This thesis is dedicated to my family - Henry, Christopher, and Kimberly - who's love, support, and encouragement was never ending and greatly appreciated and to my thesis committee - Faith Hohloch, Catherine Malloy, and Margaret Duffy - who became like family to me.
The documents required by the Institutional Review Board of the Medical University of South Carolina were approved on July 17, 1986.
Accepted by the faculty of the College of Nursing, Medical University of South Carolina, in partial fulfillment of the requirements for the Master of Science in Nursing Degree.

Director of Research Project

Research Committee:
The author would like to acknowledge Dr. Arthur Williams and Elaine Sweatman for allowing the project to take place at Dialysis Clinics, Inc. of Charleston, S.C.

Emma Green, RN, BSN, Nursing Supervisor for administering the Exercise of Self-care Agency Scale.

The nine participants of the study without whom this study would have been impossible.

Barbara Kearney and Barbara Fleischer for allowing the use of the Exercise of Self-care Agency Scale.

Patricia Geisenburg for tolerating many mistakes and adding valuable insight into the process of typing a thesis.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Theoretical Foundation</td>
<td>3</td>
</tr>
<tr>
<td>Hypotheses</td>
<td>6</td>
</tr>
<tr>
<td>Definition of Terms</td>
<td>7</td>
</tr>
<tr>
<td>II. REVIEW OF THE LITERATURE</td>
<td>8</td>
</tr>
<tr>
<td>III. METHODOLOGY</td>
<td>33</td>
</tr>
<tr>
<td>Research Approach</td>
<td>33</td>
</tr>
<tr>
<td>Setting</td>
<td>33</td>
</tr>
<tr>
<td>Population</td>
<td>34</td>
</tr>
<tr>
<td>Sample</td>
<td>34</td>
</tr>
<tr>
<td>Procedure</td>
<td>35</td>
</tr>
<tr>
<td>Data Gathering Process</td>
<td>36</td>
</tr>
<tr>
<td>Variables</td>
<td>39</td>
</tr>
<tr>
<td>Assumptions and Limitations</td>
<td>40</td>
</tr>
<tr>
<td>IV. PRESENTATION AND ANALYSIS OF DATA</td>
<td>42</td>
</tr>
<tr>
<td>The Sample</td>
<td>42</td>
</tr>
<tr>
<td>The Data</td>
<td>43</td>
</tr>
<tr>
<td>Discussion</td>
<td>46</td>
</tr>
<tr>
<td>V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS</td>
<td>50</td>
</tr>
<tr>
<td>Summary</td>
<td>50</td>
</tr>
<tr>
<td>Conclusions</td>
<td>51</td>
</tr>
<tr>
<td>Recommendations</td>
<td>52</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>53</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>59</td>
</tr>
</tbody>
</table>
APPENDIX A: Exercise of Self Care Agency

Scale (ESAS) .................................................. 59

APPENDIX B: Level of Knowledge Questionnaire ............ 60
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1</td>
<td>Knowledge Scores.</td>
<td>43</td>
</tr>
<tr>
<td>Table 2</td>
<td>ESAS Scores and Mean Weight Gains</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>in Kilograms</td>
<td></td>
</tr>
<tr>
<td>Table 3</td>
<td>Rank Order of ESAS Scores and Mean Weight Changes Following Experimental Phase</td>
<td>45</td>
</tr>
</tbody>
</table>
CHAPTER I
INTRODUCTION

End stage renal disease (ESRD), a condition which causes chronic abnormalities in the kidneys and renal system, has no cure. When the body's renal system deteriorates, all of the person's systems eventually become involved. Every aspect of the person's physical, social, and psychological states is affected (Lancaster, 1984). Persons with this condition require dialysis or a successful transplant to maintain their lives. In 1969, 2,400 people in the United States were receiving dialysis treatments, 1,700 of them in treatment centers (Cummings, 1970). Today ESRD affects approximately 78,434 persons in this country; of that population approximately 63,245 patients receive dialysis treatments in outpatient facilities (Health Care Financing Administration, 1985).

Society made a commitment to this patient population by passing into law P.L. 92-603 in 1972. This was the nation's first catastrophic disease program, and it continues to provide funds for persons who are stricken with ESRD. All persons or their dependents who are covered by Social Security are eligible for treatment (Hekelman & Ostendarp, 1975). Essentially no one at present is denied treatment for economic reasons (Orr, 1982). It therefore becomes the duty of the health care professional to seek
the most cost-effective and highest quality methods for meeting the needs of the renal population (Hekelman & Phillips, 1981).

In addition to the need for dialysis, many patients become dependent on others for income, transportation, and other activities of daily living. Dependency unintentionally may be fostered, not only by the patient and family, but also by the staff rendering care (Davison, 1985).

The ability of the patient to live with this illness centers on an understanding of a complicated treatment regimen and an ability to adapt a lifestyle to it (Lancaster, 1979). Schlotter (1970) indicated that the more the dialysis patient knows about the treatments, the more the person's independence and rehabilitation are enhanced.

As ESRD patients come into outpatient facilities to receive dialysis treatment, the nurses providing care are faced with many challenges (Lancaster, 1984). Yet, registered nurses, by the virtue of their educational background and refined communication skills, have the capabilities to meet these challenges and to incorporate the patient into the plan of care (Williamson and Bower, 1987). A study examining the effectiveness of nursing actions has direct application to the care of this patient population, to the prevention of medical complications, and to the containment of the cost of the overall program.
Theoretical Foundation

According to Fawcett (1984) conceptual models of nursing facilitate communication among nurses and provide a more unified approach to nursing practice, education, administration, and research. A conceptual model tells the nurse what to look at when interacting with patients, how to interpret observations, and generally how to plan interventions. Furthermore, it provides beginning criteria for outcome evaluation (Fawcett, 1984). Long (1985) reported that client outcomes can be predicted based on specific nursing actions under varying conditions through the utilization of nursing theories.

In 1959, Dorothea Orem introduced her self-care conceptual model of nursing. At the core of this model is the central idea that "people can benefit from nursing because they are subject to health-related or health derived limitations that render them incapable of continuous self care" (Orem, 1985, p. 34). It is this author's belief that the systematic use of nursing actions based on Orem's self-care model can be beneficial to ESRD patients in an outpatient facility.

Orem's (1985) theory of nursing had its beginnings in an insight about why individuals need to be under the care of nurses. Orem expressed her insight as a human characteristic—limitations for self-care. She defined self-care as "the product of actions directed to self or to the environment in order to regulate one's functioning in the interests of one's life, integrated functioning and well being" (p. 31).
Other terms were created to describe the properties of persons in need of nursing. Therapeutic self-care demand is the measures of care required at a particular time; self-care agency is the complex capability of the person to take necessary actions. A self-care deficit is said to exist when the self-care agency is not enough to meet the self-care demand (Orem, 1985).

Orem (1985) also created terms used to express conceptualizations of nurses. Nursing agency is the complex capability for action in order to provide care for persons with self-care deficits. The nursing system is the continuing series of actions designed to meet the person's therapeutic self-care demands or to regulate his/her self-care agency.

The purposes to be attained through self-care are termed self-care requisites. Orem (1985) described three such purposes and referred to them as universal, developmental, and health-deviation requisites. The universal self-care requisites, as the name implies, are common to all human beings. They are associated with life processes, human integrity, and general well-being. Developmental self-care requisites are associated with human development and the stages of the life cycle. Health-deviation self-care requisites are associated with human defects and deviations and with medical diagnostic and treatment measures. The health-deviation requisites exist for persons who are ill, who have specific forms of pathology, and who are under medical diagnosis and treatment (Orem, 1985).
There are three basic variations in nursing systems based on the principle that either nurses or patients or both can act to meet self-care requisites. Wholly compensatory nursing systems are required when the patient is physiologically or psychologically limited in accomplishing self-care. Partly compensatory nursing systems are required when the patient is limited for expending energy because of the health state. And finally, supportive-educative (developmental) nursing systems are required when the patient lacks knowledge or skill or is psychologically unready to perform self-care activities (Orem, 1985).

The ability of the persons with ESRD to perform self-care activities is obviously dependent on many factors. But, because of the chronicity of the condition, the complexity of treatment, and economic factors, self-care activities are essential. Nursing care delivered from within a framework designed to enhance self-care becomes increasingly necessary. The purpose of this project was to explore the possibility of enhancing one particular self-care requisite in persons on dialysis. The specific purpose was to answer the following question: can the application of a self-care model of nursing in an outpatient hemodialysis facility make a difference in the patient's interdialytic weight gains? All participants in this study had previously demonstrated weight gains in excess of 2 kilograms in between dialysis.

The patient's interdialytic weight gains are the result of what the patient eats and drinks. As described by Lancaster
(1987), fluid volume overload can cause hypertension, pulmonary edema, liver congestion and enlargement, congestive heart failure, pitting edema, and/or ascites. The consequences of fluid overload can range from minimal to lethal. If nursing actions could be identified that assist the patient in controlling fluid intake, the results could have a far reaching impact on patient morbidity and mortality.

Hypotheses

The following null hypotheses were formulated specifically for this project:

1. There will be no difference in the scores on the Exercise of Self-Care Agency Scale in patients who demonstrate a decrease in interdialytic weight gains as compared to those patients who do not demonstrate a decrease in interdialytic weight gains during the experimental phase of the study.

2. Nursing actions based on Orem's self-care concepts will have no effect on the maintenance of proper fluid intake by adult hemodialysis patients at an outpatient facility as demonstrated by no change in excessive interdialytic weight gains.

The research hypotheses were:

1. Patients who demonstrate a decrease in interdialytic weight gains during the experimental phase of the study will score higher on the Exercise of Self-Care Agency Scale as
compared to those patients who do not demonstrate a decrease in interdialytic weight gains.

2. Nursing actions based on Orem's self-care concepts will have a positive effect on the maintenance of proper fluid intake by adult hemodialysis patients at an outpatient facility as demonstrated by a decrease in the interdialytic weight gains.

Definition of Terms as Used in the Study

- Positive effect was defined as a decrease in the interdialytic weight gains.
- The interdialytic weight gain was the difference between the postdialysis weight at that time and the predialysis weight of the next treatment. This weight was indicative of the amount of fluid taken in by the patient.
- Proper fluid intake was the amount of fluid prescribed by the physician for a 24 hour period. This amount was individualized for each patient.
CHAPTER II
REVIEW OF THE LITERATURE

Introduction

End stage renal disease is a permanent condition that results in death if left untreated. The treatment is quite complex and once initiated requires some form of nursing actions for the remainder of the person's life. Because of the federal legislation providing funds for dialysis, treatment is available to all eligible citizens regardless of age, sex, education level, primary disease, economic status, or ethnic origin (Parker, 1983). Adjustment to treatment becomes a complex situation and the literature abounds with potential influencing factors. Such topics as compliance, health belief model, and locus of control cannot be ignored and are addressed in the review of the literature. In addition, support and education played primary roles in this study so they too are explored.

Dorothea Orem's self-care nursing concepts provided the framework for this study. Orem's conceptual model has been used in various clinical settings. The literature review discusses the self-care model as described in other nursing situations and then focuses on its use in the treatment of patients with ESRD.
CHAPTER II
REVIEW OF THE LITERATURE

Introduction

End stage renal disease is a permanent condition that results in death if left untreated. The treatment is quite complex and once initiated requires some form of nursing actions for the remainder of the person's life. Because of the federal legislation providing funds for dialysis, treatment is available to all eligible citizens regardless of age, sex, education level, primary disease, economic status, or ethnic origin (Parker, 1983). Adjustment to treatment becomes a complex situation and the literature abounds with potential influencing factors. Such topics as compliance, health belief model, and locus of control cannot be ignored and are addressed in the review of the literature. In addition, support and education played primary roles in this study so they too are explored.

Dorothea Orem's self-care nursing concepts provided the framework for this study. Orem's conceptual model has been used in various clinical settings. The literature review discusses the self-care model as described in other nursing situations and then focuses on its use in the treatment of patients with ESRD.
Compliance

Voluminous amounts of research and non-research literature concerning compliance have been generated. Cohen and Gildea (1984) reported that attempts have been made to correlate treatment compliance to "personality traits, family support, demographic traits, educational capacity, psychiatric problems, and staff/patient relationships" (p. 6). Yet no one factor has been shown to have a causal relationship with compliance. In addition, patients can be noncompliant with some aspects of the treatment while simultaneously being compliant with others.

Poor compliance to the treatment regimen is one of the most frustrating and baffling areas for the staff caring for dialysis patients. It becomes especially frustrating due to the fact that the staff and the patient have close, ongoing contacts (Cohen & Gildea, 1984; Eddins, 1985).

Harper (1984) reported that there is a real difference between compliance and self-care. Compliance behaviors occur when a person adheres to a prescribed regimen; self-care behaviors occur when a person initiates actions to restore or maintain health.

Orem (1985) reported that performing a self-care measure is a choice. Knowledge of human functioning, the person's present condition and circumstances, and known care measures influence the reflection about what should be done and how it will be done. The use of self-care techniques is affected by the general culture, specialized education, practical experiences, available resources,
interests, and motives. "Individuals and families may adapt themselves to chronic ill health rather than learn about therapeutic care measures" (Orem, 1985, p. 89).

Within the framework of self-care, nurses and patients interact and negotiate as the actual design of a nursing system emerges. The complementary nature of nurse-patient relations is a core concept in a nurse's development of insights about nursing and its practice (Orem, 1985). The concept of self-care has obvious differences as compared to the issues of compliance.

Health Belief Model

The Health Belief Model was first developed in 1958 while work was being done with the United States Public Health Service on the detection and prevention of tuberculosis (Hijack, 1984). The model, as described by Becker (1985), suggests that whether or not a person follows professional advice depends on four factors: (a) health motivation - the degree of interest in, and concern about health matters in general; (b) susceptibility - the perceptions of vulnerability to the particular illness; (c) severity - the perceptions concerning the probable seriousness of the consequences of contracting an illness or of leaving it untreated; and, (d) benefits and costs. Reduced adherence occurs when the regimen is complex, of long duration, dependent on an alteration of the patient's life style, inconvenient, or expensive (Becker, 1985).

The Health Belief Model is a psychosocial model and focuses on attitudes and beliefs in accounting for variances in a person's
health-related behaviors. Clearly there are other forces that influence health actions. The model assumes that health is a highly valued goal for most persons and that cues to action are widely prevalent. Where these conditions are not met, the model is not likely to be useful in, or relevant to, explaining behavior (Becker, 1985).

Yanitski (1983), in the first of a three phase study, reported that a patient's general health concerns were rather poor predictors of compliance. The purpose of the study was to determine whether elements of the Health Belief Model were related to compliance in the in-center dialysis patients at the University of Alberta Hospitals. Twenty-nine patients participated in the study by answering a 116 item questionnaire to measure the patient's beliefs. In regard to fluid control, only 20 to 30% of the patients were compliant; a weight gain of 0.5 kilograms or less per 24 hours 50 percent or more of the time was considered compliant. Yet 62 percent of the patients saw fluid retention as being serious. Patients in this study were poor compliers to their fluid restrictions (Yanitski, 1983).

In another study by Parker et al. (1985), the effects of nursing interventions based on the Health Belief Model on compliance in patients on hemodialysis were investigated. The eight patients in this study all passed a screening test for knowledge regarding diet, medications, and dialysis; they were considered to have the knowledge necessary for compliance. The experimental phase of the study lasted four weeks during which
there were no significant changes noted regarding weight. Although patients were able to verbalize benefits of compliance, there was little effect on behavior (Parker, et al., 1985).

Orem (1985) stated that the art of nursing includes diagnosing the abilities of a person to engage in self-care in relation to the person's therapeutic self-care demand. Examining one's self-care habits, appraising the benefits arrived from self-care as practiced, recognizing the need for change, becoming knowledgable about new self-care requisites, and a willingness to pursue particular self-care actions were listed by Orem as being important for maintaining the adequacy of the individual's self-care agency.

The activities of self-care are learned according to the beliefs, habits, and practices of one's cultural standards which are first learned within the family. Self-care requires not only learning and the use of knowledge, but also enduring motivation and skill. In addition, self-care requires an openness to one's self and one's environment. The individualized factors of age, developmental state, health, values and goals generally determine the scope of the self-care activities a person can perform (Orem, 1985).

The self-care model obviously goes beyond the Health Belief Model. The self-care model addresses those other forces that influence health actions that are ignored by the Health Belief Model.
Locus of Control

Health locus of control describes a person's motivation for health behavior on the basis of a trait predisposing the person to an internal or external orientation toward self and the environment. According to this theory, the person who is internally controlled is more likely to take the initiative in his/her own health care, be more knowledgeable about his/her health, and adhere to prescribed health care regimens. The person who is more externally controlled feels that one's health is a matter that can be attributed to luck, fate, or powerful others and is beyond one's own control (Cox, 1985). The internal-external locus of control construct is based on social learning theory and emphasizes the concepts of expectancy and reinforcement values (Becker, 1985).

In a study by Schwartz (1982), locus of control was used to determine if there was a measurable difference between home and in-center dialysis patients. It was suggested that the locus of control construct might be useful in the selection of candidates for home hemodialysis. The study sample was divided into three groups according to treatment setting. Group 1 (N = 14) were home dialysis patients; Group 2 (N = 15) were in-center dialysis patients who had never dialyzed at home; and, Group 3 (N = 9) were in-center dialysis patients who had previously dialyzed at home. The study tool was the Adult Nowicki-Strickland Internal-External Scale consisting of 40 forced choice (yes or no) items. The findings revealed that patients with internal scores were more...
likely to be found dialyzing at home. A Pearson product-moment correlation ($r = .3$) indicated a relationship between locus of control and setting (Schwartz, 1982).

In another study by Parker (1983), the health locus of control of home dialysis was compared to in-center dialysis patients. In this study a convenience sample of 33 adult patients was obtained. The sample consisted of 15 home patients and 18 in-center patients. The study tool was the Multidimensional Health Locus of Control Scales which measures internal, chance, and powerful other health locus of control. A Likert scale was used to identify the measurement of agreement or disagreement with each item. By using an analysis of variance the three hypotheses of the study were supported. There was no significant difference between the patients receiving home dialysis and the patients receiving in-center dialysis when utilizing the internal subscale, the chance subscale, or the powerful other subscale of the study tool (Parker, 1983).

Parker (1984) again researched the difference between the locus of control of in-center and home dialysis patients. In her second study the effects of years receiving dialysis treatments, gender, age, years of formal education, employment, residence, marital status, and income categories were explored. A random sample of 29 adult patients was chosen from the entire aggregation of chronic hemodialysis patients in the state of Indiana. The sample consisted of 14 home patients and 15 in-center patients. The study tool was the Internal-External Scale developed by
Rotter, Liverant, and Crowne. It is a 29-item forced choice test including six filler items. By using an analysis of variance it was demonstrated that there were no significant differences between the locus of control of home dialysis and in-center dialysis patients. Of the other factors explored only gender demonstrated a significant difference with males being more internally oriented than females.

Parker (1984) concluded that locus of control is a practical tool, that there are many facets to an individual's personality, and that it is difficult to obtain adequate information to label a person as internal or external. The author recommended using the locus of control construct as a situational tool, not as a predictive tool.

Orem (1985) described actions of the self-care agents who have either an internal orientation or an external orientation. The particular orientation can be determined by observation, by eliciting subjective data, or both. The four types of externally oriented self-care actions include (a) knowledge seeking actions, (b) assistance and resource seeking actions, (c) expressive interpersonal actions, and (d) actions to control external factors. The two types of externally oriented self-care actions include (a) resource using actions to control internal factors, and (b) actions to control one's self. The therapeutic self-care demand for self-care actions can originate in the individual or from others; demands may not be met or ignored (Orem, 1985).
Orem's internal-external orientation is different from the internal-external orientation of locus of control.

**Education**

Patient education is central to the nursing care of the patient with end stage renal disease. Patient education allows the patient to become an active participant in care. No other chronic illness requires as many diet restrictions, medications, or as much technical knowledge as is required by the patient with end stage renal disease. The complicated nature of the treatment is a very obvious reason why a knowledgable patient is essential (Bess & Baer, 1984).

Redman (1984) identified two facets to be considered when evaluating a patient's readiness to learn. The first facet is an emotional readiness, a motivation which determines a person's willingness to put forth the effort necessary to learn. The second facet is an experiential readiness, the person's background of experiences, skills, attitudes, and ability to learn. Readiness to learn requires assessment of the patient and surrounding circumstances. Consideration of all facets is essential since knowledge in and of itself is rarely a sufficient basis for actions (Redman, 1984).

Cummings (1970) recognized the nurse's role in patient education as an important one. Each patient needs a continuous flow of exact information to be an active participant in care. Yet, because of toxic factors, economic pressures, social role disturbance, and dependency, the patient is an abysmal information
Therefore, information must be given simply, patiently repeated, and frequently cross checked to evaluate how well it is registering (Cummings, 1970).

A comparison of predialysis and post-dialysis cognitive abilities was performed by West (1978). The purpose of the study was to determine whether markedly elevated blood urea nitrogen, creatinine, and potassium serum levels predialysis affect the cognitive abilities of chronic hemodialysis patients. Nine patients participated in the study. The study tool was a ten item mathematical test consisting of two addition, two subtraction, two multiplication, two division, and two word problems. By assessing the time and error difference between the pre and post dialysis tests, it was demonstrated that the patients overall completed the post test faster and/or with fewer errors than the pretest. This study implied that it is important for the nurse to attempt to teach the patient when chemistries are closest to normal (West, 1978).

Orem (1985) recognized teaching as a valid method of helping a patient when indicated. Orem stated that learning may not take place if the patient is not ready to learn, is not aware of the need to know, or is not interested in learning.

Support

The importance of social support is now recognized as a possible determinant of health and well being. Social support is generally considered to encompass the numbers of persons who interact closely with the patient, the emotional significance of
these relationships, the kind of help these persons can offer the patient, and the amount of support the patient has lost in the recent past (Dawson, et al., 1984).

O'Brien (1980) studied the effect of social support on the hemodialysis regimen. The purpose of the study was to determine whether the presence of strong primary support systems from family and friends and secondary support systems from physicians and nurses was associated with positive patient compliance. The study used an exploratory correlational design with the inclusion of panel analysis encompassing a three-year period. The original deliberative sample consisted of 126 subjects from three dialysis centers; at the three year follow-up exactly half (N = 63) of the original subjects were interviewed. A structured interview schedule was constructed to elicit the patient's perceptions of the expectations of the significant others, and to gather actual compliance behavior and sociodemographic data. Among other findings, this research indicated that associations between the perceived support of family and care givers and behavior were consistently positive over time. At the time of the second interview the expectations of care givers were more strongly correlated with compliance behavior than were those of the family. This was a reversal of the findings at the time of the first interview. This finding demonstrated the intense relationships that develop between staff and patients in a hemodialysis unit because of the critical and continuous nature of the dialysis treatment (O'Brien, 1980).
Piltz-Kirkby and Fox (1982) explored the influence support systems in the home had on the patient's decision regarding the preferred location of the dialysis treatments. Forty-nine dialysis patients comprised the sample, 25 were in-center patients and 24 were home patients. The study tool was a questionnaire addressing information giving, material aid and services, and emotional support. There were five questions for each aspect for a total of 15 questions. Among other findings, 60% of the in-center patients and 63% of the home patients rated nurses as being "very helpful" in initiating and maintaining their dialysis. Only two of the 49 patients listed the nurse as their key emotional support (Piltz-Kirkby & Fox, 1982).

Hilbert (1985) investigated the relationship of social support to the compliance of 26 dialysis patients. A 32 item questionnaire was used to measure the subjects' responses indicating their perceptions of the degree to which the significant other engaged in supportive behavior. Findings of this study suggested that social support from a person who is important to the patient is influential in promoting compliance from the aspect of directive guidance. It did appear that the supportive behaviors of a friend or relative were related to the patient's compliance with medication, diet, and fluid intake.

Orem (1985) listed supporting another (physically or psychologically) as a method one person can use to help another. Orem defined support as meaning to sustain in an effort.
Supportive activity is viewed as a valid way of assistance when a patient is faced with something unpleasant or painful.

**Self-Care**

Numerous conceptual frameworks and several models of nursing have been developed. Each model provides a unique perspective on nursing practice by interrelating the concepts of person, environment, health, and nursing. Nursing theory, practice, and research are mutually related and interdependent. Nursing research is the process through which theory is validated (Long, 1985). Nurses must be prepared to work with nursing models and assess their effectiveness in a variety of care settings (Aggleton & Chalmers, 1985).

Dorothea Orem based her model of nursing on the concept of self-care which is organized around individual activities to maintain health. As a model it values individual responsibility, prevention, and health education (Aggleton & Chalmers, 1985).

Orem's self-care model has been used as a theoretical base in developing academic curricula at several colleges of nursing. It has been suggested as a basis for construction of tests for the initial credentialing of graduate nurses. It has been proposed as a classification scheme for the analysis and design of research in nursing. It is evidently being adopted on many fronts (Melnyk, 1983).

One of the attractions that Orem's model has for many nurses is its utility in practice (Whelan, 1984). It is one framework within which a nurse can organize thoughts in relation to the
nursing process (Herrington & Houston, 1984). Interest in the self-care concept also stems from the need for nurses to be recognized as professional practitioners, the need for persons to be in control of their health, and the need for persons to be responsible for themselves. In addition, interest in self-care is generated secondary to the rising costs of health care and the reduction of available health care services (Bennett, 1980).

Mullin (1980) identified five constraints on implementing the self-care model in hospital systems. These constraints are systems that: (a) focus on illness and not individuals; (b) focus on tasks rather than identified needs; (c) identify care given by the type of task and not by the need of the individual; (d) set priorities for tasks; and, (e) misperceive the role of the nurse. Others criticize the self-care model as being cumbersome and filled with incomprehensible terms (Herrington & Houston, 1984).

Yet, on the clinical front the use of Orem's model has been documented in a wide variety of settings. Self-care has been described in the nursing management of a school-age child with bowel incontinence (Thackaberry, 1983); in the practice of medical-surgical nursing in an acute care setting (Mullin, 1980); in an obstetrical unit following cesarean delivery (Harris, 1980); in the community health nursing arena (Reutter, 1984); and, in the critical care unit (Walton, 1985).

Allison (1973) reported on a nurse-conducted and physician supervised Diabetic Management Clinic (DMC) at the Johns Hopkins Hospital. The DMC served to validate in practice, the further
development of Orem's self-care model. The nurse practitioner interviewed, taught, and counseled new diabetics and selected problem patients. The nurse practitioner was also involved in case finding in the family of diabetics for referral for screening. The diabetic nurse specialist had a caseload of 160 active moderate-to-severe diabetic patients. The majority of the patients were black females, over fifty years of age, who had less than a ninth grade education. Many of the patients were indigent, had a variety of other medical problems, lived alone, and had no one to rely upon for help.

Comparative surveys, using the patients as their own controls, demonstrated increased control of blood sugars, increased healing of leg ulcers and infections, and improvement of other health indicators and self-care abilities. Many patients were managed outside of the hospital so that the number of hospital admissions was reduced. In the DMC the mean no-show rate for scheduled visits was 8.8 percent over a two year period. By comparison the no-show rate for the Outpatient Department in general was 35 percent (Allison, 1973).

The patient population described in the DMC is quite similar to the patient population of this study. It is unfortunate that Allison did not report the numerical data or level of significance of the reported changes. It is interesting to note that Dorothea Orem serves as a consultant to the Center.

Backscheider (1974) reported on the same DMC. The focus of her paper was the presentation of a framework for assessing the
individual's capacities in relation to components of therapeutic regime. The assessment established the conditions for the initiation of a nursing system. The author presented an in-depth look at physical, mental, motivational, and emotional capabilities and orientations essential to therapeutic self-care for diabetics. However, as Harper (1984) pointed out, these capabilities were not specifically delineated in the design of the nursing system.

Orem's conceptual framework laid the foundation for a study by Harper (1984) which evaluated the effectiveness of a self-care medication program. The experimental study was conducted with 60 black, elderly, hypertensive women. The mean age of the participants was 66.5 years; the mean years of formal education was 6.55 years. Most of the women were widowed, single, or divorced and living alone.

A pre-test/post-test control group design was used with the participants randomly assigned to one of two treatment conditions. One group (N = 30) was the self-care program, the other group (N = 30) was the teaching program about hypertension. Women in the experimental group received four interventions about the medication and self-care behaviors. Women in the control group received four interventions about hypertension, its pathology and risk factors.

The dependent variables were knowledge, health locus of control, and medication self-care behaviors. The dependent variables were measured three times (the pretest and the post test situations) using four evaluation methods. The evaluation methods
included the Knowledge of Medical Subset (KMS), the Health Locus of Control Scale (HLCS), the Self-Care Behavioral Rating Scale (SBRS), and a pill count to assess the medication error rate. Systolic and diastolic blood pressure readings were obtained seven different times. Reliability and validity of the various study tools were reported by Harper (1984).

An analysis of co-variance showed a significant main effect on the knowledge variable for the self-care program; but, by the second post test, the treatment effect diminished indicating a loss of knowledge over time. Results of the health locus of control indicated a significant main effect in the first post test; the women in the self-care program scored more in the internal direction than did the women in the control group. The main effect did not persist in the second post test. Women in the experimental group significantly improved medication self-care behaviors; in the second post test, no statistically significant differences were noted between the groups. The same findings held true for the rate of medication error. For women in the experimental group, the rate of errors decreased significantly in the first post test. However, a significant treatment effect did not persist once the experiment ended. As treatment progressed over time, the systolic blood pressure decreased in the experimental group and increased in the control group; this was a significant interaction effect.

The diminution effects that occurred once the experiment was completed, suggested that newly learned knowledge and health
behaviors in the elderly must be periodically monitored and re-evaluated by the nurse. Further attempts to link theory and practice through research about self-care and health behaviors were called for (Harper, 1984).

Throughout the review of the literature it has become apparent that the concept of self-care is being implemented in a wide variety of settings. Self-care for hemodialysis patients is also gaining popularity. Despite this fact, there were no articles found linking this concept to this practice other than descriptive presentations and two case studies.

Rees (1980) was the first to connect Orem's self-care concepts to the nursing care of ESRD patients in the literature. Rees stated that this model of nursing seemed ideal for nursing in this patient population as it provides a firm basis for the nursing process and Orem's nursing systems can be easily applied to ESRD patients. The author provided a model linking the ESRD continuum (chronic renal failure, dialysis, transplant, and chronic rejection leading back to renal failure) with the three nursing systems (supportive-educative, partly compensatory, and wholly compensatory). The author then demonstrated a creative care plan for a hypothetical patient (Rees, 1980).

Michos (1985) implemented Orem's conceptual framework in an existing renal dialysis program which offered peritoneal and hemodialysis to both acute and chronic patients. Michos found that Orem's framework provides a sliding scale in the care of dialysis patients and allows for the visualization of the
treatment of ESRD as a dynamic, rather than stagnant, process. The patient may move from one form of treatment to another and may fluctuate frequently along the health-illness continuum. By using the nursing systems formulated by Orem, Michos (1985) claimed that patients can be accurately evaluated for self-care ability. The author concluded her article with a case study which illustrated how Orem's framework was successfully used (Michos, 1985).

Paradiso (1985) recognized self-care as a continuum with each patient located at a different point. A particular value of this article is its description of barriers to self-care in this patient population. Identified potential physical barriers included increasing serum urea and creatinine levels, anemia, fatigue, fluid accumulation, shortness of breath, restricted activity, and frequent hospitalizations. The author then described examples of barriers to the physical universal self-care requisites. Identified potential psychosocial barriers included dependency needs, life dissatisfaction, low self-esteem, low self-image, guilt, and anger. The author then described examples of barriers to the psychosocial universal self-care requisites.

Paradiso (1985) suggested that self-care agency may be halted by the health care professionals because of conflicting messages. The patient is told to carry on a normal life, yet the treatment regimen necessitates major adjustments to maintain life. The patient is expected to act as a self-care agent outside of the facility, yet inside of the facility the patient is placed in a dependent role. The patient who falls asleep and asks no
questions may be easier for the staff to deal with than the patient who insists on behaving as a self-care agent. Paradiso concluded that nurses must assess the patient's self-care assets and deficits and offer a general guide that can be used in the care of ESRD patients (Paradiso, 1985).

Drawing from the work of Paradiso in relation to the study reported herein two considerations surface. First, in looking at Orem's physical universal self-care requisite of maintenance of sufficient intake of water, the role of ESRD becomes apparent. Because of the compromised renal function, fluids are restricted. Resultant severe thirst may cause the patient to suffer. Second, in looking at Orem's psychosocial universal self-care requisite of maintenance of balance between solitude and social interaction, the role of ESRD again becomes apparent. Because of the dietary restrictions, the patient must eat and drink differently from everyone else. This assists in dramatically altering the patient's socialization skills and social roles (Paradiso, 1985).

Greenfield and Pace (1985) reported that perhaps the most important aspect of Orem's self-care model is its philosophical basis. Since self-care gives the patient a certain amount of power, it diminishes the role of victim. In addition, the nurse's role is not imposed on the patient but is called into play only when the patient needs assistance with self-care. Greenfield and Pace constructed a format designed to aid the nurse in gaining essential information related to the patient's self-care abilities and limitations. The authors also presented skeletal and
standardized care plans for ESRD patients based on Orem's framework (Greenfield & Pace, 1985). Of interest to this author was the standardized care plan formulated for the nursing diagnosis alteration in hydration (fluid overload). It appears that the patient goals and actions are in reality nursing goals and actions. The involvement of the patient in designing the care plan is questioned. As an example, one patient goal is "Lungs will be free of auscultatory rales" (p. 229). The action is "Auscultate lungs q shift and document findings" (p. 229). These statements may serve better as standards of care rather than on the patient's care plan.

Zinn (1986) described a self-care education program implemented in an outpatient dialysis facility. Based on Orem's framework, Step I was the intellectual phase during which the nurse collected data and determined why patients needed nursing care, given their histories and lifestyles. At this particular facility it was estimated that 15% of the patient population fit into the wholly compensatory category, and 25% in the educative-supportive category (Zinn, 1986). No objective data yielding this division of patients were offered, only a description of possible patient characteristics.

Step II entailed planning. This consisted of designing a patient-nursing system for the delivery of care and having the patients choose the phase of the educational program of which they wished to be a part. The patients became active participants.
Step III was the practical phase during which the educational programs were utilized (Zinn, 1986).

Problems and barriers to self-care cited in this article that were not previously mentioned included patients' resistance secondary to the staff getting paid to perform the specified activities. Zinn recommended a nice but firm response of "No, I am getting paid to help you do what you can't do for yourself, and to teach you to do what you can for yourself" (p. 68). Other potential barriers to patient education that were cited were the nurse's lack of comfort in teaching and the nurse's lack of knowledge of effective teaching. Education and support of the nurse must be provided and then the nurse must accept the responsibility for educating the ESRD patients (Zinn, 1986).

Jones and Preuett (1986) explored the self-care activities used by hemodialysis patients in dealing with stressors related to the treatment regimen. This was a descriptive study consisting of a nonrandom sample of 25 dialysis patients. There were 24 males and one female in the sample, all of whom were currently employed outside of the home for at least 20 hours a week. Selecting only employed patients served to control for severe complications and gave insight into how employed patients manage their disease and treatment regimen. The majority of patients included in other research studies were unemployed.

Semistructured interviews were used to obtain the information about self-care activities. An interview schedule was developed to identify specific aspects of the treatment regimen and the
related stressors (Jones & Preuett, 1986). Of interest in this study were the dietary/fluid restrictions. The related stressors included thirst, craving for salt and foods not allowed, frustration in changing eating habits, limit on eating out, pressure from others to eat certain foods, and the cost of foods (Jones & Preuett, 1986).

The data obtained through the interviews were first subjected to qualitative analysis. The self-care activity responses were categorized and tabulated for each stressor followed by identification of recurrent themes and concepts. Recurring themes were termed self-care processes and conceptualized as ongoing adaptive mechanism in performing self-care. Four themes emerged in this study: equalizing, substituting, withdrawing, and guarding.

Empirical indicators for equalizing were phrases describing conscious attempts to adjust or correct opposing issues. Empirical indicators for substituting were phrases describing flexibility in trading one activity for another. Empirical indicators for withdrawing were phrases describing separating one's self from activities or others. And finally, empirical indicators for guarding were phrases describing being alert to bodily changes and watchful of the staff's care (Jones & Preuett, 1986).

No attempt was made to rate the degree of inconvenience or discomfort associated with the specific stressors. The authors reported that the ultimate clinical usefulness of the finding
depended on future work that "might confirm the existence of and illuminate the dynamics of these self-care processes" (p. 78).

In regards to the stressor thirst, identified self-care activities fell within three of the four self-care processes. The equalizing response was "Exercise to sweat, then drink more" (p. 75). The substituting responses included: "Suck candy, chew gum;" "Rinse mouth with water frequently;" and, "Suck on ice" (p. 76). The guarding responses included: "I pace myself throughout day" and "Only drink when taking medications" (p. 78) (Jones & Preuett, 1986).

The patient population in Jones and Preuett's study was entirely different from those who participated in the herein reported research project. Yet, it's interesting to note that this investigator heard similar responses to the stressor thirst during the experimental phase of this study. One difference was that no participant exercised to sweat in order to drink more. One addition was that several participants "sucked lemon to cut thirst." All other responses were heard by this investigator.

The literature reviewed suggests that there are many factors which influence the patient's response and adjustment to end stage renal disease. The issues of compliance, health beliefs, and locus of control have been exposed as poor predictors of the patient's adherence to the treatment regimen. The issues of education and support appear to be essential ingredients to a successful patient outcome.
Many articles have been published regarding Orem's self-care model and its utility in various nursing situations, including the arena of end stage renal disease. Descriptive presentations and case studies suggest that self-care is a desirable framework from which to deliver nursing care to patients living with this catastrophic disease. The nursing actions used in this study were based on Orem's self-care concepts and were supportive-educative.
CHAPTER III

METHODOLOGY

Research Approach

For this research project a quasi-experimental design was utilized. Because of the small size of the study group, randomization and a control group were not possible. Polit and Hungler (1983) describe the quasi-experimental research design as being particularly valuable in nursing research partially because of its practicality and feasibility.

Setting

The setting was an outpatient hemodialysis facility located in the downtown section of a midsize, southeastern, coastal city. A specific patient population with ESRD comes to this facility thrice weekly for hemodialysis treatments. The patients are assigned certain days and times to come to the clinic based on their personal needs and preferences. Patients dialyze either Monday, Wednesday, Friday (morning or afternoon) or Tuesday, Thursday, Saturday (morning or afternoon). The patients sit in assigned reclining chairs in one of four cubicles; there are four to six chairs per cubicle. The clinic provides a relaxed environment where patients can sleep, read, watch TV, cross-stitch, etc. during the hemodialysis treatments. The treatments last approximately four hours each. Keeping the patients independent is a high priority at this facility.
Population

When this research project was being planned, 88 patients were dialyzing at this facility. The attrition rate since that time has been high, as a result of new dialysis clinics opening in this area. The majority of patients at this clinic were black females with a mean age of 58 years. The average educational level attained was 7.9 grades with range extending from no formal education to graduation from college. The most common medical diagnoses were hypertension and diabetes mellitus, accounting for 66% of the primary disease processes. The patient population of this facility was chosen because this is where the investigator was employed. The investigator knew the patients and had easy access to the medical records. All charts were reviewed to determine the patients who demonstrated weight gains in excess of 2 kilograms in between dialysis. At least 51 patients met this criteria; 60% of the patient population had self-care deficits.

Sample

As the patient population was being reviewed, it was discovered that 23 black females over the age of 55 presented a rather homogeneous group. The criteria for inclusion in the study became (a) black female, (b) 55 years of age or older, (c) averaging interdialytic weight gains of 2 kilograms or more, (d) having been on dialysis at least six months, (e) not missing over three consecutive treatments secondary to hospitalization or planned vacation; and (f) be mentally competent.
The 23 persons who met the above criteria were approached by the investigator regarding the study. Three patients planned on transferring, six patients improved their weight gains, one patient was hospitalized, three patients refused, and ten patients agreed to participate. Subsequently one patient was successfully transplanted the week prior to the experimental phase of the study. A convenience sample of nine participated in the study.

**Procedure**

The investigator received permission to conduct the study from the Medical Director and the Administrator of the facility where the project was to take place. In addition, an application was submitted to the Institutional Review Board (IRB) of the Medical University of South Carolina. Because of the nature of the proposed study, it was determined that the participants need not sign an informed consent. In addition the IRB deferred the application to the Expedited Review process as a method of saving time. The IRB maintained periodic contact with the investigator to monitor the progress of the study and to continue surveillance to ensure the protection of human rights.

The potential participants of the study were approached by the investigator during their routine dialysis treatments. A full explanation of the study was given and the patient was invited to join; all patients had the right to refuse and the right to drop out of the study at any time. The only potential risk to the patient was the possibility of embarrassment should the patient have difficulty answering the two tools used in the study.
Confidentiality was maintained at all times regarding the patient's responses to the study tools. At the time the patient agreed to be in the study, the investigator negotiated with the patient the days and times of future meetings.

Data Gathering Process

The first phase of the study lasted four weeks during which time the patient received 12 dialysis treatments. The 12 interdialytic weight gains were recorded and provided a baseline for each patient. With each treatment the patient weighed on the same set of balanced scales wearing approximately the same amount of clothing. The scales were calibrated every morning.

During the last week of the first phase the Nursing Supervisor administered to each participant the tool to measure exercise of self-care agency. The Nursing Supervisor explained the questionnaire to the patient, read it to the patient, and marked the answer as indicated by the patient. This procedure took place in an office outside of the patient care area to assure the patient's confidentiality and protect the right to privacy. The questionnaire was read to all patients to control for any difficulty in reading a patient may have and guard against embarrassing the patient. Having only one person administer the tool helped keep the way in which the tool was administered consistent. The primary investigator did not see the completed questionnaire until after the project was finished. This prevented the investigator from forming any preconceived notions
about the patients' capability for self-care prior to the experimental phase of the study.

The Exercise of Self-Care Agency Scale (ESAS) (Appendix A) was constructed by Kearney and Fleischer (1979). The 43 item questionnaire was developed to measure a person's perception of his or her exercise of self-care agency. Each item is scored on a 5-point Likert scale. Clarification regarding the way in which test results are interpreted was sought. According to Ms. Kearney (Personal Communication, January 26, 1987) the raw score is compared to the score obtained in her study on the development of the tool. Scores higher than 120 to 125 as reported in her study are considered as indicators of good exercise of self-care agency. The degree of good is rather arbitrary. The maximum score is 172 which indicates a high degree of exercise of self-care agency.

Kearney and Fleischer (1979) hypothesized that there would be a positive correlation between the exercise of self-care agency and internal control as measured by Rotter's Internal-External Locus of Control Scale. This hypothesis was not supported indicating that locus of control has no bearing on exercise of self-care agency. A person may practice self-care from either internal motivation or secondary to external authority figures.

The ESAS was found to be reliable with both the test-retest and split-half methods. Evidence of content and construct validity was found. The population used for these studies were
nursing students (n = 79, first testing; n = 84 second testing) and college students taking a psychology course (n = 153) (Kearney & Fleischer, 1979). Written permission to use this tool was obtained from the authors.

The second phase of the study extended over the next four weeks during which time the patient received 12 more dialysis treatments. This was the experimental phase of the study. The first step in phase two was to assess the patient. It was assumed that the patient had a self-care deficit based on the objective data of the excessive interdialytic weight gains. In order to help clarify the cause of this deficit, the patient was asked to answer seven multiple choice questions regarding fluids and fluid control (Appendix B). The test was used for screening patients to identify if a knowledge deficit was present.

The seven questions were part of a 33 item multiple choice Dialysis Knowledge Questionnaire which was found in a publication of the National Kidney Foundation. The reliability and validity of the tool was not addressed (Cohen & Gildea, 1984).

The test was read to all patients in the same manner as the ESAS but this time by the investigator. A score of 70% was considered adequate. An educative-supportive nursing system was immediately established with teaching and supporting being the methods of assisting the patient develop her self-care agency.

The investigator met with each participant individually at the time specified by the patient. During this phase the patient was seen for at least four sessions lasting anywhere from 15
minutes to one hour a piece. The time fluctuated with the needs and desires of the patient; each session was individualized for each patient.

The educational session was kept short and simple. The roles of motivation and knowledge were discussed; the meal plan, measuring cups, and scales were discussed; and fluid overload in relation to how it made the individual patient feel was discussed. Tricks of the trade were shared when appropriate; things such as - measure out the fluid for the day in one container then drink only from that container and suck on a lemon to quench thirst - are a couple of examples.

The supportive-educational sessions focused on the patient, the weight gain, what had helped maintain the weight or what had hindered the maintenance of fluid control. Personal stressors were explored including their possible contributory role to fluid overload. The 12 interdialytic weight gains for the experimental phase were recorded.

The third and final phase of the study extended over the next four weeks. The patient again dialyzed 12 times. No contact by the investigator was made with the nine participants but the 12 interdialytic weight gains were still recorded.

Variables

The independent variable in this study was the nursing system based on Orem's conceptual model of nursing. The nursing system utilized was supportive-educative. This system is indicated in situations where the patient is able to perform required measures
of therapeutic self-care but cannot do so without assistance. Valid helping techniques include combinations of support, guidance, provision of a developmental environment, and teaching (Orem, 1985).

The dependent variable in this study was the interdialytic weight gain. For purposes of this study 0.1 kilogram was equivalent to 100 cc of fluid. A weight gain of 0.5 kilograms or 500 cc per 24 hours is considered ideal for this patient population (Bollin & Hart, 1982; Larson, Lindbloom, & Davis, 1982; Liddle, 1984; Yanitski, 1983).

The extraneous variables with regard to the attributes of the sample population were controlled by keeping the group as homogeneous as possible. In regard to the environment, the rest of the staff was neither told of the study nor of what the investigator was doing. The Nursing Supervisor was the only nursing personnel who knew what was happening. This was done so that the staff would not alter their usual patterns of providing nursing care.

With this patient population it is never known when hospitalization may be deemed necessary. Had any of the sample required lengthy hospital stays, they would have been dropped from the study. Fortunately none of the sample population needed hospitalization during the three month study.

Assumptions and Limitations

The assumptions of this study included: (a) weights were measured and recorded accurately, (b) subjects answered the two
study tools to the best of their abilities, (c) the ESAS is an appropriate tool to be used with chronically ill patients, and, (d) the knowledge questionnaire was an accurate evaluator of the patient's level of knowledge regarding fluids. Ideally, the weights would have been measured and recorded by the investigator but this was not practical and would have called attention to the study.

The limitations of this study included: (a) the sample size and (b) the administration of the tools being either predialysis or during dialysis. The patient was allowed to choose where and when meetings would take place. No patient chose to meet after dialysis when cognitive abilities have been shown to be improved (West, 1978).

The sample size was small and unrepresentative of the total patient population. Because of this the employment of inferential statistics was negated and generalization of the findings thwarted.
Chapter IV
Presentation and Analysis of Data

The Sample

Nine subjects, all of whom were black and female, provided the data for this project. The average age of the women was 65.4 years with the range extending from 58 to 73 years. The average educational level was 6.2 years with the range extending from 2 years to 13 years of formal education. The average length of time on dialysis was 3.8 years with the range extending from 8 months to 123 months.

While assessing the sample population it was discovered that the group was more homogeneous than seemed apparent. All nine of the subjects were diagnosed as being hypertensive and eight of the nine were diabetic. All nine had previously worked outside of the home, most commonly as a custodian, domestic worker, or field worker. One participant was a retired licensed practical nurse. All nine were either widowed or separated for at least three years but more commonly for ten years. Five of the subjects lived alone; four lived with one of their children or grandchildren. The subjects who lived alone liked it that way and had the support of family and/or friends.

The data indicated that the sample population was similar not only from a health orientation but also from the developmental
stage, life cycle events, and the sociocultural orientation. Yet, each was an individual and treated as such.

The Data

The data for this project included the scores on the Exercise of Self-care Agency Scale (ESAS), the results of the knowledge test, and the 36 interdialytic weight gains over the three month study period. Data summarizing the scores on the level of knowledge questionnaire are presented in Table 1.

Table 1

<table>
<thead>
<tr>
<th>Subject</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1</td>
</tr>
<tr>
<td>S2</td>
<td>1</td>
</tr>
<tr>
<td>S3</td>
<td>0</td>
</tr>
<tr>
<td>S4</td>
<td>3</td>
</tr>
<tr>
<td>S5</td>
<td>3</td>
</tr>
<tr>
<td>S6</td>
<td>2</td>
</tr>
<tr>
<td>S7</td>
<td>3</td>
</tr>
<tr>
<td>S8</td>
<td>0</td>
</tr>
<tr>
<td>S9</td>
<td>3</td>
</tr>
</tbody>
</table>

As shown in Table 1, the mean score on the level of knowledge questionnaire was 1.8. The range extended from 0 to 3.
Data reflecting the scores on the ESAS and the interdialytic weight gains are presented in Table 2.

Table 2

<table>
<thead>
<tr>
<th>Subject</th>
<th>ESAS Score</th>
<th>PHASE 1&lt;sup&gt;a&lt;/sup&gt;</th>
<th>PHASE 2&lt;sup&gt;b&lt;/sup&gt;</th>
<th>PHASE 3&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>117</td>
<td>+2.5</td>
<td>+2.8</td>
<td>+2.9</td>
</tr>
<tr>
<td>S2</td>
<td>129</td>
<td>+3.0</td>
<td>+4.1</td>
<td>+3.7</td>
</tr>
<tr>
<td>S3</td>
<td>137</td>
<td>+2.7</td>
<td>+2.8</td>
<td>+2.6</td>
</tr>
<tr>
<td>S4</td>
<td>126</td>
<td>+2.1</td>
<td>+2.2</td>
<td>+2.4</td>
</tr>
<tr>
<td>S5</td>
<td>129</td>
<td>+3.2</td>
<td>+3.3</td>
<td>+3.5</td>
</tr>
<tr>
<td>S6</td>
<td>142</td>
<td>+3.2</td>
<td>+2.6</td>
<td>+2.8</td>
</tr>
<tr>
<td>S7</td>
<td>126</td>
<td>+3.0</td>
<td>+3.5</td>
<td>+3.4</td>
</tr>
<tr>
<td>S8</td>
<td>131</td>
<td>+3.3</td>
<td>+3.4</td>
<td>+3.5</td>
</tr>
<tr>
<td>S9</td>
<td>139</td>
<td>+2.8</td>
<td>+2.8</td>
<td>+2.6</td>
</tr>
</tbody>
</table>

a. Phase 1 consisted of the 4 weeks immediately prior to the experimental phase of the study; the mean is for the 12 weights for each subject.

b. Phase 2 was the 4 weeks of the experimental phase of the study; the mean is for the 12 weights for each subject.

c. Phase 3 consisted of the 4 weeks immediately after the experimental phase of the study; the mean is for the 12 weights for each subject.
As Table 2 indicates, the average score on the ESAS was 130 with the range extending from 117 to 142. The mean weight gain for the subjects in phase one of the study was 2.86 kilograms with the range extending from 2.1 to 3.3. In phase two that mean was 3.05 kilograms with a range of 2.2 to 4.1. And in the third phase, the mean weight gain was 3.04 kilograms with a range of 2.4 to 3.7.

In order to determine if there were any post experimental differences in mean weight gains among those who scored above the mean on the ESAS and those who scored below, the scores were ranked ordered. These data appear in Table 3.

Table 3

Rank Order of ESAS Scores and Mean Weight Changes Following Experimental Phase

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>ESAS SCORE</th>
<th>PHASE 2</th>
<th>PHASE 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>S6</td>
<td>142</td>
<td>-0.6</td>
<td>-0.4</td>
</tr>
<tr>
<td>S3</td>
<td>137</td>
<td>+0.1</td>
<td>-0.1</td>
</tr>
<tr>
<td>S9</td>
<td>136</td>
<td>0</td>
<td>-0.2</td>
</tr>
<tr>
<td>S8</td>
<td>131</td>
<td>+0.1</td>
<td>+0.2</td>
</tr>
<tr>
<td>S5</td>
<td>129</td>
<td>+0.1</td>
<td>+0.3</td>
</tr>
<tr>
<td>S2</td>
<td>129</td>
<td>+1.1</td>
<td>+0.7</td>
</tr>
<tr>
<td>S4</td>
<td>126</td>
<td>+0.1</td>
<td>+0.3</td>
</tr>
<tr>
<td>S7</td>
<td>126</td>
<td>+0.5</td>
<td>+0.4</td>
</tr>
<tr>
<td>S1</td>
<td>117</td>
<td>+0.3</td>
<td>+0.4</td>
</tr>
</tbody>
</table>
As can be seen in Table 3, as a group, the patients who scored above the mean on the ESAS lost a total of 0.4 kilograms following phase one with a mean loss of 0.1 kilogram in phase two. During phase three of the study, this group of patients lost 0.5 kilograms with a mean loss of 0.125 kilogram as compared to phase one. By contrast, the five subjects who scored below the mean on the ESAS, gained 2.1 kilograms as a group in phase two with a mean gain of 0.42 kilograms. In phase three, this group gained 2.0 kilograms with a mean gain of 0.4 kilograms.

It is interesting to note that the data revealed that those patients who scored above the ESAS mean, averaged 3.0 kilograms interdialytic weight gains in phase one. In comparison, the subjects who scored below the ESAS mean began with a mean weight gain of 2.77 kilograms.

Discussion

The outcome of this study is probably the result of many factors. The nursing system designed for this sample population was similar for all, yet quite different for each participant making quantitative objective data difficult to obtain. The investigator assessed each participant carefully and worked with each participant one-to-one.

The results of the level of knowledge questionnaire revealed a knowledge deficit existed. Not one subject passed this test. Different results may have been obtained if the tests were given post-dialysis as suggested by West (1978). All patients in this facility receive at least monthly dietary counseling from a
registered dietitian. In addition, the nursing staff is available to provide instructions inbetween these visits. It may be that these patients possess a practical knowledge base rather than an intellectual one.

The scores on the Exercise of Self-care Agency Scale (ESAS) appeared to be high at first glance. Only one participant scored below the 120 to 125 that the nursing students and psychology students scored in Kearney and Fleischer's project (1979). One may question how a group of elderly black females with low educational levels, with diabetes, end stage renal disease and on hemodialysis, as a group, could score higher than the college students did on this tool. One might challenge the validity of the tool when used in such diverse populations.

This author would argue that this sample should have scored higher on the ESAS. This group of patients faces overwhelming health situations that may be totally devastating to other persons. This group of patients, or their significant others, has to be exercising high levels of self-care agency. Looking at the average length of time on dialysis (3.9 years) supports this claim. The self-care demands of this patient population are much greater than those of presumably healthy college students.

The identified self-care deficit of ingesting more than the prescribed amount of fluid was interesting. This one self-care deficit does not mean that self-care deficits existed in other areas of self-care. In fact, the whole issue of fluid allowance in the treatment of ESRD may be called into question. Perhaps the
ideal interdialytic weight gain of no more than 0.5 kilograms per 24 hours is too rigid. Perhaps it is the consumption of this fluid that helps to alleviate the stress of having ESRD and undergoing its complicated treatment. Perhaps this consumption of fluid was a self-care activity itself. Perhaps a patient population who regularly gained more than 3.0 kilograms in between dialysis would have provided more meaningful data.

What motivated the sample population to maintain fluid control remains a complex and unanswered question. The patients verbalized interest in self-care and their own health, saw themselves as vulnerable to fluid overload, named the complications they had had secondary to fluid overload, and listed for themselves benefits of fluid control. However, thirst, heat, social pressures, or whatever, often won out over the desire to control fluid intake. The complexity and chronicity of the disease and treatment must also be considered as possible hindering factors to fluid control. The studies previously noted by Yanitski (1983) and Parker, et al. (1985) provide objective data that support these subjective findings. Patients in those studies demonstrated the knowledge and the beliefs about the dangers of fluid overload, yet failed to maintain their weights.

Eight of the nine participants verbalized statements regarding the roles of their families and/or friends in offering support. This was subjectively analyzed as very important to the patients by the investigator. The subjects concurred that the support was meaningful. The findings of O'Brien (1980), Pultz-
Kirkby and Fox (1982), and Hilbert (1985) imply that support is important to the dialysis patient. It was interesting to note that seven of the nine participants asked the investigator when she was coming back following the experimental phase of the study.

*The subjects of this study were demographically similar to the subjects in other studies (Allison, 1973 & Harper, 1984) that utilized Orem as their conceptual framework.* The nursing system established by Harper seemed to resemble the nursing system established in this study. The objective data collected by Harper seemed to support the continuation of that nursing system.

The sample of this study was small and not representative of the outpatient hemodialysis population in general. And, the differences generated were found to be statistically insignificant. Yet, during the experimental phase the group of subjects who scored above the mean on the ESAS did demonstrate a decrease in the interdialytic weight gains. This decrease continued into phase three. These data appear to support the first research hypothesis.

Because other factors remained constant during the experimental phase of the study, nursing actions have to be assumed to be a causative factor in assisting some patients to control fluid intake. Some evidence appears to support the second research hypothesis.
Summary

In order to determine the effectiveness of a nursing system based on Orem's conceptual framework, a quasi experimental research project was conducted. The subjects were nine black females who dialyzed at a moderate sized outpatient dialysis facility in a southeastern city. All participants were over 55 years of age and averaged gaining over two kilograms in between their dialysis treatments. The purpose of the study was to discern if the subjects could be helped to control their fluid intake through a supportive-educative nursing system.

Permission was obtained from the appropriate authorities at the dialysis facility and from the Institutional Review Board of the Medical University of South Carolina. The participants received a full explanation of the study including their rights.

The study was divided into three phases. In phase one baseline interdialytic weight gains were obtained. In the last week of phase one the Nursing Supervisor administered the Exercise of Self-care Agency Scale; the investigator did not know the results of this tool. Phase two was the experimental phase. The investigator administered a seven item multiple choice questionnaire regarding fluids to screen the patients' levels of
knowledge. The investigator also met with each participant at least four times during this phase. The day and time for the sessions was negotiated with each subject and a supportive-educative nursing system designed for each. Interdialytic weight gains continued to be monitored. The third and final phase consisted of monitoring and recording interdialytic weight gains. The investigator had no contact with the participants during phase three.

Findings and Conclusions

Based on the data, the following findings are reported:

(a) The subjects' knowledge base regarding fluids was inadequate as indicated by the scores on the level of knowledge questionnaire;

(b) Those subjects who scored above the mean on the ESAS gained less weight between phases two and three than did those subjects who scored below the mean; and

(c) The nursing actions based on Orem's self-care conceptual framework were of demonstrated value for those clients who scored above the mean. Based on these findings, the following conclusions seemed warranted:

(a) the Exercise of Self-care Agency Scale may be a useful tool in helping to identify a dialysis patient's perceptions of exercise of self-care agency; and

(b) nursing systems based on Orem's conceptual model of self-care may be useful in an outpatient hemodialysis facility.
Recommendations

Based on the findings and conclusions, the investigator offers the following recommendations for further research:

(a) that further attempts be made to link nursing theory to nursing practice through research;

(b) that nurses conducting research on subjects with whom they have contact of long standing continue to use objective measures to demonstrate change; and,

(c) that in future research in which attempts to change behavior of the chronically ill are made, a longer experimental phase than was used in this study be incorporated in the design.
References


APPENDIX A

Exercise of Self Care Agency Scale (ESAS)

The ESAS can be obtained by writing:

Ms. Barbara Y. Kearney
Louisiana State University School of Nursing
1900 Gravier Street
New Orleans, Louisiana 70112-2262

Telephone Number: (504) 568-4200
APPENDIX B

Level of Knowledge Questionnaire

Number ____________

Please answer all questions by circling the most correct response:

1. Symptoms of fluid overload include:
   a. Shortness of breath, edema
   b. Bone pain, blurred vision
   c. Chest pain, thirst
   d. All of the above

2. Which medical problem is not associated with fluid overload:
   a. High blood pressure
   b. Fluid in the lungs
   c. Fluid around the heart
   d. Low blood pressure

3. Which of the following contributes to fluid overload:
   a. Excessive protein in diet
   b. Excessive salt intake
   c. Excessive phosphorous in the diet
   d. Excessive potassium in the diet

4. How many compartments within the body hold fluid:
   a. 1   c. 3
   b. 2   d. 4

5. Hemodialysis directly removes fluid only from the:
   a. Blood   c. Tissue
   b. Lungs   d. All of the above

6. How much fluid is there in one (1) pound:
   a. 120 cc (1/2 cup)   c. 500 cc (1 pint)
   b. 240 cc (1 cup)     d. 1000 cc (1 quart)

7. Fluid overload adds stress to which system:
   a. Heart   c. Vascular systems (arteries and veins)
   b. Lungs   d. All of the above