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Predictors of quality of life in individuals with end stage renal disease.

Kristen L. McDonald

University of Massachusetts Amherst

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PREDICTORS OF QUALITY OF LIFE IN INDIVIDUALS WITH END STAGE RENAL DISEASE

A Dissertation Presented

by

KRISTEN L. MCDONALD

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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ProQuest LLC
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106-1346

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Richard Halgin, Chair

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Finally, I would like to thank my friends and family for helping me realize that I was meant to become a psychologist and not a computer programmer. Their love and support allowed me to find my life's work. For that I will be forever grateful.

ABSTRACT

PREDICTORS OF QUALITY OF LIFE IN INDIVIDUALS WITH END STAGE RENAL DISEASE

MAY 2008

KRISTEN L. MCDONALD, B.A., POMONA COLLEGE

M.A., SAN FRANCISCO STATE UNIVERSITY

Ph.D., UNIVERSITY OF MASSACHUSETTS AMHERST

Directed by: Professor Richard P. Halgin

The primary purpose of this study was to examine the role of posttraumatic growth in determining quality of life outcomes for patients with a chronic medical condition. Predictors of quality of life were examined for 65 hemodialysis patients with End Stage Renal Disease, 82% of whom were Caucasian, 14% African American, 3% Hispanic, and 2% Native American. Multiple regression analyses were performed in which depressive symptomatology, posttraumatic growth, gender, interval since diagnosis, nutritional status, optimism, and social support were examined as main effects and moderators. Depressive symptomatology was associated with better quality of life when controlling for other variables. Optimism moderated the relationship between depressive symptomatology and quality of life, such that individuals high in optimism and depressive symptomatology had quality of life scores similar to scores obtained by those reporting few depressive symptoms. Similarly, there was a trend toward posttraumatic growth moderating the relationship between depressive symptomatology and quality of life, such that individuals high in posttraumatic growth and depressive symptomatology had quality of life scores similar to those obtained by individuals reporting few depressive symptoms. An exploratory analysis provided evidence that depressive symptomatology and optimism were positively associated with posttraumatic growth in this group. Findings suggest that perceptions of growth, or benefit finding, may be especially beneficial for patients prone to depression. Treatment implications and suggestions for future research are discussed.

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CHAPTER I

INTRODUCTION

"I didn't know what I had until I lost it," captures the poignancy of how ordinary, everyday experiences can take on greater meaning when a person's life changes dramatically. A diagnosis of a life-threatening illness changes an individual's life in permanent, profound ways, but the process of adjusting to these changes can also bring opportunities for self-reflection and personal growth. Researchers have shown that posttraumatic growth, as in improved relationships with others and an enhanced sense of meaningfulness, occurs in cancer survivors (Ho, Chan, & Ho, 2004; Lechner, Carver, & Antoni, 2006) and in survivors of other traumatic experiences (Janoff-Bulman & Berg, 1998; Janoff-Bulman & Berger, 2000; Solomon & Dekel, 2007.) Very little research has been done, however, on whether this type of personal growth occurs in individuals with chronic illnesses such as kidney disease. This proposed dissertation project will extend existing research by investigating the extent to which positive growth experiences (i.e., posttraumatic growth) and negative emotional experiences (i.e., depressive symptoms) are associated with the subjective quality of life of people with End Stage Renal Disease (ESRD).

People with kidney disease face a number of challenges that have traditionally been viewed as even more difficult than those faced by patients with other chronic illnesses, such as diabetes and rheumatoid arthritis. In most cases, kidney disease progresses to the point at which the kidneys fail, making renal replacement therapy or kidney transplantation necessary for survival. With waiting lists for transplants averaging three or more years, most patients with ESRD must begin renal replacement therapy. The most common form of therapy is hemodialysis in which people go to a clinic or hospital three times each week and spend about four hours connected to a machine that filters toxins from their blood. Dialysis treatment consumes much of the free time in a person's life, has painful side effects, and does not take away all of the symptoms of kidney disease (Polaschek, 2003). Many people complain of feeling "washed out" or extremely fatigued for the rest of the day after treatment. They must avoid eating many of their favorite foods, including dairy products, many fruits and vegetables, and anything high in salt. They often feel thirsty, but they cannot drink more than a small amount each day because their bodies retain liquid. Additionally, many dialysis patients experience high blood pressure, anemia, heart problems, bone disease, nerve damage, difficulty sleeping, and problems with sexual functioning (National Kidney Foundation, 2008.)

Kidney disease is also becoming increasingly common, with incidence and prevalence rates in the United States more than doubling between 1990 and 2000. These statistics are expected to rise steadily in the future due to increases in rates of obesity and diabetes (USRDS, 2000). With the number of people needing dialysis increasing so dramatically, it has been difficult for the medical system to meet the demand for increased dialysis stations and physician specialists. Many patients are left feeling that their physicians do not have enough time to address the psychological aspects of their situation (National Kidney Foundation, 2004).

Given that the healthcare system is burdened by the rapidly increasing number of patients who need renal replacement therapy, it is important to understand the psychological experiences that lead to better outcomes for patients, to increase effectiveness and efficiency of mental health services offered, and to develop interventions informed by research. Research findings may help to correct misperceptions that exist in the minds of healthcare providers and the general public about the poor quality of life of dialysis patients. Traditionally, many outside observers have viewed dialysis patients as depressed and long-suffering, but many patients describe their experiences differently (Hoothay, Leary, DeStefano, & Foley-Hartel, 1990.) Setting aside preconceptions, how do these individuals describe their experiences? What psychological experiences emerge as the most important predictors of their overall quality of life?

In this project I will investigate the relationship between key quality of life indicators and psychosocial predictors such as depressive symptoms and posttraumatic growth in a sample of individuals with ESRD. Participants will include 60-80 individuals currently undergoing hemodialysis treatment for kidney failure at facilities associated with the University of Massachusetts Memorial Medical Center (UMMMC). The proposed study, the first study of posttraumatic growth in this population, will extend existing research on dialysis patients by measuring the experience of depression and posttraumatic growth as separate constructs.

Predictors of Quality of Life in ESRD Patients:

Several bodies of literature inform the current project, the most relevant of which are studies that have investigated predictors of quality of life in people with ESRD. What factors are the best predictors of how people with kidney failure evaluate the quality of their lives? How have researchers defined and evaluated quality of life? Looking more broadly, it is important to consider what researchers who have studied people with other chronic and life-threatening conditions have discovered regarding the experiences or personality traits that enhance or detract from quality of life. For example, what associations between personality traits and psychological resilience have been reported in studies of cancer patients that might help to inform our understanding of how people with kidney failure adjust to their condition?

The conceptual framework for the current study is also informed by trauma research, which suggests that many people who have experienced a wide array of traumatic events, including physical illnesses and other traumas such as natural disasters, experience profound shifts in the way that they view and experience their lives (Janoff-Bulman & Berg, 1998). In the following section, I will review the evidence for experiences of posttraumatic growth in people who have experienced life-threatening illnesses or other traumas.

In order to organize this literature review according to the methodology of the proposed study, I will first review the evidence for the control, or background variables: (1) nutritional status; (2) time since diagnosis, (3) gender, (4) degree of optimism, and (5) level of social support. Next, I will review the evidence for two proposed predictor variables: (1) depressive symptoms and (2) posttraumatic growth.

Nutritional Status. One of the most important physical health indicators in dialysis patients is nutritional status, as measured by levels of serum albumin, a plasma protein (Don & Kaysen, 2004.) Patients with very low levels of serum albumin are diagnosed with hypoalbuminemia and have a poor prognosis. Hypoalbuminemia has been shown to be one of the most powerful predictors of mortality in dialysis patients (Lowrie, Huang, & Lew, 1995). Don and Kaysen (2004) suggest that nutritional status is an important indicator of health, primarily because inflammation, which leads to low serum albumin levels, is also associated with the cardiovascular events which are the leading cause of death in this population.

Although the ties between nutritional status and mortality are clear, research suggests that there is little connection between physical health and perceived quality of life in this population. In other words, patients may describe feeling satisfied with their lives in spite of their physical health problems. Several researchers (e.g., Bremer, McCauley, Wrona, & Johnson, 1989; Hoothay, DeStefano, Leary, & Foley-Hartel, 1990; Molzahn, Northcott, Dossetor, & Parker 1997) have reported that people with kidney failure report only a slight reduction in subjective quality of life compared to people who do not have a physical illness. Tanyi and Werner (2003) explored multiple dimensions of well-being in a group of 65 women with ESRD, and found that they reported fairly high levels of adjustment on variables such as adjustment to illness, life-satisfaction, self-perceived health, and spiritual well-being.

Other researchers have found, however, that dialysis patients report problems that are generally associated with poor quality of life, including lowered activity levels, sexual difficulties, and inability to remain in paid employment (Lok, 1996; Merkus, Jager, Dekker, Boeschoten, Stevens, & Krediet, 1997; Vazquez, Valderrabano, Jofre, Fort, Lopez-Gomez, Moreno, & Sanz-Guajardo, 2003). In several of these studies, however, the link between physical health problems and quality of life was not clear (e.g., Lok, 1996; Vazquez, Valderrabano, Jofre, Fort, Lopez-Gomez, Moreno, & Sanz-Guajardo, 2003). In other words, individuals who reported good physical health did not necessarily report high levels of overall quality of life. Other researchers (e.g., Merkus, Jager, Dekker, Boeschoten, Stevens, & Krediet, 1997), though, have found a direct link between poor physical health status (e.g., higher number of comorbid conditions, lower hemoglobin levels, and less residual renal function) and poorer quality of life. This suggests that for some ESRD patients, objective health indicators may be an important consideration in understanding their perceptions of their quality of life.

Many researchers have assessed the quality of life of people with kidney failure by measuring their level of depressive symptoms; bearing this in mind, it is important to examine the connection between physical health and depressive symptoms, as well as the connection between physical health and more comprehensive quality of life measures. Guzman and Nicassio (2003) found that disease severity did not predict the level of depression experienced by a group of 109 hemodialysis patients suffering from kidney failure. Rather, the level of depression experienced by these individuals was related to how they perceived themselves in terms of their illnesses. People who saw themselves as "survivors," who created a positive schema around their experience of illness, felt less depressed than those whose self-view was more focused on concepts such as "defective" and "frail." These results suggest that perceptions of self, including health-related schemas, may be better predictors of psychological well-being than objective, physiological health indicators.

Interval Since Diagnosis. Along with declines in physical health, another common-sense guess about what might affect quality of life in dialysis patients is the amount of time that has passed since they were first diagnosed with kidney disease. In other words, individuals who have been sick longer would be expected to report a lower quality of life. This is a complicated variable to study, however, because the course of the illness varies widely depending on the underlying cause, the stage at which diagnosis is made, and the type of treatment provided (i.e., dialysis or kidney transplantation). Some patients may find themselves on dialysis at several time points because of failed transplants, whereas others may choose to remain on dialysis for many years rather than receive a transplant.

Despite these complications, time since diagnosis is positively correlated with age and negatively correlated with physical health status; people who have been ill longer tend to suffer from declines in overall functioning (Lok, 1996), though some evidence suggests that physical health declines more than mental health (Merkus, Jager, Dekker, De Haan, Boeschoten, & Krediet, 1999).

Tanyi & Werner (2003) suggest that the passage of time may be linked to improved psychological well-being in ESRD patients, due to the opportunity for them to adjust and accommodate to the illness. Perhaps patients go through an initial period of adjustment followed by eventual decreases in quality of life as health declines in the terminal phase of illness. Organizing the experiences of dialysis patients into phases of adjustment – with an initial decrease in adjustment at time of diagnosis or crisis, followed by increase, stabilization, and then decline - helps clarify the impact of the passage of time on quality of life. Although this relationship may not be linear, it is still helpful to include basic temporal information in any study of dialysis patients.

Gender. Several researchers have found that women with ESRD report lower quality of life than men. This difference has been reported in pre-dialysis patients (Rocco, Gassman, Wang, & Kaplan, 1997), dialysis patients (Vasquez, Valderrabano, Jofre, Fort, Lopez-Gomez, Moreno, & Sanz-Guajardo, 2003), and transplant patients (Jofre, Lopez-Gomez, Moreno, Sanz-Guajardo, & Valderrabano, 1998). For example, in one study of 117 young (< 65 years of age) hemodialysis patients, women were more likely than men to report lower levels of health-related quality of life (Vasquez et al., 2003). One plausible explanation for this gender difference is that a higher level of depression in female ESRD patients leads to poorer health-related quality of life.

Some evidence, however, contradicts findings on gender differences in quality of life. In a study of 165 hemodialysis patients, researchers found no gender differences on the physical, psychological, or existential subscales of a comprehensive quality of life measure (Kimmel, Emont, Newmann, Danko, & Moss, 2003). It is possible that the way quality of life is assessed leads to gender differences in some studies and not in others. This inconsistency makes it even more essential that quality of life be measured carefully, ideally using multiple measures. If, for example, gender differences in quality of life emerge because of higher rates of depression in women, measures of quality of life that assess both positive and negative emotionality may find fewer gender differences. By looking at different subscales and using multiple measures, it may be possible to identify the emotional, physical, and social experiences that are associated with higher levels of quality of life in both men and women.

Optimism. Research suggests that ESRD patients who view the proverbial glass as half full rather than half empty tend to cope better with their illness and enjoy an enhanced quality of life. Molzahn and her colleagues (1997) measured the quality of life of 215 people with ESRD in three ways, incorporating questions about perceived health, ability to perform daily activities, and life satisfaction. The researchers found that having a positive outlook predicted higher scores on all three measures of quality of life.

Patients with other illnesses also report similar benefits from positive coping strategies such as a sense of personal control, positive attitude, and gratefulness. In a study of people with diabetes, rheumatoid arthritis, and multiple sclerosis, those who believed in a positive outcome and who felt a sense of control over their lives were less likely to experience symptoms of anxiety and depression (Fournier, de Ridder, & Bensing, 2001).

Social Support. There is mixed evidence for the role of social support in quality of life for ESRD patients. In their study of 158 people with ESRD, Symister & Friend (2003) found that self-esteem explained the relationship between social support and several dimensions of psychological health, including depressive symptoms and optimism. Social support was important, but its effects on psychological well-being may have been produced through its influence on self-esteem. The researchers concluded that social support may have maintained or enhanced self-esteem; it was then this increase in self-esteem that led to reduced levels of depression and increased feelings of optimism.

Other researchers have found no link between social support and quality of life in people with ESRD. In a sample of 215 people with ESRD, Molzahn and her colleagues (1997) found that higher levels of perceived social support did not predict higher evaluations of quality of life. Vasquez and her colleagues (2003) reported similar findings with a sample of 117 young people whose reported levels of social satisfaction did not predict their health-related quality of life.

Depressive Symptoms. Depression is the most common psychological condition diagnosed in people with ESRD. As many as 25% of patients facing dialysis suffer from major depression, though levels decline to closer to 10% in patients who have started dialysis (Kimmel, 2002; Lew & Piraino, 2005.) Exact percentages of depression in ESRD patients vary depending on how depression is defined (i.e., subclinical or clinical), which measure is used, and the characteristics of the given sample (e.g., age, physical health status, age, gender, etc.). Christensen and Ehlers (2002) suggest that with ESRD patients, structured clinical interviews produce lower rates of depressive symptoms than self-report inventories such as the BDI.

Some researchers have suggested using only cognitive versions of depression measures so that questions about somatic symptoms such as fatigue and sleeplessness (which are likely to be the result of kidney failure) do not lead to inaccurate diagnoses of depression (Kimmel, Weihs, & Peterson, 1993). It is also important, however, not to undertreat the problem of depression by only intervening with patients who reach clinical levels of symptomatology. When depressive symptoms are evaluated along a continuum, many dialysis patients report some symptoms of distress, even when they are not clinically depressed (Shidler, Peterson, & Kimmel, 1998). The best tools for assessing depression in ESRD patients should therefore focus on thoughts and feelings rather than physical complaints, and should assess the full spectrum of depressive severity so as not to miss individuals who feel mildly or moderately distressed.

Depression in people with ESRD has been consistently linked to poorer quality of life and to other negative health outcomes. Dialysis patients who report greater levels of depressive symptoms, such as sadness and hopelessness, are more likely to describe their day-to-day life as unsatisfying and difficult. Vasquez and her colleagues (2003) surveyed 117 young and middle-aged dialysis patients (younger than 65 years old) who were not struggling with the high rates of associated medical problems that tend to plague older dialysis patients. For these individuals, higher levels of depressive symptoms were associated with lower levels of health-related quality of life. Older ESRD patients showed the same link between depression and negative health outcomes. In a comprehensive review of studies of depression in ESRD patients, Kimmel (2002) pointed out that depressive symptoms have been linked to non-compliance with medical treatment, reduced quality of life, and lower survival rates.

Posttraumatic Growth. Although feelings of sadness and depression are understandable reactions to tragic events, they are only one part of the story. As philosophers and religious figures have taught for centuries, suffering can be viewed as noble, and can lead to a maturing of the mind and soul. Individuals who have suffered traumas or losses may turn inward and experience a deepening spirituality, or they may reach out to others and develop more intense connections with the world around them (Frazier, Conlon, & Glaser, 2001; Solomon & Dekel, 2007.) The concept of posttraumatic growth emerged in the psychological literature as a way of capturing the positive benefits that sometimes occur for people who experience traumas such as assaults, natural disasters, life-threatening illnesses, and the loss of loved ones. For example, Janoff-Bulman and Berg (1998) found that many trauma survivors created new values and new meaning in their lives. Some reported feeling stronger, more self-assured, and more emotionally mature after surviving the traumatic event. Others described feeling more appreciative of their own existence, or feeling that they now had their priorities straight.

As interest in positive, trauma-related growth increased, trauma researchers sought to develop a multidimensional measure that would reliably measure and compare growth in people with different types of trauma. Tedeschi and Calhoun (1996) created 21 items based on a literature review of studies in which trauma survivors mentioned positive changes. They tested their items on a large group of people who had experienced "difficult life events," and then used a factor analysis to identify the following five major components: Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation of Life. The resulting measure, the Posttraumatic Growth Inventory (PTGI) (Appendix F), contains items such as: "Knowing that I can count on people in times of trouble;" "I discovered that I'm stronger than I thought I was;" "I have a stronger religious faith;" and, "My priorities about what is important in life" (Tedeschi & Calhoun, 1996). Participants were asked to what degree they experienced each change "as a result of [their] crisis." Although virtually all study participants reported negative consequences of their difficult life events, 60% also reported perceived positive effects. Individuals who perceived these positive changes were more likely to be extroverted, open to internal experience, and to describe themselves as optimistic.

Since it was first developed, the PTGI has been used to measure posttraumatic growth in a wide variety of populations, including cancer survivors, patients diagnosed with HIV, bereaved parents, college students, sexual assault victims, and former prisoners of war (Frazier, Conlon, & Glaser 2001; Ho, Chan, & Ho, 2004; Milam, 2004; Polatinsky & Esprey, 2000; Solomon & Dekel, 2007; Smith & Cook, 2004). In their study of college students, Smith and Cook (2004) found that the wording of the PTGI items may actually *underestimate* the amount of positive growth following trauma. They used the standard version of the PTGI, which asked people to indicate positive changes that had been caused by the traumatic event, and an alternate version that asked about positive changes but omitted the causal language. They found that the alternate version led respondents to recall many more positive changes in their lives. Some of these changes may have been associated with growth from the traumatic event even if respondents did not initially recognize this link.

A cross-sectional study of predictors of posttraumatic growth was recently conducted with 224 breast cancer survivors (Bellizzi & Blank, 2006). The researchers found that many breast cancer survivors reported posttraumatic growth, including increased appreciation for life, improved relationships with others, spiritual change, and increased personal strength. Younger women and those employed outside of the home were more likely to report posttraumatic growth experiences. Additionally, women whose disease was more advanced, and thus more life-threatening, were also more likely to report posttraumatic growth. This study elucidates the relationship between demographic characteristics, severity of disease, and posttraumatic growth in one group of trauma survivors; however, many questions remain about whether these factors would hold true with other groups of trauma survivors, and about how the growth that they experience relates to changes in quality of life. No research has been conducted on whether posttraumtic growth occurs in people with ESRD.

A chronic, life-threatening illness such as ESRD is a different experience from a one-time trauma such as sexual assault or an acute but curable form of cancer. Dialysis patients, many of whom may never receive kidney transplants, face an ongoing battle with very little chance of a permanent cure. A diagnosis of ESRD, and the dialysis treatments that usually follow, are thus best viewed as a combination of acute trauma (e.g., receiving the initial diagnosis or beginning dialysis) and ongoing trauma (e.g., continuing dialysis treatments for many years). These disease-related experiences are traumatic events that require individuals to reshape the meaning of their lives and make drastic changes in lifestyle. Based on research with other trauma survivors, it is likely that posttraumatic growth occurs for some subset of dialysis patients. It is important to not only answer the question of whether posttraumatic growth occurs, but also to investigate for whom it occurs and how the experience of growth may relate to overall quality of life.

Why Study Posttraumatic Growth in Individuals with ESRD?

This study was the first investigation of the ways in which negative emotional experiences (i.e., depression) and positive emotional experiences (e.g., posttraumatic growth) contribute to the everyday experience of life satisfaction in people with kidney failure. Instead of just looking at kidney failure as an "illness," this research approach expanded the view of the adjustment process to include the often overlooked category of positive change and growth. For a disease such as kidney failure, which has traditionally been viewed in a sharply negative light by the general public and by some healthcare workers, research that takes this broad, multidimensional perspective may help change underlying assumptions by providing patients and those who care for them with a new way to frame their experience.

Research Questions:

Research Question One (Q1). **To what extent is the experience of depression in dialysis patients associated with their evaluation of quality of life?** To answer this question, I measured the extent to which depressive symptoms predicted subjective quality of life above and beyond the impact of patient gender, interval since diagnosis, nutritional status, optimism, and perceived social support.

The Beck Depression Inventory (BDI) (Appendix J) was used to measure depressive symptoms during the two-week period prior to participation in the study. Overall quality of life was measured using the comprehensive Quality of Life Inventory (QOLI) (Appendix G). Information on the patient's gender and the time interval since diagnosis was gathered from the introductory section of the questionnaires (Appendix E). Information on the patient's level of optimism and level of perceived social support was measured using the Life Orientation Test-Revised (LOT-R) (Appendix H), and the Multidimensional Scale of Perceived Social Support (MSPSS) (Appendix K). The final variable, nutritional status, was measured using serum albumin levels taken from the most recent medical chart records. Because serum albumin is measured biweekly, the levels reflect the patient's physical health status within 2 weeks of the date of their participation.

Drawing from past research, my hypothesis was that people who experience a greater level of depressive symptoms would report lower quality of life. I predicted that depressive symptoms would predict quality of life even after controlling for gender, interval since diagnosis, nutritional status, optimism, and social support.

Research Question Two (Q2). **To what extent is the subjective experience of posttraumatic growth in dialysis patients associated with their evaluation of quality of life?** To answer this question, I measured the extent to which the amount of posttraumatic growth reported by patients predicted their quality of life above and beyond the impact of gender, interval since diagnosis, nutritional status, optimism, and perceived social support.

Posttraumatic growth was measured with the Posttraumatic Growth Inventory (PTGI) (Appendix F). The procedure used for Question 1 was also used to measure all other variables.

My hypothesis was that people with higher levels of posttraumatic growth would report higher quality of life. I predicted that posttraumatic growth would predict quality of life even after controlling for gender, interval since diagnosis, nutritional status, optimism, and social support.

Research Question Three (Q3). **To what extent does consideration of both negative as well as positive emotional experiences inform an understanding of how kidney dialysis patients evaluate quality of life?** In other words, to what extent do depressive symptoms and posttraumatic growth jointly predict subjective quality of life above and beyond the impact of gender, interval since diagnosis, physical health status, optimism, and social support?

Research Question Four (Q4). **To what extent does the relationship between level of depressive symptoms and evaluation of quality of life depend on the level of posttraumatic growth?** In other words, to what extent do people with kidney failure who are moderately depressed report better quality of life when they are also experiencing positive growth (e.g., increased appreciation for life, deeper sense of meaningfulness, etc.)?

My hypothesis was that there would be an interaction between these two variables such that people who felt more depressed would experience a better overall quality of life when they were also experiencing higher levels of posttraumatic growth.

Research Question Five (Q5). **How does the relationship between depressive symptoms and quality of life vary depending on: (1) gender, (2) interval since diagnosis, (3) nutritional status, (4) optimism, and (5) social support?** All two-way interactions between depressive symptoms and the control variables listed above were analyzed. For example, how similar for men and women is the relationship between depressive symptoms and quality of life?

Research Question Six (Q6). **How does the relationship between posttraumatic growth and quality of life vary depending on: (1) gender, (2) interval since diagnosis, (3) nutritional status, (4) optimism, and (5) social support?** All two-way interactions between posttraumatic growth and the control variables listed above were analyzed. For example, how similar is the relationship between posttraumatic growth and quality of life for people who have been diagnosed more recently as compared with those diagnosed less recently?

Exploratory Analyses. Given that this was the first study of posttraumatic growth in this population, exploratory analyses were conducted to determine which patients with kidney failure were more likely to have the kind of positive, growth-oriented experiences that could be described as posttraumatic growth. For example, are patients who have been sick longer more likely to report greater levels of posttraumatic growth? Are women more likely to report posttraumatic growth than men?

Interview Data. In order to enrich the quantitative findings, I interviewed 5% of the sample. This exploratory clinical component allows me to better understand how individuals with kidney failure understand their experience (Appendix C). Excerpts from these interviews are used to tell the personal stories of the patients behind the numbers.

CHAPTER II

METHOD

Participants:

The participants in this study included 79 patients with End Stage Renal Disease who were undergoing hemodialysis treatment at outpatient facilities affiliated with University of Massachusetts Memorial Medical Center (UMMMC). These patients were drawn from the larger group of approximately 130 patients receiving hemodialysis at the affiliated clinics. Due to the medically compromised status of some of the patients, exclusion criteria, and practical constraints, it was expected that not every patient would be able to participate. However, every attempt was made to encourage participation and to approach patients randomly and systematically.

No one under the age of 18 was included in this study. Given that the purpose of the study was to investigate quality of life and other psychosocial experiences of adult patients, measures were chosen that were validated on adult populations. Regarding health status, patients with moderate to severe dementia or psychosis were not included in this study. The measures used were not designed for people with these conditions.

Patients whose physical health status made it difficult or impossible for them to participate were not included in this study. For example, patients who were so fatigued that they needed to sleep during their treatments were not able to fill out the necessary questionnaires. Physicians, nurses, and patients themselves had the opportunity to communicate that patients were not physically capable of comfortably participating. However, all efforts were made to include interested patients while minimizing any risk of discomfort.

Patients who had difficulty writing or who were not fluent in written English were encouraged to participate in this study. In these cases, the researcher read the questionnaires aloud to the participant and recorded their answers. Those patients who were not fluent in spoken English were unable to participate due to the lack of availability of an interpreter.

Out of the initial sample of 79 participants, 4 individuals chose to withdraw their participation before completing the study. The first two individuals withdrew because of fatigue, the third cited lack of interest, and the fourth stated that he was not comfortable disclosing personal information. An additional 10 participants were not included in the data analyses for the current study because of incomplete data (e.g., participants who gave their best effort but were feeling too tired or ill to complete the majority of the questions.) The final sample included 65 participants with an average age of 61 years. The ethnic makeup of the sample (82% White, 14% African American/Black, 3% Hispanic/Latino, and 1% Native American) was similar to the demographics of the region. Table 1 contains complete demographic information.

Procedure:

Recruitment and consent. The principal investigator consulted with UMMMC's team of eleven nephrologists, including Dr. David M. Clive, a co-investigator for the current research study, in order to plan for the recruitment of participants. The principal investigator received permission from each prospective participant's nephrologist before commencing any recruitment procedures.

The principal investigator received assistance from four research assistants who were undergraduate psychology students. Hereafter, use of the phrase "the researcher"

Table 1
Demographic Information

	N	%
1. Gender		
female	26	40.0
male	39	60.0
2. Age*		
20-35	3	4.6
36-50	14	21.6
51-65	20	26.7
66-80	22	37.8
81-87	6	9.3
5. Marital status		
single	12	18.5
married	24	36.9
separated	1	1.5
divorced	12	18.5
widowed	15	23.1
unknown	1	1.5
6. Ethnicity/Race		
Hispanic/Latino	2	3.1
African Amer./Black	9	13.8
White	53	81.5
Asian American	0	0
Native American	1	1.5
7. Employment Status		
full-time	6	9.2
part-time	7	10.8
not employed	50	76.9
unknown	2	3.1

Notes: *M = 61.61, Range = 64 (23-87)

may refer to the principal investigator (Kristen McDonald), the co-investigator (David M. Clive, M.D.), or to any of the undergraduate research assistants, whose work was closely supervised.

All study participants were recruited during their regularly scheduled hemodialysis visits at one of the participating UMMMC facilities. The researcher, having received initial permission from the individual's physician, then approached the nurse on duty to find out whether the person's physical health that day might preclude participation. For example, if a patient was severely fatigued, disoriented, or in pain, that patient was not approached that day. Having chosen an appropriate patient to recruit, the researcher then approached the patient, introduced herself, and began the informed consent procedure.

The researcher began by explaining why the person was being recruited to participate, i.e., that all adult hemodialysis patients at UMMMC were part of the potential participant pool. The researcher then explained that participation was confidential and completely voluntary, and would in no way affect the medical treatment that the patient was receiving at UMMMC. Next was a brief description of the study procedures, including the amount of time that would be required and the nature of the activities involved. The researcher then handed the prospective participant a card (Appendix A) that included these facts, and then left the person alone for five minutes to think over his or her decision. If after five minutes the person was still interested in participating, then the researcher carefully obtained verbal and written informed consent (Appendix C).

Data collection. During the initial meeting with participants, the researcher obtained informed consent and then administered a series of questionnaires. The researcher took care not to interrupt any dialysis-related medical procedures, and emphasized to the patient that he or she should only fill out the questionnaires if doing so did not cause any burden or discomfort. Any patients who could not comfortably write due to dialysis-related conditions or procedures were assisted in the process of filling out the questionnaires; the researcher read items aloud and recorded the patient's answers. (Appendices E-J.) In these cases, privacy screens were used in order to enhance privacy during verbal exchanges. The questionnaires consisted of the following instruments: (1) Instructions and demographic questions (Appendix E); (2) Posttraumatic Growth Inventory (PTG) (Appendix F); (3) Quality of Life Inventory (QOLI) (Appendix G); (4) Life Orientation Test-Revised (LOT-R) (Appendix H); (5) Beck Depression Inventory (Appendix I); and (6) Multidimensional Scale of Perceived Social Support (MSPSS) (Appendix J). The researcher also referred to the laboratory data in the patient's medical chart to obtain the most recent serum albumin level.

When the participant completed the questionnaires, the researcher collected the questionnaires and answered any questions about the research study. The researcher also fully debriefed the participant, unless he or she was one of the randomly selected patients who was asked to participate in the interview, the second phase of the project.

Approximately every tenth patient was asked to participate in a follow-up interview. If the patient was not interested, the researcher then thanked him or her, completed the debriefing procedure, and gave the patient a copy of the debriefing sheet (Appendix D) and consent form (Appendix B). If the patient agreed to participate in the follow-up interview, the researcher thanked him or her, left a copy of the consent form, and scheduled Visit 2, which took place within three months of Visit 1.

Visit 2, which consisted of the 45-minute interview, took place during a regularly scheduled dialysis treatment, or, if the patient wished, immediately following the treatment. Privacy was enhanced through the use of portable privacy screens. The purpose of this semi-structured interview was for the researcher to ask additional questions about the patient's psychological, social, and physical functioning (Appendix C.) The interview was audiotaped and later transcribed. All tapes were kept in a locked filing cabinet. No names were written on any tapes, and use of this information did not contain any patient names or identifying information.

Measures:

Demographics. Participants reported their age, gender, ethnicity, and the amount of time that had passed since first receiving the diagnosis of kidney disease. These questions were presented on the initial form at the beginning of the packet of questionnaires (Appendix E).

Optimism. Individual differences in generalized optimism versus pessimism were measured using Scheier and Carver's (1985) eight-item self-report *Life Orientation Test-Revised (LOT-R)*. On this questionnaire, participants indicate the extent to which they agree or disagree with each item according to a 5-point scale that ranges from *strongly disagree* to *strongly agree*. A sample question is: "In uncertain times, I usually expect the best." The instrument also contains "filler" statements that do not relate to optimism or pessimism, such as: "It's important for me to keep busy." The validity and reliability of the *LOT-R* has been demonstrated in studies of cancer patients (e.g., Allison , Guichard, & Gilain, 2001) and in studies of other individuals facing life stressors (e.g., Fontaine, Mastead, & Wagner, 1993).

Social support. Perceived social support was measured using Zimet, Dahlem, Zimet, and Farley's (1988) 12-item self-report *Multidimensional Scale of Perceived Social Support (MSPSS)*. This questionnaire asks respondents to indicate the extent to which they agree or disagree with each item according to a 7-point scale that ranges from *very strongly disagree* to *very strongly agree*. A sample item is: "There is a special person with whom I can share my joys and sorrows." The instrument has three subscales for separately measuring support from family, friends, and significant others. Psychometric studies have indicated that each of the three subscales has strong factorial validity, and that the measure as a whole has moderate construct validity and good internal and test-retest reliability (Zimet et al., 1988).

Depressive symptoms. Depressive symptoms were measured using the Cognitive Depression Inventory (CDI) (Sacks, Peterson, & Kimmel, 1990), a 15-item version of the Beck Depression Inventory (BDI) (Beck, Ward, Mendelsohn, Mock, & Erbaugh, 1961). The CDI assesses cognitive and affective symptoms of depression, including sadness, pessimism, sense of failure, suicidality, and feelings of guilt, but omits questions about somatic symptoms such as fatigue, sleep problems, appetite changes, and sexual difficulty which are often the result of kidney failure. The CDI has demonstrated internal consistency similar to that of the BDI (Sacks et. al, 1990), and is viewed by many ESRD researchers as the best choice for measuring depressive symptoms in this population (e.g., Christensen & Ehlers, 2002; Guzman & Nicassio, 2003; Peterson, Kimmel, Sacks, Mesquita, Simmens, & Reiss, 1991; Sacks et al., 1990).

Posttraumatic growth. Posttraumatic growth was measured by Tedeschi and Calhoun's (1996) Posttraumatic Growth Inventory (PTGI) (Appendix F), which includes

21 items divided into five components: Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation of Life. For example, item six, which loads onto the Relating to Others subscale, states: “I more clearly see that I can count on people in times of trouble.” Respondents are asked to indicate, using a six-point scale, the degree to which the change occurred in their lives as a result of the traumatic event in question. For the current study, the instructions asked respondents to consider the impact of their experience of kidney disease. A “0” on the six-point scale therefore read, “I did not experience this change as a result of my kidney disease and its treatments (e.g., dialysis),” and a “5” read, “I experienced this change to a very great degree as a result of my kidney disease and its treatments (e.g., dialysis).” The PTGI has demonstrated good internal validity and acceptable test-retest reliability in several studies of American trauma survivors (Tedeschi & Calhoun, 1996) and Australian trauma survivors (Bates, Trajstman, & Jackson, 2004). The PTGI has also been used in recent investigations of posttraumatic growth in cancer survivors (Bellizzi & Blank, 2006; Ho, Chan, & Ho, 2004), individuals living with HIV (Milam, 2004) and ex-prisoners of war (Solomon & Dekel, 2007).

Quality of Life. Quality of life was measured using the Quality of Life Inventory (QOLI) (Appendix G), which is a comprehensive and multi-dimensional measure of subjective quality of life, or life satisfaction, which asks respondents to evaluate the degree to which their most important needs, goals, and wishes have been fulfilled (Frisch, 1993). The QOLI is comprised of 32 items that assess 16 dimensions of life (e.g., work, play, children, community.) Each of the 16 sections begins with an objective definition of the dimension and also includes two questions about the person’s evaluation of that dimension. For example, Section Six states: “Play is what you do in your free time to relax, have fun, or improve yourself. This could include watching movies, visiting friends, or pursuing a hobby like sports or gardening.” This is followed by an item which asks, “How important is play to your happiness?” Answer choices are: “Not Important,” “Important,” or “Extremely Important.” The subsequent item asks: “How satisfied are you with the play in your life?” and offers answer choices on a six-point scale, ranging from “Very Dissatisfied” to “Very Satisfied.”

The QOLI has demonstrated validity and reliability in psychometric studies, and has been widely used with medical and psychiatric populations. (Frisch, Cornell, Villanueva, & Retzlaff, 1992). Because it has been standardized on an ethnically and socioeconomically diverse, non-clinical sample of 943 people in 12 American states, it is an appropriate measure for assessing how the quality of life of medical patients compares to that of healthy samples (Frisch et al., 1992).

Data Analyses:

First, exploratory and descriptive analyses were conducted in order to determine the means, distribution, and variability of the data. Then a series of multiple regression analyses were conducted using the techniques of Aiken and West (1991), who recommend centering outcome variables and avoiding artifacts of regression. In each analysis, gender, interval since diagnosis, nutritional status, optimism, and social support were entered in as control variables. As discussed in the introductory section of this paper, previous research has suggested that these variables may contribute to health outcomes and quality of life for individuals with ESRD. It is therefore important to construct a model that includes as many relevant predictors as possible in order to most accurately identify the unique predictive value of the variables of primary interest.

Data Analysis Strategy for Q1. Q1 examines the relationship between level of depressive symptoms and evaluation of quality of life. To answer this question, a multiple regression analysis was performed. The association between level of depressive symptoms and evaluation of quality of life was tested, controlling for gender, interval since diagnosis, nutritional status, optimism, and social support.

Data Analysis Strategy for Q2. Q2 examines the relationship between level of posttraumatic growth and evaluation of quality of life. To answer this question, a multiple regression analysis was performed. The association between level of posttraumatic growth and evaluation of quality of life was assessed, controlling for gender, interval since diagnosis, nutritional status, optimism, and social support.

Data Analysis Strategy for Q3. Q3 examines the extent to which level of depressive symptoms and level of posttraumatic growth jointly predict evaluation of quality of life. To answer this question, a multiple regression analysis was performed in which both predictor variables were entered into the model simultaneously. The association of these predictor variables (i.e., level of depressive symptoms and level of posttraumatic growth) with evaluation of quality of life was tested while controlling for gender, interval since diagnosis, nutritional status, optimism, and social support.

Data Analysis Strategy for Q4. Q4 examines the extent to which the relationship between level of depressive symptoms and evaluation of quality of life depends on the level of posttraumatic growth. For this multiple regression analysis, an interaction term was created by multiplying the two predictor variables (depressive symptoms and posttraumatic growth). This interaction term was then added to the multiple regression model before the analysis was conducted.

Data Analysis Strategy for Q5. Q5 examines the extent to which the relationship between level of depressive symptoms and evaluation of quality of life depends on each of the control variables: (1) gender, (2) interval since diagnosis, (3) nutritional status, (4) optimism, and (5) social support. All two-way interactions between level of depressive symptoms and the control variables listed above were analyzed. As described in the Data Analysis Strategy for Q4, interaction terms were created by multiplying the two predictor variables of interest (e.g., level of depressive symptoms and gender; level of depressive symptoms and interval since diagnosis). The appropriate interaction term was then added to each model before the multiple regression analyses were conducted.

Data Analysis Plan for Q6. Q6 examines the extent to which the relationship between level of posttraumatic growth and evaluation of quality of life depends on each of the control variables: (1) gender, (2) interval since diagnosis, (3) nutritional status, (4) optimism, and (5) social support. All two-way interactions between level of posttraumatic growth and the control variables listed above were analyzed. As described in the Data Analysis Strategy for Q5, interaction terms were created by multiplying the two predictor variables of interest (e.g., level of posttraumatic growth and gender; level of posttraumatic growth and interval since diagnosis). The appropriate interaction term was then added to each model before the multiple regression analyses were conducted.

Exploratory Analyses. The goal of the exploratory analyses is to better understand how each of the study variables (depressive symptoms, gender, interval since diagnosis, nutritional status, optimism, and social support) is associated with posttraumatic growth in people with ESRD. To explore this question, a multiple regression analysis was performed. The association between each of the variables listed above and posttraumatic growth was tested. All predictors were entered into the model simultaneously.

Interview Data. As mentioned previously, portions of five semi-structured interviews were transcribed, with excerpts used to elucidate major themes in an effort to enhance the richness of the quantitative data.

CHAPTER III

RESULTS AND DISCUSSION

Preliminary Steps:

Several preliminary steps were conducted before beginning the major phase of data analysis. Data entry was verified for accuracy by checking each number against the hard copies of the questionnaires and correcting miscoded entries. Each scale was then examined for missing data. When more than 50% of the items on a scale were present, mean substitution was used on the remaining items. Next, residuals were examined to ensure that they were normally distributed, and all predictor variables were centered. In order to correct a positive skew for the variable that measured interval since diagnosis, a transformation was performed in which the natural log was taken. Similarly, a transformation was performed on the variable measuring social support; this process involved taking each number to the 3rd power, in order to correct a negative skew. Finally, bivariate correlations (see Table 2) and descriptive statistics (see Table 3) of study variables were examined.

Data Analysis Strategy:

Each multiple regression analysis was performed using the standard procedure of simultaneous entry of all variables. Each analysis included one, two, or three predictor variables of interest (i.e., depressive symptoms, posttraumatic growth, and/or interaction terms) as well as several additional predictor variables that were viewed as controls. The multiple regression analyses were performed several times, in order to look at the initial model as well as additional "trimmed" models in which non-significant controls were eliminated. The purpose of this procedure was to increase power. When relevant, both the

Table 2
Intercorrelations Between Study Variables

	1	2	3	4	5	6	7	8
1. Gender	-	.12	.27*	.28*	.17	-.08	.15	.05
2. Interval since diagnosis		-	.18	-.02	.11	-.06	.16	.15
3. Nutritional status			-	-.08	.22	-.04	-.21	-.13
4. Optimism				-	.10	.34**	.11	.35**
5. Social Support					-	-.27*	-.07	.32*
6. Depressive symptoms						-	.24	.50**
7. Posttraumatic growth							-	-.02
8. Quality of life								-

Note: * = p < .05. ** = p < .01

original model and the trimmed model will be discussed in the results sections that follow.

Research Question One (Q1):

This research question assessed the extent to which the level of depressive symptoms in dialysis patients was significantly associated with their evaluation of quality of life. Depressive symptoms were a significant predictor of quality of life (B = -.92; SE = .28; *p* = .002) when controlling for gender, interval since diagnosis, nutritional status, level of optimism, and level of social support. As expected, patients with fewer depressive symptoms reported higher levels of quality of life. The total model predicted 35% of the variance in quality of life. Depressive symptoms remained a significant predictor even after nonsignificant controls (gender, nutritional status, interval

Table 3
Descriptive Statistics

	N	M	SD	Range (Min-Max)	Skewness (SE)	Reliability
Interval since diagnosis*	65	8.38	9.37	41.75 (.25-42)	1.76 (.30)	
Nutritional status**	65	3.86	0.38	1.8 (2.8-4.6)	-.25 (.30)	
Optimism	65	20.31	5.47	24 (6-30)	-.38 (.30)	0.70
Social Support	65	67.55	16.10	70 (14-84)	-1.33 (.30)	0.92
Depressive symptoms	65	6.87	5.70	22 (0-22)	.93 (.30)	0.80
Post-traumatic growth	65	51.94	27.25	98 (0-98)	-.13 (.30)	0.94
Quality of life	65	48.52	13.28	77 (4-81)	-.53 (.30)	0.80

Note: * = in years. ** = serum albumin

since diagnosis) were trimmed from the model (see Table 4 for final model). The final model predicted 33% of the variance in quality of life.

As hypothesized, patients with more depressive symptoms reported poorer quality of life, even after controlling for other variables that were also tied to the outcome. In the final model, depressive symptoms were found to be a significant predictor of quality of life above and beyond the impact of optimism and social support. Optimism and social support were each significant predictors at the level of a trend. The final model predicted 33% of the variance in quality of life.

This connection between depressive symptoms and quality of life confirms past research that has pointed to the importance of screening for and treating depression in ESRD patients in order to positively affect quality of life. Several researchers have found

Table 4
Final Model of Simultaneous Multiple Regression Analysis for Depressive Symptoms and Control Variables Predicting Quality of Life (N = 65)

Variable	*B*	*SE B*	β
Optimism	.49	.27	.20^t
Social Support	.01	.01	.19^t
Depressive Symptoms	-.89	.27	-.38**

Note. * $p < .05$. **$p < .01$. $^t p < .10$

that dialysis patients who experience depressive symptoms such as hopelessness, irritability, and loss of interest are more likely to experience poor quality of life (e.g., Kimmel et al., 1993; Peterson et al., 1991, and Vasquez et al., 2003.) As was the case in the current study, several previous researchers have noted that depressive symptoms affect quality of life more profoundly than other factors commonly deemed important, such as physical health status and social support. For example, Vasquez and her colleagues (2003) found that depressive symptoms predicted nearly every domain of health-related quality of life, including social and emotional-role functioning, whereas hemoglobin levels and social support were only weakly associated with a few dimensions of quality of life. Hemoglobin levels are commonly used as an objective indicator of physical health status, with low levels signifying anemia and high levels being associated with mortality. Even an accurate, objective assessment of physical health, however, does not seem to predict how a patient will perceive his or her overall functioning in daily life.

In understanding the results of the current study, it is important to keep in mind that the mean CDI score of 6.87 (the equivalent of approximately 9 on the BDI) reflects slight to moderate levels of depression, which is similar to levels of depressive symptoms reported in other samples of ESRD populations (Craven et al., 1991). Only 17% of the individuals in the current study had CDI scores that indicate moderate to severe depression, and only one individual (1.5%) had a score indicating severe depression. So although the results indicate that depressive symptoms are tied to worse quality of life, the participants in the current project would not be considered severely depressed. In fact, the majority of this sample (54%) reported very few depressive symptoms, and fell into the normal range for the CDI.

Research Question Two (Q2):

This research question assessed the extent to which posttraumatic growth in dialysis patients was associated with their evaluation of quality of life. Posttraumatic growth was not a significant predictor of quality of life (B = -.05; SE = .06; $p = .42$) when controlling for gender, interval since diagnosis, nutritional status, level of optimism, and level of social support. The total model predicted 24% of the variance in quality of life. Posttraumatic growth remained nonsignificant even after nonsignificant controls (i.e., gender, nutritional status, interval since diagnosis) were trimmed from the model (see Table 5 for final model). The final model predicted 21% of the variance in quality of life.

Participants who reported that their experience of kidney disease had led to changes such as having a stronger religious faith, putting more effort into their relationships, and feeling more appreciative of each day were no more likely to report good quality of life than participants who did not report these types of posttraumatic

Table 5
Final Model of Simultaneous Multiple Regression Analysis for Posttraumatic Growth and Control Variables Predicting Quality of Life (N = 65)

Variable	*B*	*SE B*	B
Optimism	.80	.28	.33**
Social Support	.02	.01	.28*
Posttraumatic Growth	-.02	.06	-.04

Note. *$p < .05$. **$p < .01$.

growth experiences. These data, therefore, do not support the initial hypothesis that posttraumatic growth would be tied to higher levels of quality of life in this population. The trauma-related growth that they do report does not appear to directly impact their experience of satisfaction with the key areas of life assessed by the QOLI, such as financial security, neighborhood quality, and relationships with children. It should be noted that recent research on posttraumatic growth (e.g., Bellizzi & Blank, 2006; Ho, Chan, & Ho, 2004; Janoff-Bulman & Berg, 1998; Polatinsky & Esprey, 2000; Smith & Cook, 2004) focused on the extent to which posttraumatic growth occurs in people with particular types of traumas, rather than on the relationship between such growth and perceptions of quality of life.

Interestingly, many individuals in this study did report experiences of posttraumatic growth. The mean score of 52 (out of 115) possible on the PTG indicates moderately high levels of posttraumatic growth, similar to levels found in other groups of patients with life-threatening illnesses. Sears and her colleagues (2003) found an average score of 58 on the PTG in a group of 60 breast cancer patients. In the current study, there was also adequate variability in the PTG measure, with scores ranging from 0 to 98 (SD = 27.25). Therefore, this non-significant result cannot be explained by an absence of posttraumatic growth in the sample, or by statistical problems caused by inadequate variability in the predictor of interest. It is possible that patients' perceptions of growth were just that – perceptions – and not actually indicative of real behavioral or internal changes that would result in improvements in key outcomes such as quality of life. However, quality of life in this study was also measured subjectively, using a self-report measure, so one would think that if self-report bias is operating here, it would affect the validity of both measures.

It is also possible that the absence of a relationship between posttraumatic growth and quality of life in this study was influenced by the chronic, difficult demands faced by dialysis patients. Perhaps these individuals feel so burdened by the lifestyle changes required to stay alive that they are unable to translate internal growth experiences into practical life advantages, such as satisfaction with home, family, and neighborhood. One 40-year-old female participant, during an interview, spoke about being on dialysis since she was 15 years old. She described how her declining health brought with it the loss of two of her favorite activities, bicycling and walking, as well as the loss of a significant romantic relationship. Regarding the relationship, she said, "After 15 years, he left me because he wanted a healthy person who could have kids and who could run around as much as he could." This woman's Quality of Life score was low, at the 11th percentile, because she felt dissatisfied with several key areas of her life, and yet she spontaneously mentioned during the interview several positive, growth-related experiences related to her disease. “I’m a stronger person,” she said. “My faith in God has grown. I always look at it like there’s a reason why I’m here. Things just don’t happen for no reason at all.... I live one day at a time. Every day is a gift and I’m lucky to be here. I’m lucky I’ve come this far.” These comments call to mind the parts of the Posttraumatic Growth Inventory that inquire about appreciation of life, gratefulness, and involvement in religious or spiritual activities. It is no surprise that her PTG score was 98, among the highest scores of any participant. However, she is also quick to acknowledge, both in the interview and in her answers on the QOLI, the deep losses endured during 25 years of dialysis treatments.

It is important to keep in mind that the low quality of life reported by the participant described above is not typical of the overall sample of patients in this study. Descriptive data indicate that for the overall sample, perceptions of quality of life (QOLI mean at the 47th percentile) were only slightly below the average score reported by Frisch (1993) in the large, nonclinical samples used to standardize the QOLI measure. This means that the average patient in this study reported quality of life similar to that reported by individuals not experiencing kidney disease. The majority of these dialysis patients, a full 72%, reported that they experience average or above average quality of life. Only 28% fall into the low or very low categories for the QOLI. Overall this is a group of remarkably resilient people who are able to enjoy their lives even though they are dealing with a chronic, life-threatening illness.

Because these dialysis patients reported that they have experienced posttraumatic growth tied to their illness, although such growth did not predict better quality of life, it is possible that the relationship between posttraumatic growth and quality of life is more complicated than what this regression analysis is able to reveal. Later analyses will explore the possibility of an interaction between posttraumatic growth and other variables when looking at quality of life outcomes. It is also possible that quality of life and posttraumatic growth are related to one another in a curvilinear fashion, or that they are separate, independent constructs with no relationship to each other in this population.

Research Question Three (Q3):

This research question assessed the extent to which negative and positive emotional experiences jointly predict quality of life in dialysis patients. When including both depressive symptoms and posttraumatic growth in the model, depressive symptoms remained a significant predictor (B = -.93; SE = .30; $p = .003$) and posttraumatic growth remained nonsignificant (B = .01; SE = .06; $p = .88$) while controlling for gender, interval since diagnosis, nutritional status, level of optimism, and social support. The total model predicted 35% of the variance in quality of life. Depressive symptoms remained significant and posttraumatic growth remained nonsignificant even after nonsignificant controls (gender, nutritional status, interval since diagnosis, level of optimism) were trimmed from the model (see Table 6 for final model). The final model predicted 30% of the variance in quality of life.

Although both the initial and final models in this regression analysis offer adequate predictions of quality of life, neither model offers evidence to support the hypothesis that we can better predict quality of life by jointly considering both negative and positive emotional experiences. This is not surprising, given that posttraumatic growth did not significantly predict quality of life when examined separately from depressive symptoms. It was initially expected that posttraumatic growth and depressive

Table 6
Final Model of Simultaneous Multiple Regression Analysis for Depressive Symptoms, Posttraumatic Growth, and Control Variables Predicting Quality of Life (N = 65)

Variable	*B*	*SE B*	β
Social Support	.02	.01	$.20^{t}$
Depressive Symptoms	-1.11	.27	-.48**
Posttraumatic Growth	.05	.05	.11

Note. *$p < .05$. **$p < .01$. $^{t}p < .10$

symptoms would each be tied to quality of life, and that a more powerful model might be created by looking at both variables simultaneously; however, posttraumatic growth was not related to quality of life and therefore did not add predictive power to the model. This should not be taken to mean that negative and positive emotional experiences are not both important in understanding dialysis patients' experiences; high levels of posttraumatic growth and low levels of depressive symptoms may be more beneficial for some individuals rather than others, depending on factors such as mood or optimism. RQ4 examines one of these possibilities, that is, whether trauma-related psychological growth enables depressed individuals to feel more satisfied with their lives. RQ5 goes on to examine whether an optimistic personality style acts as a buffer for individuals who are reporting depressive symptoms. In other words, it is possible that depressed individuals who view themselves as generally optimistic may not suffer the same decrements in quality of life as individuals who report both state (depression) and trait (pessimism) types of negative emotionality.

Research Question Four (Q4):

This research question assessed the extent to which posttraumatic growth acted as a moderator in the association between depressive symptoms and evaluation of quality of life. A trend was evident in the relationship between depressive symptoms and quality of life (B = .02; SE = .01; *p* = .06) when controlling for gender, interval since diagnosis, nutritional status, level of optimism, and level of social support. The total model predicted 39% of the variance in quality of life. The interaction of depressive symptoms and posttraumatic growth remained significant at the level of a trend even after nonsignificant controls (gender, nutritional status, interval since diagnosis) were trimmed from the model (see Table 7 for final model.) The final model predicted 37% of the variance in quality of life.

Although an earlier regression analysis indicated that posttraumatic growth did not predict quality of life, the addition of an interaction term to this analysis allows us to see that dialysis patients who report high levels of depressive symptoms may fare better, in terms of quality of life, when they also experience posttraumatic growth. In graphing the interaction using data from the trimmed model, the group with the lowest quality of life scores (QOLI T-Score = 18.46 / Very Low) are the participants with high levels of depressive symptoms and low levels of posttraumatic growth (see Figure 1.) These individuals are feeling depressed, not experiencing posttraumatic growth, and report that their quality of life is far below average. However, participants who are comparably

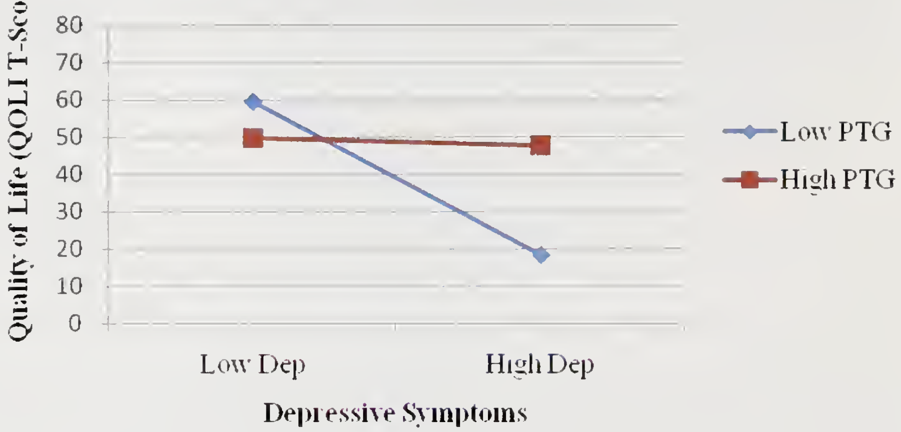
Table 7
Final Model of Simultaneous Multiple Regression Analysis for Depressive Symptoms, Posttraumatic Growth, the Interaction Between Depressive Symptoms and Posttraumatic Growth, and Control Variables Predicting Quality of Life (N = 65)

Variable	*B*	*SE B*	*β*
Optimism	.46	.27	$.19^{t}$
Social Support	.02	.01	$.20^{t}$
Posttraumatic Growth	.05	.05	.11
Depressive Symptoms	.93	.28	.40**
Interaction Term (Ds X Ptg)	.02	.01	$.19^{t}$

Note. *$p < .05$. **$p < .01$. $^{t}p < .10$

depressed but report high levels of posttraumatic growth fare much better, with QOLI T-Scores in the average range (47.70.) This pattern suggests that growth experiences may act as a buffer for patients who are depressed, such that they do not experience the same decrement in quality of life as patients who feel depressed and do not experience growth. Interestingly, for patients who are not depressed, level of posttraumatic growth seems to be a less important predictor of quality of life, though the pattern that does exist is in the opposite direction. That is, for those individuals reporting positive moods, posttraumatic growth may actually have a slight negative effect on their quality of life. As shown in Figure 1, the QOLI T-Scores for participants with low levels of depressive symptoms and low levels of posttraumatic growth (59.27 / High) are higher than the scores for those

Figure 1
Interaction Between Posttraumatic Growth and Depressive Symptoms Predicting Quality of Life



with low levels of depressive symptoms and high levels of posttraumatic growth (49.70 / Average) In other words, dialysis patients report the best quality of life when they are not experiencing either depression or posttraumatic growth. Perhaps this group of patients might be described as easy-going and less internally focused, since they do not report strong emotional experiences of either a positive or negative nature. Some of these individuals may be similar to the 87-year-old female participant who presented a stoical, accepting attitude toward her situation. She said, “My advice to someone starting dialysis would be to just accept it as if there’s no other way out. I mean, you’ve got to figure that if you don’t, you’re gonna die. So just take it like you’re going to work every other day.” She mentioned no positive growth related to kidney disease during the interview, but also failed to endorse depressive symptoms on the CDI questionnaire.

Another way of understanding why patients might report the best quality of life when they are not experiencing either depression or posttraumatic growth would be to focus on perceptions of trauma. Patients who report posttraumatic growth may be more likely to perceive and explain their illness experience as a trauma. It is possible that the non-depressed patients who report more posttraumatic growth are also experiencing their illness as more traumatic; although positive growth can occur in trauma, there are, by definition, many distressing effects of trauma that could negatively impact quality of life. Both groups of non-depressed patients report adequate quality of life in this case (either Average or High) so any negative effects of posttraumatic growth on their quality of life are very minimal.

Research Question Five (Q5):

This research question examined the moderating role of the following variables in the association between depressive symptoms and quality of life: (1) gender, (2) years since diagnosis, (3) nutritional status, (4) level of optimism, and (5) level of social support. All two-way interactions between level of depressive symptoms and the control variables listed above were analyzed.

Gender. This interaction analysis looked at whether the relationship between depressive symptoms and quality of life is different for male and female dialysis patients. Although people with fewer depressive symptoms reported better quality of life, gender did not act as a moderator in the association between depressive symptoms and quality of life (B = -.50; SE = .50; p = .32) when controlling for interval since diagnosis, nutritional status, optimism, and social support. In other words, when holding the other variables constant, the relationship between depressive symptoms and quality of life did not depend on gender of the participant. The total model explained 36% of the variance in quality of life. Depressive symptoms remained significant and the interaction of gender and depressive symptoms remained nonsignificant even after nonsignificant controls (nutritional status, interval since diagnosis, social support) were trimmed from the model. The final model predicted 31% of the variance in quality of life.

Although there was no specific hypothesis due to the exploratory nature of this research question, the purpose of the analysis was to examine whether depressive experiences might impact quality of life in different ways for men and women. Given that past research has revealed higher rates of depressive symptoms in female dialysis patients (Kimmel, 2002; Lew & Patel, 2007), but research findings have been mixed on whether female patients experience worse quality of life (Kimmel et al., 2003; Vasquez et al., 2003), it is important to learn more about the role of gender in determining the relationship between these negative emotional experiences and quality of life. One possibility is that depressive symptoms might be more strongly connected to quality of life in men than in women, given that female patients seemed more depressed but did not show a consistent decrement in quality of life. The results of the current study, however, indicate that gender does not moderate the relationship between depressive symptoms and quality of life for these patients.

Interval since diagnosis. This interaction analysis examined the role of interval since diagnosis as a moderator of the association between depressive symptoms and quality of life. The amount of time that had passed since the diagnosis of chronic kidney disease did not moderate the relationship between depressive symptoms and quality of life ($B = -.45$; $SE = .33$; $p = .18$) when controlling for gender, nutritional status, optimism, and social support. The total model explained 30% of the variance in quality of life. The interaction of interval since diagnosis and depressive symptoms remained nonsignificant even after nonsignificant controls (gender, social support, nutritional status) were trimmed from the model. The final model predicted 34% of the variance in quality of life.

The thinking behind this exploratory analysis is that the amount of time patients had been ill might play a role in how depressive symptoms impact quality of life. Past research has suggested that the passage of time, usually accompanied by worsening physical symptoms, is an important but complicated variable to study because of the variable course of the illness (e.g., Lok, 1996; Merkus et al., 1999; Tanyi & Werner, 2003.) Tanyi and Werner (2003) pointed out that some patients show improved mental health as their physical health declines, due to adjustment and adaptation, whereas Lok (1996) found that all areas of functioning declined over time. In the current study, it was thought that the impact of passage of time might be better understood by including this variable as a moderator. One possibility with the current analysis, which looked at the interaction between depressive symptoms and interval of time since diagnosis, was that patients who had been ill longer, and who were also depressed, might be more likely to experience poor quality of life. These individuals might be having more trouble adapting to their illness, perhaps experiencing emotional suffering of a chronic nature rather than the symptoms that accompany the shock of initial diagnosis. It is also possible that patients who had been ill longer might be better able to handle depressive symptoms and thus would not show decrements in quality of life. However, the non-significance of this result does not allow us to form any conclusions.

Nutritional status. This interaction analysis investigated whether nutritional status acts as a moderator in the relationship between depressive symptoms and quality of life in dialysis patients. Nutritional status was not a significant predictor of quality of life (B =

-.006, SE = .004, p = .15), nor did nutritional status moderate the relationship between depressive symptoms on quality of life (B = -.002; SE = .001; p = .11) when controlling for gender, interval since diagnosis, optimism, and social support. The total model explained 38% of the variance in quality of life. However, after nonsignificant controls (gender, social support, optimism) were trimmed from the model, nutritional status was a predictor of quality of life at the level of a trend (B = -.007, SE = .004, p = .06), with patients with poorer nutrition reporting higher levels of quality of life. Additionally, the interaction of nutritional status and depressive symptoms was significant (B = -.002; SE = .001; p = .03) in the trimmed model (see Table 8.) The final model explained 36% of the variance in quality of life.

This interaction analysis suggests that dialysis patients who are more depressed and are also malnourished enjoy better quality of life than equally depressed patients with good levels of nutrition. As shown in Figure 2, the patients with low levels of depressive symptoms report average to above average quality of life regardless of their nutritional status, whereas nutritional status seems to play a role in the relationship between depressive symptoms and quality of life for those patients who are more depressed. The group with the best quality of life appears to be people who suffer from poor nutrition and high levels of depressive symptoms.

A closer look at the data indicates that this result should be interpreted cautiously. All of the patients in this study were being monitored and treated in order to maintain adequate levels of nutrition whenever possible. Because most of the patients therefore had average levels of nutrition, and were not malnourished, there was not great variability

Table 8
Final Model of Simultaneous Multiple Regression Analysis for Depressive Symptoms, Nutritional Status, the Interaction Between Depressive Symptoms and Nutritional Status, and Control Variables Predicting Quality of Life (N = 65)

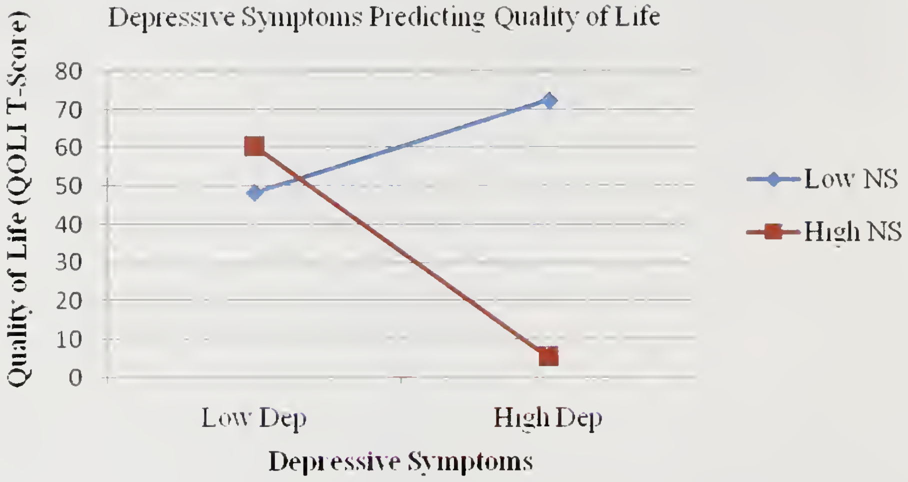
Variable	*B*	*SE B*	*β*
Years Since Diagnosis	2.15	1.28	.18
Nutritional Status	.007	.004	-.21^{t}
Depressive Symptoms	1.02	.25	.44**
Interaction Term (Ds X Nut)	.002	.001	-.25*

Note. $^{*}p < .05$. $^{**}p < .01$. $^{t}p < .10$

in the data collected for this measure. This lack of power is one reason that the results may not be valid.

Additionally, the result was influenced by the responses of a small number of elderly patients who were in the advanced stages of kidney disease, and were not able to be maintained at adequate levels of nutrition. These three individuals, who were 79, 77, and 67 years of age, had problems with nutrition and reported high levels of depressive symptoms, but also said that they were satisfied with their quality of life. It is possible that these patients had adjusted to their illness and lowered their expectations of everyday life, due to their awareness of being close to death. Each of these individuals was diagnosed with hypoalbuminemia (i.e., abnormally low levels of albumin, a major protein, in the blood serum), an indication of significantly declining physical health and a

Figure 2
Interaction Between Nutritional Status and Depressive Symptoms Predicting Quality of Life



very poor prognostic sign (Don & Kaysen, 2004; Mafra, Farage, Azevedo, Viana, Mattos, Velarde, & Fouque, 2007). Perhaps these patients were experiencing the mixed emotions that come with an increasing awareness of mortality (and thus the depressive symptoms) but also felt an appreciation of life that accompanies this final stage for some people. Without having a larger sample size, it is difficult to know whether their experiences are typical of other patients in similar situations.

Level of optimism. This interaction analysis investigated whether level of optimism acts as a moderator in the association between depressive symptoms and quality of life in dialysis patients. Level of optimism was a significant predictor of quality of life (B = .54, SE = .27, p = .04), with more optimistic patients reporting higher levels of quality of life. Level of optimism also moderated the relationship between depressive symptoms and quality of life (B=.09, SE = .04, p = .04) when controlling for interval since diagnosis and social support (See Table 9.) More depressed patients who were also optimistic were more likely to be satisfied with their quality of life. The total model

Table 9
Final Model of Simultaneous Multiple Regression Analysis for Depressive Symptoms, Optimism, the Interaction Between Depressive Symptoms and Optimism, and Control Variables Predicting Quality of Life (N = 65)

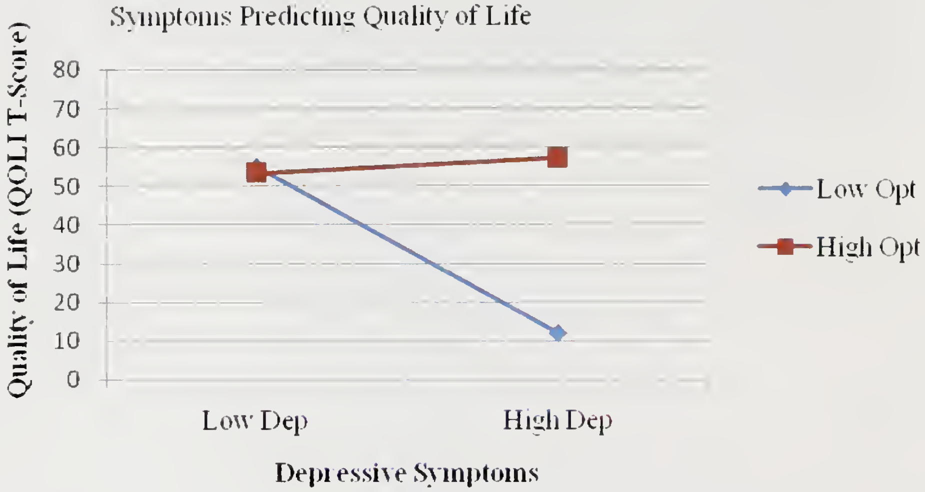
Variable	*B*	*SE B*	*β*
Years Since Diagnosis	1.64	1.25	.14
Optimism	-.54	.27	.05*
Social Support	.02	.01	$.20^{t}$
Depressive Symptoms	-.68	.28	-.29*
Interaction Term (Ds X Opt)	.09	.04	.23*

Note. $^{*}p < .05$. $^{**}p < .01$. $^{t}p < .10$

explained 38% of the variance in quality of life. Gender and nutritional status were trimmed from the model because they were not significant predictors of quality of life.

As shown in Figure 3, patients who were less depressed reported that their quality of life was in the Average range regardless of their level of optimism. In other words, patients who described themselves as pessimistic did not report experiencing problems with quality of life as long as they were not experiencing high levels of depressive symptoms. In contrast to this, the more depressed group of patients showed significant differences in quality of life depending on whether they described themselves as optimistic or pessimistic. The group with the worst quality of life scores (QOLI t-score =11.93, Quality of Life Classification=Very Low) was comprised of individuals who

Figure 3
Interaction Between Optimism and Depressive Symptoms Predicting Quality of Life



perceived themselves as both depressed and pessimistic. Equally depressed individuals who described themselves as optimistic fared significantly better, reporting quality of life at the high end of the Average range (QOLI t-score = 57.14, Quality of Life Classification = Average.)

This result extends previous research findings that have tied optimism to quality of life in populations with ESRD and other chronic illnesses. Molzahn and her colleagues (1997) found that ESRD patients with a positive outlook are more likely to feel satisfied with life, and other researchers have reported a similar relationship in those with diabetes, rheumatoid arthritis, and multiple sclerosis (Fournier et al., 2001.) In the current study, this interaction analysis looked more specifically at optimism as a moderator in the relationship between depressive symptoms and quality of life. The results of the analysis, which suggest that optimism protects the quality of life of dialysis patients who are experiencing depressive symptoms, is noteworthy because it contradicts the assumption that people who are experiencing depressive thoughts and emotions must necessarily describe key areas of life in negative ways. It appears that quality of life can be more accurately predicted by considering both the current emotional state of individuals (i.e., symptoms of depression) and the static personality traits that affect how they interpret themselves and their life over a long period of time (i.e., optimism.) It seems likely that individuals draw on their optimistic personalities in order to cope with negative life events, such as suffering from a chronic illness. Perhaps by expecting positive outcomes and having the ability to “see the light at the end of the tunnel,” these individuals might be able to retain appreciation of key life domains, such as romantic love, friends, and community, even in the midst of a transient episode of depressive symptoms.

It is also possible that optimism and posttraumatic growth act in similar ways, as mechanisms that protect quality of life in depressed people. As shown in Figure 1 and Figure 3, the interactions between depressive symptoms and posttraumatic growth and between depressive symptoms and optimism look similar, in that the group of patients that seems to be suffering is the group that lacks the positive emotional experience (in this case, optimism, in the other case, posttraumatic growth), rather than the group that is experiencing the negative emotionality that accompanies depression. The measure of optimism asks people to think about their whole lives, and whether they tend to see the glass as half full or half empty, whereas the posttraumatic growth measure asks people to think about how they may have changed in positive ways as a result of enduring the trauma of a serious illness. Therefore, the optimism measure looks at an enduring personality trait whereas the PTG measure looks at positive emotional changes brought on more recently as the result of illness. What they have in common, and what is perhaps the most important part of this picture, is that both of these measures tap into positive emotional experiences.

One participant, when interviewed, spoke about how experiencing kidney disease transformed her into a more optimistic person. “I was a real worrywart before,” she explained, “but now I make the best of whatever the situation is. I really don’t worry anymore about it.” It may seem surprising that experiencing a negative event, such as a chronic illness, could lead to someone approaching life with a more positive, relaxed attitude, and yet that is exactly what she seems to be communicating. Her most memorable comment referred to the process of transforming her experience of spending three days each week in a dialysis clinic. She declared, “I don’t have to go to the doctor as much.” She feels reassured by the staff checking her vital signs and other markers of health three times a week, and notes the benefit of not needing to visit a physician as often. This is an example of how an optimistic attitude (e.g., “this treatment will help me stay healthier and keep me out of the doctor’s office”) leads to the recharacterization of a challenging experience.

Level of social support. This interaction analysis assessed whether level of perceived social support moderates the relationship between depressive symptoms and quality of life in dialysis patients. This interaction was not significant ($B = .00$, $SE = .001$, $p = .85$) when controlling for gender, nutritional status, interval since diagnosis, and optimism. The total model explained 35% of the variance in quality of life. The interaction of social support and depressive symptoms remained nonsignificant even after nonsignificant controls (gender, nutritional status, time since diagnosis) were trimmed from the model. The final model predicted 33% of the variance in quality of life.

One reason for looking at social support as a possible moderator of the relationship between depressive symptoms and quality of life is that a significant result might have improved our understanding of how positive factors protect dialysis patients from experiencing a poor subjective sense of well-being. In the health psychology literature, social support is often mentioned as a strong predictor of quality of life outcomes, in cancer survivors (Bloom, Petersen, & Kang, 2007), cardiac patients (Woodgate, Brawley, & Shields, 2007) and organ transplant recipients (Cetingok, Hathaway, & Winsett, 2007). The ESRD literature has been mixed on whether social support plays a large role in influencing the experience of quality of life (e.g., Symister & Friend, 2003; Molzahn et al., 1997; Vasquez et al., 2003). In the current study, this interaction analysis was designed to test social support as a possible moderator, in an effort to enhance our understanding of the ways in which social support might impact quality of life. It is important to know, for example, if social support is a stronger protective factor than other positive variables such as posttraumatic growth and optimism. The nonsignificant findings suggest that in this sample of patients, perceived social support does not affect the relationship between mood and quality of life.

Research Question Six (Q6):

This research question examined the moderating role of the following variables in the association between posttraumatic growth and quality of life: (1) gender, (2) interval since diagnosis, (3) nutritional status, (4) level of optimism, and (5) level of social support. All two-way interactions between posttraumatic growth and the control variables listed above were analyzed.

Gender. Gender was not a moderator in the association between posttraumatic growth and quality of life (B = -.09, SE = .13, p = .46) when controlling for nutritional status, interval since diagnosis, optimism, and social support. In other words, posttraumatic growth did not predict quality of life differently for men and women. The total model explained 25% of the variance in quality of life. The interaction of gender and posttraumatic growth remained nonsignificant even after nonsignificant controls (nutritional status, time since diagnosis) were trimmed from the model. The final model explained 22% of the variance in quality of life.

Given that one of the main goals of the current study is to examine how posttraumatic growth is associated with quality of life, it is important to consider the possibility that this type of positive psychological growth may impact men and women differently. For example, it is possible that female patients might be more psychologically minded, or more aware of their internal emotional experiences, and thus better able to translate posttraumatic growth experiences into day-to-day improvements in life satisfaction, such as improvements in their relationships with their children. Other possibilities exist as well. In their review of gender differences in ESRD research, Lew and Patel (2007), suggested that female dialysis patients face a number of unique challenges, such as decreased support from spouses, problems with fertility and conception, and burdens of homemaking and juggling multiple roles. It is possible that such challenges might limit the quality of life improvements that could emerge from posttraumatic growth in female patients. Unfortunately, the results of the analysis discussed here do not provide sufficient clarification of these important questions.

Interval since diagnosis. Interval since the diagnosis of chronic kidney disease was not a moderator in the association between posttraumatic growth and quality of life (B = -.06, SE = .05, p = .25) when controlling for gender, nutritional status, optimism, and social support. In other words, the effect of posttraumatic growth on quality of life did not vary as a function of the amount of time that had passed since the diagnosis. The total model explained 26% of the variance in quality of life. The interaction of interval since diagnosis and posttraumatic growth remained nonsignificant even after nonsignificant controls (i.e., gender, nutritional status, and social support) were trimmed from the model. The final model explained 18% of the variance in quality of life.

It is possible that the passage of time might change the relationship between patients' psychological growth and their quality of life, perhaps because growth may be more beneficial early in the course of the illness when patients are just beginning to understand the meaning of their experience, or, alternately, more beneficial in the later stages when patients have an opportunity to reflect back on their experiences. The nonsignificant results of this interaction analysis should be interpreted cautiously, given that these patients were not studied at multiple time points. A longitudinal study would better answer the question of the ways in which relationships between psychosocial factors and quality of life change over time, as patients go through markedly different stages of adjustment to illness.

Nutritional status. Nutritional status was not a moderator in the association between posttraumatic growth and quality of life (B = .00, SE = .00, p = .13) when controlling for gender, interval since diagnosis, optimism, and social support. The total model explained 27% of the variance in quality of life. However, there was a trend toward significance for the interaction between nutritional status and posttraumatic growth when non-significant controls (i.e., gender, interval since diagnosis) were trimmed from the model (B = .00, SE = .00, p = .07). This model explained 25% of the variance in quality of life (See Table 10 for final model.)

As shown in Figure 4, this interaction analysis suggests that there is a trend toward better quality of life for dialysis patients who fall into one of the following two categories: 1) poor nutrition and high levels of posttraumatic growth, or 2) good nutrition and low levels of posttraumatic growth. This result should be interpreted with caution because it is not statistically significant, and also because exploration of the data suggests that a small number of elderly individuals with poor nutrition also happen to be experiencing positive growth and above average quality of life. Similar to the discussion of RQ5, the vast majority of the patients in this sample were able to be maintained at adequate levels of nutrition, with only a few, extremely ill patients showing signs of hypoalbuminemia. Because of this pattern, the data collected on nutritional status did not have sufficient variability to lead to meaningful results in these multiple regression analyses.

Level of optimism. Level of optimism was not a moderator in the association between posttraumatic growth and quality of life (B = 9.75E-008, SE = .00, p = .79) when controlling for gender, nutritional status, interval since diagnosis, and social support. The total model explained 24% of the variance in quality of life. The interaction between posttraumatic growth and level of optimism remained nonsignificant when nonsignificant controls (i.e., gender, nutritional status) were trimmed from the model. The final model explained 23% of the variance in quality of life.

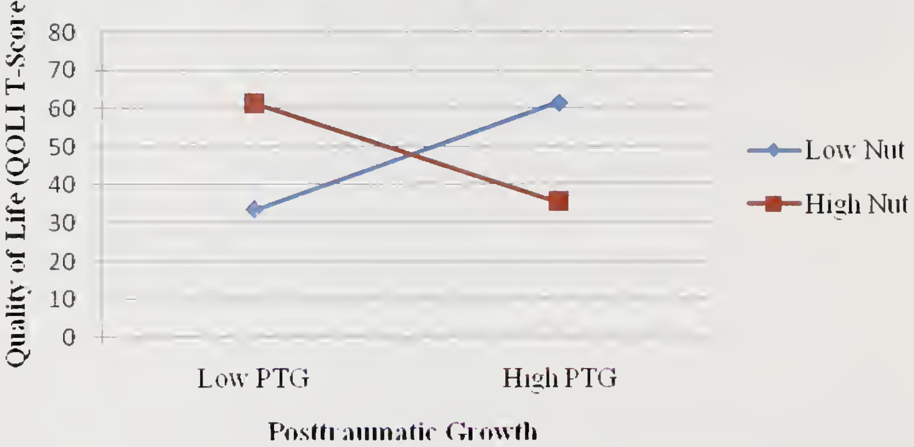
Table 10
Final Model of Simultaneous Multiple Regression Analysis for Posttraumatic Growth, Nutritional Status, the Interaction Between Posttraumatic Growth and Nutritional Status, and Control Variables Predicting Quality of Life (N = 65)

Variable	*B*	*SE B*	*β*
Nutritional Status	-.0004	0.00	-.01
Optimism	.63	.29	.26*
Social Support	.02	.009	$.21^{t}$
Posttraumatic Growth	-.04	.06	-.08
Interaction Term (Nut X PTG)	.0003	.0002	$.24^{t}$

Note. *$p < .05$. **$p < .01$. $^{t}p < .10$

The goal of this exploratory analysis was to determine whether pessimistic and optimistic patients show a difference in how their experience of positive growth affectstheir assessment of important life domains, such as work, love, and play. It appears that optimism is not a moderator in this relationship. As discussed previously, posttraumatic growth did not predict quality of life in the current study (RQ2) whereas optimism consistently predicted quality of life throughout this series of analyses. It seemed likely that examining optimism as a moderator might clarify what types of persons would be best able to draw from traumatic experiences in ways that would benefit their overall quality of life. More optimistic people might be better able to translate internal growth into more positive assessments of practical life domains. It appears that research is needed to elucidate the nature of the relationship between

Figure 4
Interaction Between Nutritional Status and Posttraumatic Growth Predicting Quality of Life



optimism - an enduring personality trait - and the internal, situationally-based experience that is conceptualized as posttraumatic growth.

Level of social support. Level of social support was not a moderator in the association between posttraumatic growth and quality of life (B = 9.75E-005, SE = .00, p = .79) when controlling for gender, nutritional status, interval since diagnosis, and social support. The total model explained 24% of the variance in quality of life. The interaction between posttraumatic growth and level of social support remained nonsignificant when nonsignificant controls (gender, nutritional status) were trimmed from the model. The final model explained 23% of the variance in quality of life.

Similar to the above analysis (interaction between posttraumatic growth and optimism), perhaps dialysis patients make different use of posttraumatic growth depending on their level of social support. For example, individuals with lower levels of social support may benefit more from their internal experience of growth because they are more solitary, self-sufficient types of people. Alternatively, it could be argued that good social support would enable individuals to better translate internal experiences of growth into improvements in their subjective quality of life. Processing growth experiences with others may enhance any effect on quality of life. Although this is an interesting question that merits further research, the current analysis does not suggest that social support is a moderator in the relationship between posttraumatic growth and quality of life in this population.

Additional Exploratory Analyses:

The goal of this set of exploratory analyses was to better understand how each of the study variables (i.e., depressive symptoms, gender, interval since diagnosis, nutritional status, level of optimism, and level of social support) is associated with posttraumatic growth in people with ESRD. Using multiple regression, the association between each of the variables listed above and posttraumatic growth was tested. All predictors were entered into the model simultaneously.

Although gender, interval since diagnosis, nutritional status, and level of social support were not significant predictors of posttraumatic growth (see Table 11 for model), depressive symptoms significantly predicted posttraumatic growth (B = 1.56, SE = .63, p = .02). More depressed dialysis patients were also likely to report the most psychological growth. This finding is consistent with the perspective that salutary and pathological outcomes are positively associated, a seemingly counterintuitive point of view that has been supported by recent research on veterans suffering from posttraumatic stress disorder (Solomon & Dekel, 2007). The authors of this study suggest that after traumatic experiences, positive and negative outcomes emerge as separate outcomes, and that these two constructs (i.e., posttraumatic growth and PTSD) are related to one another in a

Table 11
Model of Simultaneous Multiple Regression Analysis for Depressive Symptoms, Gender, Interval Since Diagnosis, Nutritional Status, Optimism, and Social Support Predicting Posttraumatic Growth (N = 65)

Variable	*B*	*SE B*	*β*
Depressive Symptoms	1.56	.63	.33*
Gender	11.16	7.32	.20
Interval Since Diagnosis	5.06	3.01	.20
Nutritional Status	-.01	.01	-.18
Optimism	1.40	.66	.28*
Social Support	-.02	.02	-.11

Note. **p < .05. **p < .01.* $^{t}p < .10$

curvilinear fashion, with individuals experiencing moderate levels of distress being the most likely to show growth. Although PTSD is a different type of negative outcome than depression, the important similarity here is that vulnerability and resilience seem to co-occur in the same individuals. For dialysis patients, it appears that experiencing moments of sadness, hopelessness, or lack of interest in activities does not preclude the possibility of profound psychological growth.

It should be noted that very few of the patients in this sample were clinically depressed, which lends support to the idea that a curvilinear relationship could be present. Perhaps it is the individuals with mild to moderate levels of depressive symptoms, rather than no symptoms at all, who are self-aware and internally focused enough to experience

- or notice and report that they are experiencing - existential changes such as increased spirituality or appreciation of life.

The results of this exploratory analysis also call to mind Bradburn's (1969) classic theory of emotion which posits that positive and negative emotional dimensions are separate but related. For example, in a given week or month, an individual could experience high levels of both positive and negative affect, such as excitement and disappointment. It is possible that the dialysis patients in this study who are experiencing some negative emotionality may also have a heightened sensitivity to the positive growth that can potentially arise out of difficult life experiences. Perhaps they are reacting more intensely in both positive and negative ways to the traumatic experience that is kidney disease.

In addition to looking at depressive symptoms, a changeable affective state, this exploratory analysis also included level of optimism, which is best thought of as a more stable, enduring personality trait. Level of optimism was a significant predictor of posttraumatic growth (B = 1.40, SE = .66, p = .04), such that people who were more optimistic were more likely to report experiencing posttraumatic growth. This is not surprising, given that some of the attitudes and styles of thinking that accompany an optimistic personality, such as expecting a good outcome or looking on the bright side, would also enhance a person's ability to find something positive in a seemingly negative life experience. This result also fits with other research that has demonstrated a positive connection between optimism and posttraumatic growth, such as Milam's (2004) study of posttraumatic growth in HIV/AIDS patients.

CHAPTER IV

CONCLUSIONS, TREATMENT IMPLICATIONS, LIMITATIONS, AND FUTURE DIRECTIONS

Conclusions:

The results of this study confirm that people undergoing hemodialysis treatments for ESRD do experience posttraumatic growth, and that this growth may play a role in certain quality of life outcomes. Most importantly, posttraumatic growth appears to act as a buffer for patients who are experiencing high levels of depressive symptoms, allowing them to experience quality of life that is in the High Average range. The kinds of psychological changes captured by the Posttraumatic Growth Inventory, which include increased personal strength, appreciation of life, and spirituality, may act as a protective mechanism by helping people make meaning out of their life experiences. These changes help them keep their painful affective experiences in perspective, thus limiting or even preventing their impact on quality of life.

This study adds to a wide body of research showing that depressive symptoms negatively impact quality of life. However, this relationship was mitigated by the presence of psychological growth experiences, as mentioned above. Additionally, this group of patients was not severely depressed, with the majority reporting low levels of depressive symptoms and quality of life in the average range. This is important information for the general public and for health providers to keep in mind; the majority of dialysis patients demonstrate resilience and healthy adjustment in the face of a life-threatening, incurable, and chronic illness.

Treatment Implications:

Because quality of life is subjective and multidimensional, health professionals can help patients improve their quality of life by helping them restructure how much importance they place on each dimension (e.g., health, goals and values, work, community.) It is likely that the participants in this study who reported depressive symptoms, but high levels of posttraumatic growth and overall satisfaction with their quality of life, were able to assign greater importance to dimensions of life in which they could remain fully engaged while coping with their illness. For example, the process of making meaning of one's experience through spiritual practice may lead an individual to prioritize goals and values, or cherish relationships with relatives. For those patients who are depressed, the first treatment priority should be to alleviate the symptoms of depression. The findings of this study suggest, however, that these same patients would benefit from both cognitive-behavioral and existential therapeutic approaches aimed at improved quality of life. Patients may be able to tolerate moderate levels of negative emotionality if they can also recognize and appreciate the positive parts of their lives.

Limitations:

Several important limitations should be kept in mind when interpreting the results of this study. First, the sample (65 patients) was drawn from a larger group of approximately 135 dialysis patients being treated at the outpatient clinics affiliated with the University of Massachusetts Medical School. Although every effort was made to include as many of the 135 patients as possible, some patients were too ill to be able to answer the large number of questions included in this battery. A few patients chose not to participate, and several patients also needed to be excluded because they did not speak

English, were under the age of 18, or were diagnosed with a psychotic disorder. Because of these exclusions, it is possible that the patients in this study represent the healthier, better adjusted segment of the dialysis patient population. Results should therefore be applied to the larger population of dialysis patients with caution.

Although every effort was made to provide privacy to patients while they were verbally responding to questionnaires, the busy nature of the clinic setting meant that some patients' responses may have been affected by concerns about being overheard. Additionally, some patients responded orally whereas others provided written responses, so there may be a difference in the quality or accuracy of some of these data. Patients who responded orally may have benefited from having the chance to ask for clarification, but may also have felt more limited in answering questions about sensitive topics, such as sexual functioning.

This study also has the limitations that are inherent in using self-report questionnaires. Although each of the measures used in this study demonstrated adequate validity and reliability, self-report measures by definition tap into what individuals believe to be true, and what they are willing to communicate about what they believe to be true. With posttraumatic growth in particular, researchers have pointed out that few studies link reports of growth to actual growth as evidenced by behavioral reports or other objective indicators (Frazier & Kaler, 2006; Helgeson, Reynolds, & Tomich, 2006). Some have characterized posttraumatic growth as being a type of denial, or illusion (Frazier & Kaler, 2006). Clearly, more research will be needed to clarify the mechanisms behind posttraumatic growth and to tie it to objective outcomes. This type of research will mitigate the potential inaccuracies and response biases present when using self-report instruments.

In this study, the interval since patients were diagnosed with chronic kidney disease was obtained by asking patients, rather than by relying on medical records. Patients' memories may not have been accurate. The lack of significant findings tied to this variable should therefore be interpreted with caution. It is possible that a more accurate assessment of time passing may have yielded significant findings.

In measuring objective physical health status for this study, it was decided that nutritional status would be used as the main indicator, even though it is only one component of overall physical health. Ideally, each patient's physician would have examined several health indicators and decided on an appropriate overall rating. Results involving nutritional status should also be interpreted with caution because of the lack of variability in these data for this sample. The vast majority of these patients were in the adequate range of nutritional status. This lack of variability led to low power, even after data transformations were performed.

Future Directions:

In order to overcome the limitations of a cross-sectional design, future studies should ideally measure growth at more than one point in time. This type of longitudinal approach would help clarify when growth occurs, how it changes over time, and how growth processes are tied to quality of life, mental health, and physical health outcomes. It is important to assess growth as it is occurring, rather than asking patients years later to rely on their memories of past growth experiences. In addition to preventing inaccuracies due to flawed memory, this type of multi-stage assessment approach would also help tease out biases in reporting caused by mood fluctuations. Patterns of relationships between mood and posttraumatic growth could be assessed over time. It would be expected that true growth would remain stable or increase over time, though decrements in growth might be seen with the progression of illness.

Questions remain about the validity and benefits of a person's perceived posttraumatic growth experiences. Future studies should investigate how reports of growth in particular domains, such as personal strength or spirituality, correlate with better functioning in those same domains. Growth reports should also be corroborated by behavioral observations of those close to the patients, such as family members and friends. Although self-perceptions are important, and some would say paramount, posttraumatic growth would be more universally recognized as valid if self-reports were consistent with multiple indicators of improved life functioning. This is an especially crucial point which future research should consider, given that some studies have recently shown that posttraumatic growth may be illusive, or may be negatively tied to quality of life (Frazier & Kaler, 2006; Tomich & Helgeson, 2004.)

Assuming that posttraumatic growth is a valid phenomenon and is shown to be beneficial in a particular population, research studies should be designed to test growth as a treatment outcome. For example, individual or group therapy approaches could be developed with the facilitation of growth in mind, with post-therapy success partly determined by scores on the Posttraumatic Growth Inventory or other appropriate measures. Some ways of encouraging growth during mental health interventions might include writing about gratefulness (e.g., daily gratefulness journaling), participating in activities that promote spirituality, peer support from a fellow patient who has found meaning in his or her experiences, or assisting the patient in continuing with pre-illness employment. Cognitive behavioral techniques could be used to help patients reframe traumatic experiences in more positive terms while not ignoring the profound loss and pain brought on by the illness. Attempts to foster posttraumatic growth should not be viewed as an avoidance of acknowledging the negative feelings of those who are suffering. However, viewing resilience and growth as existing in the foreground, next to suffering, may help providers identify and support the unique capacities of each individual.

APPENDIX A

FACT SHEET

Quality of Life in Dialysis Patients

Patient Information Card

Your participation in this study is entirely voluntary. If you agree to participate, this is what the study will involve:

1) Fill out questionnaires for about 1 ½ hours during your dialysis visit. The questionnaires will ask you about:
    - your experiences with kidney disease and dialysis
    - your feelings about your health
    - sadness, fatigue, anxiety, or other difficulties you might be experiencing
    - experiences with friends and family
    - thoughts about your life in general

2) If you have difficulty writing, the researcher will ask you the questions and record your answers for you.

3) The researcher will also copy the following pieces of information from your medical chart:
    - date of birth, date of beginning dialysis, and ethnicity
    - serum albumin levels
    - URR and Kt/v
    - hemoglobin
    - parathyroid hormone level

All information will be kept completely confidential and your name will not be used in association with any information.

APPENDIX B

CONSENT FORM

UNIVERSITY OF MASSACHUSETTS MEDICAL SCHOOL COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS IN RESEARCH

CONSENT TO PARTICIPATE IN A RESEARCH PROJECT

Title: Quality of Life in Dialysis Patients

Principal Investigator: David M. Clive, M.D.
Co-Investigator: Kristen McDonald, M.A.

Research Subject's Name:________________________________Date:_________

Invitation to Take Part and Introduction

You are invited to volunteer for a research study. You are asked to take part because you are receiving dialysis treatments at a facility associated with the University of Massachusetts Medical School (UMMS). 150 dialysis patients at UMMS facilities are being recruited to participate in this study, with the approval of their physicians.

Purpose of Research

The goal of this research is to better understand how patients adapt to being on dialysis. We are interested in knowing what challenges you have encountered as well as what coping strategies have worked best for you. By finding out more about your experiences, we hope to design better support services and interventions to maximize the quality of life for people on dialysis.

Your Rights

It is important for you to know that:

Your participation is entirely voluntary.

You may decide not to take part or decide to quit the study at any time, without any changes in the quality of the health care you receive.

You will be told about any new information or changes in the study that might affect your willingness to participate.

PROCEDURES

1. You will be excluded from participating in this research study if any of the following criteria apply:
    a) you are under the age of 18
    b) you are not fluent in English
    c) your physical condition makes it difficult for you to answer questions on a series of forms. (You may verbally state your answers if you cannot write.)
    a) your physician believes your participation would not be in your best interests because of your medical or psychological condition.
2. Your participation in this study will occur during one or two of your regularly scheduled dialysis visits. Your participation will last for approximately 1 ½ - 2 ¼ hours. One in five participants (randomly selected) will be asked to participate in an optional 45 minute follow-up interview. If you agree to participate in the interview, it will last 45 minutes and will take place during a different dialysis session or at another time that is convenient for you.
3. Your participation will include filling out a series of questionnaires about your social, psychological, and physical experiences as a dialysis patient. If you cannot fill out the questionnaires, you can say your answers aloud and the researcher will write them down.
4. No medical procedures will be part of this study. The medical care you receive while at your dialysis sessions will be the same as usual, and you will be able to take a break from filling out the questionnaires at any time.

Timeline of Procedures

If you participate only in the questionnaire portion of this research study, your participation will last for approximately 1 ½ hours. If you are asked to take part in the follow-up interview and you agree to participate, a member of the research team will meet with you during one of your regularly scheduled dialysis visits in the three month period following your initial date of participation. If this is not a convenient time for you, the researcher will make every effort to schedule a different time that is more convenient for you.

Visit 1

This part of the study will take about 1 ½ hours. While you are undergoing dialysis, the researcher will verbally explain the study procedure to you and receive both your verbal and written consent. Then he or she will give you a packet of questionnaires to fill out, which takes most people about 1 – 1 ½ hours. The researcher will be available to answer any questions you have about the questionnaires, and you will be able to stop at any time if you are not feeling well. When you are finished, you will have an opportunity to ask the researcher any additional questions. He or she will also ask you if you are interested in participating in a follow-up interview.

Visit 2
If you are randomly selected and you agree to participate in the follow-up interview, you will be scheduled to meet with a member of the research team for 45 minutes during a regularly scheduled dialysis visit or at another convenient time during the 3 month period following Visit 1. The interview will take place behind a privacy screen. The purpose of this interview will be for the researcher to ask additional questions about your psychological, social, and physical functioning. The researcher will audiotape (tape record) this conversation. This information will be kept confidential. Neither your name nor any identifying information will be used in any written document pertaining to this interview.

CONFLICT OF INTEREST DISCLOSURE:

None.

RISKS

There is a risk that your arm or hand might feel uncomfortable while filling out the questionnaires. There is also a possibility that answering some of the questions on the forms may cause you psychological distress. The researcher will be available to discuss any concerns you may have and will provide appropriate referrals for psychological counseling.

BENEFITS

Although there is no direct benefit to you from being in this study, you may find it beneficial to reflect upon your experiences with kidney disease. You will also be given the opportunity to receive a mailing containing a summary of the research findings. Your participation may also help others with this condition in the future as a result of knowledge gained from the research.

REASONS YOU MIGHT BE WITHDRAWN FROM THE STUDY WITHOUT YOUR CONSENT

You may be taken out of the research study if:

1. The investigator decides that continuing in the study would be harmful to you.
2. The study is canceled by the University of Massachusetts Medical School Institutional Review Board.

ALTERNATIVES

Choosing not to participate in this study will have no effect on the medical treatment provided to you.

COSTS

There will be no cost to you associated with your participation in this research study.

COMPENSATION

You will not be compensated monetarily for your participation in this study.

CONFIDENTIALITY

Your privacy is important to us. Your research records will be confidential to the extent possible. In all records, you will be identified by a code number and your name will be known only to the researchers. Your name will not be used in any reports or publications of this study. However, the UMMS Institutional Review Board and/or their representatives may inspect your medical records that pertain to this research study. We will not allow them to copy any parts of your identifiable information (e.g., your name) or take any of your identifiable information from our offices.

YOUR PARTICIPATION IN THIS PROJECT IS ENTIRELY VOLUNTARY. YOU MAY WITHDRAW FROM THE STUDY AT ANY TIME.

THE QUALITY OF CARE YOU RECEIVE AT THIS HOSPITAL WILL NOT BE AFFECTED IN ANY WAY IF YOU DECIDE NOT TO PARTICIPATE OR IF YOU WITHDRAW FROM THE STUDY.

QUESTIONS

Before you sign this consent form, please feel free to ask any questions you may have about the study or about your rights as a research subject. If other questions occur to you later, you may contact Dr. David M. Clive, the Principal Investigator, by calling 508-856-3155. You may also contact Kristen McDonald, M.A., the Co-Investigator, by calling 413-687-3081. You may take as much time as needed to think this over. If at any time during or after the study, you would like to discuss the study or your research rights with someone who is not associated with the research study, you may contact the Administrative Coordinator for the Committee for the Protection of Human Subjects in Research at UMMS. The telephone number is (508) 856-4261.

CONSENT TO PARTICIPATE IN THE RESEARCH PROJECT

Title: **Quality of Life in Dialysis Patients**

P.I. Name: **David M. Clive, M.D.** Co-Investigator's Name: **Kristen McDonald, M.A.**

Subject's Name:

I understand the purpose and procedures of this research project and the predictable discomfort, risks, and benefits that might result. I have been told that unforeseen events may occur. I have had an opportunity to discuss the risks and benefits of this research with the investigator and all of my questions have been answered. I agree to participate as a volunteer in this research project. I understand that I may end my participation at any time. I have been given a copy of this consent form.

____ Date:_______________

Subject's signature

STATEMENT OF PERSON OBTAINING CONSENT

I, the undersigned, have fully explained the details of this clinical study as described in the consent form to the subject named above.

____ Date: _______________

Signature of person obtaining consent

INVESTIGATOR'S DECLARATION

As the principal investigator or co-investigator on this study, I attest to the following:

- the nature and purpose of the study and study procedures, as well as the foreseeable risks, discomforts and benefits have been explained to the above-named subject
- this subject has been given the opportunity to ask questions and to have those questions answered by knowledgeable research staff
- this subject meets the inclusion/exclusion criteria for this study

I have considered and rejected alternative procedures for answering this research question.

___________________________ ___________________

PI Signature Date

APPENDIX C

SEMI-STRUCTURED INTERVIEW

Questions

(1) How long have you been on dialysis?
(2) Tell me the story of your experience.
(3) How have changed as a result of your experience?
(4) How are you feeling emotionally now?
(5) How have your relationships been affected by your experiences with kidney disease?
(6) What activities do you do for pleasure?
(7) Are you working? If so, how has your work experience changed since developing kidney disease?
(8) Which activities have you had to give up as result of being sick?
(9) What positive benefits, if any, have you experienced since developing kidney disease?
(10) What advice would you give to someone else who is just starting dialysis?
(11) What are your thoughts about the future?

APPENDIX D

DEBRIEFING SHEET

Quality of Life in Dialysis Patients

Patient Information Sheet

The purpose of this research study was to better understand the psychological experiences of people with kidney failure who are undergoing dialysis treatments. We asked you questions about different parts of your life, including both experiences related directly to your illness and its treatment, as well as questions about other aspects of your life, such as your relationships with friends and family, in order to gain a broad understanding of how different aspects of your experience might relate to one another. Specifically, we were wondering whether some patients experience positive growth through coping with their illness. We were also interested in how feelings of sadness or hopelessness impact people's overall quality of life.

We appreciate your time and consideration in being a part of this study. We realize that your time is valuable and we thank you for your generosity in being willing to provide us with information about your experiences. All of the information that you have provided will be kept confidential. If you have any questions or concerns about this study, please feel free to contact the research manager, Kristen McDonald, at (413) 687-3081, or the principal investigator, David M. Clive, M.D., at (508) 856-3155. You may also contact the UMass Amherst faculty sponsor of this project, Richard Halgin, Ph.D., at (413) 545-5966, or the Administrative Coordinator for the Committee for the Protection of Human Subjects in Research at UMMS at (508) 856-4261. If you have requested to receive a brief summary of the research results in the mail and provided your postal address, the researchers will mail you that information as soon as the study is completed.

APPENDIX E

QUESTIONNAIRE: PAGES 1 AND 2

Quality of Life in Dialysis Patients

A Research Study Sponsored by

University of Massachusetts Memorial Medical Center and

University of Massachusetts Amherst

Thank you for agreeing to participate in today's research study!

We appreciate your time, and we want to make sure that you are comfortable while you are filling out these questionnaires. If at any point you experience discomfort, please stop and call your nurse so that she can assist you. Also, if you have any questions as you are filling out these questionnaires, please feel free to stop and ask the researcher for clarification.

All information will be kept anonymous and confidential.

1. Your participant number: ______________

2. Your age: ______________

3. Today's date: ____________

4. Your marital status (Please circle):

   Single Married Separated Divorced Widowed

5. Your ethnicity (Please circle):

   Hispanic/Latino African-American/Black White

   Asian/Asian-American Native American Other

6. Are you currently working outside of the home? (Please circle)

   Yes, full-time Yes, part-time No

7. When were you first diagnosed with chronic kidney disease?

   __________________ __________

   month year

8. When did you first begin hemodialysis treatments?

   __________________ __________

   month year

APPENDIX F

POSTTRAUMATIC GROWTH INVENTORY (PTGI)

Posttraumatic Growth Inventory

Using the following scale, indicate for each of the statements below the degree to which this change occurred in your life as a result of your kidney disease and its treatments (e.g., dialysis).

0 = I did not experience this change as a result of my kidney disease.
1 = I experienced this change to a very small degree as a result of my kidney disease.
2 = I experienced this change to a small degree as a result of my kidney disease.
3 = I experienced this change to a moderate degree as a result of my kidney disease.
4 = I experienced this change to a great degree as a result of my kidney disease.
5 = I experienced this change to a very great degree as a result of my kidney disease.

1. I changed my priorities about what is important in life. _____

2. I have a greater appreciation for the value of my own life. _____

3. I developed new interests. _____

4. I have a greater feeling of self-reliance. _____

5. I have a better understanding of spiritual matters. _____

6. I more clearly see that I can count on people in times of trouble. _____

7. I established a new path for my life. _____

8. I have a greater sense of closeness with others. _____

9. I am more willing to express my emotions. _____

10. I know better that I can handle difficulties. _____

11. I am able to do better things with my life. _____

12. I am better able to accept the way things work out. _____

13. I can better appreciate each day. _____

14. New opportunities are available which wouldn't have been otherwise. _____

15. I have more compassion for others. _____

16. I put more effort into my relationships. _____

17. I am more likely to try to change things which need changing. _____

18. I have a stronger religious faith. _____

19. I discovered that I'm stronger than I thought I was. _____

20. I learned a great deal about how wonderful people are. _____

21. I better accept needing others. _____

APPENDIX G

QUALITY OF LIFE INVENTORY (QOLI)

QOLI® ™

QUALITY OF LIFE
INVENTORY
Michael B Frisch, PhD

Hand-Scored Answer Sheet

DIRECTIONS:

1. Print your name, identification number, age, gender, and test date on the right side of the page.
2. Use a No. 2 pencil only and make heavy, dark marks when responding to the questions.
3. If you want to change an answer, erase it carefully and then fill in your new choice.
4. Do not make any marks outside the circles.

Last Name First MI

ID Number

Age Gender Test Date

PEARSON
Assessments

Pearson Assessments P. O. Box 1416 Minneapolis MN 55440
800-627-7271 www.pearsonassessments.com

Published and distributed exclusively by NCS Pearson, Inc.
Printed in the United States of America.

Product Number
02104

DIRECTIONS:

This survey asks how satisfied you are with parts of your life such as your work and your health. It also asks how important these things are to your happiness. Special definitions are used for words like “money,” “work,” and “play.” Keep these definitions in mind as you answer the questions. Answer every question, even if it does not seem to apply to you. It is your feelings and opinions that are important, so there are no right or wrong answers. Just give the answers that best describe you.

The survey asks you to describe how **important** certain parts of your life (such as work and health) are and how **satisfied** you are with them.

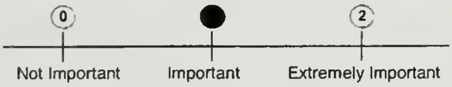
Important means how much this part of your life adds to your overall happiness. You can say how important something is by picking one of three choices: “Not Important” (0), “Important” (1), or “Extremely Important” (2).

Satisfied means how well your needs, goals, and wishes are being met in this area of life. You can say how satisfied you are by picking one of six choices from “Very Dissatisfied” (-3) to “Very Satisfied” (+3).

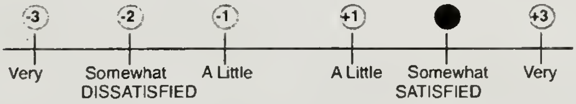
For each question, blacken the circle that best describes you.

EXAMPLE:

This is how you would answer if WORK was “Important” to your overall happiness:



You would answer this way if you were “Somewhat Satisfied” with your WORK:



HEALTH is being physically fit, not sick, and without pain or disability.

1. How **important** is HEALTH to your happiness?

0	1	2
Not Important	Important	Extremely Important

2. How **satisfied** are you with your HEALTH?

-3	-2	-1	+1	+2	+3
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

SELF-ESTEEM means liking and respecting yourself in light of your strengths and weaknesses, successes and failures, and ability to handle problems.

3. How **important** is SELF-ESTEEM to your happiness?

0	1	2
Not Important	Important	Extremely Important

4. How **satisfied** are you with your SELF-ESTEEM?

-3	-2	-1	+1	+2	+3
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

GOALS-AND-VALUES are your beliefs about what matters most in life and how you should live, both now and in the future. This includes your goals in life, what you think is right or wrong, and the purpose or meaning of life as you see it.

5. How **important** are GOALS-AND-VALUES to your happiness?

0	1	2
Not Important	Important	Extremely Important

6. How **satisfied** are you with your GOALS-AND-VALUES?

-3	-2	-1	+1	+2	+3
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

MONEY is made up of three things. It is the money you earn, the things you own (like a car or furniture), and believing that you will have the money and things that you need in the future.

7. How **important** is MONEY to your happiness?

0	1	2
Not Important	Important	Extremely Important

8. How **satisfied** are you with the MONEY you have?

-3	-2	-1	+1	+2	+3
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

WORK means your career or how you spend most of your time. You may work at a job, at home taking care of your family, or at school as a student. WORK includes your duties on the job, the money you earn (if any), and the people you work with. (If you are unemployed, retired, or can't work, you can still answer these questions.)

9. How **important** is WORK to your happiness?

0	1	2
Not Important	Important	Extremely Important

10. How **satisfied** are you with your WORK? (If you are not working, say how satisfied you are about not working.)

-3	-2	-1	+1	+2	+3
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

PLAY is what you do in your free time to relax, have fun, or improve yourself. This could include watching movies, visiting friends, or pursuing a hobby like sports or gardening.

11. How **important** is PLAY to your happiness?

0	1	2
Not Important	Important	Extremely Important

12. How **satisfied** are you with the PLAY in your life?

-3	-2	-1	+1	+2	+3
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

LEARNING means gaining new skills or information about things that interest you. LEARNING can come from reading books or taking classes on subjects like history, car repair, or using a computer.

13. How **important** is LEARNING to your happiness?

⓪	①	②
Not Important	Important	Extremely Important

14. How **satisfied** are you with your LEARNING?

(-3)	(-2)	(-1)	(+1)	(+2)	(+3)
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

CREATIVITY is using your imagination to come up with new and clever ways to solve everyday problems or to pursue a hobby like painting, photography, or needlework. This can include decorating your home, playing the guitar, or finding a new way to solve a problem at work.

15. How **important** is CREATIVITY to your happiness?

⓪	①	②
Not Important	Important	Extremely Important

16. How **satisfied** are you with your CREATIVITY?

(-3)	(-2)	(-1)	(+1)	(+2)	(+3)
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

HELPING means helping others in need or helping to make your community a better place to live. HELPING can be done on your own or in a group like a church, a neighborhood association, or a political party. HELPING can include doing volunteer work at a school or giving money to a good cause. HELPING means helping people who are not your friends or relatives.

17. How **important** is HELPING to your happiness?

⓪	①	②
Not Important	Important	Extremely Important

18. How **satisfied** are you with the HELPING you do?

(-3)	(-2)	(-1)	(+1)	(+2)	(+3)
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

LOVE is a very close romantic relationship with another person. LOVE usually includes sexual feelings and feeling loved, cared for, and understood. (If you do not have a LOVE relationship, you can still answer these questions.)

19. How **important** is LOVE to your happiness?

⓪	①	②
Not Important	Important	Extremely Important

20. How **satisfied** are you with the LOVE in your life? (If you are not in a LOVE relationship, say how satisfied you feel about not having a LOVE relationship.)

(-3)	(-2)	(-1)	(+1)	(+2)	(+3)
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

FRIENDS are people (not relatives) you know well and care about who have interests and opinions like yours. FRIENDS have fun together, talk about personal problems, and help each other out. (If you have no FRIENDS, you can still answer these questions.)

21. How **important** are FRIENDS to your happiness?

⓪	①	②
Not Important	Important	Extremely Important

22. How **satisfied** are you with your FRIENDS? (If you have no FRIENDS, say how satisfied you are about having no FRIENDS.)

(-3)	(-2)	(-1)	(+1)	(+2)	(+3)
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

CHILDREN means how you get along with your child (or children). Think of how you get along as you care for, visit, or play with your child. (If you do not have CHILDREN, you can still answer these questions.)

23. How **important** are CHILDREN to your happiness? (If you have no CHILDREN, say how important having a child is to your happiness.)

0	1	2
Not Important	Important	Extremely Important

24. **How satisfied** are you with your relationships with your CHILDREN? (If you have no CHILDREN, say how satisfied you feel about not having children.)

-3	-2	-1	+1	+2	+3
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

RELATIVES means how you get along with your parents, grandparents, brothers, sisters, aunts, uncles, and in-laws. Think about how you get along when you are doing things together like visiting, talking on the telephone, or helping each other out. (If you have no living RELATIVES, blacken the 0 ["Not Important"] circle for question 25 and do not answer question 26.)

25. How **important** are RELATIVES to your happiness?

0	1	2
Not Important	Important	Extremely Important

26. How **satisfied** are you with your relationships with RELATIVES?

-3	-2	-1	+1	+2	+3
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

HOME is where you live. It is your house or apartment and the yard around it. Think about how nice it looks, how big it is, and your rent or house payment.

27. How **important** is your HOME to your happiness?

0	1	2
Not Important	Important	Extremely Important

28. How **satisfied** are you with your HOME?

-3	-2	-1	+1	+2	+3
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

NEIGHBORHOOD is the area around your home. Think about how nice it looks, the amount of crime in the area, and how well you like the people.

29. How **important** is your NEIGHBORHOOD to your happiness?

0	1	2
Not Important	Important	Extremely Important

30. How **satisfied** are you with your NEIGHBORHOOD?

-3	-2	-1	+1	+2	+3
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

COMMUNITY is the whole city, town, or rural area where you live (it is not just your neighborhood). COMMUNITY includes how nice the area looks, the amount of crime, and how well you like the people. It also includes places to go for fun like parks, concerts, sporting events, and restaurants. You may also consider the cost of things you need to buy, the availability of jobs, the government, schools, taxes, and pollution.

31. How **important** is your COMMUNITY to your happiness?

0	1	2
Not Important	Important	Extremely Important

32. How **satisfied** are you with your COMMUNITY?

-3	-2	-1	+1	+2	+3
Very	Somewhat	A Little	A Little	Somewhat	Very
	DISSATISFIED			SATISFIED	

PROBLEMS THAT GET IN THE WAY OF YOUR SATISFACTION

List any problems that get in the way of your satisfaction in each area of life. For example, if you do not get along with your boss and this makes WORK less satisfying, you may write "Don't get along with boss" on this section of the answer sheet. Please take your time, be specific, and *write as much as you can* to help explain what reduces your satisfaction in each area of life.

Health ______________________________

Self-Esteem ______________________________

Goals-and-Values ______________________________

Money ______________________________

Work ______________________________

Play ______________________________

Learning ______________________________

Creativity ______________________________

Helping ______________________________

APPENDIX H

LIFE ORIENTATION TEST - REVISED (LOT-R)

LOT-R

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer.

A = I agree a lot
B = I agree a little
C = I neither agree nor disagree
D = I DISagree a little
E = I DISagree a lot

1. In uncertain times, I usually expect the best._____

2. It's easy for me to relax. _____

3. If something can go wrong for me, it will. _____

4. I'm always optimistic about my future. _____

5. I enjoy my friends a lot. _____

6. It's important for me to keep busy. _____

7. I hardly ever expect things to go my way. _____

8. I don't get upset too easily. _____

9. I rarely count on good things happening to me. _____

10. Overall, I expect more good things to happen to me than bad. _____

APPENDIX I

COGNITIVE DEPRESSION INVENTORY (CDI)

CDI

This questionnaire consists of 15 groups of statements. After reading each group of statements carefully, circle the number (0, 1, 2, or 3) next to the one statement in each group which **best** describes the way you have been feeling the **past week, including today**. If several statements within a group seem to apply equally well, circle each one. **Be sure to read all the statements in each group before making your choice.**

1	0	I do not feel sad.
	1	I feel sad.
	2	I am sad all the time and I can't snap out of it.
	3	I am so sad or unhappy that I can't stand it.

2	0	I am not particularly discouraged about the future.
	1	I feel discouraged about the future.
	2	I feel I have nothing to look forward to.
	3	I feel that the future is hopeless and that things cannot improve.

3	0	I do not feel like a failure.
	1	I feel I have failed more than the average person.
	2	As I look back on my life, all I can see is a lot of failures.
	3	I feel I am a complete failure as a person.

4	0	I get as much satisfaction out of things as I used to.
	1	I don't enjoy things the way I used to.
	2	I don't get real satisfaction out of anything anymore.
	3	I am dissatisfied or bored with everything.

5	0	I don't feel particularly guilty.
	1	I feel guilty a good part of the time.
	2	I feel quite guilty most of the time.
	3	I feel guilty all of the time.

6	0	I don't feel I am being punished.
	1	I feel I may be punished.
	2	I expect to be punished.
	3	I feel I am being punished.

7	0	I don't feel disappointed in myself.
	1	I am disappointed in myself.
	2	I am disgusted with myself.
	3	I hate myself.

8	0	I don't feel I am any worse than anybody else.
	1	I am critical of myself for my weaknesses or mistakes.
	2	I blame myself all the time for my faults.
	3	I blame myself for everything bad that happens.

9	0	I don't have any thoughts of killing myself.
	1	I have thoughts of killing myself, but I would not carry them out.
	2	I would like to kill myself.
	3	I would kill myself if I had the chance.

10	0	I don't cry any more than usual.
	1	I cry more now than I used to.
	2	I cry all the time now.
	3	I used to be able to cry, but now I can't cry even though I want to.

11	0	I am no more irritated now than I ever am.
	1	I get annoyed or irritated more easily than I used to.
	2	I feel irritated all the time now.
	3	I don't get irritated at all by the things that used to irritate me.

12	0	I have not lost interest in other people.
	1	I am less interested in other people than I used to be.
	2	I have lost most of my interest in other people.
	3	I have lost all of my interest in other people.

13	0	I make decisions about as well as I ever could.
	1	I put off making decisions more than I used to.
	2	I have greater difficulty in making decisions than before.
	3	I can't make decisions at all anymore.

14	0	I don't feel I look any worse than I used to.
	1	I am worried that I am looking old or unattractive.
	2	I feel that there are permanent changes in my appearance that make me look unattractive.
	3	I believe that I look ugly.

15	0	I can work about as well as before.
	1	It takes extra effort to get started at doing something.
	2	I have to push myself very hard to do anything.
	3	I can't do any work at all.

APPENDIX J

MULTIDIMENSIONAL SCALE OF PERCEIVED SOCIAL SUPPORT (MSPSS)

MSPSS

Instructions: We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Circle the "1" if you **Very Strongly Disagree**
Circle the "2" if you **Strongly Disagree**
Circle the "3" if you **Mildly Disagree**
Circle the "4" if you are **Neutral**
Circle the "5" if you **Mildly Agree**
Circle the "6" if you **Strongly Agree**
Circle the "7" if you **Very Strongly Agree**

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1. There is a special person who is around when I am in need. 1 2 3 4 5 6 7
2. There is a special person with whom I can share my joys and sorrows. 1 2 3 4 5 6 7
3. My family really tries to help me. 1 2 3 4 5 6 7
4. I get the emotional help and support I need from my family. 1 2 3 4 5 6 7
5. I have a special person who is a real source of comfort to me. 1 2 3 4 5 6 7
6. My friends really try to help me. 1 2 3 4 5 6 7
7. I can count on my friends when things go wrong. 1 2 3 4 5 6 7
8. I can talk about my problems with my family. 1 2 3 4 5 6 7
9. I have friends with whom I can share my joys and sorrows. 1 2 3 4 5 6 7
10. There is a special person in my life who cares about my feelings. 1 2 3 4 5 6 7
11. My family is willing to help me make decisions. 1 2 3 4 5 6 7
12. I can talk about my problems with my friends. 1 2 3 4 5 6 7