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The Relationship of health locus of control and treatment adjustment in chronic hemodialysis

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**The relationship of health locus of control and treatment
adjustment in chronic hemodialysis**

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San Jose State University, 1993

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THE RELATIONSHIP OF HEALTH LOCUS OF CONTROL AND TREATMENT
ADJUSTMENT IN CHRONIC HEMODIALYSIS

A Thesis

Presented to

The Faculty of the Department of Nursing
San Jose State University

in Partial Fulfillment
of the Requirements for the Degree
Master of Science

by

Melinda Zimmer-Rankin

August, 1993

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ABSTRACT

THE RELATIONSHIP OF HEALTH LOCUS OF CONTROL AND TREATMENT ADJUSTMENT IN CHRONIC HEMODIALYSIS

by Melinda Zimmer-Rankin

This study explored the relationship between locus of control (LOC) and adjustment to the prescribed treatment regimen in chronic hemodialysis patients. The two areas of treatment adjustment examined were dietary compliance and fluid restriction as measured by serum potassium, phosphorus, urea nitrogen levels, and interdialytic weight gains. Using the Multidimensional Health Locus of Control Scale Questionnaire (MHLC) and chart reviews, data were collected and analyzed from 31 hemodialysis patients.

The data showed there was not a strong relationship between internal LOC and any physiological indicator of treatment adjustment. External LOC and powerful other LOC were significantly correlated with a decrease in BUN ($r = -.42$, $p = .02$ and $r = -.57$, $p = .0008$). The results suggest that beliefs about the control one has over their health is not a primary influence upon adjustment or adherence to the prescribed treatment regimen. Future investigations into treatment adjustment to the prescribed regimen of chronic hemodialysis should consider additional factors which may influence compliance in this population.

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Chapter 1

INTRODUCTION

The annual data report from the TransPacific Renal Network of Northern California indicated that as of December 31, 1991, there were 130,097 individuals diagnosed with end stage renal disease (ESRD) on some form of dialysis in order to sustain life. According to Speroles (1977) the National Dialysis Registry reported only 29,182 patients on chronic hemodialysis in the United States in January of 1977. In less than 15 years the number of individuals on chronic hemodialysis had increased to 116,847 (TransPacific Renal Network, 1991).

With the advent of hemodialysis as a method to sustain life, an ever increasing population who would have otherwise died now live in "abject dependence upon a machine and a prescribed treatment regimen" (Levy, 1974). The chronic hemodialysis population is comprised of individuals from a variety of cultural, educational, and financial backgrounds. The diversity, the growing size of this population, and the mortality associated with this disease reveal the need for planning and research to meet projected health care needs.

Problem

The problem to be examined in this study is the potential influence an individual's locus of control (LOC)

has on adjustment to the prescribed treatment regimen of chronic hemodialysis. The ability to adjust to the prescribed treatment protocol differs among individuals and may depend upon certain aspects of the regimen such as fluid and dietary restrictions (Wolcott, Maida, Diamond, & Nissenson, 1986). In addition, various psychological stressors may impact an individual's ability to cope with the demands of chronic hemodialysis.

Failure to comply with various aspects of the treatment regimen, such as dietary compliance and fluid restriction, may result in serious, life threatening crises and a potentially decreased survival time. The two primary complications related to noncompliance to the prescribed fluid and dietary protocol and requiring immediate medical and nursing interventions are: (a) hyperkalemia and (b) pulmonary edema (Lancaster, 1987). Hyperkalemia is the most serious electrolyte problem associated with renal failure. It is a condition that results from too much potassium in the blood due to the following: (a) failure of the excretory ability of the kidneys, (b) breakdown of cellular protein which releases potassium, (c) acidosis, and (d) excesssive potassium intake (Lewis & Collier, 1992). Hyperkalemia may precipitate cardiac dysrhythmias, cardiac arrest, and death. Pulmonary edema results from the accumulation of extravascular fluid in the alveoli of the

lungs causing severe shortness of breath and dyspnea which may lead to hypoxemia, respiratory failure, and death (Urdang & Swallow, 1983). Pulmonary edema may be linked to excessive fluid intake in the chronic hemodialysis population.

Inability to adjust to the prescribed treatment regimen may exacerbate other physiological complications which include hypertension, neuropathy, and renal osteodystrophy. Hypertension is an elevated blood pressure due to the kidney's inability to excrete sodium and water (Lancaster, 1987). Hypertension can partially be controlled by sodium and fluid restriction. Neuropathy is initially manifested by a slowing of nerve conduction to the extremities. It may lead to muscle weakness and paresthesia which sometimes require the use of braces, walkers, or crutches for ambulation (Hudak, Gallor, & Lohr, 1986). The exact cause of neuropathy is unknown, however, it may be exacerbated in the presence of severe or chronic uremia (Lewis & Collier, 1992). Uremia is the accumulation of nitrogenous waste products which causes physiologic changes and alters the function of various organ systems. The end products of nitrogen breakdown are directly proportional to one's protein intake (Lancaster, 1987). Renal osteodystrophy is a bone disease that occurs from an imbalance of calcium and phosphorus associated with end stage renal disease (Hudak et

al., 1986). Renal osteodystrophy causes demineralization of the bones which may lead to spontaneous fractures. In addition, the imbalance between phosphorus and calcium may lead to the formation of calcium phosphate crystals that deposit in various parts of the body, especially the brain, eyes, lung, and myocardium (Lancaster, 1987).

Adjustment to the prescribed treatment regimen has been a prime health care issue in the chronic hemodialysis population over the past few decades. Past research studies have focused on: (a) situational factors (Cummings, Becker, Kirscht, & Levin, 1982; Procci, 1978), (b) characteristics of the treatment regimen (Blackburn, 1977; Hartman & Becker, 1978; Kaplan De-Nour, 1981), (c) demographic elements (Brock, 1990; Cumming et al., 1982; Procci, 1978, 1981), and (d) patient-physician interaction (Kirilloff, 1981). Theoretical models that explored hemodialysis compliance have included: (a) health beliefs and health promotion (Bandura, 1976, 1977; Cummings et al., 1982; Hartman & Becker, 1978), (b) sociocultural, learning theory, cognitive theory (Blackburn, 1977; Kaplan De-Nour & Czaczkes, 1976; Kirilloff, 1981; Levy, 1980; Procci, 1981); and (c) personality traits (Poll & Kaplan De-Nour 1980; Rosenstock, Strecher & Becker, 1988; Rotter, 1954, 1966; Zetin, Plummer, Vaziri, & Cramer, 1981).

Psychiatrists have played an active role in identifying and treating various psychological factors and personality traits associated with the inability to adhere and adjust to the prescribed regimen in chronic hemodialysis patients. Sand, Livingston, and Wright (1966) were among the first to note psychological factors as influential elements in determining adjustment to various aspects of the hemodialysis regimen. Later reports concentrated on the perceptions, anxieties, and stresses associated with chronic dialysis (Procci, 1978). More recent studies have gathered information about specific personality characteristics such as locus of control and cognitive variables which may promote or hinder treatment adjustment (Brock, 1990; Brown & Fitzpatrick, 1988; Levin & Schulz, 1980; Poll & Kaplan De-Nour, 1980; Zetin et al., 1981).

The problems associated with treatment adjustment to the prescribed regimen of chronic hemodialysis are widespread. There may be significant individual differences in the level of adjustment depending upon different aspects of the regimen. The diversity of the chronic hemodialysis population, in addition to the complexity of the treatment regimen, makes it difficult to create a standard profile to identify all individuals at risk of engaging in behaviors associated with noncompliance. However, the life threatening implications of noncompliance to the prescribed

treatment regimen calls for future planning and research to prevent complications and promote behaviors conducive to treatment adjustment.

Purpose

The purpose of this study was to explore the relationship between a psychological concept, locus of control, and the ability to comply with the prescribed treatment regimen in 31 chronic hemodialysis patients. The ability to comply to the prescribed treatment regimen was measured by the following: (a) predialysis serum potassium (K) levels, (b) serum phosphorus (P) levels, (c) blood urea nitrogen (BUN) levels, and (d) interdialytic weight gains (IWG). The individual's self-reported health locus of control (HLOC) was derived from the total points scored on an 18 item multidimensional health locus of control questionnaire.

Research Question

The question that guided this research was: What is the relationship between locus of control and adjustment to the prescribed treatment regimen in chronic hemodialysis patients?

Sub Questions

1. What is the relationship between locus of control and predialysis serum potassium levels?

2. What is the relationship between locus of control and predialysis serum phosphorus levels?

3. What is the relationship between locus of control and predialysis blood urea nitrogen levels?

4. What is the relationship between locus of control and interdialytic weight gain?

Definitions of Terms

1. End-stage renal disease (ESRD) occurs when the kidneys are no longer functioning sufficiently to support life. The kidneys are unable to filter excess fluid and waste products, regulate fluid and electrolytes, regulate blood pressure, or stimulate the production of red blood cells (RBC).

2. Hemodialysis is a method of using an artificial kidney machine and an artificial kidney (dialyzer) to remove excess fluid and waste products from the blood. The treatment generally takes 3-4 hours and must be done routinely 3 times a week.

3. Chronic hemodialysis patient is an individual who has been medically diagnosed as having ESRD and requires hemodialysis to sustain life.

4. Prescribed treatment regimen includes hemodialysis treatments 3 times per week, a diet low in potassium and protein, and a fluid restriction of 1000-1500 cc per day.

5. Optimum physiological treatment adjustment is defined by the criteria established by Wenorowicz, Riskind, and Jenkins (1978). These criteria were measurements of:

- (a) predialysis serum potassium (K) less than 5.5 meq/l,
- (b) predialysis serum phosphorus (P) less than 4.5/dl,
- (c) predialysis serum urea nitrogen (BUN) less than 100 mg/dl, and (d) interdialytic weight gain (IWG) less than 2.6 kilograms. Furthermore, it includes those behaviors undertaken by an individual to maintain an optimal level of physical well-being (e.g., adhering to prescribed treatment regimen).

6. Interdialytic weight gain (IWG) is the amount of weight that is gained in between dialysis treatment.

7. Uremia is the presence of excessive amounts of urea and other nitrogenous waste products in the blood as compared to normal blood values. Historically, increased protein catabolism has been associated with the severity of clinical manifestations of uremia. Urea is the bulk catabolite of protein. Blood urea nitrogen (BUN) concentration is generally considered a non toxic solute except at very high levels (Lancaster, 1987).

8. Kt/V is a symbol showing part of the urea kinetic model. It is a mathematical description of input, output, and accumulation of urea in patients with chronic renal failure or end stage renal disease. Kt/V was developed as

an index of dialysis adequacy. Kt/V is the dialyzer urea clearance value multiplied by the length of dialysis then divided by the patient's volume. For example: dialyzer urea clearance is 170 ml/min or 0.170 liters/min; treatment time is 3 hours or 180 minutes; the patient's volume is 30 liters, then: $Kt/V = (.170)(180)/30 = 1.02$. A dialysis prescription providing a Kt/V greater than 1.0 reduces the risk of uremic complications in chronic hemodialysis patients (Lancaster, 1987).

9. Health Locus of Control (HLC) refers to the degree to which individuals perceive events in their lives as being a consequence of their own actions (Wallston & Wallston, 1978). An individual with an internal locus of control believes that his/her actions have causal relationships which produce outcomes. On the other hand, a person with an external locus of control relates events and outcomes to forces such as fate, chance, or powerful others (Rotter, 1966).

Summary

The anticipated benefit of the study is improved understanding of the relationship between locus of control and the ability to adjust to the prescribed treatment regimen in the chronic hemodialysis population. This knowledge may serve as a basis for identification of individuals at risk of engaging in behaviors that may

precipitate serious life threatening complications.

Moreover, it will aid in the development of readily needed education strategies designed to teach health behaviors that will promote treatment adjustment and, therefore, maximize health.

Chapter 2

CONCEPTUAL FRAMEWORK AND REVIEW OF LITERATURE

This chapter begins with background information that describes the complexity associated with treatment adjustment to the prescribed regimen among the chronic hemodialysis population, after which, the theoretical foundation for exploring the relationship between a person's locus of control and treatment adjustment is discussed. This chapter concludes with a review of locus of control and its relationship to treatment adjustment within the chronic hemodialysis population.

Background Information

Clinical investigations of patients undergoing long-term hemodialysis are in unanimous agreement as to the tremendous psychological stress constantly faced by these individuals. Fear of death, loss of income, reductions in family and social status, uncertainty about the future, lack of stamina, changes in body image, and worry about additional medical problems all contribute to one of the most stressful life situations imaginable (Goldstein & Reznikoff, 1971; Lancaster, 1987). These psychological stressors result in varying degrees of depression and other psychopathology disorders in this population (Tynes, Ruggiero, & Brantley, 1993). An individual's effort to cope

with chronic hemodialysis and its demanding treatment regimen may be related to these psychological stressors. Therefore, nursing interventions and patient goal setting should be based on the assessment of various stressors in order to promote adjustment (Lancaster, 1987).

Few medical illnesses require a treatment program as demanding or as stringent as chronic hemodialysis. Adjustment to the prescribed treatment regimen of chronic hemodialysis is a complex interaction of the patient's ability to respond to diet, medication, scheduling of treatment, social and vocational expectations, and numerous other factors (Zetin, Plummer, Vaziri, & Cramer, 1981).

Individuals that are noncompliant with the prescribed treatment regimen may have severe consequences to health and survival. Plough and Salem (1982) and Kaplan De-Nour (1981) found that dietary indiscretion was the primary and immediate cause of death from congestive heart failure (a complication associated with excessive fluid intake). Cummings, Becker, Kirscht, and Levin (1981) found that fluid noncompliance is a widespread problem for more than one third of patients with end stage renal disease. Not surprisingly, patients report being persistently preoccupied with thirst (Rosenbaum & Ben-Ari Smira, 1986) and rank fluid compliance as the most stressful of 30 physiological and psychological stressors (Baldree, Murphy, & Powers, 1981).

Brown and Fitzpatrick (1988) investigated dietary compliance in 41 randomly selected dialysis clients from a large renal dialysis unit in a London teaching hospital. Twenty patients were on home hemodialysis, 11 were hemodialyzed at the hospital and 10 were on continuous ambulatory peritoneal dialysis (CAPD). Objective criteria to assess dietary abuse included: (a) interdialytic weight gain (IWG) to indicate fluid intake, (b) blood potassium (K) levels to assess potassium intake, and (c) serum urea (BUN) levels to reflect protein intake. Assessment of dietary abuse was made on a 4-point scale, from great abuse (4) to excellent or no abuse (1). The results revealed that 58% of the 41 subjects had difficulty with various aspects of their dietary regimen as measured by elevated interdialytic weight gains, potassium and urea blood levels.

Hartman and Becker (1978) measured regimen compliance with the following objective criteria: (a) serum phosphorus (P) level, (b) serum potassium (K) levels, and (c) interdialytic weight gain (IWG). The results of the study revealed that only 39% of 50 stable chronic hemodialysis patients were compliant with phosphorus binding medications (PBM), 74% with diet based on serum potassium levels, and 78% with fluid restriction based on interdialytic weight gain (IWG).

The predominant methods of assessing one's ability to adapt to the prescribed treatment regimen are: (a) objective laboratory values, (b) patient self-reports, and (c) reports from dialysis personnel (Wolcott et al., 1986). These methods may also identify those individuals at risk for life threatening crises and other complications. Objective measurements of treatment adjustment include the following physiological markers: (a) serum potassium levels, (b) serum phosphorus level, (c) blood urea nitrogen levels, and (d) interdialytic weight gains (Wolcott et al., 1986).

Conceptual Framework

The theoretical foundation of this study was the social learning theory which evolved from Julian Rotter's early work (1954, 1966). The focus of this review will be Locus of Control, hereafter referred to as LOC. The inquiry of LOC will include a discussion of the construct as introduced by Julian Rotter and the scale to measure LOC.

Rotter (1954, 1966) investigated the role of reinforcement in explaining behavior. Reinforcement acts to strengthen an expectancy that a particular behavior will be followed by the same reinforcement in the future. Rotter pointed out that the effect of reinforcement following a particular behavior depends upon whether or not the person perceives a causal relationship between his/her own behavior and the reinforcement. This perceived relationship between

behavior and its reinforcement or outcome has been referred to as the LOC. If the person perceives that the reinforcement (outcome) is contingent upon his/her own behavior, then this belief derives from an internal LOC. On the contrary, when an individual interprets a reinforcement to one's behavior not totally a result of his/her own actions, but rather the result of luck, chance, or fate, this belief is from an external LOC according to Rotter.

Rotter (1975) expressed that there were problems and misconceptions about the Internal-External Scale to measure LOC. "It was developed as a broad gauge instrument...to allow for a low degree of prediction of behavior across a wide range of potential situations" (Rotter, 1975, p. 64). Rotter dealt with global life happenings, not health specific phenomena. It was recommended that a health related locus of control scale be developed in order to determine the relationship between expectancy for reinforcement and health related behavior.

K. Wallston, B. Wallston, Kaplan, and Maides developed the Health Locus of Control (HLC) Scale in 1976. The HLC Scale was further expanded upon in 1978 by K. Wallston and B. Wallston, and is known as Multidimensional Health Locus of Control (MHLC) Scale, the tool implemented in this study.

The MHLC Scale measures the degree to which individuals believe that their health is controlled by internal versus

external forces. This multifaceted scale measures three distinct dimensions: (a) internality (IHLC), (b) chance externality (CHLC), and (c) powerful others externality (PHLC) (Wallston & Wallston, 1978). The internal locus of control segment measures the subject's beliefs about the extent to which his/her own behavior influences health. Chance locus of control measures the subject's beliefs about the extent that chance and fate influence one's health. The powerful others locus of control element of the MHLC scale measures the subject's beliefs about the extent to which doctors, nurses and other health professionals influence his/her health.

Literature Review

Rotter's Internal/External Locus of Control (I/E) scale (1966), the Health Locus of Control (HLC) scale (Wallston, et al., 1976), and the Multidimensional Health Locus of Control (MHLC) scale (Wallston & Wallston, 1978) have been utilized in past research to explore the relationship between locus of control and treatment adjustment in chronic hemodialysis populations.

Zetin, et al. (1981) investigated the influence of locus of control to treatment adjustment in 15 chronic hemodialysis patients. They hypothesized that internals in comparison with externals would demonstrate greater physiological compliance to the dialysis regimen by

maintaining lower predialysis serum concentrations of potassium, phosphorus, and urea nitrogen and lower weight gain between dialysis treatments. Good compliance was defined for each of the physiological variables by the criteria of Wenerowicz et al. (1978): (a) mean potassium less than 5.5 meq/l, (b) mean phosphorus less than 4.5 mg/dl, (c) mean BUN less than 100 mg/dl, and (d) mean interdialytic weight gain less than 2.6 kg. A global compliance score was derived by assigning 1 point for each of the above four criteria if the condition was met and 0 points if it was not met, leading to a global compliance score from 0 to 4.

All 15 subjects completed Rotter's internal/external questionnaire. Analysis of Rotter's tool in relationship to global compliance scores indicated that externals had lower overall compliance, as measured physiologically. Their findings indicated that patients with a higher external locus of control had greater interdialytic weight gain (IWG), a good proxy measure of noncompliance. However, analysis of the correlations of Rotter's tool and mean serum potassium, phosphorus, and urea nitrogen levels were insignificant.

Poll and Kaplan De-Nour (1980) studied the effect of locus of control on dietary compliance in 40 chronic hemodialysis patients. They utilized Rotter's Locus of

Control Scale questionnaire. An individual's locus of control was found to correlate significantly with diet compliance. Assessment of compliance with fluid and dietary restriction was made on a 5-point scale, from excellent (5) to great abuse (1). Internals had a mean compliance score of 3.25, whereas the externals had a mean score of only 2.15. There was a significant negative correlation between locus of control and compliance.

Brown and Fitzpatrick (1988) studied the MHLC Scale with 41 randomly chosen chronic hemodialysis patients to investigate the relationship between locus of control and dietary adjustment. The three variables examined were (a) interdialytic weight gain, (b) serum potassium, and (c) urea levels. The three measures were converted into measures of dietary compliance ranging from excellent (1), average (2), some abuse (3), and great abuse (4). Brown and Fitzpatrick's (1988) findings indicated that the level of dietary abuse was high. Fifty-eight percent of the patients showed some degree of abuse. None of the three health locus of control scales were significantly correlated with dietary abuse as measured by serum K, BUN, and IWG. Thus it would appear that beliefs about the control one has over one's health are not a salient influence upon complying with diet among this particular population. Clearly, the influence of locus of control on treatment adjustment particularly to

dietary compliance and fluid restriction requires further study.

Summary

The theoretical constructs and related empirical support for the relationship between locus of control and treatment adjustment to the prescribed treatment regimen of chronic hemodialysis were presented in this chapter. The next chapter presents the methodology that was used in the study.

Chapter 3

METHODOLOGY

This chapter begins with a description of the research design. Human subjects approval, setting, and the sample selection criteria will then be addressed. After which the development of the instrument is presented. The methods and procedures for data collection are described. The chapter concludes with the plan for data analysis.

Research Design

A prospective, nonexperimental, exploratory design was used to explore whether relationships existed among the variables utilized in this study. This design was used to examine the relationship between locus of control, dietary compliance, and fluid restriction in 31 chronic hemodialysis patients.

Human Subject Approval

The research proposal was reviewed and approved by the Human Subject Institutional Review Board at San Jose State University (Appendix A) and the Institution Review Board at the dialysis center (Appendix B). Access to the outpatient dialysis center was obtained initially by telephone contact with the Administrator of Patient Services. Upon request of the IRB, the investigator submitted an addendum (Appendix C) to the proposal which addressed the MHLC Scale questionnaire

and permitted the facility access to the results.

The 3 primary nephrologists providing medical services to participants at the dialysis center were contacted in person. An overview of the study was presented. A letter of support was received from the 3 nephrologists (Appendix D).

Written informed consent from the participants was obtained using the consent forms approved by both Review Boards (Appendix E). The consent form states that there are no anticipated risks for participating in the study, and there are no discernible benefits to the subjects. Participants with questions or complaints were provided with the appropriate names of the individuals to contact, along with their corresponding telephone numbers.

Setting

The sample for the study was recruited from an out patient chronic hemodialysis center in the South San Francisco Bay area. The facility was a free standing center that provided hemodialysis services to approximately 90 chronic hemodialysis patients. It had the capacity to dialyze 13 patients at one time. Most patients were dialyzed for 3 hours, 3 times a week.

Sample Size and Sample Selection

The criteria for sample selection included renal patients who were between 20-80 years of age and who were on

hemodialysis treatments 3 times per week and had been for at least 5 months. Only the subjects without any medically diagnosed mental disorders, impaired level of consciousness, or inability to understand written instructions were eligible to participate. Individuals with any form of mental impairment were not eligible to participate because the MHLC Scale questionnaire requires the subject to be able to read and understand English at the eighth grade level. In addition, subjects had to have a Kt/V of 1.0 or greater and a prescribed treatment regimen that included: (a) a low potassium, (b) low protein diet, and (c) a 1000 cc to 1500 cc fluid restriction per day. Individuals with a Kt/V less than 1.0 were eliminated from the study because these individuals may have elevated laboratory values as a result of inadequate hemodialysis.

Assistance was rendered by the head nurse of the dialysis center to ascertain whether the subjects met all the criteria for inclusion in the study. There were 39 potential subjects eligible to participate in this study. The researcher approached potential participants while on dialysis to explain: (a) the purpose of the research, (b) benefits of the study, (c) potential risks involved, (d) their rights as research participants, and (e) protection of confidentiality. Each subject received a cover letter explaining the study and a consent form. The

cover letter reinforced the purpose, contents, benefits, risks and confidentiality of the study. Subjects were given time to read the materials and ask questions before signing the consent form. After the consent form was signed by both the participant and investigator, a copy was given to each subject.

Out of the 39 eligible subjects in the dialysis center, 1 was in the hospital during the study, 4 refused to participate, and 2 did not return the questionnaire. Thirty-two subjects completed the questionnaire. One subject later decided not to participate and was withdrawn from the study upon request. Thirty-one patients comprised the final study sample.

Multidimensional Health Locus of Control Questionnaire

The Multidimensional Health Locus of Control (MHLC) Scale was developed by K. Wallston and B. Wallston in 1978 (Appendix F). Permission to utilize the MHLC questionnaire in the study was granted by K. Wallston (Appendix G). The MHLC questionnaire was designed to study and confirm that individual beliefs for engaging in health promoting behavior are primarily internal, a matter of chance, or under the control of powerful others (Lefcourt, 1981).

During the development of the MHLC Scale, persons over 16 years of age who were waiting at gates in a metropolitan airport were approached by a research assistant who briefly

described the study and asked if they would be willing to answer questions in a booklet. The booklet consisted of 81 personally worded health-related locus of control questions. Of the 354 persons approached, 282 (80%) took the booklet of questions. Forty-eight percent of this population were male, and 90% were white, with a median estimated age of 35-44 years. Of the 282 booklets handed out, 125 (44%) were completed and returned. Of the 125 booklets returned, 115 were utilized for the MHLC scale development. Two were returned after data analysis had begun, and 8 had to be discarded because more than 10% of the items were incomplete.

Two equivalent forms (A and B) of the MHLC Scales have been developed, each consisting of three 6-item scales. Fixed response Likert scale responses ranging from strongly agree to strongly disagree were used. The alpha reliability for the MHLC scale ranged from .67 to .77. The three MHLC dimensions are more or less statistically independent, especially the Internal Health Locus of Control (IHLC) and Powerful Other Health Locus of Control (PHLC) Scales. The IHLC and Chance Health Locus of Control (CHLC) Scales are negatively correlated (but share less than 10% common variance), and the CHLC and PHLC Scales report a moderate significantly positive correlation with a shortened version

of the Marlowe-Crowne Social Desirability Scale ($r = -.24$) (Lefcourt, 1981).

The concurrent and discriminate validity of the MHLC Scales were established by correlating them with Levenson's Internal (I), Powerful Other (P), and Chance (C) Scales. The intercorrelations of the MHLC Scales and the I, P, and C Scales were such that each MHLC Scale correlated most highly with the theoretical counterpart among Levenson's scales. The designation of items into the IHLC, CHLC, PHLC Scales was determined by a factor analysis that reproduced the three dimensions without error. The development of these new scales provided health researchers with a set of instruments with far greater potential usefulness than the original HLC scale. Not only can scores be obtained on three separate theoretically and empirically differentiated dimensions, but equivalent forms of the scales are available for research designs which require repeated administrations.

Data Collection

All data were collected directly by the investigator using chart reviews and the 18 item Multidimensional Health Locus of Control questionnaire. After obtaining informed consent, the investigator collected data from the subjects' charts to determine if they met the criteria to participate in the study. Information obtained included:

(a) demographic information; (b) the last three consecutive monthly predialysis serum K, P, BUN; and (c) the last 12 preceding IWG (Appendix H).

Each subject was approached while on dialysis, and given the 18-item MHLC questionnaire with a stamped, self-addressed, return envelope. This provided each subject with the option to either complete the form while on dialysis or take the questionnaire home and return it by mail. The data were coded to allow for anonymity. Subjects were assured that their identity would not be disclosed during the analysis or in any published report. All documents received from subjects were locked in a file cabinet in the researcher's home. Materials completed at the dialysis center were returned directly to the investigator or placed in sealed envelopes to be picked up by the investigator. For those individuals who elected to take the questionnaire home to complete, measures were taken to assure a high mail response rate. If the questionnaire was not returned within 5 days either to the dialysis center or to the investigator by mail, a follow up visit was made when the patient returned to dialysis. This follow up visit was to determine if the questionnaire had been sent or if the subject had any problems in completing it.

Data Analysis

The plan was to use descriptive statistics to analyze the demographic characteristics of the sample. The scores from this data were entered into a computer for analysis using the Statistical Package for the Social Sciences (SPSS). The Pearson product-moment correlation coefficient was computed between internal LOC, powerful other LOC, chance LOC, serum potassium level, serum phosphorus level, blood urea nitrogen levels, and interdialytic weight gains.

Summary

This chapter reviewed the design, human subjects approval and site access, sample selection criteria, instrumentation, data collection procedure, and the analytical plan for the study data. The results are presented in tables and text in the following chapter.

Chapter 4

ANALYSES AND INTERPRETATION OF DATA

The purpose of this exploratory study was to examine the relationship between health locus of control and adjustment to the prescribed treatment regimen in 31 chronic hemodialysis patients. This chapter begins with a description of the data collection, followed by the demographic elements of the sample. The Pearson product moment correlation coefficient for each locus of control subscale and the physiological indicators of treatment adjustment will be presented. The findings for each research question will then be addressed.

Data Collection

All data were collected by the investigator using the 18 item Multidimensional Health Locus of Control questionnaire and chart review. Names of potential patients who met the criteria for the study were obtained from the head nurse of the dialysis center. Patients were assisted with completion of the questionnaire as needed. Five subjects elected to take the questionnaire home to complete due to difficulty in completing the questionnaire while on dialysis. Three of the five subjects returned the questionnaire to the dialysis center. The two subjects who had not returned the questionnaire were visited while on

dialysis during their next scheduled treatment to determine if they needed assistance in completing the questionnaire. Although no problems were reported, these two patients never returned their questionnaires. Materials completed at the dialysis center were returned directly to the investigator or placed in sealed envelopes to be picked up by the investigator.

The second portion of data collection was obtained through chart review. The investigator collected data from the subjects' charts to verify that they met the criteria to partake in the study. Information obtained from the chart included demographic information and physiological indicators of treatment adjustment. The data were analyzed using the Pearson product moment correlation coefficient to ascertain if there was a relationship between LOC and treatment adjustment as indicated by serum K levels, serum P levels, BUN levels, and IWGs.

Demographic Characteristics

The convenience sample consisted of 31 renal patients from an outpatient chronic hemodialysis center in the South San Francisco Bay area. Descriptive statistics included the characteristics of the sample: (a) age, (b) sex, (c) race, (d) marital status, (e) employment status, (f) diabetic status, and (g) length of time on dialysis. Of the original

39 eligible subjects who met the criteria for the study, the final sample consisted of 31 subjects.

Table 1 summarizes the demographic characteristics of the sample. The sample consisted mainly of white, nondiabetic males. Twenty-five percent were between the ages of 25-55 years of age and 43% were 71-80 years old. The mean age was 62.5 years and the median age was 66 years. Sixty-four percent of the sample were married. More than half of the sample had been on dialysis less than 2.5 years.

Table 2 summarizes the means, medians, and range values for each of the physiological indicators of treatment adjustment (K, P, BUN, and IWG). The criteria for good physiological treatment adjustment, established by Wenerowicz and Associates (W&A) (1978) are given. In addition, the percentages of the population that exceeded the criteria for each physiological variable are presented.

The criteria for optimum physiological treatment adjustment were: (a) predialysis serum potassium less than 5.5 meq/l, (b) serum phosphorus less than 4.5 mg/dl, (c) serum urea nitrogen less than 100 mg/dl, and (d) interdialytic weight gain less than 2.6 kilograms. The mean score for serum potassium was 4.9 meq/l with a range from 3.7-6.0 meq/l. Although the mean potassium score for the sample complied with the recommended criteria for

Table 1

Demographic Characteristics of the Sample (N = 31)

Characteristics	Number (%)	
Gender		
Male	22 (71%)	
Female	9 (29%)	
Age in Years		
25-40	2 (06%)	
41-55	6 (19%)	
56-70	10 (32%)	
71-80	13 (43%)	
Ethnicity		
Caucasian	19 (61%)	
Black	9 (29%)	
Hispanic	2 (07%)	
Asian	1 (03%)	
Marital Status		
Married	20 (64%)	
Divorced	6 (19%)	
Single	2 (07%)	
Widowed	3 (10%)	
Diabetic Status		
Diabetic	9 (29%)	
Nondiabetic	22 (71%)	
Months on Dialysis		
5-30	17 (55%)	(Mean 51.4 months)
31-60	3 (10%)	(Median 24 months)
61-100	7 (23%)	
101-150	2 (06%)	
151-270	2 (06%)	

Table 2

Physiological Indicators of Treatment Adjustment (N = 31)

Variable	Mean	Median	Range	W&A Values	% Pop. > W&A Values
K (meq/l)	4.9	5.0	3.7- 6.0	<5.5	16%
P (mg/dl)	6.4	6.1	3.3-11.5	<4.5	84%
BUN (mg/dl)	71.8	77.0	42-100	<100	0%
IWG (kg)	2.9	2.8	1.5-6.7	<2.6	58%

potassium, 16% (n = 5) scored greater than 5.5 meq/l.

Therefore, 16% of the sample were in a hyperkalemic state which could have predisposed them to arrhythmias, cardiac arrest, and death.

For the entire sample the mean phosphorus level was 6.4 mg/dl, nearly one and a half times the recommended level. Eighty-four percent had values greater than 4.5 mg/dl and were therefore more likely to develop disorders associated with hyperphosphatemia which may lead to renal osteodystrophy.

The mean BUN level was 71.8 mg/dl with a range from 48-100 mg/dl. The sample meets the criteria for good physiological adjustment in regards to BUN.

Interdialytic weight gains ranged from 1.9 to 6.7 kg. with a mean value of 2.9 kg. Fifty-four percent exceeded the recommended interdialytic weight gain of 2.6 kg and consequently were at risk for life threatening complications linked with fluid overload such as congestive heart failure and pulmonary edema.

In conclusion, this sample does not demonstrate good treatment adjustment according to their physiological markers. Sixteen percent are predisposed to complications associated with hyperkalemia; 84% may be more likely to experience calcium and phosphorus imbalances associated with hyperphosphatemia; and 54% are apt to develop complications related to fluid overload.

Locus of Control

The Multidimensional Health Locus of Control scales (MHLC) yielded scores on three subscales (Wallston et al., 1978). These subscales measured the variables of internal, chance, and powerful other locus of control. Each subscale had a possible 6 to 36 score for a possible range of 30.

In Table 3, the means, standard deviations, and ranges for each subscale of the MHLC Scale are presented. The mean score on the internal LOC was 27.9 with a standard deviation of 5.0. The mean score on the chance LOC was 20.4 with a

Table 3

Multidimensional Health Locus of Control (N = 31)

Subscale	Mean	Standard Deviation
Internal	27.9	5.0
Chance	20.4	6.5
Powerful other	26.3	7.9

standard deviation of 6.5. The mean score on the powerful other LOC was 26.3 with a standard deviation of 7.9.

Table 4, reports the correlation coefficients between the four physiological indicators of treatment adjustment and the three locus of control scores. Serum potassium, phosphorus, blood urea nitrogen levels and interdialytic weight gains were each correlated with each of the internal, chance, and powerful other scores.

The data indicated that there were no statistically significant relationships between internal locus of control and any of the physiological measurements of treatment adjustment. There were no significant correlations between chance locus of control (CLOC), powerful other (PLOC), serum potassium, serum phosphorus, and interdialytic weight gains.

Table 4

Correlations Between Physiological Indicators of Treatment Adjustment and Locus of Control (N = 31)

Physiological Indicator	Locus of Control		
	Internal	Chance	Powerful Other
Potassium	$\underline{r} = .28$ $p = .13$	$\underline{r} = -.35$ $p = .06$	$\underline{r} = -.09$ $p = .63$
Phosphorus	$\underline{r} = -.02$ $p = .92$	$\underline{r} = .03$ $p = .88$	$\underline{r} = .00$ $p = .99$
Blood Urea Nitrogen	$\underline{r} = -.14$ $p = .46$	$\underline{r} = -.42$ $p = .02^*$	$\underline{r} = -.57$ $p = .0008^*$
IWG	$\underline{r} = .09$ $p = .64$	$\underline{r} = -.30$ $p = .11$	$\underline{r} = -.09$ $p = .62$

* Significant $p < .05$

However, there were significant negative correlations between CLOC and blood urea nitrogen (BUN) ($\underline{r} = -.43$, $p = .02$) and PLOC and BUN ($\underline{r} = -.57$, $p = .0008$). This strong relationship between CLOC and BUN or PLOC and BUN proposes that subjects who scored high in control by fate and powerful others had lower BUN levels, and therefore they may be more compliant with their dietary restriction of protein.

However, it should be pointed out that the BUN level for this sample was within the recommended level ($<100\text{mg/dl}$), whereas the K, P, and IWG have exceeded recommended level. This suggests the following: (a) it may be easier to control an individual's protein consumption in comparison to potassium, phosphorus, and fluid intake; and (b) the hemodialysis procedure may maintain BUN levels more effectively than potassium and phosphorus levels, and interdialytic weight gain.

Summary

In summary, a small convenience sample of 31 chronic hemodialysis patients reported their locus of control on a questionnaire. Physiological indicators of treatment adjustment were obtained from chart reviews. In reference to research questions number 1, 2, and 4, the results of this study do not support a relationship between LOC and serum potassium, phosphorus, or interdialytic weight gain within this population. There was a statistically significant positive relationship between powerful other, chance locus of control, and BUN (research question 3). Therefore, in this population, the measurement of one's LOC can only explain how one may adjust to the treatment regimen in regards to protein intake. It does not explain how one responds to the other dietary limitations such as potassium,

phosphorus and fluid restrictions associated with the complex treatment regimen of chronic hemodialysis.

In this chapter, analyses of the results obtained through chart reviews and scores from the Multidimensional Health Locus of Control Scale questionnaire were presented. A discussion of the findings, results, limitations, and recommendations for nursing research will be included in the following chapter.

Chapter 5

DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

Summary

The purpose of this study was to explore the relationship between locus of control and treatment adjustment for 31 chronic hemodialysis patients. This study determined the locus of control, reported physiological measurements of treatment adjustment, and measured the relationship between locus of control and physiological indicators of treatment adjustment among 31 chronic hemodialysis patients. This chapter draws conclusions from the study and identifies limitations to the study. This chapter concludes with the recommendations for further study and the implications for nursing practice.

The results of this study suggest that there may not be a strong relationship between locus of control and the physiological indicators of treatment adjustment except for chance LOC, powerful other LOC, and blood urea nitrogen levels. Thus, it would appear that beliefs about the control one has over his/her health may not be a salient influence upon how one adjusts to the prescribed treatment regimen of chronic hemodialysis.

The Pearson's product moment correlation coefficients revealed negative relationships between powerful other locus

of control and blood urea nitrogen levels, and there were negative relationships between chance locus of control and blood urea nitrogen levels. These correlations may suggest that subjects who score high in chance LOC and control by powerful others comply with their restricted protein intake better than those who score high on the internal locus of control subscale.

The prescribed hemodialysis treatment regimen is a complex program that requires long term psychological, sociological, and physiological adaptations. In addition, it imposes a measure of dependency upon all chronic hemodialysis patients, and therefore, it is essential that all factors contributing to successful treatment adjustment be explored. Factors linked to optimum treatment adjustment may include: (a) one's culture, (b) socioeconomic status, (c) education, (d) age, (e) disability, (f) social support, (g) perceived health status, (h) perceived control over health, (i) knowledge pertaining to treatment compliance, (j) staff-patient relationship, and (k) length of time on dialysis (Wolcott et al., 1986). These confounding variables were not controlled for in this study.

Limitations

There were several limitations to the study. First, this exploratory study utilized a small, convenience sample. Therefore, the results are limited to this specific target

population of 31 subjects and cannot be generalized to all chronic hemodialysis patients. Second, the MHLC questionnaire measures a subject's LOC. An individual's LOC may not be totally orientated to internal, chance, or powerful other, and it may vary depending upon certain aspects of the treatment regimen. Third, the results of this study did not investigate other variables that may influence compliance such as: (a) age, (b) gender, (c) employment status, (d) marital status, (e) support systems, (f) depression, (g) transplant failure, (h) other chronic medical disabilities, (i) economic status, (j) perception of illness, and (k) length of time on dialysis. Fourth, the terms internal, chance, and powerful other locus of control can only depict the subject's more common tendencies regarding the relationship of their health with adjustment to the prescribed treatment regimen. Another limitation to this study is that the MHLC questionnaire allows subjects to report data about themselves. Self reported information is a limitation in all questionnaire completion (Burns & Grove, 1987). Furthermore, the researcher must assume that the subject will be able to read and understand the questions, and then respond accurately and honestly to all 18 items.

Recommendations for Further Study

1. A replication of this study in other dialysis centers that utilize a larger population would yield valuable information to dialysis personnel.
2. A longitudinal study that examines how long term treatment adjustment to the prescribed regimen correlates with locus of control would provide valuable data over time.
3. A study that utilizes current criteria for determining compliance and treatment adjustment would provide valuable data that reflects the present chronic hemodialysis population. This study defined optimal treatment adjustment according to the criteria established in 1978 by Wenorowicz, et al. It would be valuable to apply recent standards of treatment adjustment such as those established in 1990 by the ESRD Program Management and Medical Information System.
4. A study that focuses on the possibility of changing an individual's locus of control through extensive psychological counseling would provide valuable data for nurses in health promotion and patient education.
5. A study that explores the relationship between locus of control and treatment adjustment through an incentive program would provide useful information to dialysis personnel. For example, it may be possible to change one's LOC orientation and promote treatment

adjustment by offering incentives, such as shorter dialysis treatments.

6. A study that examines the relationship of survival and mortality of chronic hemodialysis patients and their MHLC scores would generate valuable data for all health care providers.

7. A study that explores the significance "powerful others" have in contributing to an individual's level of treatment adjustment would assist nurses in health promotion.

8. A study that examines treatment adjustment and multiple psychosocial elements within the chronic hemodialysis population such as the following:

(a) social support, (b) perceived health status, (c) marital status, (d) employment, and (e) education would generate valuable data. These factors would provide more complete and concrete data regarding one's ability to adjust to the complex treatment modality of hemodialysis. This information would be valuable for all dialysis personnel.

9. A study that examines the relationship between various psychological stressors and their influence on an individual's ability to cope with the demands of chronic hemodialysis and the prescribed treatment regimen would provide valuable information. Psychological stressors to be examined include: (a) fear of death, (b) loss of income,

(c) lack of stamina, (d) changes in body image, and
(e) uncertainty about the future.

10. Further research is needed to predict a cause and effect relationship between locus of control and treatment adjustment to the chronic hemodialysis regimen.

Implications For Nursing Practice

Understanding an individual's locus of control could be helpful to nurses who wish to promote adherence to the prescribed treatment regimen in the chronic hemodialysis population. If a relationship between LOC and treatment adjustment was supported, it would be beneficial during the initial assessment of a patient beginning hemodialysis to measure the patient's LOC. Once an individual's locus of control is identified, appropriate teaching strategies could be implemented to promote treatment adjustment to the prescribed treatment regimen of chronic hemodialysis.

An individual with an internal locus of control is reinforced by his/her personal belief that a particular behavior is directly linked to his/her health. This type of patient may benefit from a one on one teaching strategy that reinforces personal control over one's health status and treatment adjustment. This same information might be given in the written form of a pamphlet or brochure. This is a cost effective way to deliver health promoting information.

A patient with a chance locus of control may feel that he/she has no control over his/her health and therefore his/her behavior is not connected with health or treatment adjustment. Individuals with an external LOC will need repetitive contact with health promoting information. Personal contacts and individual experience may be the best method of teaching health promotion to these types of individuals. The nurse may be able to encourage health promoting activities associated with treatment adjustment through individualized incentive programs.

Lastly, an individual with a powerful other locus of control orientation may associate one's health status to be dependent upon the behaviors of others such as family, friends, and health professionals. This individual might benefit more from receiving health promoting information from one on one conversation with the nurse or from a guest speaker who is recognized as an expert on the subject. The focal point for nursing in this instance is to involve those significant "powerful others" in the learning process. There was a strong statistically significant negative correlation between powerful other LOC (PLOC) and blood urea nitrogen levels ($r = -.57$, $p = .0008$). Therefore, nurses need to investigate the significance of "powerful others" and their influence on treatment adjustment.

Strategies for promoting treatment adjustment in the chronic hemodialysis population will vary. It is important to keep in mind that chronic hemodialysis patients are very diversified. Therefore the nurse must be attentive to new modes for teaching a variety of individuals and groups.

A person's locus of control is only one psychological factor that may play a part in predicting adjustment and compliance to the treatment regimen. Other psychological factors include: (a) cultural background, (b) socioeconomic status, (c) education, (d) age, (e) disability, (f) social support, (g) perceived health status, (h) perceived control over health, (i) knowledge pertaining to treatment compliance, (j) staff-patient relationship, and (k) length of time on dialysis. These additional factors may play a significant role in determining treatment adjustment among the chronic hemodialysis populations.

Conclusion

This study found that locus of control was related to treatment adjustment in regards to one aspect of dietary compliance. There was a statistically significant negative correlation between chance locus of control, powerful other locus of control and serum blood urea nitrogen levels. However, the statistically significant relationship between chance locus of control and serum blood urea nitrogen is not consistent with findings from past research. Moreover, the

findings from this study do not support a relationship between locus of control, serum potassium levels, serum phosphorus levels, and interdialytic weight gains.

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APPENDIX A

San Jose State University's Human-Subjects-Institutional
Review Board Approval

A campus of The California State University

Office of the Academic Vice President • Associate Academic Vice President • Graduate Studies and Research
One Washington Square • San Jose, California 95192-0025 • 408/924-2480

To: Melinda Zimmer-Rankin, Nursing

From: Serena W. Stanford
AAVP, Graduate Studies and Research

Date: March 18, 1992

The Human Subjects-Institutional Review Board has approved your request to use human subjects in the study entitled:

"Locus of Control: A Predictor of Dietary Compliance
and Fluid Restriction in Chronic Hemodialysis"

This approval is contingent upon the subjects participating in your research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project, and with regard to any and all data that may be collected from the subjects. The Board's approval includes continued monitoring of your research by the Board to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must notify Dr. Serena Stanford immediately. Injury includes but is not limited to bodily harm, psychological trauma and release of potentially damaging personal information.

Please also be advised that each subject needs to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate or withdrawal will not affect any services the subject is receiving or will receive at the institution in which the research is being conducted.

If you have questions, please contact me at 408-924-2480.

CC: Emilie Musci, Nursing

Appendix B

Agency's Institutional Review Board Approval

A Non-Profit Corporation

April 3, 1992

Melinda Zimmer-Rankin

Dear Melinda:

This letter is to confirm our phone conversation of yesterday. Satellite's IRB did approve your request to study, as described in your proposal, the patients in our facility for your research.

As we discussed, you will need to revise the MHLC questionnaire letter (page 11) and resubmit it to me for approval before disseminating it to the patients.

All of your research work will need to be done at times other than your scheduled work time as a Staff Nurse in SDC. This would also include time spent collecting data and demographic information. While you are interacting with the patients as part of your research, you must wear a name tag indicating that you are there as a San Jose State University graduate student rather than an SDC employee.

You will need to meet with [redacted] to determine mutually agreed upon times for you to be in the facility performing your research. You and [redacted] will also need to plan a time for a staff in-service to explain your project before you begin your research work in the facility.

We wish you good luck in this endeavor, and look forward to seeing the results.

Sincerely,

Director of Patient Care Services

AR:gw

Appendix C

Addendum

Health Locus of Control: A Predictor of Dietary Compliance
and Fluid Restriction in Chronic Hemodialysis

An Addendum to the Research Proposal

Included in the methodology section entitled site access, the following statement will be added: Upon completion of this research study, a copy in its entirety will be made available to Satellite Dialysis Centers, Inc., upon their request.

Appendix D

Letter of Support from Physicians

INTERNAL MEDICINE AND NEPHROLOGY

February 14, 1992

RE:

To Whom It May concern:

This is to inform you that Melinda Zimmer has our approval to use dialysis patients on dialysis to provide her with clinical information and material for her nursing thesis.

If there is any further information that you need, please let us know.

Clinical Professor of Medicine

Clinical Associate Professor of Medicine

Clinical Associate Professor of Medicine

TIG/sc

Appendix E
Cover Letter and Consent Form

Date

Dear

I am a student at San Jose State University working towards a Master of Science Degree in Nursing Education. For my thesis I am doing a research study on the adjustment to the prescribed hemodialysis regimen focusing on dietary compliance and fluid restriction. By means of the enclosed questionnaire I hope to explore the relationship between locus of control and treatment adjustment.

Your physician, (Dr , Dr. , and Dr. , support my efforts in this project. The findings of this study will help me provide the health care professionals with a greater understanding of the locus of control construct and will facilitate the development of appropriate interventions readily needed to facilitate and improve treatment adjustment, promote health, and prevent complications.

I am asking for your assistance in completing this questionnaire. The enclosed questionnaire should take less than 10 minutes to complete. You can be assured that any information that can be identified with you will remain confidential and disclosed only with your consent.

I truly appreciate your time, cooperation and honest response in completing this form. This research is designed to assist hemodialysis patients like yourself adjust to the stringent complex treatment regimen associated with hemodialysis. The results of the study will be available to you upon your request. Please feel free to contact me with and questions or concerns regarding this questionnaire. I will look forward to your response.

Sincerely,

Consent Form
AGREEMENT TO PARTICIPATE IN RESEARCH
SAN JOSE STATE UNIVERSITY

RESPONSIBLE INVESTIGATOR; Melinda Zimmer-Rankin

TITLE OF PROTOCOL; Locus of Control: A predictor of
Treatment Adjustment in Chronic Hemodialysis.

I have been asked to participate in a research study that is exploring the relationship between health locus of control and treatment adjustment to chronic hemodialysis focusing on dietary compliance and fluid restriction. The results of this study will help health care professionals gain a fuller understanding of locus of control and treatment adjustment in order to develop appropriate interventions.

I understand that

- 1) I will be asked to complete an 18-item questionnaire. It will take me about 10 minutes to complete. I will return it to the primary investigator within 2 weeks:
- 2) There are no anticipated risks to me in this study. However, I may experience some psychological discomfort while completing the questionnaire due to the sensitive nature of the questions.
- 3) There are no discernible benefits to me, however the results may facilitate appropriate interventions that will promote adjustment to the prescribed treatment regimen of which I and future hemodialysis patients must live by.
- 4) The results from this study may be published, but any information from this study can be identified with me will remain confidential and will be disclosed only with my permission.
- 5) Any questions about my participation in this study will be answered by Melinda Zimmer-Rankin.

- 6) Complaints about the procedures may be presented to Dr. Emilie Musci, Department of Nursing, Faculty Advisor, (408) 924-3130. For questions or complaints about research participants' rights contact Serena Stanford, Ph.D., Associate Academic Vice President for Graduated Studies and Research, (408) 924-2480.
- 7) My consent is given voluntarily with no coercion. I may refuse to participate, and I may withdraw at any time.
- 8) I have received a copy of this consent form.

MY SIGNATURE INDICATES THAT I HAVE READ THE INFORMATION
GIVEN ABOVE AND THAT I HAVE DECIDED TO PARTICIPATE.

Date _____
Participant's signature Investigator's signature

APPENDIX F
MHLC Scale Questionnaire

MHLC

This is a questionnaire designed to determine the way in which different people view certain important health-related issues. Each item is a belief scale which ranges from strongly disagree (1) to strongly agree (6). For each item I would like you to circle the number that represents the extent to which you agree or disagree with a statement. The more strongly you agree with the statement, then the higher will be the number you circle. The more strongly you disagree with a statement, then the lower will be the number you circle. Please make sure that you answer every item and that you circle only one number per item. This is a measure of your personal beliefs; obviously, there are no right or wrong answers.

Please answer these items carefully, but do not spend too much time on any one item. As much as you can, try to respond to each item independently. When making your choice, do not be influenced by your previous choices. It is important that you respond according to your actual beliefs and not according to how you feel you should believe or how you think we want you to believe.

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1. If I get sick, it is my own behavior which determines how soon I get well again.	1	2	3	4	5	6
2. No matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5	6
3. Having regular contact with my physician is the best way for me to avoid illness.	1	2	3	4	5	6
4. Most things that affect my health happen to me by accident.	1	2	3	4	5	6
5. Whenever I don't feel well, I should consult a medically trained professional.	1	2	3	4	5	6
6. I am in control of my health.	1	2	3	4	5	6
7. My family has a lot to do with my becoming sick or staying healthy.	1	2	3	4	5	6
8. When I get sick I am to blame.	1	2	3	4	5	6
9. Luck plays a big part in determining how soon I will recover from an illness.	1	2	3	4	5	6

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately agree	Strongly Agree
10. Health professionals control my health.	1	2	3	4	5	6
11. My good health is largely a matter of good fortune.	1	2	3	4	5	6
12. The main thing which affects my health is what I myself do.	1	2	3	4	5	6
13. If I take care of myself, I can avoid illness.	1	2	3	4	5	6
14. When I recover from an illness, it's usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.	1	2	3	4	5	6
15. No matter what I do, I'm likely to get sick.	1	2	3	4	5	6
16. If it's mean to be, I will stay healthy.	1	2	3	4	5	6
17. If I take the right actions, I can stay healthy.	1	2	3	4	5	6
18. Regarding my health, I can only do what my doctor tells me to do.	1	2	3	4	5	6

Appendix G

Permission to Use the MHLC Questionnaire

VANDERBILT UNIVERSITY

NASHVILLE, TENNESSEE 37240

TELEPHONE (615) 322-7311

Health Care Research Project • School of Nursing • Direct Phone 343-3317

To: Fellow Health Researcher
From: Kenneth A. Wallston, Ph.D.

Thank you for your interest in the Health Locus of Control Scales. Please excuse this form response, but I have so many inquiries requiring similar replies that I have found this to be an efficient means of disseminating information.

You have my permission to utilize Form A or B of the MHLC scales in any health related research you are doing. My only request is that you keep me informed of any results you obtain using the scales. In that way I hope to continue to serve as a clearinghouse for information about the scales.

We have recently developed Form C of the MHLC scales, an instrument which can easily be made specific to any existing medically-related condition which your subjects might have (e.g., diabetes, cancer, high blood pressure, migraine headaches, arthritis, chemical dependencies, etc.) We have used Form C as an "Arthritis Locus of Control Scale" and are generally pleased with its psychometric properties. If you think such an instrument would be helpful in your research and if you are willing to share your data back with us, we would be pleased to make it available to you.

If you wish us to send you additional material, please complete and return the enclosed form. For most items there is a small charge to cover duplication and postage.

If you have more specific questions, don't hesitate to contact me. Please remember to send me information on any use you make of these scales. I have included a usage questionnaire to facilitate your doing so. I look forward to hearing from you.

P.S. I have enclosed a copy of a brief article I just wrote on the importance of placing measures of Health Locus of Control in a Theoretical Context. I hope you find it interesting and stimulating.

APPENDIX H
Data Collection Form

Data Collection Form 1: Chart Review Information

Number: _____

Patient's Initials: _____ Doctor: _____ Age: _____

Race: _____ Sex: _____ Martial Status: _____ Living alone: _____ (Y/N)

Education: _____

Occupation: _____ Presently employed _____ (Y/N)

Diabetic _____ (Yes/No)

Status post transplant rejection _____ (yes/no)

Diagnosis: _____

Number of months on dialysis: _____

Actively on transplant list: _____

Low potassium diet _____ (yes/no)

Low protein diet _____ (yes/no)

1500cc Fluid restriction per day _____ (yes/No)

KT/V >1.0 _____ (yes/no)

Predialysis: Month 1 _____ Month 2 _____ Month 3 _____

K _____

P _____

BUN _____

Interdialytic Weight Gain
(Last 12 consecutive treatments)

1.	7.
2.	8.
3.	9.
4.	10.
5.	11.
6.	12.

***Eligible to participate in the study (yes/no)