The studies that have been completed have selected different conditioning factors to study. Thus, comparison is difficult. No studies have included all of the basic conditioning factors as variables. The basic conditioning factors most frequently studied include gender, age, and health state. Additionally, sociocultural factors have also been studied, but the method of measurement of the variable has differed among studies. Denyes has made an effort at bringing consistency to this measure by including two measures of the construct in the DSCAI-90. Only a small proportion of variance in self-care agency has been accounted for to date. Sample sizes have generally been small and nonrandom. Work that uses the DSCAI with adults is just beginning and currently focuses on studies of women. A study that focuses on a different adult population with threats to self-care agency imposed by health problems and that examines measurable basic conditioning factors as they relate to self-care agency is therefore warranted.

Factors Affecting Functional Status in the Chronically Ill Adult

Factors affecting some aspect of functional adjustment to chronic illness have been of interest to nursing and other disciplines. The concept of functional status is particularly important in nursing because of nurses' responsibilities for assisting people to maintain or improve their functional status (American Nurses Association, 1980). A lack of consistency is apparent in the themes and frameworks of studies identified related to this topic. In these studies, functional status is defined in a variety of ways. Other words, such as quality of life, which incorporate aspects of functional status, are also used. Leidy (1994) states that, despite the centrality of the concept of functional status to the nursing profession, the phenomenon is still poorly understood.

> No consensus has been reached on naming, much less defining, measuring and testing it. Functional status, ability, capacity; self-care; activities of daily living; health status; quality of life--the list goes on, with an intuitive sense that there are similarities and differences among these terms, but no coherent approach to their use. (p. 196)

This ambiguity has left research efforts disjointed and has correspondingly inhibited the advancement of clinical research and practice.

Additionally, "various authors have made a distinction among different types of functional status. There is considerable agreement that self-care and mobility are central to the determination of functional status" (Moinpour, McCorkle, & Saunders, 1988, p. 24). Beyond these two categories, the domains of measurement by various investigators show little congruence. Through their program of qualitative research, Corbin and Strauss (1988) have made significant contributions to the understanding of chronic illness management in the home as well as the effects of chronic illness on the individual and spouse. The frequent, often unexpected, fluctuations that occur due to illness call for creation of new management plans on a sporadic basis. Attempts to control the illness and maintain some quality of life lead to problems with allocation of available resources and unbalanced workloads between client and spouse (Corbin & Strauss, 1985, 1988). Corbin and Strauss' research focused on effects of chronic illness, however, rather than on predictors of functional adjustment.

Viney and Westbrook (1981) also used qualitative methodology to analyze psychological reactions of 88 clients with various chronic illnesses while in the hospital and after being at home for at least 6 months. During the subjects' hospitalizations, they were found to be anxious, angry, and helpless, but also expressed some good feelings. At home, at least 6 months later, they continued to feel anxious and helpless but expressed less anger and fewer good feelings. Patient characteristics thought to be associated with these two patterns of reaction were sex, age, education, and occupational status. Reactions of patients while in the hospital did prove to be significantly related to this set of factors, canonical $\underline{R} = 0.48$, $\underline{X}^2 = 51.83$, $\underline{df} = 36$, $\underline{p} < 0.04$). The coefficients for subject characteristics were: education (1.11), age (0.50), occupation (0.30), and sex (-0.27). Subjects who were older, and better educated, but with lower occupational status, showed less uncertainty, depression, and sociability, but more helplessness. At home, the relationships were not significant, $\underline{R} = 0.32$, $\underline{X}^2 = 32.03$, $\underline{df} = 36$, $\underline{p} = 0.67$. The type of illness was not associated with any specific reaction, but the severity of disability was associated with more anxiety, depression, anger, and fewer good feelings. This study, then, supports the influence of aspects of health state and other basic conditioning factors on adjustments to chronic illness.

Lewis (1982) examined the association between experienced personal control and quality of life in late stage cancer patients. The most consistent correlate of quality of life was perceived control over one's life. However, the magnitude of this relationship was only moderate. One explanation for this was that the measurement instrument, Health Locus of Control, was an inconsistent predictor of quality of life in this sample. The investigator cautioned against use of this instrument with chronically ill subjects, because the meaning of health is unclear.

Lowery and Jacobsen (1985) investigated the factors that diabetic, hypertensive, and arthritic patients identified for their perceived successes or failures with their illnesses and the relationship of those factors to illness outcome and expectations. Patients studied tended to attribute success to their own efforts and failure to externally controlled factors. Future expectations of the chronically ill patients were not mediated by the stability of causes given for current success or failure. Consistently, subjects were optimistic about their future despite their current status.

The findings from Lowery and Jacobsen's (1985) research and those of Forsyth et al. (1984) are congruent. When exploring the process used by hospitalized chronically ill patients to defend themselves against selected unpredictable and progressive diseases, Forsyth and associates found that patients responded with strategies designed to maintain an attitude that they are staying ahead of their illness and, to some extent, in control of their situations. Hospitalization was viewed as a chance to refuel, restabilize, or try a new treatment. Maintenance of customary role functions helped them retain their sense of hope and control.

Nagy and Wolfe (1984) proposed health locus of control and the health belief model as predictors of compliance with medical regimens in chronically ill patients with adult onset diabetes mellitus, hypertension, and pulmonary disease. Medical regimen was measured by medication compliance. Additional variables examined were age, socioeconomic status, perceived severity of illness, outlook on illness, experienced symptoms, satisfaction with treatment, family support, and support of others. Based on stepwise multiple regression analysis, only patient satisfaction with medical care and lack of symptoms were found to be significant predictors of compliance with medical regimen.

When studying selected coping strategies and their effects on the psychological adjustment of patients with two pairs of chronic illnesses (rheumatoid arthritis and cancer, hypertension and diabetes), Felton and Revenson (1984) found that information seeking facilitated adjustment while wish- fulfilling fantasy had deleterious consequences. Neither coping strategy was modified by whether or not the patient had an opportunity to control the outcome of the illness.

Skenazy and Bigler (1985) compared visually impaired diabetics with nonvisually impaired diabetics, nondiabetic chronically ill patients, and healthy control subjects on various measures of psychological adjustment. The results of the study suggested that the key variable in psychological adjustment in diabetes is not the diabetes itself but rather the feature of having a chronic disease. Neither of the diabetic groups could be differentiated from the nondiabetic chronic illness group on test scores.

Burckhardt (1985) examined the impact of pain and functional impairment on the quality of life experienced by persons with arthritis. A causal model was developed in which disease-related variables, severity of pain, and severity of impairment, along with demographic (age and sex) and social factors (social network and socioeconomic status), were hypothesized to indirectly affect quality of life through the psychological mediators, perceived support, attitude, self-esteem, and internal control over health. All four psychological mediators contributed directly to quality of life while the severity of impairment indirectly affected quality of life through the mediators of self-esteem and internal control over health.

Pearlman and Uhlmann (1988) also explored the quality of life of elderly clients with a variety of chronic diseases. Clients with arthritis, ischemic heart disease, chronic obstructive pulmonary disease, diabetes mellitus, and cancer were included in the study. The investigators reported that they found a similarity in ratings of quality of life, irrespective of the disease state. In general, elderly patients with chronic diseases considered their quality of life to be adequate, and they voiced no complaints. Significant correlates of patients' ratings of quality of life included the patients' perceptions of their health, interpersonal relationships, and finances.

Pollock (1986) studied subjects with essential hypertension, diabetes mellitus, and rheumatoid arthritis to identify factors that promoted adaptation to those illnesses. Hardiness was found to be significantly correlated with adaptation in the diabetic group but not for the hypertensive or arthritic groups. Pollock suggested that hardiness may influence adaptation indirectly through social support and recommended that hardiness be studied in relation to both its direct and indirect effects on adaptation to chronic illness.

Redeker (1988) reviewed research that examined the relationship between health beliefs and adherence behavior in chronic illness. Individuals with hypertension and end-stage renal failure frequently have been studied using the health belief model, with inconsistent results. Reasons posited for this inconsistency included methodological differences and the lack of symptoms as cues to action for the hypertensive individual. However, consistent support for the health belief model was found in studies dealing with coronary bypass patients, diabetics, and hemodialysis patients.

Lambert, Lambert, Klipple, and Mewshaw (1989) studied women with rheumatoid arthritis to determine whether social support and hardiness predicted psychological well-being when the severity of the disease process is statistically controlled. Both factors were found to be significant predictors of psychological well-being in women with rheumatoid arthritis.

Predictors of poor adjustment and family dysfunction in three chronically ill patient populations (oncology, rheumatology, gastroenterology) were studied by Arpin, Fitch, Browne, and Corey (1990). The investigators found that the chronically ill subjects were similar in their levels of adjustment, family function, and meaning given to illness. Neither socioeconomic variables nor disease severity variables were significant in explaining psychological adjustment. Unfavorable meanings of the illness and unhealthy family communication patterns were significant predictors of adjustment.

Benoliel, McCorkle, and Young (1980) have been actively involved in the study of functional status in the chronically ill. They developed and tested the ESDS to measure the functional status of 60 adult subjects with advanced chronic disease. Fifty-two were diagnosed with cancer and 8 had a medical condition of another type. Findings were reported as aggregates for 60 chronically ill subjects, although they noted that the largest percentage of change in capacities occurred in subjects with noncancerous conditions. Benoliel and colleagues cited the need for extension of their study to other chronic patient populations.

Based on this pilot study, the investigators extended their study to include subjects with both cancer and heart disease (McCorkle & Benoliel, 1981). Revisions in the ESDS were made as a result of this federally supported study.

Since that time, McCorkle and Benoliel's functional status instrument has been used in several studies with chronically ill adult populations.

Long and Weinert (1992) examined differences in functional status among adults with multiple sclerosis living in urban and rural areas. Data obtained from 361 adults showed that functional status in this chronically ill sample was not significantly affected by place of residence, when controlled for age, gender, educational level, income, and length of illness. This finding differed from research on urban/rural differences using nonclinical populations. The personal competence subscale of the ESDS was used, with Cronbach's alpha of 0.90 reported. The investigators recommended that further studies of the chronically ill are needed to clarify the applicability of generally held health and nursing knowledge to this special population.

Cowan, Graham, and Cochrane (1992) tested a theory of quality of life for chronic illness by comparing patients with diagnoses of myocardial infarction (n = 27) and malignant melanoma (n = 30). Functional status was one of the mediating variables included in the model. This construct was measured, in part, by use of the ESDS. Findings supported the inclusion of functional alterations as a mediating variable and gave credence to the possibility of a valid model of quality of life for chronic illness.

In a recent study, Sarna, Lindsey, Dean, Brecht, and McCorkle (1993) examined the relationship of nutritional intake to several variables, including functional status. Over a 6-month period, measurements were taken every 6 weeks, beginning 2 months after the diagnosis of lung cancer in 28 subjects. Functional status was measured using the ESDS. Percentage of body weight lost, number of pounds lost, and decreased caloric intake were moderately related to functional status, $r = -0.58$, $p = 0.01$; $r = -0.50$, $p = 0.01$; $r = -0.56$, $p = 0.01$.

In 1993, O'Hare, Malone, Lusk, and McCorkle studied 63 Black patients who were discharged from seven urban hospitals with solid cancerous tumors. One of the purposes of the investigation was to describe the functional status of Black patients at different points during the illness experience. Functional status was again measured by the ESDS. When compared to a study group of predominantly White, lung cancer patients from Seattle, Washington, this sample had significantly more functional limitations, $p = .01$.

Finally, Narsavage and Weaver (1994) examined the relationship of physiologic status, coping, and hardiness to functional status in 96 adults with chronic obstructive pulmonary disease. The commitment component of hardiness was significantly correlated with functional status, $r = -.17$. The authors concluded that, except in extreme disease conditions, physiological parameters are not strongly correlated with functional status and noted that, despite similarities in physiological status, some patients with chronic illness consistently function better than others. The finding that the commitment component of hardiness was significant supports the contention that involvement in what is happening in one's life rather than avoidance is positively related to improved functioning.

In summary, researchers have approached the study of chronic illness from a variety of perspectives with emphasis on a multiplicity of variables. Several investigators have examined effects of chronic illness, selecting study variables, such as uncertainty, depression, reallocation of resources, and quality of life, as outcomes. Other investigators have described factors affecting functional status of individuals with chronic illness. Variables studied include personal control, perceived quality of life, severity of symptoms or impairment, information-seeking behaviors, financial security, hardiness, and interpersonal relationships. In many of the studies, the investigators recognized the importance of including as variables factors related to individual habits and values, along with health state variables, in assessing functional status. Moinpour and associates (1988) stressed the necessity of not assuming that variations in functioning are necessarily attributable to changes in health status. Additionally, they encouraged investigators to distinguish between the usual functional performance of the person and his or her capacity to perform (Moinpour et al., 1988). Orem's conceptualization of self-care agency is congruent with this perspective in that health state is only one of several variables identified as determinants of the development and adequacy of self-care agency. However, Orem's Self-Care Model has been used infrequently as a framework of study, although several of the variables could easily be labeled as one or more of the basic conditioning factors described by Orem.

There is considerable support in the literature presented for examining factors predictive of self-care agency and chronic illness from a multi-illness framework. There was also limited support for looking at personal and environmental factors (basic conditioning factors) in the study of predictors of self-care agency. Research using Orem's model as an organizing framework to examine determinants of human functioning in chronically ill adults could be helpful in delineating factors both internal and external to the individual that significantly affect functioning. Given this framework, future research can then add other variables to more fully explain the factors determining optimal adjustment.

CHAPTER III

Methodology

The purposes of this descriptive, correlational study were to describe the relationships among selected basic conditioning factors and self-care agency, as identified by Orem (1991), and functional status in chronically ill adults. Additionally, the investigator proposed to determine which combination of study variables best predicts self-care agency and functional status.

To accomplish these purposes, instruments designed to measure self-care agency and functional status were administered to chronically ill adults with three medical diagnoses. Demographic data were also collected. Descriptive statistics were used to describe the sample. Various measures of association were calculated to answer this study's research questions.

Research Questions

The following research questions were developed to address the purposes of the study:

1. Is there a linear relationship between self-care agency and each of the following basic conditioning factor variables: age, sex, health state, and sociocultural factors?

2. What linear combination of basic conditioning factor variables (age, sex, health state, and sociocultural factors) best predicts self-care agency?

3. Is there a linear relationship between functional status and each of the following variables: age, sex, health state, sociocultural factors, and self-care agency?

4. What linear combination of the variables of age, sex, health state, sociocultural factors, and self-care agency best predicts functional status?

The four selected basic conditioning factors were measured by responses to a six-item addendum to the DSCAI-90. Self-care agency was measured by the summated scores on the DSCAI-90. Functional status was measured by the total score on the ESDS.

Setting

Data collection for this study took place in two settings. Subjects were selected from outpatient clinics associated with a large university hospital in the Southeast and a VA hospital in the same area. Both of these health care agencies draw not only from the local geographic area but also from the eastern half of the state in which they are located. Thus, it was anticipated that subjects would vary in age, sex, and sociocultural backgrounds. In each setting there was private space allocated for completion of the data collection instruments.

Sample

A convenience sample of 90 subjects was drawn from a population of persons who were being seen in outpatient clinics associated with two major hospitals and who (a) had a confirmed medical diagnosis of either diabetes mellitus, essential hypertension, or chronic obstructive pulmonary disease; (b) had been diagnosed for at least 1 year; (c) were 21 years of age or older; (d) could read and speak English; (e) had no concurrent psychiatric diagnosis (psychopathology); and (f) were willing to participate in the study. The sample size ($\underline{N} = 90$) was determined based on Steven's (1986) description of the requirement for sample size in the calculation of multiple regression procedure (15 subjects per predictor variable). Six variables have been identified for purposes of this study. Based on six predictor variables, a power analysis was computed using Cohen's medium effect size of $\underline{r}^2 = .15, \alpha = .05$. The result was a power of .84 (Borenstein & Cohen, 1988). Thirty subjects were selected representing each chronic disease category. Individuals meeting the study criteria were identified by the investigator on the day before the scheduled clinic visit, using a patient record review. A list was prepared for the clinic receptionist, who then notified the investigator when the individuals arrived for their scheduled appointment. Individuals were then approached by the investigator regarding participation.

Instrumentation

All subjects were asked to complete the DSCAI and the ESDS (McCorkle & Benoliel, 1987). Permission for use of these instruments was obtained (see Appendix A). Copies of the instruments and scoring instructions are found in Appendix B.

Self-Care Agency

The DSCAI-90 was used to measure the subjects' potential for self-care. Denyes (1980) originally developed the instrument to measure self-care agency in adolescents. Instrument development was based on the early work of Orem (1971) and the NDCG (1979) and on concepts from human development theory. Denyes developed a theoretical description of self-care agency consisting of approximately 100 statements relating to strengths and limitations in individuals' abilities to problem solve and implement self-care. Following that, measurable indicators of those strengths and limitations were developed and tested, which led to the current DSCAI (Gast et al., 1989). A response format of 0-100 scoring is used. Factor analysis (Denyes, 1980) showed close parallels with the ten-power components identified by the NDCG (1979). Six factors identified by this analysis were: "(a) ego strength and health decision-making capability; (b) relative valuing of health; (c) health knowledge and decision-making experience; (d) physical energy levels; (e) feelings; and (f) attention to health" (Gast et al., 1989,

p. 33). Initial evidence of construct validity for the DSCAI was also reported (Denyes, 1980). Research completed since 1980 supports the DSCAI's construct validity by demonstrating correlations in the predicted direction between self-care agency and self-esteem, health problem-solving ability, health status, health behavior, and health problems (Gast et al., 1989).

Since 1989, the DSCAI has been used effectively with adult subjects. Campbell (1989) reported on its use in studying battered women's perceived ability to care for themselves. Denyes also reported the use of this instrument in two additional studies using adult subjects. These studies have not yet been reported in the literature (M. J. Denyes, personal communication, October 8, 1993).

Evidence supporting test-retest and alternate forms reliability has been reported (Denyes, 1980). Internal consistency within factors has been reported (Denyes, 1990). The coefficient alphas for the entire instrument reported for 13 samples range from 0.81-0.90 (Denyes, 1990).

In 1991, McBride conducted a study to examine the latent traits associated with the three instruments designed to measure self-care agency. These were the DSCAI, Kearney and Fleisher's (1979) Exercise of Self-Care Agency, and Hanson and Bickel's (1985) Perceptions of Self-Care Agency. A convenience sample of 573 nonhospitalized adult subjects completed the three instruments. Factor analysis and canonical correlation were used to identify latent traits and their relationships. Findings suggested that all three instruments measure the same trait. McBride concluded that findings of this study supported Orem's view of the multidimensionality of the construct, self-care agency, and that one instrument alone does not fully measure the construct. However, Denyes' (1980) instrument most fully measured the components of the construct.

The DSCAI-90 consists of 34 items, which are to be read and answered in writing by the subject. A scale of 0-100 is used. At the end of the 34 items, Denyes has included an additional six questions that provide demographic data related to basic conditioning factors under study. The entire instrument requires 15 to 20 minutes to complete.

Enforced Social Dependency Scale

The ESDS was developed by Benoliel et al. (1980). It was developed as a tool to be used in both clinical practice and research as an outcome measure to assess the effects of disease and treatments on patients' personal and social functioning. It has been used primarily with populations of chronically ill adults. The original scale consisted of three components: (a) everyday self-care competence, (b) mobility competence, and (c) social competence. Initial validity and reliability were established on 60 patients with progressive chronic illnesses. The scale has demonstrated face and content validities for measures of usual daily activities and social roles (Benoliel et al., 1980; McCorkle & Benoliel, 1981). Based on the findings of the initial study, the scale was refined and finalized for use in their next study of cancer patients' responses to psychosocial variables (McCorkle & Benoliel, 1981). At that time, two items from the mobility competence subscale were eliminated on the basis of high correlations among items. The remaining mobility items were combined with the self-care items and the combination was relabeled as personal competency. This category is made up of six activities of daily living deemed essential to performing as a normal adult: eating, dressing, walking, traveling, bathing, and toileting. Scores are summed and may range from 6 to 36.

The social competency subscale remained unchanged. Three specific role activities are included: activities in the home, at work, and in social and recreational situations. Each role activity is coded on a 4-point, Likert-like scale, while the communication section of this category is coded on a 3-point scale. Scores for the social competency subscale are summed and may range from 4 to 15. The total ESDS score is the sum of the personal and social competency subscales and may range from 10 to 51. The total score may be used as well as the two subscale scores. Higher scores reflect less functional ability.

This scale has been used with other patient groups representing a variety of chronic illnesses. Standardized

Cronbach's alphas have remained consistently at 0.80 to 0.90 in studies reported over the years (Benoliel, et al., 1980; Cowan et al., 1992; McCorkle & Benoliel, 1981). In addition, factor analysis confirmed the two unique factors, personal and social competence. The ESDS has been shown to be sensitive to changes in the level of functioning over time (Moinpour et al., 1988).

The ESDS is simple to administer and is structured as a semi-structured interview guide. It requires 10-20 minutes to administer. Beginning with general, open-ended questions, the subjects are encouraged to share perceptions of their individual functional abilities. More specific questions are available if the subject needs additional prompting to fully address the area being examined. Responses are coded and standardized to allow for comparison across groups.

Procedures

Approval of the Institutional Review Board of the University of Alabama at Birmingham, the Medical Review Board at a university in Kentucky, and the Research and Development Committee of the Department of Veterans Affairs was obtained prior to beginning the investigation (see Appendix C).

A pilot study was then conducted to identify any problems with use of the data collection instruments and the procedure itself. A sample of 15 subjects who met the study's inclusion criteria was selected, using the proposed procedure, and invited to participate in the study. Data collected from individuals in the pilot study are included in the sample because no procedural difficulties were encountered during the pilot study period.

On the day preceding each clinic, the investigator reviewed the records of all clients scheduled to have clinic/physician appointments in the pulmonary, geriatric, endocrinology, and general medicine clinics and developed a list of all those who met study criteria. This list was given to the registration clerk, who notified the investigator when the clients arrived. In a private office, the investigator invited the client to participate in the study after introducing self and explaining the purpose of the study, the procedures, and the time involved. Written permission was obtained. After the clinic visit was completed, data collection took place. The subjects were first asked to complete the DSCAI-90 (15 to 20 minutes) and then to complete the ESDS (15 to 20 minutes). Data collection was conducted in a private, well-lighted, temperature controlled office or conference room. (See Figure 1.)

Procedures for Data Analysis

In addition to an analysis of the descriptive statistics related to demographic data, Pearson correlations were calculated to answer Research Questions 1 and 3 and stepwise multiple regression analysis was used to answer Questions 2 and 4. Criteria for entering a variable

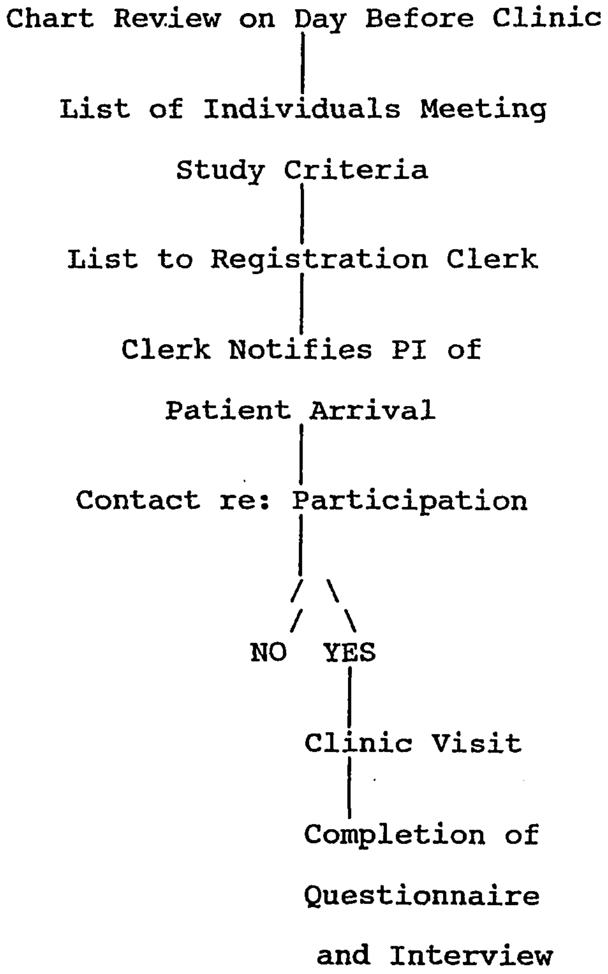

Figure 1. Procedure for Selection and Recruitment at Site 1 and Site 2. PI = Principal Investigator.

was a p value of .05; criteria for removing a variable was a p value of .10.

According to Myers (1986), regression analysis allows for the incorporation of noncontinuous variables along withthe usual continuous variables through the use of categorical or dummy variables. Through the use of a coding procedure, noncontinuous variables, such as health state and sex in this study, are incorporated into the state and sex in this study, are incorporated into the regression equation. The gender variable was coded, males = 1 and females = 2. The health state variable was coded so that, in one instance, presence of diabetes mellitus equated 1 and the other two health problems were coded 0. In the next coding, presence of essential hypertension was coded as 1 and the other two health problems were coded as 0. This coding mechanism provided a mechanism for examining the effects of each problem on the dependent variable. Because regression is an extension of correlation, this same procedure was used in examining zero order correlations. This practice of dummy coding is in practice in several of the studies reviewed as basis for this research (Ailinger & Dear, 1993; Kart & Engler, 1994; Laukkanen, Kauppinen, Era, & Heikkinen, 1993; McCaleb & Edgil, 1994; Moore, 1993; Simmons, 1993). The Statistical Package for the Social Sciences, version 4.1 for IBM VM/CMS main frame systems (SPSS, 1990), was used for data analysis.

Summary

The methodology used to conduct the investigation was described. Research questions were stated, followed by a description of the setting, procedures, and sample selection. Rationale for selection of the research instrument, including validity and reliability estimates, was discussed. Procedures for data collection and data analysis concluded the chapter.

CHAPTER IV

Findings

The purposes of the study were to examine the relationship among selected basic conditioning factors, self-care agency, and functional status in chronically ill adults and to determine which combination of study variables best predicts self-care agency and functional status. Findings of the study are presented in three sections: description of the subjects, scores on the research instruments, and statistical test of the hypotheses.

Description of Sample

A total of 412 individuals met the criteria for inclusion in the sample based on a review of patient records. Of this number, 322 persons were not included in the study for a variety of reasons, which are depicted in Figure 2. Of the 14 potential subjects who were judged to be ineligible after initial contact with the investigator, 5 were found to be unable to read, six had substantial cognitive impairment, 2 did not confirm the diagnosis recorded on the patient record, and 1 could not speak English well enough to communicate with the investigator. In addition, five potential subjects, who had initially agreed to participate, declined after the physician visit

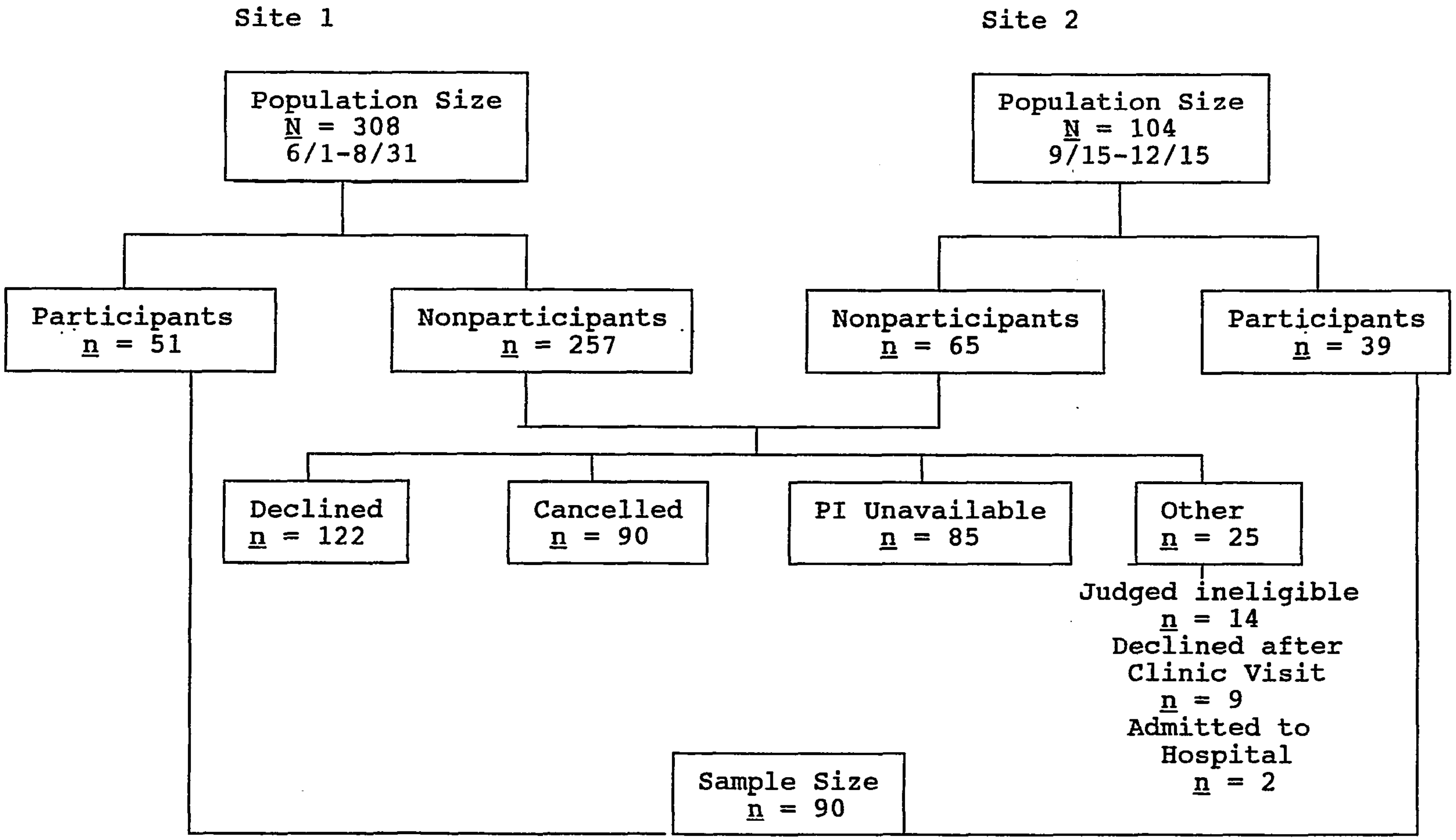

Figure 2. Flow diagram of subject recruitment. PI = Principal Investigator.

but prior to the interview because their appointments lasted longer than anticipated. Four other potential subjects were too tired after the clinic visit to follow through with previously agreed upon participation. The resulting sample of 90 subjects consisted of 58 males and 32 females who carried a medical diagnosis of either essential hypertension, diabetes mellitus, or chronic obstructive pulmonary disease. Subjects were enrolled in the study from June 1, to December 15, 1994.

Data collected that described personal characteristics of the sample included age, sex, educational level, and total household income. Subjects ranged in age from 28 to 81 years, with a mean of 59.7 years, a median of 62 years, a mode of 74, and a standard deviation of 12.40. More than one half of the subjects were over 62 years of age. Table 1 provides a summary of the distribution by age groups.

Table 1

Number and Percentage of Subjects by Age

Age groups	n	%
25-40	10	11.1
41-55	17	18.9
56-70	43	47.8
Over 70	19	21.1
Missing	1	1.1
Total	90	100.0

When asked their highest year of education completed, subjects' responses ranged from 5 to 21 years with one person declining to respond. The mean number of years of schooling was 11.6, with a median and mode of 12.0 years and a standard deviation of 3.35. Approximately one third of the subjects had some post-high school education (32.2%), while a similar percentage completed 9 years or less (31.1%). Table 2 reflects a summary of these findings.

Table 2

Number and Percentage of Subjects by Years of Education Completed

Educational level (years)	n	%
5-9	28	31.1
10-12	32	35.6
13-16	22	24.4
17 and higher	7	7.8
Missing	1	1.1
Total	90	100.0

Table 3 provides a summary of reported annual household income. Due to the large number of missing values (n = 27), the investigator decided to use educational level as the sole measure of the sociocultural factors variable. This was justified based on the significant correlation between income and educational level, _r_ = .6354, _p_ = < .05 and the nonsignificant difference between the mean educational level of responders and nonresponders on the income item, _t_ = - 1.20, df = 87, _p_ = .233.

Table 3

Number and Percentage of Subjects by Annual Household Income Level

Annual household income	n	%
Under $10,000	21	23.3
$10,000-$14,999	16	17.9
$15,000-$19,999	8	8.9
$20,000-$24,999	2	2.2
$25,000-$29,999	0	0
$30,000-$34,999	2	2.2
$35,000-$39,999	1	1.1
$40,000-$44,999	3	3.3
$45,000-$49,999	4	4.4
$50,000 or higher	6	6.7
Missing	27	30.0
Total	90	100.0

Scores on Research Instruments

Self-Care Agency

The DSCAI-90 was used to gather data about self-care agency for this study. This instrument consists of 34 items, which are read and answered in writing by the subject. Total score is reported as a scale, which can range from 0-100, with lower scores indicating a lesser potential for self-care. Scores for subjects in this study ranged from 40.0 to 93.1, with a mean of 72.1, a median of 74.2, and a mode of 61.2. The standard deviation was 11.95. A Cronbach's alpha reliability, $\underline{r}$ = .89, was obtained for the total instrument. This finding is consistent with reliability figures reported from other studies, which ranged from 0.81 to 0.90 (Denyes, 1990).

Functional Status

McCorkle and Benoliel's ESDS was completed by all subjects as the measure of functional status. The instrument measures the effects of illness and treatments on patients' personal and social functioning and has been used primarily with chronically ill populations. A total ESDS score is calculated, which is the sum of the personal and social competency subscales. Only the total score was used in this analysis. Total scores on the ESDS may range from 10 to 51, with higher scores reflecting less functional ability. A mean of 17.04 with a standard deviation of 5.95 was obtained in the study group, with a range of scores from 10 to 37. A Cronbach's alpha reliability coefficient, *r* = .89, was obtained for the total instrument. This finding is consistent with standardized Cronbach's alphas reported for other studies, which ranged from 0.80 to 0.90 (Benoliel et al., 1980; Cowan et al., 1992; McCorkle & Benoliel, 1981).

Research Questions

In this section, each research question will be stated, followed by findings related to it. In each analysis, an alpha level of 0.05 was chosen as the criterion for statistical significance. In all instances, the data were examined for violation of assumptions for correctly performing correlation and multiple regression procedures. Histograms and scatterplots were examined for all variables to assess normality of the sample. No problems were identified. The *F* statistic was calculated to assess linearity (*F* for self-care agency = 8.41; *F* for functional status = 4.60; see Tables 5 and 7). Additionally, histograms of standardized residuals were analyzed to identify any cases that fell outside the -2 to +2 range. In this study, no cases fell outside that range.

Research Question 1

Is there a linear relationship between self-care agency and each of the following basic conditioning factor variables: age, sex, health state, and sociocultural factors?

Pearson correlations were computed to evaluate these relationships. As stated previously, educational level is being used as the sole measure of sociocultural factors. As stated in the definitions, health state is represented by the presence of one of three chronic illness: diabetes mellitus, essential hypertension, or chronic obstructive pulmonary disease. The correlation coefficients and level of significance are depicted in Table 4.

A statistically significant linear relationship exists between educational level and self-care agency, $\underline{r}$ = .30, $\underline{p}$ = .005. Household income and self-care agency were also significantly related, $\underline{r}$ = - .36, $\underline{p}$ = .004, but were not included in Table 4 due to the decision to eliminate the income variable from the study.

Research Question 2

What linear combination of basic conditioning factor variables (age, sex, health state, and sociocultural factors) best predicts self-care agency?

Stepwise multiple regression analysis was used to examine this question with age, sex, health state, and sociocultural factors (measured by educational level) as independent variables and self-care agency total score as the dependent variable. Sex and health state are classified as qualitative variables. Regression analysis allows for the incorporation of this type of variable along with the usual quantitative variables through the use of categorical or dummy variables (Myers, 1986). Results of this analysis are displayed in Table 5.

Table 4

Pearson Correlation Matrix Between Age, Sex, Educational Level, Health State, and Self-Care Agency (SCA)

	SCA (Total score)	Age	Sex (1 = M) (2 = F)	Educational level	Health state		
					HTN	DM	COPD
SCA (Total score)							
Age	.08 p =.46						
Sex	.09 p =.38	- .27 p =.01					
Educational level	.30 * p =.01	- .22 p =.04	.19 p =.08				
Health state							
HTN	.07 p =.58	- .07 p =.49	.07 p =.54	- .03 p =.81			
DM	.07 p =.49	- .28 p =.01	.36 p =.00	.42 p =.00	- .50 p =.00		
COPD	- .14 p =.18	.35 p =.00	- .43 p =.00	- .39 p =.00	.50 p =.00	- .50 p =.00	

Note. HTN = Essential hypertension. DM = Diabetes mellitus.
COPD = Chronic obstructive pulmonary disease

* Indicates statistical significance: p = or < .05

Table 5

Summary of Stepwise Regression of Age, Sex, Educational Level, and Health State With Self-Care Agency

Variable	*B*	Beta	*F*	*R*	R^2
Educational level	1.059	.297	8.41*	.30	.088
(Constant)	59.901				

Note. Predicted self-care agency = 59.901 + 1.059 (educational level)

* Indicates signficant *F* at $p = .005$; *df* 1,87.

The best predictor of self-care agency was educational level, p = .0047, which accounted for 9% of the variance. Sex, health state, and age did not achieve significance in the final regression model.

Research Question 3

Is there a linear relationship between functional status and each of the following variables: age, sex, health state, sociocultural factors, and self-care agency?.

Pearson correlations were computed to evaluate these relationships. The correlation coefficients and the level of significance for the variables are shown in Table 6. Health state was found to be significantly correlated with functional status for the health problems of diabetes mellitus, $r = -.26$, $p = .01$, and chronic obstructive pulmonary disease, $r = .27$, $p = .01$. The finding indicates that individuals with chronic obstructive pulmonary disease demonstrated significantly less functional ability, because the higher score on the ESDS indicates less functional states. The portion of the sample with diabetes mellitus demonstrated significantly higher functional ability.

Research Question 4

What linear combination of the variables of age, sex, health state, sociocultural factors, and self care agency best predicts functional status?

Table 6

Pearson Correlation Matrix Between Self-Care Agency (SCA), Age, Sex, Educational Level, Health State, and Functional Status

	Functional Status (ESDS)	Age	Sex (1 = M) (2 = F)	Educational Level	Health State			SCA
					HTN	DM	COPD	
Functional Status (ESDS)								
Age	.07 p =.53							
Sex	.06 p =.59	-.27 p =.01						
Educational Level	-.18 p =.09	-.22 p = .04	.19 p = .08					
Health State								
HTN	-.005 p =.96	-.07 p =.49	.07 p =.54	-.03 p =.81				
DM	-.26 *p =.01	-.28 p =.01	.36 p =.00	.42 p =.00	-.50 p =.00			
COPD	.27 *p =.01	.35 p =.001	-.43 p =.00	-.39 p =.00	-.50 p =.00	-.50 p =.00		
Self-Care Agency (SCA)	-.04 p =.69	.08 p =.46	.09 p =.38	.30 p =.01	.07 p =.52	.08 p =.49	-.14 p =.17	

Note. ESDS = Enforced Social Dependency Scale. HTN = Essential hypertension. DM = Diabetes mellitus. COPD = Chronic obstructive pulmonary disease
* Indicates statistical significance: p = or < .05

Stepwise multiple regression analysis was used to test this question. Results of the analysis are displayed in Table 7.

Of the variables in the study, sex and health state provided the best combination of predictors. These variables account for 14% of the variance in functional status

Summary

The results of data collection and data analysis have been presented. Data were collected using two instruments, the DSCAI-90 and the ESDS. Descriptive statistics were used to summarize and analyze the demographic characteristics of the sample, which also corresponded to the basic conditioning factors being investigated. Based on substantial correlation between two of the independent variables, years of education completed and household income, and missing data in the income variable, the decision was made to use years of education completed as the sole measure of sociocultural factors.

Pearson product moment correlation and stepwise multiple regression procedures were used to evaluate the relationships among variables. Results of the statistical testing completed to answer each question were reported.

Table 7

Summary of Stepwise Regression of Age, Sex, Health State, Educational Level, and Self-Care Agency With Functional Status

Variable	*B*	Beta	*F*	*R*	R^2
Sex (M = 1, F = 2)	3.059	.245	4.598*	.374	.140
Health state					
Diabetes mellitus	- 3.292	- .259			
Chronic obstructive pulmonary disease	- 6.032	- .479			
(Constant)	16.003				

Predicted functional status = 16.003 + 3.059 - 3.292 - 6.032.

* Indicates significant *F* at *p*= .005.

CHAPTER V

Discussion, Conclusions, Implications, and Recommendations

The purposes of this descriptive, correlational study were to describe the relationships among selected basic conditioning factors and self-care agency, as identified by Orem (1991), and functional status in chronically ill adults. Additionally, the investigator aimed to determine which combination of study variables best predicts self-care agency and functional status in chronically ill adults. The following research questions were developed to address the purposes of the study:

1. Is there a linear relationship between self-care agency and each of the following basic conditioning factor variables: age, sex, health state, and sociocultural factors?

2. What linear combination of basic conditioning factor variables (age, sex, health state, and sociocultural factors) best predicts self-care agency?

3. Is there a linear relationship between functional status and each of the following variables: age, sex, health state, sociocultural factors, and self-care agency?

4. What linear combination of the variables of age, sex, health state, sociocultural factors, and self-care agency best predicts functional status?

Data were collected using two instruments. The DSCAI-90 was used to gather information to measure basic conditioning factors and self-care agency. The ESDS (McCorkle & Benoliel, 1987) was used to assess subjects' functional status. These instruments were administered to a convenience sample of 90 chronically ill adults with three medical diagnoses (diabetes mellitus [N = 30], essential hypertension [n = 30], and chronic obstructive pulmonary disease [n = 30]). Thirty-two (32) women and 58 men participated in the study and were selected from outpatient clinics associated with two large hospitals in a Southeastern city. All of the subjects had been diagnosed for at least 1 year, could read and speak English, and had no current psychiatric diagnosis. Ages ranged from 28 to 81 years.

Descriptive statistics were used to describe the sample. Pearson product moment correlations and stepwise multiple regression techniques were used to determine the relationships among the study variables.

Analysis of data revealed a statistically significant relationship between educational level and self-care agency, $r = -.30$, $p = .01$. No significant findings emerged in this sample for age, sex, and health state as they related to self-care agency. Educational level accounted for 9% of the variance in self-care agency. Of the variables in the study, sex and health state provided the best combination for predicting functional status.

These variables accounted for 14% of the variance in functional status.

Discussion

Related to Conceptual Framework

Orem's (1991) self-care deficit theory of nursing suggests that specific factors within the individual and the environment determine that individual's ability to carry out self-care activities. Orem identified 10 such factors and labeled them basic conditioning factors. According to Orem, these factors determine one's potential for self-care, or self-care agency. Understanding the relationships among these multiple factors can provide a framework for looking at the complex situations nurses encounter as they help clients achieve their optimal functional status.

Because the self-care demands of people with chronic illness are often great, the nurse can potentially be more effective in helping this population if the factors determining their self-care abilities are better understood. For these reasons, the investigator chose a self-care framework to study determinants of functional status in the chronically ill adult.

This framework was helpful because it provided a way of looking at factors internal and external to the individual and determining their relative effect on client functioning. Use of the 10 basic conditioning factors and the components of self-care agency can provide a comprehensive way to examine these relationships. The investigator found that in some instances the definitions of basic conditioning factors lacked the specificity needed to give complete direction to the research effort. For example, health state is defined very generally as a factor that determines the appropriate focus for health care and desired health outcome (Orem, 1991). Refinement of the definition to address important characteristics or components of health state, such as perceived severity of illness, length of time since diagnosis, and self-reported symptoms, in addition to presence or absence of disease, would give more direction, especially when studying the chronically ill adult population.

Similar refinement in the definitions for sociocultural factors would be helpful. The list of defining characteristics currently available is general in nature, which leads to ambiguity in operationalizing the variable for measurement. Although not included as variables in the current study, family system factors and health system factors also are defined quite generally. Because there is evidence from other studies that family support and support of others, including health care providers, may be significant in facilitating one's ability to care for self, further refinement in this area of the theory may be profitable.

Related to Literature Review

Research findings related to variations in level of self-care agency associated with factors, such as chronological age and gender, are mixed and limited in number. For example, in a study of healthy adults, Braun (1987) found a significant relationship between chronological age and self-care agency and gender and self-care agency. These findings are congruent with those of Kruckenberg (1982) who found both age and gender to be significantly related to self-care agency in both healthy and physically disabled 10 to 16 year olds. Stullenbarger (1984) also found gender differences in school-aged children's reports of taking action to meet self-care requisites. Gender also significantly related to self-care agency in a study by Gaut and Kiekhefer (1988) with 51 chronically ill adolescents.

On the other hand, Moore (1987) found no significant relationship between gender and self-care agency in a study involving 92 healthy fifth-grade students. Monsen (1988), McDermott (1993) and Ward-Griffin and Bramwell (1990) similarly reported negligible contributions to explaining self-care agency by age or gender. Hanucharurnkul (1989), Dodd and Dibble (1993), and Ailinger and Dear (1993) also reported nonsignificant relationships between age and self-care agency.

In the present investigation, no significant relationships were found between age and self-care agency and gender and self-care agency. Differences in findings among the various studies must be interpreted cautiously because of the variety of instruments/methodologies used to measure self-care agency and perhaps because of differences in the health/illness state of subjects in the different studies. Some studies utilized healthy subjects, while some used subjects who were ill or disabled, and others used subjects at various positions on a health/illness continuum.

Similar discrepant findings occurred when looking at relationships between sociocultural factors, including educational level, although the number of studies addressing these variables was fewer. For example, Braun (1987) found no significant relationship between educational level and self-care agency. Similar findings were reported by McDermott (1993), Moore (1993), and Monsen (1988). However, studies by Hanucharurnkul (1989), Kruckenberg (1982), Ailinger and Dear (1993), Dodd and Dibble (1993), and McCaleb and Edgil (1994) reported significant relationships. The current investigation yielded a significant relationship between educational level and self-care agency, with this variable explaining 9% of the variation in self-care agency. Income was not reported specifically as a sociocultural variable in the other studies reviewed to date. As stated previously, this may be related to problems the investigator encountered when using annual household income as a measure of sociocultural factors in the present study.

When investigators have examined relationships between health state and self-care agency, various approaches have been taken. Some researchers use only healthy subjects; others use the presence or absence of disease as a way of examining this relationship. For example, Denyes (1988) reported an analysis of five previously completed nursing studies using adolescents as study subjects. In those studies, a significant correlation was noted between presence or absence of health problems and self-care agency. Health state was also determined to be significantly related to self-care agency in a study by Gaut and Kiekhefer (1988), although the actual method of measurement was not stated. Rhodes et al. (1988) examined more specifically the relationship between self-reported symptoms and self-care agency in subjects receiving cancer chemotherapy. Specific relationships between tiredness and weakness as symptoms and self-care agency were found to be most significant. In the current study, all subjects had a chronic illness of at least 1 year's duration. The effect of each of three chronic illnesses was examined to determine any differential findings. No significant differences in level of self-care agency were found among the three disease states. This finding lends support to the findings of Skenazy and Bigler (1985) and Pearlman and Uhlmann (1988), which suggested that the phenomenon of having a chronic illness of any type is a key variable requiring additional study. Perceived severity of illness, length of time since diagnosis, and self-reported symptoms were not assessed in this study. As stated previously, the measurement of these other aspects of health state could have strengthened the study.

Research related to factors affecting functional status has yielded mixed results. In the present study, sex and health state were found to be predictive of functional status. These two variables accounted for 14% of the variance in functional status in this study. These findings are consistent with those of Viney and Westbrook (1981), Nagy and Wolfe (1984), Burkhardt (1985), and Lambert et al. (1989), all of whom found significant relationships between some aspect related to health state, such as presence or absence of disease, severity, or symptoms, and functional status. Arpin et al. (1990) reported that disease severity did not predict adjustment.

Viney and Westbrook (1981) also reported that the subjects' sex was significantly related to functional status, but only while the subjects were hospitalized; followup at home did not reveal a significant relationship. This finding differs from the current study in that the current study found a significant relationship in an outpatient population. No other studies specifically identified sex as a study variable.

Pearlman and Uhlmann (1988) found a significant relationship between income and ratings of quality of life. In the present study, income was also identified as significant, but, because of problems associated with measurement, this variable was not fully analyzed.

Other investigators have linked additional variables to functional status. Viney and Westbrook (1981) identified age and educational level as being significantly related to functional status in hospitalized subjects. These relationships were not seen, however, on home followup. These variables did not achieve significance in the present study. Arpin et al. (1990) found no significant relationships between functional status and socioeconomic variables.

Some variables not addressed in this study have been suggested by other researchers as being significantly related to functional status. Lewis (1982), Lowery and Jacobsen (1985), and Forsyth et al. (1984) have reported that personal control is an important variable to consider in relation to functional status. Inclusion of this variable in future work may help investigators more fully account for variances in functional levels.

Family support and/or support of others were identified by Nagy and Wolfe (1984), Pollock (1986), Lambert et al. (1989), and Arpin et al. (1990) as being significant in relation to functional status. These two variables are included among Orem's basic conditioning factors, but a specific definition of those terms is not explicit in Orem's work. This may account for the fact that there were no reports of use of these variables in research using Orem's framework.

Related to Findings and Methodology

Only a small portion of the variance in functional status has been explained to date. In the present study, educational level was significantly related to self-care agency, explaining 9% of the variation in self-care agency. Gender and health state accounted for 14% of the variance in functional status.

It is likely that a higher percentage of the variance in self-care agency could be explained if more of the basic conditioning factor variables had been included as study variables. As stated previously, lack of specificity in conceptual and, therefore, operational definitions limited the numbers of basic conditioning factors that could be readily examined.

As stated previously, expanding the parameters included within the health state variable to include more than presence of selected illnesses might also help to explain more about factors that determine self-care agency. Additionally, the investigator's decision to use presence of one of three chronic illnesses as the operational definition for health state necessitated the creation of dummy variables in order to perform the regression analysis. Defining the health state variable in a manner that would have provided data at a higher level would have made the analysis simpler. As stated in the discussion of conceptual framework, other possibilities would have been to use perceived severity of illness, length of time since diagnosis, or self-reported symptoms as defining characteristics, either singly or in combination.

Additionally, the research literature suggests that there are variables other than those included in this study that are significantly related to functional status. For example, personal control has been cited in three studies as being significant (Lewis, 1982; Lowery & Jacobsen, 1985; Forsyth et al., 1984). There are subscales within the DSCAI that address personal control: the ego strength subscale and the health knowledge and decision-making capability subscale. Thus, there is a possibility that these subscales might be specifically examined to fully explain factors associated with functional status.

The investigator's ability to fully examine the relationship between income, as a sociocultural factor, self-care agency, and functional status were limited by the large number of nonresponders to that item on the DSCAI-90. Because many subjects are unwilling to answer the income item, which is currently worded as an open-ended question requiring a specific numerical response, it may help to change the wording in the DSCAI-90 to a question that allows subjects to rank their income as part of a range.

Conclusions

The following conclusions are based on the research findings and are applicable to the sample studied: (a) Self-care agency in chronically ill adults is related to the educational level of the subjects; (b) self-care agency in chronically ill adults is not related to age, sex, or health state; (c) functional status in chronically ill adults is significantly related to the health state and sex of the subject; (d) functional status in chronically ill adults is not related to age, educational level, and level of self-care agency; and (e) self-care agency is not related to functional status.

Implications

As stated previously, findings from this study are not generalizable because of limitations in the study. However, the findings offer interesting possibilities for future research and theory development and give additional ideas for consideration in clinical practice.

Clinical Practice

Findings indicated that educational level was significantly related to the level of self-care agency. This knowledge may be helpful to nurses who are trying to predict those clients with a lesser potential for self-care. Interventions, such as telephone calls after discharge from hospital or after clinic visits and home health referrals, might be more necessary for clients targeted as needing more assistance by this assessment.

Nurses might also be especially careful to include other possible support figures in teaching activities. All of these interventions would provide the client with more frequent encouragement or monitoring by health care providers, family, and other support figures.

Research and Theory Development

Continued research is needed to identify factors that are related to functional status in adults with a variety of chronic illnesses. Only a small proportion of the variance in functional status has been accounted for to date. Orem's framework provides a helpful framework to advance this study but needs refinement in definitions of several of the basic conditioning factors. More precise definitions would allow researchers to operationalize additional variables that may then explain a greater proportion of the currently unexplained variance in functional status. Examples of these factors are health care system factors and family system factors. More specificity regarding health state and sociocultural factors would also provide better direction for researchers, resulting in more consistency in research efforts and more rapid building of knowledge.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Replicate the study using a larger sample and/or using only one illness state so that analysis can include use of the subscales of both instruments.

2. Focus future study on subscales of DSCAI-90 that have been suggested as relevant in other studies, such as personal control (ego strength and health knowledge and decision-making capability subscales), family support, health care provider support, and support of others.

3. Define more clearly and fully measure parameters of the health state variable to include more than presence or absence of disease. Areas, such as perceived severity vs. actual severity, and length of time since diagnosis should be added.

4. Consider the effect of multiple chronic illness on functional status.

5. Design a similar study that includes other commonly occurring chronic illnesses to gain additional knowledge of the concept of chronicity.

6. Modify the DSCAI-90 question regarding income to give income range choices to subjects in order to increase response rate for that item.

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APPENDIX A

Permission to use Instruments

Wayne State University
College of Nursing

5557 Cass Avenue
Detroit, Michigan 48202

October 8, 1993

Kay L. Robinson
1348 Prother Road
Lexington, KY 40502

Dear Ms. Robinson:

Assuming your agreement to the requests I have made regarding attention to copyright, sharing of data, and keeping me aware of your progress, I am pleased to grant you permission to use the Denyes Self-Care Agency Instrument (DSCAI-90) in your dissertation research with chronically ill adults at the University of Alabama.

Sincerely,

Mary Denyes

Mary J. Denyes, PhD, RN
Associate Professor and Assistant Dean
Family Health and Well Being
Across the Life Span

UNIVERSITY of PENNSYLVANIA

Center for Advancing Care in Serious Illness

Ruth McCorkle, PhD, FAAN
Director
Barbara Lowery, EdD, FAAN
Co-Director

School of Nursing
420 Guardian Drive
Philadelphia, PA 19104
Tel: (215) 898-9134
Fax: (215) 898-1868

November 5, 1993

Kay L. Robinson
University of Kentucky
College of Nursing
Chandler Medical Center
Lexington, KY 40536-0232

Dear Ms. Robinson:

You have my permission to use the Enforced Social Dependency Scale. I've enclosed a copy of the scale and surrounding materials for your use.

I'd appreciate a summary of the results of your study when it is complete. Good luck to you in your work.

Sincerely,

Ruth McCorkle

Ruth McCorkle, PhD, FAAN
Professor

RM/ll
Enclosure

APPENDIX B

Denyes' Self-Care Agency Instrument and Enforced Social Dependency Scales (ESDS)

APPENDIX C

Institutional Review Board Approvals

UAB THE UNIVERSITY OF
ALABAMA AT BIRMINGHAM

Office of the Institutional Review Board for Human Use

FORM 4: IDENTIFICATION AND CERTIFICATION OF RESEARCH PROJECTS INVOLVING HUMAN SUBJECTS

THE INSTITUTIONAL REVIEW BOARD (IRB) MUST COMPLETE THIS FORM FOR ALL APPLICATIONS FOR RESEARCH AND TRAINING GRANTS, PROGRAM PROJECT AND CENTER GRANTS, DEMONSTRATION GRANTS, FELLOWSHIPS, TRAINEESHIPS, AWARDS, AND OTHER PROPOSALS WHICH MIGHT INVOLVE THE USE OF HUMAN RESEARCH SUBJECTS INDEPENDENT OF SOURCE OF FUNDING.

THIS FORM DOES NOT APPLY TO APPLICATIONS FOR GRANTS LIMITED TO THE SUPPORT OF CONSTRUCTION, ALTERATIONS AND RENOVATIONS, OR RESEARCH RESOURCES.

PRINCIPAL INVESTIGATOR: MARY KATHRYN ROBINSON

PROJECT TITLE: DETERMINANTS OF FUNCTIONAL STATUS IN CHRONICALLY ILL ADULTS

____1. THIS IS A TRAINING GRANT. EACH RESEARCH PROJECT INVOLVING HUMAN SUBJECTS PROPOSED BY TRAINEES MUST BE REVIEWED SEPARATELY BY THE INSTITUTIONAL REVIEW BOARD (IRB).

__X__2. THIS APPLICATION INCLUDES RESEARCH INVOLVING HUMAN SUBJECTS. THE IRB HAS REVIEWED AND APPROVED THIS APPLICATION ON 4-20-95 IN ACCORDANCE WITH UAB'S ASSURANCE APPROVED BY THE UNITED STATES PUBLIC HEALTH SERVICE. THE PROJECT WILL BE SUBJECT TO ANNUAL CONTINUING REVIEW AS PROVIDED IN THAT ASSURANCE.

- __X__ THIS PROJECT RECEIVED EXPEDITED REVIEW.
- _____ THIS PROJECT RECEIVED FULL BOARD REVIEW.

____3. THIS APPLICATION MAY INCLUDE RESEARCH INVOLVING HUMAN SUBJECTS. REVIEW IS PENDING BY THE IRB AS PROVIDED BY UAB'S ASSURANCE. COMPLETION OF REVIEW WILL BE CERTIFIED BY ISSUANCE OF ANOTHER FORM 4 AS SOON AS POSSIBLE.

____4. EXEMPTION IS APPROVED BASED ON EXEMPTION CATEGORY NUMBER(S)__________.

DATE: 4-20-95

RUSSELL CUNNINGHAM, M.D.
INTERIM CHAIRMAN OF THE
INSTITUTIONAL REVIEW BOARD

UAB THE UNIVERSITY OF
ALABAMA AT BIRMINGHAM

Office of the Institutional Review Board for Human Use

FORM 4: IDENTIFICATION AND CERTIFICATION OF
RESEARCH PROJECTS INVOLVING HUMAN SUBJECTS

THE INSTITUTIONAL REVIEW BOARD (IRB) MUST COMPLETE THIS FORM FOR ALL APPLICATIONS FOR RESEARCH AND TRAINING GRANTS, PROGRAM PROJECT AND CENTER GRANTS, DEMONSTRATION GRANTS, FELLOWSHIPS, TRAINEESHIPS, AWARDS, AND OTHER PROPOSALS WHICH MIGHT INVOLVE THE USE OF HUMAN RESEARCH SUBJECTS INDEPENDENT OF SOURCE OF FUNDING.

THIS FORM DOES NOT APPLY TO APPLICATIONS FOR GRANTS LIMITED TO THE SUPPORT OF CONSTRUCTION, ALTERATIONS AND RENOVATIONS, OR RESEARCH RESOURCES.

PRINCIPAL INVESTIGATOR: MARY KATHRYN ROBINSON

PROJECT TITLE: DETERMINANTS OF FUNCTIONAL STATUS IN CHRONICALLY ILL ADULTS

_____ 1. THIS IS A TRAINING GRANT. EACH RESEARCH PROJECT INVOLVING HUMAN SUBJECTS PROPOSED BY TRAINEES MUST BE REVIEWED SEPARATELY BY THE INSTITUTIONAL REVIEW BOARD (IRB).

X 2. THIS APPLICATION INCLUDES RESEARCH INVOLVING HUMAN SUBJECTS. THE IRB HAS REVIEWED AND APPROVED THIS APPLICATION ON 4-1-94 IN ACCORDANCE WITH UAB'S ASSURANCE APPROVED BY THE UNITED STATES PUBLIC HEALTH SERVICE. THE PROJECT WILL BE SUBJECT TO ANNUAL CONTINUING REVIEW AS PROVIDED IN THAT ASSURANCE.

X THIS PROJECT RECEIVED EXPEDITED REVIEW.

_____ THIS PROJECT RECEIVED FULL BOARD REVIEW.

_____ 3. THIS APPLICATION MAY INCLUDE RESEARCH INVOLVING HUMAN SUBJECTS. REVIEW IS PENDING BY THE IRB AS PROVIDED BY UAB'S ASSURANCE. COMPLETION OF REVIEW WILL BE CERTIFIED BY ISSUANCE OF ANOTHER FORM 4 AS SOON AS POSSIBLE.

_____ 4. EXEMPTION IS APPROVED BASED ON EXEMPTION CATEGORY NUMBER(S)_____.

DATE: 4-1-94

RUSSELL CUNNINGHAM, M.D.
INTERIM CHAIRMAN OF THE
INSTITUTIONAL REVIEW BOARD

The University of Alabama at Birmingham
212 Mortimer Jordan Hall • 1825 University Boulevard
Birmingham, Alabama 35294-2010 • (205) 934-3789 • FAX (205) 975-5977

APR

UNIVERSITY
OF KENTUCKY

Research and Graduate Studies

Research Subjects Office
301 Kinkead Hall
Lexington, Kentucky 40506-0057
Medical IRB 606-257-8295
Non-Medical IRB 606-257-3138
IACUC 606-257-2934

Continuation Review	Approval Ends	Project Ends	IRB Number
Extension Approved	May 5, 1996	July 30, 1995	94-00123

TO: Mary Kathryn Robinson, MSN
College of Nursing
315-G CON/HSLC
0232

FROM: Chairperson/Vice Chairperson
Medical Institutional Review Board (IRB)

SUBJECT: Approval of Protocol Number 94-00123

DATE: April 10, 1995

On April 10, 1995, the Medical Institutional Review Board approved your protocol entitled:

Determinants of Functional Status in Chronically Ill Adults

Approval is effective from May 6, 1995 until May 5, 1996. Prior to the end of this period, you will be sent a Continuation Review Report Form which must be completed and returned to the Research Subjects Office so that the protocol can be reviewed and approved for the next period.

In implementing the research activities, you are responsible for complying with IRB decisions, conditions and requirements. The research procedures should be implemented as approved in the IRB protocol.

Attached for your review is a booklet describing investigator responsibilities after IRB approval has been obtained. Please read the information carefully and retain a copy for your files. If you have questions or need additional information, contact the Research Subjects Office at 257-8295 (Medical) and 257-3138 (Nonmedical).

Chairperson/Vice Chairperson

UK UNIVERSITY
OF KENTUCKY

Research and Graduate Studies

Research Subjects Office
301 Kinkead Hall
Lexington, Kentucky 40506-0057
Medical IRB 606-257-8295
Non IACUC 606-257-293138
34

Initial Review	Approval Ends	Project Ends	IRB Number
			94-00123____
	May 5, 1995	November 30, 1994	94-00123

TO: Mary Kathryn Robinson, MSN
College of Nursing
315-G CON/HSLC
0232

FROM: Chairperson/Vice Chairperson
Medical Institutional Review Board (IRB)

SUBJECT: Approval of Protocol Number 94-00123

DATE: May 12, 1994

On May 6, 1994, the Medical Institutional Review Board approved your protocol and consent form entitled:

Determinants of Functional Status in Chronically Ill Adults

Approval is effective from May 6, 1994 until May 5, 1995. Attached is the IRB approved consent/assent document(s) to be used when enrolling subjects. [Note, subjects can only be enrolled using consent/assent forms which have a valid "IRB Approval" stamp unless special waiver has been obtained from the IRB.] Prior to the end of this period, you will be sent a Continuation Review Report Form which must be completed and returned to the Research Subjects Office so that the protocol can be reviewed and approved for the next period. This applies only to full and expedited reviews.

In implementing the research activities, you are responsible for complying with IRB decisions, conditions and requirements. The research procedures should be implemented as approved in the IRB protocol.

Attached for your review is a booklet describing investigator responsibilities after IRB approval has been obtained. Please read the information carefully and retain a copy for your files. If you have questions or need additional information, contact the Research Subjects Office at 257-8295 (Medical) and 257-3138 (Nonmedical).

Arthur Lieber, M.D. / ME
Chairperson/Vice Chairperson

GRADUATE SCHOOL
UNIVERSITY OF ALABAMA AT BIRMINGHAM
DISSERTATION APPROVAL FORM

Name of Candidate Mary Kay Robinson

Major Subject Adult Health Nursing

Title of Dissertation Determinants of Functional Status in Chronically Ill Adults

Dissertation Committee:

Judy Holcombe, Chairman

Anne G. Foote

Elizabeth Stullenbarger

Director of Graduate Program Carol Dashiff

Dean, UAB Graduate School John F. Lorden

Date 9/25/95

PS-1428