The Evaluation of a Predialysis Class on Client Knowledge and Attitude Toward Compliant Behaviours

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Abstract

In this quasi-experimental study, the theory of reasoned action was used as a conceptual framework to assess the outcome effect of a predialysis class. A pretest, posttest design was used to determine changes in client knowledge about their condition and its treatment, and their intention, attitudes and social norm towards compliant behaviours. The related compliant behaviours were following a low-salt diet and taking medications as proscribed. Thirty-eight End Stage Renal Diseases (ESRD) clients were self-selected into the treatment or control groups. Both groups received the standard predialysis education from members of the multidisciplinary renal team. In addition, the treatment group also attended the predialysis class. Subjects' health locus of control, anxiety and demographic variables were measured as possible extraneous variables. Study subjects from both groups demonstrated a high internal and powerful others health locus of control and a normal range of anxiety. Although not statistically significant ($p = .64$), the experimental group demonstrated higher knowledge level and greater intention to follow a low salt diet ($p = .73$). They developed more significantly positive attitudes towards following a low salt diet and increased subjective norm influence after attending the predialysis class. Attending the predialysis class did not have an effect on subjects' intentions, attitudes or subjective norm towards taking medications as prescribed. Conclusion: The predialysis class was only marginally effective in increasing client knowledge, but influenced clients' attitudes towards following a low-salt diet. Based on the results, recommendations for improvements to the class have been suggested.
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Operational Definitions

creatinine - an amino acid formed by muscle, a diagnostic indicator of kidney function and muscle mass

End stage renal disease (ESRD)- is a progressive, prolonged process involving an irreversible loss of 90-95% of kidney function

hematocrit - a ratio of the total red blood cell volume to the total blood volume

hemodialysis - the removal of certain low molecular elements from the blood by virtue in the rates of diffusion through a semipermeable membrane

peritoneal dialysis - dialysis through the peritoneum

potassium - the chief cation of muscle and other cells

urea - the principle end product of protein catabolism

uremia - an excess in the blood or urea, creatinine and other end products of protein and amino acid metabolism

CHAPTER ONE: INTRODUCTION

The provision of health education is a fundamental aspect of health care. People require appropriate education to gain illness-related knowledge that will assist them in maintaining their health. This is especially significant for those living with a chronic disease, where control, rather than cure, is the goal of treatment. The goal of health care professionals is to help the clients living with chronic illness to achieve optimal health and prevent complications of their condition.

Renal (kidney) failure is a progressive, chronic disease of diminished kidney function. End Stage Renal Disease (ESRD) is diagnosed when kidney failure has progressed to 90-95% irreversible loss of kidney function. At this point, the kidneys are not able to effectively remove metabolic wastes and excess fluid from the body and some form of renal replacement needs to be initiated to maintain life. There were approximately 8,000 Canadians being treated for ESRD in 1994 (Canadian Institute for Health Information, 1996) (Appendix A). By 1996, this number increased by 6.7% and the growth rate is expected to be at least 14% by 1998 (A. Howe, Administrative Director of St. Joseph’s Hospital Kidney and Urinary Program, personal communication, January 30, 1998).

The most common causes of renal failure are diabetes and hypertension.
(Anderson, Fedje & Pulliam, 1993). In Canada, the three leading causes of ESRD requiring renal replacement therapy in 1994 were diabetes (27.8%), glomerulonephritis (18.9%) and renal vascular disease including hypertension (17.4%) (Canadian Institute for Health Information, 1996). There is a 5 year survival rate for 54% of the nondiabetic ESRD group and only 33% for the people with ESRD and diabetes (Canadian Institute for Health Information, 1996) (Appendix B). As recently as 30 years ago, ESRD was not treatable. Since the 1970s renal replacement therapy has been available to treat people afflicted with ESRD. Renal replacement therapy includes hemodialysis, peritoneal dialysis and kidney transplantation. Hemodialysis is a process whereby an artificial kidney machine removes blood from the body and cleans it of excess wastes and fluids. The blood is then returned to the body. This process takes about 3-5 hours and is usually performed three times a week. Peritoneal dialysis is a cyclic form of dialysis which involves fluid exchanges that occur within a person’s peritoneal cavity (abdomen) to facilitate the removal of excess body fluids and wastes. These fluid exchanges occur usually four times a day. Kidney transplantation is the most effective treatment for ESRD and offers the best chance of returning to a normal life.

**Background of the Problem**

People living with ESRD are prescribed a multifaceted treatment regimen
consisting of stringent dietary and medication guidelines. The goal of dietary management is to limit the intake of foods that will cause an increase in metabolic by-products (urea, creatinine) and electrolytes (especially potassium and sodium) that would normally be cleared by functioning kidneys. Foods high in sodium are avoided as they promote the retention of excess body fluid and can exacerbate any existing hypertension. People with ESRD are instructed to limit their fluid intake to prevent excess body fluid, since the damaged kidneys are unable to produce adequate amounts of urine. They must consume a multitude of medications to maintain their health. Many of them take medications to control hypertension, as hypertension is both a cause and complication of chronic renal failure. Phosphate binding drugs are taken to control the excess phosphorus in the blood. Calcium supplements are prescribed because of the inability of the kidney to absorb calcium from dietary sources. Much of the success of ESRD treatment depends on compliance in following the recommended treatment regimen. Failure to adhere to the treatment regime will lead to acceleration of the disease process and can result in health complications, more frequent hospitalizations, and premature death (Friend, Singletary, Mendell, & Nurse, 1986).

Significance of the Problem

Despite the potential adverse effects of non-compliance, it is estimated that 30 -
50% of people with ESRD have problems adhering to their dietary and medication regimen (Wolcot, Maida, Diamond, & Nissenson, 1986). Compliance has been defined by Haynes, Taylor and Sackett (1979) as “the extent to which a person’s behaviour (such as taking medications, following diet or changing lifestyle) coincides with medical and health advice” (cited in Churchill, 1995, p.834). Individuals must understand the regimen, the rationale behind the regimen, and how it is to be followed in order to be compliant (Weed-Collins & Hogan, 1989). Health education is considered an appropriate intervention to promote desired health and to secure behavioural changes in the prevention of major contemporary chronic illnesses (Tones, Tilford, & Robinson, 1990). It involves gain in knowledge and understanding, attitude change, and lifestyle modifications. Goals of health education would be to: improve the client’s knowledge of their condition, provide information regarding ways to maintain health/prevent illness while living with their condition, and assist clients to understand the purpose of treatment regimens. One goal of health care is to facilitate client compliance in following their recommended treatment regime. To intervene effectively, health care providers need to first identify the individual correlates that determine adherence of ESRD clients to treatment regimens. Several renal centres in Ontario offer health education to their ESRD clients as a component of their formal predialysis program. In 1992, a Working Group on Renal Services was formed to work with the Ontario Ministry of Health to develop a
One of the recommendations of the group was that all ESRD programs should ensure that all patients have access to a formal pre-dialysis program; which includes an educational component for patients and their families. The primary purpose of pre-dialysis programs is to provide peer support, diet education, work-up for possible kidney transplantation, psychosocial care, and counselling (Kidney Foundation of Ontario, 1995). The goals of predialysis education are to enhance client self-care strategies, promote client-informed choice of treatment, and decrease anxiety for the clients and their families (Hayslip & Suttle, 1995). According to Churchill (1995, p.831),

early education with respect to the progression of renal disease and treatment modalities available, as well as implications for diet, leisure and vocational activities, will permit the patient to be an informed participant in the decision making process. Early pre-dialysis education has the potential to improve the quality of client satisfaction, delay the onset of dialysis treatment and improve the cost-effectiveness of treatment.

At St. Joseph’s Hospital in Hamilton, Ontario, clients in the Nephrology program receive support and education from members of the multidisciplinary Nephrology team. The team includes Primary Care Nurses (PCN), Nephrologists, a dietician, a pharmacist,
an occupational therapist, a physiotherapist, and a social worker. Clients (and their significant others) also have the opportunity to attend a “Pre-Dialysis Class”, which is presented by various members of the Nephrology health care team. The class is usually presented as a 4-hour session and is offered four times a year. It is intended for clients who are in the predialysis stage of their ESRD, but clients who have already started dialysis may also attend. An average, 40 clients (and their significant others) attend the class per year. In 1995, of the 132 clients registered in the predialysis program, 36 (27%) attended the class (C. VanderKoy, Nephrology PCN, personal communication, October 28, 1997). The main objectives of the class are to promote client compliance, to assist clients in making an informed choice of dialysis treatment, to provide psychosocial support and to reduce anxiety (K. Hunter, Nephrology PCN, personal communication, September 12, 1997). Although this health education has been a component of the predialysis services, its effectiveness has never been evaluated.

Statement of the Problem

In this study, the effectiveness of a predialysis class offered at St. Joseph’s hospital in Hamilton, Ontario to the clients with end stage renal (kidney) disease has been evaluated. Using the Ajzen and Fishbein (1975) Theory of Reasoned Action as a theoretical framework in a pretest/ posttest study design, the following questions were
asked:

1. Did attending the class affect the subject’s knowledge scores regarding kidney disease and its treatment?

2. Did attending the class affect the subject’s attitude, subjective norm, or intentions toward following a low-salt diet?

3. Did attending the class affect the subject’s attitude, subjective norm or intentions toward taking medications as prescribed?

4. Did the subject’s attitude or subjective norm correlate with their behavioural intentions?

5. Did the control and treatment groups significantly differ in relation to their: health locus of control, creatinine levels, state-anxiety, trait-anxiety, or demographic characteristics?

Demographic characteristics, considered to be indirect variables (age, gender, formal education, marital status, years of kidney disease, and history of diabetes) that may affect attitude, were assessed in both control and treatment groups.

Many people with ESRD suffer impaired cognitive function as a result of excess body fluid and build-up of metabolic toxins. They can experience impaired concentration, fatigue, apathy, and loss of recent memory. These symptoms may appear early in the course of renal failure and progress as renal function deteriorates and can
adversely affect their ability to learn and retain information. Serum creatinine, a by-product of protein metabolism, is widely used as an indicator of renal function and has been identified as a correlate of cognitive impairment (Woolcot et al., 1988). In this study, I recorded the subject's creatinine levels as an indirect function of their cognitive function and determined any correlation with the pretest and posttest scores.

**Theoretical Framework**

There have been various theoretical approaches that attempt to promote understanding of the concept of compliance. One such model is the rational belief model. This model views noncompliance as a result of insufficient knowledge. It assumes that human behaviour is determined by a logical thought process and, given the appropriate information on health risks and benefits, individuals will modify their behaviours to preserve their health (Leventhal & Cameron, 1987). This concept is supported by the Preventive Model approach to health education. In this approach, the goal of health education is to persuade the individual to make responsible decisions by adopting health behaviours that will either prevent illness or prevent the development of an existing disease (Tones, et al., 1990).

Research has demonstrated that increased knowledge may be a predictor of compliance but not a sufficient cause for compliance (Collins & Hogan, 1989).
Leventhal and Cameron (1987) state that “non-compliance is a multifactorial problem influenced by characteristics of the disease, treatment regime and setting, as well as a variety of both relatively stable dispositions and highly variable states of the participants” (p. 118). Numerous studies have attempted to identify individual psychosocial and cognitive characteristics associated with treatment compliance. These include patient knowledge or information gain, self-control skills, internal control expectancies, avoidance coping behaviour (negative association), and preference for active involvement in one’s health care delivery (Christensen & Smith, 1995). To facilitate compliance, the client needs to understand the treatment regime, be persuaded that the treatment is worthwhile, and generate favourable attitudes toward the recommended actions (Leventhal & Cameron, 1987). All of these factors would need to be taken into consideration when developing a health education program with a goal of facilitating client compliance with desired health behaviours.

In addition, client-specific or individual factors may also play a role in determining levels of compliance. Locus of control, a construct derived from Rotter’s social learning theory, has proven to be a predictor of health related behaviours and compliance (Rotter, 1954, 1966). Locus of control (LOC) is a general expectancy that individuals develop as a result of their experiences in a given situation. Their expectancies play a role in determining their future behaviour. According to this theory,
an individual with an external LOC will attribute events in their lives to external causes over which they have no control (i.e., fate, luck, or control of others). Those with an internal LOC believe events occur as a direct result of their behaviour. Wallston, Wallston and DeVellis (1978) modified Rotter's Locus of Control Theory to develop the Multidimensional Health Locus of Control (MHLC) Scales to predict client compliance to health care regimes. According to Wallston, an individual’s health locus of control orientation is one factor that determines which health-related behaviours that person will perform (Wallston, Stein, & Smith, 1994). The health locus of control scales have been used in studies that evaluate the relationship between individual health locus of control and health-related behaviours. Some of these studies have determined a direct relationship between health locus of control and the health-related behaviours of individuals living with chronic illnesses such as arthritis (Bradbury & Catanzaro, 1989), diabetes (de Weertd, Visser, Kok & van der Veen, 1989; Gregg, Kriska, Narayan & Knowler, 1996; Tamez & Vacalis, 1989; Wooldridge, Wallston, Graber, Brown & Davidson, 1992) and renal failure (Bollin & Hart, 1982; Parker, 1983; Schneider, 1992; Snyder, 1989; Suttle & Hayslip, 1992).

Although locus of control may provide some level of prediction regarding individual health behaviour, it does not take into consideration the effect of the amount of influence that others have on an individual’s decision to adopt desired health behaviours.
The Fishbein and Ajzen Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1980) provides a framework for assessing how the beliefs, attitudes and influence of significant others affect individual health decision-making. According to the theory, an individual’s behaviour is predicted by their intention to perform that behaviour. A person’s behavioural intention is a function of (a) their attitude toward performing the behaviour, and (b) subjective norms or their perception of the expectation of significant others with regard to performing the behaviour. The Fishbein and Ajzen model has demonstrated the ability to predict health behaviours in a number of studies.

**Purpose**

The purpose of this study was to evaluate the outcome effectiveness of a predialysis class offered to ESRD clients at St. Joseph’s Hospital. Compliance is very difficult to effectively measure. Sackett (1977) states “accurate measurement of compliance is not easy; easy measurements of compliance are not accurate” (cited in Haynes, 1987, p.103). Therefore, instead of measuring the direct outcome of client compliance, I assessed the client’s knowledge and behavioural intention, which are considered to be the intermediate indicators of compliance. In accordance with the TRA, I assessed the client’s attitude and subjective norm regarding compliant behaviours (following a low salt diet and taking prescribed medications as ordered). The study
questions were:

1. Did attending the class affect the subject’s knowledge scores regarding kidney disease and its treatment?

2. Did attending the class affect the subject’s attitude, subjective norm or intentions toward following a low salt diet?

3. Did attending the class affect the subject’s attitude, subjective norm or intentions toward taking medications as prescribed?

4. Did the subject’s attitude or subjective norm correlate with their behavioural intentions?

5. Did the control and treatment groups significantly differ in relation to their: health locus of control, creatinine levels, state-anxiety, trait-anxiety, or demographic characteristics?

Importance of the Study

Since the 1980s, health reports have recommended a delivery of health care that focuses on health promotion and the maintenance of health, instead of the treatment of illness. Health education is a vital component of health promotion and the maintenance of client health. Health education must demonstrate effective outcomes to be valued and funded.
ESRD client services and treatments are reimbursed on a fee-for-service basis. In 1996, an ESRD Funding Working Group was jointly established by the Ontario Ministry of Health and The Ontario Hospital Association through the Joint Policy and Planning Committee to recommend new funding and costing methodologies for ESRD health care. They recommended, for the first time, that “predialysis treatment” be funded separately from other ESRD treatments. This predialysis treatment includes assessment, medical management, treatment, and education for predialysis ESRD clients within an interdisciplinary outpatient clinic (Joint Policy and Planning Committee 1997, p.16). Client education, a component of this predialysis treatment is not funded independently, and thus is in a vulnerable position. In their recommendations on improvements to health care, the Report of the Panel on Health Goals for Ontario (1987) supported financial remuneration of health practitioners who provided preventative services, but only when they had proved to be cost effective. It is unlikely that a Nephrology program that is trying to meet the needs of an increasing ESRD population will support an education program that has not demonstrated effective outcome or cost effectiveness.

At St. Joseph’s Hospital, there is inconsistent support for the predialysis class. Subjectively, some of the Nephrologists value the predialysis class, believing that it is effective in offering valuable information and support to their clients. Others believe it to be a waste of time and incapable of providing any positive outcomes for clients in terms
of longevity or health behaviours. Without a clear understanding of the effectiveness of the predialysis education offered, we may not be adequately providing a service that is vital to people who need assistance to stay healthy while living with their chronic condition.

**Rationale for the Study**

Health educators require a good understanding of the psycho-social factors that underpin client decision-making and behaviour to design and implement effective health interventions that promote client compliance. Very few of many studies in the literature that evaluate health education effectiveness and outcomes offered to clients with chronic illnesses, such as diabetes and arthritis, evaluate the education and support provided for ESRD clients. Although studies have been done to identify the psychological and social effects of living with ESRD, there is a lack of literature related to the evaluation of the programs of education and support provided for these clients.

This study is based on research done by de Weerdt, et al., (1989), who conducted a multicentered, controlled randomized study to evaluate an education program for insulin-treated patients with diabetes. In their study, 558 patients from 15 randomly recruited hospitals were equally divided into three groups: two experimental groups that received the education program from either a health care professional or fellow patient...
and a control group. They assessed the effects of the program on patient knowledge, diabetes locus of control, anxiety, attitude, and social norm with respect to active self-care behaviours with the Fishbein and Ajzen model as a theoretical framework. Diabetes is comparable to ESRD in many ways. Both are chronic noncurable conditions that require the afflicted person to adapt their lifestyle to comply with stringent therapeutic regimes of dietary and medication management to maintain optimal health and prevent complications. Clients receive health education that focuses on promoting adoption of self-care behaviours that will help them to maintain optimal health. Health educators may gain some insight into the various factors that influence client behaviour, by understanding the existing relationships between knowledge, beliefs, and attitudes. This information could aid health educators to devise educational strategies and methods that assist in achieving desired client health education goals and ultimately help clients with chronic illness to maintain optimal health.

Outline of the Remainder of the Thesis Document

In Chapter Two, I provide a review of the related literature. This includes a review of the theoretical frameworks used in this study (Theory of Reasoned Action and Health Locus of Control) and related studies and literature pertaining to compliance and education of ESRD clients. Chapter Three provides a review of the methodologies used
in this study. I discuss the analysis of the data collected. An analysis and evaluation of
the data are presented in Chapter Four, with the summary and recommendations provided
in Chapter Five.
CHAPTER TWO: LITERATURE REVIEW

In this chapter, I review the literature relative to this study. First I outline literature pertaining to predialysis education. This includes reports on the content and delivery of existing predialysis programs and program recommendations, and a review of studies conducted to measure the effectiveness and outcomes of predialysis education. I include an overview of the theoretical frameworks employed in this study, the Theory of Reasoned Action (TRA) and Health Locus of Control (HLC) and a review of studies that have applied the TRA to evaluate health behaviours and assessed the effects of HLC with ESRD clients.

Predialysis Education

Predialysis educational programs are offered to clients during the late stages of renal disease. Program content generally includes information about kidney disease, lifestyle changes, treatments, and resources available to the client. Most Predialysis programs are hospital based or facility based and serve only clients referred to their institution for treatment, while some programs in the United States are associated with educational institutions and serve multiple metropolitan areas.

There are over 20 published articles on Predialysis education; most are descriptive reports. In their review of current literature on pre-ESRD patient education, Hayslip and Suttle (1995) noted that most available reports discussed program methods, content, or innovations, with some recommendations for program improvements. They provide some relevant information and a historical perspective of ESRD education. Early ESRD patient
education programs focused on increasing patients' awareness of the treatment options available to them (Perras, Mattern, & Zappacosta, 1984). The content and process of the predialysis program at Vancouver General Hospital was evaluated by Starzomski (1986). This evaluation revealed that patients wanted to have the kidney failure information at least 1 year prior to treatment to help explain the symptoms they were experiencing. The patients also indicated a need to have family and friends included in the educational sessions. In her conclusions, Starzomski recommended that predialysis education sessions be individually designed to accommodate different learning styles and to facilitate family involvement. In 1990, Kochavi (cited in Hayslip & Suttle, 1995) suggested implementing a predialysis program that utilizes both individual and group sessions. The individual sessions create opportunities for client assessment and are essential to identify client learning needs, any physical and psychosocial limitations, available support, and client coping skills. The group sessions are used to facilitate group learning.

A predialysis program at St. Peter's Kidney Dialysis Center in Lacy, Washington has won an award (Life Options Advisory Council's Exemplary Practices in Rehabilitation Award) for it's multidisciplinary program. This program offers client education in a series of five 2-hour classes, offered 10 times a year, with an extensive follow-up routine (Hayslip & Suttle, 1995).

Another successful multidisciplinary program is the Missouri Kidney Program Patient Education Program, associated with the University of Missouri-Columbia. Participants attend a schedule of six classes that are offered on a sequential basis...
throughout the year. They decide which sessions to attend, based on their learning needs (Hayslip & Suttle, 1995).

To date, the outcomes of predialysis programs have been evaluated in only four studies. Levin et al. (1997) conducted a prospective, nonrandomized cohort study to examine the outcomes of a multidisciplinary predialysis service at St. Paul’s hospital in Vancouver, B.C. One group \( (n = 39) \) received the usual standard physician care (7–15 hrs./year), while the treatment group \( (n = 37) \) received a standardized educational program offered in a stepwise progressive fashion over the course of multiple clinic visits (15–33 hrs./year). Clients in the treatment group demonstrated improved clinical outcomes (less urgent dialysis required and reduced hospitalization days in the first month of dialysis treatment) and significantly better control (normal values) of their blood pressure, calcium, phosphate and hemoglobin levels than the standard group \( (p < .05) \). The predialysis program proved to be cost efficient, offering an estimated saving of $100,000 per treatment patient (assuming the standard patients would have the same reduction in the number of hospital stay days). These savings could be considerable, considering that most nephrology programs treat 200–300 clients per year.

Rasgon, Schwankovsky and James-Rogers (1993) demonstrated that a predialysis program could have positive influence on client employment. They evaluated employment status of a group of employed blue-collar workers with renal disease. The program featured early referral to a licensed social worker, psychosocial assessment, predialysis education and counseling, dialysis center orientation, and multidisciplinary follow-up. The group that received the predialysis program was 2.3 times more likely to maintain their employment at least 6 months after initiation of dialysis. Although
predialysis education was a component of the predialysis program, it is difficult to determine the direct effect it had on the results.

While collecting data for their 9-year longitudinal study, Binik et al. (1993) randomized 204 ESRD clients in their study to receive either the standard predialysis education available at their hospital, an enhanced educational program, or no education at all. The standard education involved receiving information from the physician or a nurse clinician and through written material. The enhanced education involved a 75-minute individually administered slide-lecture presentation and 22-page booklet on renal disease, dietary guidelines, and renal replacement therapies. The groups demonstrated no significant difference in demographic data, presence and severity of uremic symptoms, or in blood chemistry parameters indicative of the extent of their renal failure (creatinine, urea, potassium, phosphates and hematocrit). The group with the enhanced education received additional contact time with research team members (228.3 minutes versus 142.7 minutes for the control group) as a result of attending the educational session. Although other studies have demonstrated that any increase in client support can improve ESRD client outcomes, the authors believed that the additional 85 minutes of interaction the treatment group received was not relevant. Their results indicated a significant difference across the groups ($F = 40.23, p < .0001$). The participants in the enhanced educational group had significantly higher knowledge scores ($2.62, SD = 2.47$) than the standard education group ($-2.00, SD = 2.30$) and greater change between pretest and posttest scores. Since the posttest was conducted immediately after the educational session, the scores may have been more related to information recall than knowledge retention. The individuals in the enhanced educational group were also able to go 4.6
months longer than the control group before requiring dialysis treatment. The decision to start dialysis was made by the clients' Nephrologists, who were blind to the experimental manipulations. These results present the predialysis education as an important cost-effective intervention, considering the typical cost of dialysis treatment in Canada is $2,000 - $3,000 per patient per month (Binik et al., 1993, p. 376). It would also provide the client 4 or more months of freedom from the burdens of depending on dialysis treatments.

In 1991, Hayslip and Suttle conducted a retrospective study to assess the effects of predialysis education on client dialysis modality of treatment and dialysis access placement. Both treatment and control groups received care from a Nephrologist, but the treatment group also received pre-ESRD education. In the treatment group, 78% were able to start dialysis on the modality of their choice, compared to 55% of the control group. Only 7% of the treatment group required more than one dialysis access (invasive procedure) to initiate the primary dialysis treatments, whereas 45% of individuals in the control group required more than one access procedure. The investigators concluded this decrease in invasive access procedures would result in potentially reduced treatment costs and increase in client satisfaction.

In summary, notwithstanding the limitations of design and sample size, these studies have identified the following positive outcomes for clients receiving predialysis education: potential to delay need for dialysis, potential for employment retention, choice in dialysis modality of treatment, decreased cost of treatment initiation (less invasive dialysis access procedures), and decreased hospitalization time at initiation of dialysis.
Although these studies demonstrated positive outcomes of predialysis education program more research is needed to support the results.

Theoretical Frameworks

The Theory of Reasoned Action

The Theory of Reasoned Action (TRA) provides the theoretical framework for this study (Figure 1). This theory, which was first developed by Fishbein and Ajzen in 1975, offers an approach to predict and understand human behaviour. It is based on the assumption that people behave in a rational manner and consider the implications of their actions before they decide to engage or not engage in a behaviour. According to the theory, behaviour is determined by one's intention to perform (or not perform) the behaviour. A person's intention is a function of their attitude toward the behaviour and subjective norm. Attitude toward a behaviour reflects one's beliefs about the behaviour and the probable (favourable or unfavorable) outcomes of carrying out the behaviour. Beliefs that influence a person's attitude toward a behaviour are called behavioural beliefs. Subjective norm is a function of normative beliefs. Subjective norm represents the person's perception that people generally important to them think they should engage (or not engage) in the behaviour and their motivation to comply with those expectations. Normative beliefs are subjective norms involving specific individuals or groups. Fishbein and Ajzen state that "it is possible to predict and gain some understanding of a person's behaviour by measuring their attitude toward performing a behaviour, their subjective norm and their relative weights" (Ajzen and Fishbein, 1980, p.7).
Figure 1. The theory of reasoned action (Ajzen & Fishbein, 1980, p. 100)
In general, a person will perform behaviour when they have a positive attitude about it and when they believe that people who are important to them think that they should do it.

Some intentions (behaviours) are likely to be under attitudinal control and therefore predicted by attitude, whereas intention to perform other behaviours may be under the normative control and predicted by subjective norms. External variables such as personality traits and demographic characteristics are not directly related to behaviour, but may contribute to a person’s attitude and normative beliefs. Application of the TRA is appropriate to use only when the behaviour being studied is under the voluntary control of the individual. Empirical evidence for the model has produced high multiple regression correlation coefficients between the predictor variables (attitudes and social norm) with behavioural intentions. The theory has demonstrated strong and valid evaluation of a variety of health related behaviours. I will review some studies that have applied the TRA to evaluate health behaviours.

Baker, Morrison, Carter and Verdon (1996) used the TRA in their study of heterosexual clients utilizing the services at a sexually transmitted disease health clinic in an attempt to understand their decision-making concerning the use condoms. The results demonstrated support of the TRA, in that social norms and attitudes toward condom use were significant predictors of intention for both men ($R = .56$) and women ($R = .65$) with steady partners. For clients with casual partners, social norm was a predictor for women and attitude was a predictor for men. Similarly, Zimmerman and Olson (1994) found the TRA useful in predicting AIDS-related risk behaviour in a sample of 441 sexually active, heterosexual university students in the United States. Behavioural attitudes and subjective norm were used as predictors of behavior change. A negative attitude
about risk reducing behaviours predicted current risk behaviors. Those individuals with a positive attitude reported a greater intention to change their risk behaviours ($F = 16.95$, $p < .001$).

Blue (1995) conducted a critical review of the literature of studies that used the TRA model to assess exercise behaviours. In all of the 16 studies reviewed, attitude proved to be a predictor of intention to exercise. Results demonstrated a positive correlation of the behavioural belief component with attitude and with the normative belief component and subjective norm. Alpha coefficients ranged from .72 to .87 for direct measures between attitude and subjective norm toward the behaviour. The investigators reported internal consistency of .73 for behavioural intention measures and .64 -. 67 for normative belief components. Seven of the studies tested instrument stability obtained test-retest reliability scores between .70 and .93.

Exercise behaviour was also assessed by Amato-Vealey (1992). She used the TRA to predict the behavioural intentions of post myocardial infarction patients to enroll in and attend an exercise cardiac rehabilitation program. Results revealed that the attitude and subjective norm measures were significant predictors of the behaviour.

The applicability of the TRA related to compliance behaviours of newly diagnosed hypertensive patients was evaluated by Miller, Wikoff and Hiatt (1992). The purpose of their study was to test the adequacy of perceived beliefs of others (i.e., subjective norm) and motivation to comply to determine behavioural intention and the ability of intention to predict of behaviour. Upon diagnosis, all patients received individual instruction on hypertension, intervention measures for control of hypertension (i.e., diet, smoking, activity, stress management, and medications). Attitudes, perceived
beliefs of others, motivation to comply, intentions, and compliance behaviours were measured with all subjects 6 months after diagnosis. Patient current health behaviour was evaluated by self-report and, interestingly, also by the patient’s significant other to validate the subject’s response. The results indicated a significant relationship between patient and significant other scores for diet ($r = .38, p < .002$), smoking ($r = .61, p < .002$) and stress modification ($r = .23, p < .05$) but not for behaviours related to activity and taking medication. In support of the theory, perceived beliefs of others and motivation to comply determined intentions and those intentions predicted behaviour for diet, activity and stress reduction behaviours ($R = .217 - 7.21$). There was a direct relationship between attitude and motivation to comply for smoking ($R = .727$) and stress reduction behaviours ($R = .456$). The perceived beliefs of others directly influenced attitude in smoking ($R = .508$) and activity behaviours ($R = .393$). There was a slightly negative relationship between motivation to comply and intention to stop smoking ($R = -.261$). Attitude and motivation to comply were strong predictors of taking medications ($R = .333$ and $.610$) but contrary to the theory, intentions did not predict actual behaviour. Perceived beliefs of others strongly influenced motivation to comply with medication regimes (.753). Information from this type of study reflects patients’ responses to required lifestyle adjustments and would prove to be useful in assisting health professionals plan and develop treatment programs to facilitate client compliance.

Miller (1988) used the TRA in a study to examine myocardial infarction patients’ compliance to prescribed medical regimes. The results also supported the theory since positive attitudes towards taking prescribed medications and perceived expectations of health professionals were predictors of medication adherence. Intentions to stop smoking
were decreased for patients with negative attitudes toward smoking cessation and frequent warnings from health care professionals. These results were consistent with other studies that used the TRA to predict smoking behaviours (Chassin, Presson, Bensenberg, Corty, & Sherman, 1981; Chassin, Presson, Sherman, Corty, & Olvshavsky, 1984).

N. Pender and A.R. Pender (1986) used the TRA as a conceptual framework to analyze the relationships between attitudes, subjective norms, and intentions of a large group of adults to engage in health behaviours (exercise regularly, maintain normal body weight and avoid stressful situations). They found that attitudes, subjective norms and weight affected intentions to exercise regularly (R = .364, p < .01). The main determinants of maintaining normal body weight were attitudes, weight and perceived health status (R = .428, p < .01). Only attitude was associated with the intention to manage/avoid stressful situations (R = .271, p < .01). Groups intending to exercise regularly and avoid stressful situations had significantly more positive attitudes and subjective norms regarding the desired behaviors. The individuals who intended to maintain normal weight did not have any significant differences on either attitude or subjective norms from the individuals who did not intend to manage their weight.

The TRA demonstrated varying degrees of success in predicting breast self-examination (BSE) intention and behaviour in groups of middle-aged and older women (Powell-Cope, Lierman, Kasprzyk, Young & Benoliel, 1991). They conducted two similar studies, using diverse sample groups. In their first study, they used a convenience sample of volunteers over 50 years old from local church groups. The sample for the
second study consisted of middle-aged and older women subscribers to a large health maintenance organization (HMO) who were identified as being at low risk for developing breast cancer. Client attitude and subjective norm significantly correlated with intention to perform BSE ($R = .58$) and with BSE frequency ($R = .64$) in the first study. Attitude was the only significant predictor of intention in both study groups. In the second study, attitude and subjective norm were correlated significantly with BSE intention but not BSE frequency. The authors state that the only difference in samples was age, yet age was not significantly correlated with intention or frequency of BSE in the first study and only minimally correlated ($r = 14, p = .03$) with frequency in the second study. In study two, the study sample source is a significant factor. Subjective norms did not predict intentions to perform BSE probably because women considered it a private matter. The fact that the HMO identified these women as low risk for breast cancer suggests they may have been routinely assessed for this risk (i.e. via routine physician assessment) and received health education on the importance of BSE. The researchers concluded that the TRA was useful in predicting BSE intention and less useful in predicting BSE frequency in both samples.

Shepard, Hartwick and Warshaw (1988) conducted a meta-analytic review of 87 studies to test the predictability of the TRA. They found the average correlations between intentions and behaviours to be above .50 and the average correlation between intentions, attitudes and subjective norms to be above .65.

Application of the TRA model has demonstrated strong and valid prediction of a variety of other health-related behaviours such as: weight loss (Saltzer, 1978, 1980), infant feeding decisions (Manstead, Proffitt, & Smart, 1983), participation in alcohol
treatment program (Jaccard, 1981), obtaining flu shots (Montano, 1986), and taking drugs (Bentler & Speckart, 1979).

In 1989, de Weerdt et al. conducted a multicentered study using the TRA as theoretical framework. The purpose of their study was to assess the usefulness of the TRA in predicting self-care behaviours of insulin-treated diabetics and to evaluate the effectiveness of a diabetic education program to assess the effects of education. The effect of the health education program on knowledge, locus of control, anxiety, attitude, and social norm with diabetic clients was assessed. The main goal of the education program was to improve clients' level of active self-care behaviours. Active self-care behaviours consisted of: home blood glucose monitoring (HBGM), self-regulation of insulin dose, meals planning, and exercising regularly. Results showed that attitude and social norm were equally important in determining behavioural intentions. Variables external to the theory (i.e., level of knowledge and locus of control) demonstrated significant partial correlation with behaviour. A low orientation on the powerful others locus of control scale and knowledge predicted active self-care behaviour. Level of anxiety did not play a significant role in determining self-care behaviours. The external variables had no significant effect on the behaviour of exercising regularly. The effect of the education program on the TRA variables was assessed, using a pretest-posttest method. Compared to the control group, the experimental group demonstrated improved scores on knowledge and diabetes health locus of control. They experienced only partial improvement in attitudes, social norm, and level of self-care behaviours. Behavior related to meal planning and regular exercise did not change. Only the attitude related to HBGM improved in the experimental group. The researchers concluded that the positive change
in behavior demonstrated by the experimental group was directly related to the external
variables of change in level of knowledge and powerful others diabetes locus of control.
These study results assisted the researchers in making recommendations for improvement
in the educational program offered to diabetic clients.

Similarly, Saltzer (1978) demonstrated the relationship between the TRA
variables and individual health locus of control in predicting weight loss intentions. He
discovered that attitude was the best predictor of weight loss behavior in individuals with
internal locus of control. Social norm was the best predictor of weight loss intention for
those with external locus of control. These results support Ajzen and Fishbein’s (1980)
view that external variables can influence attitudes or subjective norms, thereby affecting
their behavioural intentions. Saltzer encourages health educators to utilize health locus of
control measurements to effectively design health programs by emphasizing person health
attitudes for internal subjects and social pressures to change health behaviours in external
health locus of control (HLC) groups.

Health Locus of Control (HLC)

The concept of locus of control was first introduced by Rotter (1954) in his social
learning theory. According to this theory, an individual’s experience in a given situation
will produce specific expectancies that will then determine their future behaviour in that
situation. From this idea, Rotter developed internal-external locus of control scales that
measured the individual control of reinforcement and their behaviour. An individual with
an internal locus of control (LOC) would achieve positive reinforcement from himself
and believe they personally had control over their behaviour. Someone with an external
LOC would require reinforcement from others to perform or not perform a behaviour.
Wallston, Wallston, Kaplan and Maides (1976) further developed Rotter’s concept to develop the Health Locus of Control (HLC) Scales as a unidimensional measure of people’s belief that their health is or is not determined by their own behaviour. “Health internals” believe their health status is a result of their behaviour, whereas “health externals” have generalized expectancies and conclude they have little control over their health because it is determined by things such as luck, fate, or powerful others. In 1978, Wallston, Wallston and DeVellis further refined the HLC scales to incorporate the idea that fate and chance expectations can influence behaviour separate from external control from powerful others. Their product was the Multidimensional Health Locus of Control Scales (MHLC), which contained two equivalent forms of the health locus of control scales (forms A and B). This instrument has been used in numerous studies assessing the effect of individual HLC on various health behaviours. For the purposes of this paper, I reviewed studies that have assessed the relationship of LOC to evaluate the health compliance behaviours of ESRD clients. In all of these studies, the subjects were all being treated for their renal failure with some form of renal replacement therapy.

The MHLC scales were used by Bremer (1995) to examine the relationship between perceived LOC over health outcomes and psychological adjustment in a group of ESRD clients who received various modes of renal replacement therapy. There was no relationship between internal or powerful others HLC, but the ESRD clients with low levels of chance LOC demonstrated overall high indicators with life adjustment. Based on these results and similar findings of other studies, she concluded that “it does not matter whether the locus of control is believed to be internal or external; the perception that
something other than chance determines one's health seems to predict psychological adjustment to renal failure” (Bremer, 1995, p. 232).

Poll and De-Nour (1980) studied the relationship between LOC and adjustment to chronic hemodialysis in ESRD clients. Rotter's (1966) locus of control questionnaire was used to assess LOC. Adjustment to hemodialysis was determined by client compliance with dietary and fluid restrictions, vocational adjustment (client self-report on employment status) and acceptance of the disease (subjective perception of their disability). Client compliance was determined by the physicians in charge of the dialysis unit, based on a review of the client's chart. Clients with a LOC score 0-10 formed the "internals" group and those with scores of 10-20 were in the "externals" group. Locus of control correlated with all aspects of adjustment. Internals compliance scores were significantly higher than the scores for the externals. The externals demonstrated a significant negative correlation ($r = -.49$) between locus of control and compliance. Locus of control had a significant effect on vocational rehabilitation, as 75% of the "internals" were currently working, while 38% of the "externals" were not. Disease acceptance also correlated significantly with LOC ($r = -.68$, $p = .001$). Locus of control did not significantly correlate to client education, although "internals" were more highly educated compared to the "externals". Locus of control did not correlate to length of time on dialysis.

Schneider (1992) administered the MHLC scales to chronic hemodialysis patients in his exploratory research that examined the relationship of HLC and demographic data to dietary compliance in ESRD. Serum phosphorus levels measured dietary compliance of limited phosphorus intake. The multiple regression analysis demonstrated a negative
correlation between age and powerful others HLC. The older clients, who tended to have high powerful others HLC scores, were more likely to be compliant with phosphorus diet restrictions. Limitations to this study include lack of statistical power analysis, nonrandomized sampling and effects of nonmeasured variables (i.e., economic status, etiology of disease).

In a similar study, Brown and Fitzpatrick (1988) evaluated the relationship of HLC and compliant behaviours (i.e., dietary restriction of fluid, protein, and potassium). They discovered that older clients scored high on powerful others and reported themselves as compliant even though there was not evidence of this in the laboratory indicators of compliance (blood urea nitrogen, serum potassium, and inter-dialysis weight gain). Demographic variables (i.e., sex, social class, and marital status) were not related to compliance.

The relationship of HLC, health belief motivations, and health valuing to dietary compliance in ESRD clients was examined with a group of 30 dialysis patients in a study by Bollin and Hart (1982). Client dietary compliance was related to fluid and potassium adherence and knowledge of their prescribed diet (in terms of which foods were restricted or permitted). Dietary compliance was determined by serum potassium levels, client report of dietary habits, and weight gain between dialysis treatments. To be categorized as compliant, the subject needed to demonstrate compliance with fluid adherence and at least one of potassium or dietary adherence. Compliance ranged from 15.4% to 83.4% within three dialysis sites the study sample was obtained from. Overall compliance scores correlated positively ($r = .35$, $p = .06$) with length of time the client had been on dialysis, which contradicts general compliance inference that length of illness is inversely
related to compliance levels. Health belief motivations did not predict compliant behaviour. In this group, 21 subjects were external HLC focused and 9 were internal HLC focused. Compared with the internals, the externals demonstrated lower mean compliance scores.

The literature available on predialysis education is limited, as most are descriptive reports that provide a review of various program methods and content with some recommendations for program improvement. Some studies have demonstrated that predialysis education can improve clinical outcomes and assist clients to be employed longer and have more opportunity to choose their modality of dialysis treatment.

The TRA has demonstrated to be a strong and valid evaluation of a variety of voluntary health behaviours such as: condom use, self-breast examination and participation in exercise programs. Many studies have used the TRA to evaluate health compliance behaviours of clients living with chronic illnesses such as diabetes, hypertension and heart disease.

Studies have demonstrated a relationship between health compliance behaviours of ESRD clients and client locus of control. Increased compliance has been associated with an internal and powerful others locus of control. Clients with a low chance locus of control tend to adjust better to the changes in their lifestyle as a result of their ESRD.

In the next chapter I reviewed the study methodologies. This includes a description of the research design, study participants, and an outline of the predialysis class. The methods of data processing and analysis are reviewed, along with a description of the study limitations.
CHAPTER THREE: METHODOLOGY

In this chapter, I review the methodologies of this study. A description of the study design and sample population are provided. I outline the instruments used in this study including evidence of their validity and reliability. Included are the Kidney Disease Questionnaire (KDQ; (Devins, et al., 1990), used to evaluate client knowledge; Form C of the Multidimensional Health Locus of Control Scale (MHLC; Wallston, Stein, & Smith, 1994), and the State–Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970). The development of the questionnaire designed to measure the variables of the Theory of Reasoned Action (TRA; Fishbein & Ajzen, 1975, 1980) is reviewed. An overview of the predialysis class is included, along with the data collection methods. Limitations of the study are discussed as possible sources of bias that may have operated. The chapter is concluded with a restatement of the problem.

Research Methods

This was a quasi-experimental study, using a pretest posttest design to evaluate the effectiveness of the predialysis class offered at St. Joseph’s hospital. The class is a component of the predialysis clinic care that is offered to clients with ESRD within the Nephrology program. Various members of the Nephrology health care team (PCN, pharmacist, dietitian, social worker, occupational therapist, and physiotherapist) present the class, usually four times a year.
Variables

The dependent variables in this study were the client's knowledge score (regarding kidney disease and treatment) and the variables of the TRA (i.e., attitude, subjective norm, and intentions) with respect to compliant behaviours. The relative client compliant behaviours compliance with following a low-salt diet and taking medications as prescribed. Interdependent variables (i.e., study subject's health locus of control, anxiety, and demographic data) were identified to assess for differences between the groups. Although "there is no consistent relationship between compliance and race, income, marital status, education, age or sex" (Churchill, 1995, p.835) and these variables are outside the focus of the model, these factors can indirectly influence the dependent variables and client compliance.

Participants

Study participants consisted of a convenience sample of all ESRD clients who were new to the predialysis program from April 1, 1997 to January 1, 1998 and were deemed eligible to attend the predialysis class. Eligibility to attend the class was determined by preestablished criteria developed by the Nephrology Primary Care Nurses (PCN). This included clients that were:

1. diagnosed with end-stage renal failure,
2. oriented to time, person and place,
3. able to read and understand English, and,
4. did not have any barriers to learning (i.e., non-corrected vision or hearing
impairment, diagnosed with depression, disruptive behaviour, or group phobias). From April 1, 1997 to February 1, 1998 the PCNs evaluated 83 new predialysis ESRD clients. The Nephrology PCNs and the Nephrology department receptionist forwarded the names of 47 potential research subjects from this group to the researcher. These clients were then contacted by phone by the researcher (or research assistant), who explained the purpose of the study and requested their verbal consent to participate in the study. Of the 47 clients contacted, 37 clients agreed to participate and were included as study subjects. Study participants reviewed and signed the study consent forms at the pretest time. (Appendix K).

It was the goal of this researcher to obtain at least 38 subjects to randomize into either the experimental (enhanced education/support) group or the control (routine education and support) group. The desired number of subjects was based on prestudy field work, expecting a 30% increase in knowledge scores of the experimental group (achieving alpha error of .05 and beta error of .08). The Nephrology health care providers who routinely participated in ESRD client education determined this expectation. Unfortunately, randomization was not possible since many clients who were willing to participate in the study were either unable or unwilling to attend the scheduled predialysis class. Reasons for not being able to attend the class included previous plans on the day and time the class was offered, lack of transportation (for clients who lived out of town), and inability to leave an ill/dependent spouse for a period of time. Other participants indicated they were not interested in attending the class or believed they had received adequate information already. Consequently, clients were self-selected to the experimental or control groups. Clients who were willing to participate in the study and
attend the class formed the experimental group, and the clients who were willing to participate in the study but were unable or not willing to attend the class at that time formed the control group. After receiving an explanation of the study purpose and the consent content, the subjects from both groups signed the study consent.

Study participant demographic data considered relevant to this study were collected as interdependent variables to evaluate whether differences between control and experimental participants existed (Appendix D). Some of these variables were selected because of their demonstrated relationship with HLC, such as age (Brown & Fitzpatrick, 1988; Sneider, 1992), level of education (Hartman & Becker, 1978) and gender (Ulrich, 1981). Compliance behaviours have been linked with age, employment status (Kamping & Campbell, cited in Churchill, 1995, p. 833), HLC (Bollin & Hart, 1982; Wenerowicz, Riskind & Jenkins, 1978) and length of time on dialysis (Bollin & Hart, 1982; Smith & Carson, 1981). Marital status was asked to determine the presence of a spouse and possible source of normative influence on client behaviours. To establish familiarity with therapeutic regimens, the following were assessed: years since diagnosed with kidney failure, history of diabetes, and history of diabetes or kidney disease in the immediate family. To determine any other sources of information about kidney disease and its treatment the subject had acquired prior to the pretest time, they were asked to identify other sources of information (kidney doctor, kidney nurse, others, books, kidney foundation). The subject’s creatinine level was recorded at both pretest and posttest times to indicate their renal function, since decreased renal function is associated with uremic symptoms that could affect their cognition.
Population and Sample

Subjects self-selected to the control and experimental groups. Subjects in both groups received the usual predialysis care from members of the multidisciplinary team. Clients were referred to a Nephrology PCN for further evaluation and education once their creatinine level reached 300umol/L. The initial visit with the PCN included a general psychosocial assessment and an assessment of the client’s learning needs. The client was given an extensive binder of information about kidney disease, treatment modalities, dietary guidelines, and commonly prescribed medications that was provided by the Kidney Foundation of Ontario. The client had the option of visiting with the PCN after reviewing the book, to clarify any questions or concerns. The clients could also receive information about kidney disease and its treatment from their Nephrologist, the Nephrology dietitian or the Kidney Foundation. Clients were also encouraged by the Nephrology health care team to attend monthly peer support meetings conducted by the Kidney Foundation. These peer support meetings sometimes include information sessions (i.e., about kidney disease, treatment options, available services) provided by guest speakers. The experimental group received the routine predialysis care as mentioned, and attended the predialysis class.

Prior to starting this study, permission to conduct the study was received from: Dr. David Churchill, Dialysis Medical Director, Ms. Anne Howe, Kidney and Urinary Administrative Program Director, and St. Joseph’s Hospital Research Committee (Appendix C).
Instrumentation

In this study, three established instruments were applied: the Kidney Disease Questionnaire (Devins, et al., 1990), Form C of the Multidimensional Health Locus of Control Scales (Wallston, et al., 1994) and Form X of the State-Trait Anxiety Inventory (Spielberger et al., 1970). I will outline each of these instruments, including a review of their established validity and reliability.

A client questionnaire was created to assess the variables of the TRA (behavioural attitude, subjective norm, and intentions) according to the specific provided by Ajzen and Fishbein (1980). The instrument's validity and reliability are evident with the immense number of studies that applied it to assess health behaviours, some which are outlined with the discussion of the instrument's creation.

The Kidney Disease Questionnaire (KDQ)

With permission, the KDQ was used in this study to evaluate participant knowledge of kidney disease and treatment options (Gerald Devins, personal communication, January 17, 1997). Devins et al., (1990) developed this questionnaire as a test to measure patient knowledge about end-stage renal disease and its treatment. It is available in a 26-item version and as two parallel 13-item tests. The questionnaire development started with the creation of 43 items related to normal kidney function, kidney diseases, and current treatment options, based on a rational basis on consultation with nephrology nurses and physicians. Criterion-related validity was evaluated by administering the items to groups of individuals with various levels of relevant knowledge (i.e., dialysis nurses, undergraduate psychology students, and ESRD clients). A parameter of item discrimination was calculated by subtracting the proportion of
respondents answering correctly in the lowest quartile form the proportion respondents
who answered correctly in the highest quartile. This generated D-values of +.06 - +1.0.
The content validity was assessed using separate 1-factor (group) analyses of variance
(ANOVAs) of the mean scores for each of the test items and in terms of the numbers of
significant differences across the groups per item. Corrected item-total correlations were
then calculated for each item. As a result, some items were eliminated. The final set of
25 items demonstrated an average D-value of +.65 and recalculated item-total
correlations were between .21 and .82. Criterion-related validity evaluated with a 1-
factor (group) ANOVA revealed a significant difference between the three groups (f =
100.62, p < .0001). A second 1-factor (patient group) ANOVA was performed to
compare the scores of patient groups (varied according to their treatment modality and
degree of information they received). It revealed a significant difference between the
total scores across the groups (f = 25.5, p < .001). Internal consistency reliability
calculated with Cronbach’s coefficient alpha revealed in inter-item consistency of .94.

The authors examined the content validity of the scale by assessing the effects of
testing patients before and after starting renal replacement therapy and by investigating
the effects of a patient education intervention. For this evaluation, a series of 4 (patient
groups--based on patient education information and time of testing) mixed ANOVAs
demonstrated significant effects for both the patient groups (f = 8.82, p < .0001) and time
of testing factors (f = 33.08, p < .0001). The tool also ascertained high reliability with
alpha coefficients (Form A r = .75 and Form B r = .85). Forms A and B were significantly
correlated (r = .80, p < .0001) for the patient education evaluation. In assessing the KDQ
scores with sociodemographic status, the researchers discovered that higher scores were
obtained by subjects who were younger ($r = -.26 -.27, p < .001$), more educated ($r = .39-.49, p < .001$), with higher annual incomes ($r = .14 -.18, p < .01$) and who experienced more uremic symptoms ($r = .14, p < .25$) Using five different methods of evaluation, the questionnaire was determined to be at an estimated grade 9 reading level.

To assess its appropriateness for this study, Nephrology experts (i.e., PCNs and the Nephrology dietitian) who were very familiar with the predialysis class content reviewed the KDQ. They recommended using the Form A 13-item test, considering the limited attention span of the clients and the number of questionnaires they were required to complete for this study. They also suggested the deletion of 2 items as they related to kidney transplantation and this information was limited to a few basic facts during the predialysis class. The final KDQ for this study contained 11 items, each with multiple choice responses. For each item, “I don’t know” is an optional answer (Appendix E).

Form C of the Multidimensional Health Locus of Control Scale

The Form C MHLC scales were used, with permission, to determine the HLC of study subjects (Kenneth Wallston, personal communication, April 1997) with “kidney condition” indicating the health condition (Appendix E). The mean scores and the frequency of individual scoring for the internal, chance, powerful others, doctor powerful other and other people powerful other subscales were calculated for subjects in the control and treatment groups to determine any differences between the groups.

Form C is a “condition-specific” version of the MHLC. It was developed by Wallston, Stein, and Smith (1994) as a better predictor of condition-specific outcomes than the more general HLC scales. The authors recognized that it is possible for someone with a given health condition to have locus of control beliefs about that condition that
differ from their LOC beliefs about their health in general. It is designed to be used when studying a group of subjects with an existing health/medical condition.

Based on the results of a factor analysis, the authors decided to construct the Form C version of the MHLC with two 6 item scales (internality and chance) and two separate 3--item subscales (doctor and other people) for powerful others. A 6-item Likert scale accompanies each subscale to indicate varying degrees of agreeing or disagreeing with the statement. Each scale ranges from 1 to 6 with the following descriptors: 1 = strongly disagree, 2 = moderately disagree, 3 = slightly disagree, 4 = slightly agree, 5 = moderately agree and 6 = strongly agree (Appendix F). Subjects completing the MHLC form are instructed to circle the number that best corresponds to their HLC beliefs.

Client Health locus of control was measured in this study to consider its possible influence on their attitude, subjective norm or behavioural intentions. It was also employed to ascertain any HLC differences between the control and experimental groups. For this study, the Form C MHLC was used, placing the words “kidney failure” as the client condition.

Reliability and validity testing on the Form C MHLC was completed by Wallston, et al. (1994) from five groups of subjects with chronic health conditions (rheumatoid arthritis, chronic pain, diabetes, and cancer). Their results are as follows. Internal consistency testing of the Form C subscales revealed alpha reliabilities of .70 - .87. Test-retest reliably (stability) conducted with subjects suffering with arthritis and chronic pain over multiple time periods revealed stability coefficients of .58 - .80 with the exception of the other people subscales, which generated lower stability coefficients (.35 - .54). Construct validity was attained when all 4 subscales of the Form
C changed significantly in a group of subjects suffering from chronic pain who received a pain management program (i.e., internality beliefs became stronger, whereas externality beliefs became weaker). The differences in mean scores among groups of subjects that composed their total population demonstrated similar to those found with using Forms A and B (i.e., diabetics scored higher internal LOC and individuals with cancer scored higher chance LOC). The Form C established concurrent validity by correlating with the appropriate counterparts of Form B (.38 - .65, p < .001). The researchers concluded that there is considerable evidence for the validity of the Form C and the subscales demonstrated sufficient internal consistency to be used in research as reliable indicators of unidimensional factors.

The State-Trait Anxiety Inventory (STAI)

The Form X State Trait Anxiety Inventory was employed, with permission, to ascertain the state and trait anxiety of the study subjects (Appendix G). The mean scores and the frequency of individual scoring for the S-anxiety and T-anxiety subscales were calculated for subjects in the control and treatment groups to determine any differences between the groups.

The STAI (Form X) was administered during the pretest phase of this study to determine the general trait and state anxiety of the participants since this may influence their attitudes or subjective norm toward health behaviours or reflect differences between the control and experimental groups.

The STAI consists of two, 1-page self-evaluation questionnaires that take 10-20 minutes to complete (Speilberger, 1983). The S-Anxiety scale consists of 20 statements that measure any feelings of apprehension, tension, nervousness or worry the respondent
is experiencing “right now, at this moment”. The T-Anxiety scale consists of twenty statements that assess how they feel in general. Each statement has a corresponding 4-item Likert scale that reflects the intensity of their feelings (1=not at all, 2=somewhat, 3=moderately so, and 4=very much so). (Appendix G)

The STAI has been used extensively in research and clinical practice since it was first introduced more than 20 years ago (Spielberger, 1966). Form X is the original STAI instrument. Form Y of the STAI was developed (Speilberger, 1983) as a “purer” measure of anxiety in its ability to discriminate between feelings of anxiety and depression. Several items in Form X appeared to be related to depression, rather than anxiety. These items were replaced, leaving Form Y with 13 anxiety-present and only 7 anxiety-absent items. Form X of the STAI was implemented in the study, because it was available to the researcher at the initiation of the study.

Tests conducted for instrument reliability and validity are reviewed as reported by Spielberger in his State-Trait Anxiety Inventory (1983).

Reliability testing was conducted using three different groups of undergraduate college students. Employing a test-retest method, the students were exposed to a brief period of relaxation training, a difficult IQ test, or a movie of several accidents that resulted in serious injury, between testing periods. The test-retest correlations for the trait anxiety ranged from .73 to .86 for most subgroups, except a group of high school students who scored .65 -.75. The S-Anxiety scale produced low stability coefficients (.16 -. 62), which were expected since a measure of state anxiety should reflect the situational factors at the time of testing. Since anxiety states tend to be transitory in nature, internal consistency was also measured using Cronbach’s Formula KR-20 to determine alpha
coefficients. This resulted in a mean alpha coefficient of .87 for S-Anxiety scales, and .89 for the T-Anxiety scales. Item-remainder correlations between .55 and .63 were achieved for the S-Anxiety scales and between .52 and .47 for the T-Anxiety scales further supporting internal consistency of the tools. These coefficients were higher when the S-Anxiety scales were given under stressful situations (.61 following the difficult test and .65 after observing the disturbing movie).

Construct validity of the T-Anxiety was established by comparing test results of subjects with various neuropsychiatric conditions with those of normal subjects. The normal subjects had substantially lower scores than all but one neuropsychiatric study subject. S-Anxiety construct validity was tested by comparing the scores of a group of military recruits who were participating in a highly stressful training program to scores of unstressed high school student of the same age group. The military recruits had higher mean S-Anxiety scores than their own T-Anxiety scores. The mean S-Anxiety scores of the students were similar to their T-Anxiety scores. Construct validity was further supported in a study of college students, whose S-Anxiety scores were significantly lower after relaxation training and much higher after examinations.

In general, State-Trait Anxiety Theory predicts higher correlations between S-Anxiety and T-Anxiety in social evaluative situations (i.e., situations that pose some threat to self-esteem or personal adequacy) and lower correlations, physical-danger situations (Spielberger, 1983, p.33). Since the correlation between the scales is dependent on the type of stress associated with the testing conditions, the scales were administered repeatedly to college students under stressful and nonstressful conditions. The results demonstrated an increase in mean S-Anxiety scores in stressful situations and
decreased under more relaxed conditions. The T-Anxiety scores were not affected and remained constant.

The T-Anxiety Scale has proven concurrent validity with other established trait anxiety measures. Correlations between the T-Anxiety scales and the Taylor Manifest Anxiety Scale (TMAS, 1953) and IPAT Anxiety Scale (Cattell & Scheirer, 1963) ranged from .85 to .73 (cited in Spielberger, 1983, p. 34).

Convergent and divergent validity of the STAI were supported in correlations with other measures of personality. The Minnesota Multiphasic Personality Inventory (MMPI) demonstrated correlations between -.64 and .79 for S-Anxiety and -.63 to .81 for T-Anxiety when administered to male neuropsychiatric patients. Correlations between the Edwards Personal Preference Schedule (EPPS, 1954) and STAI administered to undergraduate students with educational-vocational or emotional problems ranged between .61 and .69 (Spielberger, 1983).

The Theory of Reasoned Action Questionnaire

The TRA provides the theoretical framework for this study. A questionnaire was developed in accordance with the TRA to assess the study subject’s attitude, subjective norm, and intentions toward compliant behaviours of following a low-salt diet and taking medications as prescribed.

Many studies that utilized the TRA as a theoretical framework have demonstrated its usefulness in predicting the correlative relationship between attitude, subjective norm, and intention in predicting health behaviours. Although some results varied, most support the predictability and reliability of the TRA. A few of these numerous studies are outlined.
In a critical review of 16 studies that employed the TRA model to assess exercise behaviour, attitude proved to be a predictor of adults’ intention to exercise (Blue 1995). In these studies, attitude and subjective norm proved to be directly correlated with behaviour (alpha coefficients ranged from .72 to .87). The tool proved internal consistency with correlation coefficients of .73 for behavioural intention measures, and .64 - .67 for normative belief components. Instrument stability was determined in seven of these studies with test-retest reliability scores between .70 and .93. A study by Baker, Morrison, Carter and Verdon, (1996) found social norms and attitudes predicted adults’ intention to use condoms (R = .56 with men and R = .65 with women) with steady partners.

In newly diagnosed hypertensive individuals, Miller et al. (1992) discovered that perceived beliefs of others and motivation to comply determined their behavioural intentions. Those intentions predicted their behaviour to maintain a health diet, exercise regularly, and reduce stress (r = .217 - .721). There was a direct relationship between attitude and motivation to comply for smoking (r = .727) and stress reduction behaviours (r = .456). Attitude and motivation to comply were strong predictors of taking medications (r = .333 and .610). Perceived beliefs of others strongly influenced motivation to comply with medication regimes (r = .753).

N. Pender and A.R. Pender (1986) found that attitudes, subjective norms and weight affected a group of adults’ intentions to exercise regularly (r = .364, p < .01).

The TRA demonstrated varying degrees of success in predicting breast self-examination (BSE) intention and behaviour in groups of middle-aged and older women (Powell-Cope et al., 1991). Client attitude and subjective norm significantly correlated
with intention to perform BSE ($R = .58$) and with BSE frequency ($R = .64$) with a group of older church members. In a group of middle-aged women, they correlated to BSE intention but not frequency.

Shepard, Hartwick and Warshaw (1988) conducted a meta-analytic review of 87 empirical studies to investigate the effectiveness of the TRA model. They found the average correlations between intentions and behaviours to be above $.50$ and the average correlation between intentions, attitudes, and subjective norms to be $.66$ ($p = .001$). Many other studies conducted provide support of the validity and reliability of the TRA model.

The questionnaire designed to assess the variables of the TRA in this study was developed in accordance with the specific guidelines outlined by Ajzen and Fishbein (1980). This six-page questionnaire contained 38 statements, each with a corresponding 7-item bipolar equal interval Likert scale (Appendix H). Using this scale, the subjects were able to evaluate the statement as positive, negative, or neutral since there were no numerical values displayed on the scale. The scale items directly related to the behavioural belief statements since the validity of the equal interval scales is based on the extent to which the statement adequately covered the continuum of opinion about the subject (Dignan, 1986, p. 60).

To ascertain the behavioral outcomes that would best reflect clients' self-care compliant behaviours, I surveyed several experts. These included Nephrologists, a dietitian, nurse educator, and PCNs within the Nephrology program at St. Joseph's hospital. Based on their recommendations, the two behavioural intentions assessed within this study are following a low salt diet and taking medications as prescribed. Both of these behaviours were considered essential in maintaining the health of the ESRD client.
The goal of these behaviours is to maintain normal blood pressure and serum phosphate levels and to decrease the accumulation of excess body fluid. In the study questionnaire, subjects indicated their intention to perform or not perform each behavior, using a bipolar evaluative scale ranging from extremely likely to extremely unlikely.

“Modal salient beliefs” about the behaviours were elicited from a representative sample of the study population, a group of healthy ESRD clients who were receiving dialysis treatments in the “progressive-care unit”. In accordance with the explicit directives provided by Ajzen and Fishbein, 10 ESRD clients were interviewed to identify what they believed to be the consequences (i.e., good and bad salient outcomes) of following a low-salt diet and of taking prescribed medications. A list of all beliefs identified was compiled. Another 10 ESRD clients on dialysis were then asked to evaluate the most important salient beliefs from this list. For each behavior, 2 positive and 2 negative most frequently mentioned and highly rated outcomes were included as the belief statements for the study questionnaire. For following a low-salt diet, the positive outcomes were “it prevents excess accumulation of body fluid and “helps to maintain a normal blood pressure.” The negative outcomes included “foods taste bland/bad” and “it becomes inconvenient to eat at restaurants or buy prepared foods.” For taking medications as prescribed, the most mentioned positive outcomes were “can help one feel better” and “helps to regulate blood pressure or regulate phosphates.” The negative behavioral beliefs were “can upset one’s stomach” and “people tend to forget to take prescribed medications as ordered.” I purposely did not identify specific medications, as many of these clients take multiple medications for varying purposes (although some are common to all ESRD clients). I wanted to capture their beliefs about having to take
prescribed mediations in general. Study subjects responded to these statements, using an evaluative bipolar scale. The following is an example of one of the belief statements and corresponding evaluative scale:

**Following a low salt diet that can help to regulate blood pressure is:**

<table>
<thead>
<tr>
<th>Necessary</th>
<th>Quite Slightly</th>
<th>Neither</th>
<th>Slightly</th>
<th>Quite</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
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</table>

These responses would indicate their normative beliefs about each behaviour.

Each study subject also evaluated each of the behavioural outcomes (using the evaluative bipolar scale) according to their subjective probability that the behaviour would lead to each of the outcomes. This is an example of a behavioural outcome and corresponding scale:

**My following a low salt diet:**

<table>
<thead>
<tr>
<th>Likely</th>
<th>Quite Slightly</th>
<th>Neither</th>
<th>Slightly</th>
<th>Quite</th>
<th>Extremely</th>
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</table>

According to the TRA, this will determine the person's outcome evaluation of the behaviour.

The same sample group (of ESRD clients on dialysis) identified people or groups (salient referents) who would approve or disapprove of their performing the behaviours. Similar to the attitudes, the three most frequently mentioned individuals or groups were selected for the questionnaire. These were their doctor, family members, and friends. Using this information, normative belief statements were designed (i.e., My friends think
I should follow a low salt diet. An evaluative bipolar scale accompanied each normative belief. For example:

I think that following a low salt diet is something that:
my close friends think I should do

agree disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

For the study, each study subject was asked to indicate on the scale how strongly they believe each referent thinks they should (should not) perform the behaviour.

This would determine their normative beliefs (i.e., Following a low salt diet is something that my family thinks I should do). Each study subject was then asked to rate (on a scale) their intentions to comply with the wishes of the salient referent to determine their motivation to comply. For example:

Generally speaking, I tend to do what:
my close friends think I should do

agree disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

According to the TRA, a person’s subjective norm is predicted from the index obtained multiplying their normative beliefs by the corresponding motivations to comply and then sum the products (Ajzen and Fishbein, 1980, p. 75)

The questionnaire was reviewed by a group of nephrology experts (PCN, nephrology nutritionist, and nephrology educator) for content validity. Appropriate construction of the questionnaire in context of the TRA was determined by Dr. W. Montelparre (Brock University), who has knowledge and experienced using this
theoretical framework in his research practice. A sample of 10 ESRD clients on dialysis
in the self-care hemodialysis unit reviewed the completed questionnaire for clarity and
readability. No changes in the questionnaire were required.

The stability reliability of the questionnaire was evaluated using a test-retest
design with a group of 20 healthy ESRD clients currently on dialysis. Each subject
completed the pretest questionnaire during their dialysis treatment. The same individuals
were asked to complete the same questionnaire again 2 weeks later, as a posttest. Only 11
subjects completed the posttest for various reasons (e.g., did not complete the
questionnaire correctly, refused to complete the same questionnaire twice, felt too ill).
Reliability was determined for each item using the intraclass correlation coefficient
procedure. The result of the independent computations of intraclass correlation
coefficients for behavioural intention were .706 for following a low-salt diet and -1.0 for
taking medication as prescribed. Most items regarding following a low-salt diet
demonstrated moderate to high correlation between tests (.40 - .93) except for the belief
strength that “following a low salt diet will be difficult to follow if I am eating in a
restaurant or buying prepared foods,” which demonstrated a moderate negative
correlation (-.70). The normative belief “generally speaking, I tend to do what my close
friends think I should do” demonstrated a small negative correlation (-.114) between test
scores. This may have occurred because two outcomes were listed as making it difficult
to follow a low-salt diet (instead of only one).

For the behaviour of taking medications as ordered, the results were more diverse.
General beliefs about the behaviour produced varied correlation coefficients (-.25, .18,
.58) while the belief strengths produced low to moderate correlations (.203 to .550). The
behaviour outcome evaluations demonstrated moderate correlation, except for “taking prescribed medication upsets my stomach” (.260). The general belief that “most people who are important to me think I should take my medications as ordered” demonstrated a negative correlation between tests (-.20). Normative beliefs and motivations to comply generated moderate to high correlations (.531 to .776), except for “taking medications as ordered is something my doctor thinks I should do” (-.057). These results are not surprising, considering the small sample size used and the unstable nature of beliefs and attitudes.

Internal consistency reliability for the TRA questionnaire developed for the purpose of this study was calculated using Cronbach’s coefficient alpha and Gutman’s split half tests. With the group of 11 “healthy” ESRD clients on self-care dialysis treatments the questionnaire produced reliability coefficients of .9041 (Cronbach’s) and .7925 (Gutman’s). Since this was such as small sample size, the reliability testing was repeated with the study participant pretest results (n = 27) to assess for consistency of the coefficient alphas. The study participants’ pretest results produced reliability coefficients of .8655 (Cronbach’s alpha) and .7195 (Gutman’s split half).

**Predialysis Class**

The predialysis class attended by subjects in the experimental group (and their family members) was provided by a group of health care providers within the Nephrology program team (PCN, pharmacist, dietitian, social worker, occupational therapist, and physiotherapist) in a classroom at St. Joseph’s Hospital. From February 1997 to March 1998, four predialysis class sessions were offered. Three of these were 4-hour sessions
offered during a weekday afternoon (with a 15-minute break) and one was offered as two-
2 hour evening sessions (2 consecutive Tuesdays). The class started with a 1-hour slide
presentation and review of the causes of kidney disease and dialysis treatments available,
by one of the Nephrology PCNs. (An outline of the class content is provided in Appendix
I). With the use of a slide demonstration, the dietitian discussed predialysis nutrition for
45 minutes. She provided clients with dietary guidelines to follow regarding foods they
should restrict or avoid in their diet. (A review of the presentation contents is available in
Appendix J). This was supplemented with a handout and cookbooks were available for
participants to review or order. A representative from the Kidney Foundation briefly
outlined the function of the foundation and services they offered to clients with kidney
disease. A panel composed of clients currently receiving renal replacement therapy (i.e.,
someone on hemodialysis, peritoneal dialysis, and renal transplantation) as well as a
client caregiver (i.e., spouse of one of the clients) led a group discussion. Members of the
panel shared with the group their experiences of living with kidney disease, dialysis and
effects their illness has had on their employment, self-image, and family life. They
offered the class attendants words of encouragement, inspired them to learn about their
condition, to ask questions and develop self-care behaviours. In the predialysis classes
that I attended, this panel appeared to spark the group’s attention and much of this 45-
minute session developed into a question-and-answer session. The class ended with a
panel of Nephrology health care team members (i.e., social worker, pharmacist,
physiotherapist, and occupational therapist) who described the services they provided to
clients within the Nephrology program (including their name, department and phone
number for further contact). Clients and their family members who attended the class
appeared satisfied with the presentations and the satisfaction questionnaires completed at
the end of each session were favourable.

**Data Collection and Recording**

To maintain anonymity, each study subject was assigned a number that was
recorded on his or her questionnaires. A list of each subject’s name and corresponding
assigned number was kept in the researcher’s office. Of the 36 clients who agreed to be
study subjects, 33 completed both the pretests and posttest questionnaires. Three subjects
who agreed to participate in the study did not return the pretests (by mail).

The testing times were arranged with the study subjects to avoid inconvenience to
them. The pretest time for subjects in the control group was during their routine
predialysis clinic visit. For the experimental group, pretest data were collected prior to
the predialysis class. At the pretest period, the purpose of the study was explained to the
study subject and a written consent (Appendix K) was obtained. Brief instructions were
given about each questionnaire by the researcher or a research assistant. The study
subjects then completed the demographic data page, the HLC questionnaire, the State-
Trait Anxiety Inventory, and the TRA questionnaire. Some subjects had a family member
assist them to complete the questionnaires (i.e., the family member would read the
statement aloud, and the subject would dictate their answer). The researcher was not
present during completion of the questionnaire. A research assistant was present the
majority of the time to provide participants with directions regarding how to complete the
questionnaires if they had difficulty or questions.
The posttest consisted of the kidney knowledge test, TRA questionnaire and an information page to assess for other source of information the subject may have received between the pretest and posttest times. (Appendix L) The posttests (for both groups) were conducted 2-3 months after the pretest, during their routine predialysis clinic visit. For a few subjects who had sporadically scheduled predialysis clinic visits, the posttest questionnaires were mailed to the subject’s home, along with a self-addressed, stamped envelope. The completed posttests were then mailed back to the researcher. All mailed-out questionnaires were returned, although a few subjects required phone call reminders. Subjects’ serum creatinine results (routinely ordered) were recorded at pretest and posttest times. This information was obtained with the Nephrologist permission from the hospital computer system or the subject’s chart. All data for the study were secured in a locked drawer in the researcher’s locked office.

Data from the completed pretests and posttests were entered into a computer and kept on file for future data analysis.

Data Analysis

For the TRA questionnaire, attitudes and subjective norms were calculated according to the specific directions by Azjen and Fishbein (1980). Each evaluative Likert scale item was assigned a numerical value depending on the degree the participant agreed or disagreed with the statement. For positive responses (participant agrees with statement), extremely = 3, quite = 2 and slightly = 1. Neutral responses (neither) equaled 0. For negative responses (participant disagreed with statement), extremely = -3, quite = -2 and slightly = -1. Behavioural attitude was determined by multiplying the person’s
evaluation of each of the behavioural consequence by the belief strength that performing the behaviour will lead to the identified consequence (see sample of questionnaire, Appendix G, items 3a X 4a).

Their subjective norm is calculated by multiplying their normative belief regarding the behaviour by their motivation to comply with the individual/groups identified.

The participant demographic data were evaluated for differences between the control and experimental groups, using a t-test method. The difference between pretest and posttest knowledge scores, attitudes, subjective norms and behavioural intentions was assessed using t-test. Pearson’s correlational statistic (r) was used to measure the relationship between the TRA variables (attitude, subjective norm and behavioural intentions) and between subject’s HLC.

**Study Limitations**

Major limitations to this study were the lack of randomization of study subjects and small sample size. Although the researcher aimed to obtain a sample size of 38 participants, the study was conducted using only 33. The inability to randomize study participants may have lead to extraneous results. The self-evaluation nature of the questionnaire responses may be influenced by the Hawthorne effect in study subjects. Although the posttest included the identification of other sources of information the subject acquired since the pretest (that may have affected their knowledge scores), it did not account for other extraneous variables that could have influenced a change in the subject’s behavioural intention, attitude, or subjective norm (i.e., experiences with
medications or diet, relationships with friends, family or doctor). Time limitation was another factor. The long-term effects of the predialysis class may have produced more substantial results if the posttest could have been repeated at 4 and 6 months post pretest.

**Restatement of the Problem**

The purpose of this study was to evaluate the effectiveness of a predialysis class offered at St. Joseph’s hospital in Hamilton, Ontario to clients with end stage renal (kidney) disease. Using the Fishbein and Ajzen Theory of Reasoned Action (Fishbein & Ajzen, 1975) as a theoretical framework in a pretest/posttest study design, the following questions were asked:

1. Did attending the class affect the client’s knowledge scores regarding kidney disease and its treatment?

2. Did attending the class affect the client’s attitude, subjective norm, or intentions toward following a low-salt diet?

3. Did attending the class affect the client’s attitude, subjective norm, or intentions toward taking medications as prescribed?

4. Did the client’s attitude or subjective norm correlate with their behavioural intentions?

5. Did the control and treatment groups significantly differ in relation to their: HLC, state-anxiety, trait-anxiety, or demographic characteristics (i.e., age, gender, formal education, marital status, years of kidney disease, and history of diabetes)?
The analysis and interpretation of the data are outlined in the following chapter. The final chapter includes the study conclusions and implications of the study for practice, theory, and further research. Recommendations toward predialysis education are suggested as part of the study summary.
CHAPTER FOUR: ANALYSIS AND EVALUATION

This chapter includes a review of the research data and an interpretation of the findings to address the study questions:

1. Did attending the class affect the subject’s knowledge scores regarding kidney disease and its treatment?

2. Did attending the class affect the subject’s attitude, subjective norm, or intentions toward following a low-salt diet?

3. Did attending the class affect the subject’s attitude, subjective norm, or intentions toward taking medications as prescribed?

4. Did the subject’s attitudes or subjective norm correlate with their behavioural intentions?

5. Did the control and treatment groups significantly differ in relation to their: HLC, creatinine levels, state-anxiety, trait-anxiety, or demographic characteristics (i.e., age, gender, formal education, marital status, years of kidney disease, and history of diabetes)?

   A comparison of the control and treatment subjects in relation to the demographic data collected, their HLC result, and their State-Trait Anxiety results is presented. This is followed by an outline the knowledge pretest and posttest scores of both the control and treatment groups. In accordance with the TRA, the study subject’s behavioural intention, behavioural attitude, and subjective norm scores for both the pretest and posttest times are included. This is followed by an assessment of relationships (correlation) between
subjects' behavioural intention and their attitudes or subjective norm. The second part of the chapter includes an analysis and interpretation of the participant data (question 5).

Demographics

Demographic information of the study participants was collected in the study to assess for extraneous variables within the study and treatment groups that may affect the results. A summary of all demographic information is provided in Appendix M. The control group was comprised of 69% male and 31% female subjects. Similarly, the treatment group contained 71% male and 29% female subjects. The distribution of the study participants' marital status is presented in Table 1. Most participants were married (73%) while only 6% were single (never married).

The employment status of participants in each group was similar. Most of the participants were retired. Participants who were on disability payments because of their kidney disease were categorized as unemployed. The distribution of the study participants' employment status is presented in Table 2.

Most participants (60%) in both groups had 8 - 12 years of formal education. Post high school (college or university) education was attained by 6 control and 4 treatment subjects. Six subjects (37.5%) in the control group and 5 subjects (29%) in the treatment group had recently (less than one year) been diagnosed with their kidney failure, whereas, 7 subjects (44%) in the control group and 9 subjects (53%) in the treatment group had been living with kidney failure for more than 3 years.
Table 1

Marital Status

<table>
<thead>
<tr>
<th></th>
<th>Control (n = 16)</th>
<th>Treatment (n = 17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single (never married)</td>
<td>0 (% )</td>
<td>2 (12 %)</td>
</tr>
<tr>
<td>Married/common-law</td>
<td>12 (75 %)</td>
<td>12 (71 %)</td>
</tr>
<tr>
<td>Divorced/separated</td>
<td>2 (12 %)</td>
<td>2 (12 %)</td>
</tr>
<tr>
<td>Widow/widowed</td>
<td>2 (12 %)</td>
<td>1 (6 %)</td>
</tr>
</tbody>
</table>
## Table 2

**Employment Status**

<table>
<thead>
<tr>
<th></th>
<th>Control (n = 16)</th>
<th>Treatment (n = 17)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Employed full time</td>
<td>5 (31)</td>
<td>4 (24)</td>
</tr>
<tr>
<td>Employed part time</td>
<td>0</td>
<td>1 (6)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>3 (19)</td>
<td>2 (12)</td>
</tr>
<tr>
<td>Retired</td>
<td>8 (50)</td>
<td>10 (59)</td>
</tr>
</tbody>
</table>
Seven people (44%) in the control group were currently receiving dialysis treatments, whereas only one person (6%) in the treatment group was. Some ESRD clients are also diabetics and have experience living with dietary restrictions and alteration of lifestyle, which may affect their behavioural responses. For both groups, 7 individuals had been diagnosed with diabetes at one time. Five control subjects (31%) and 6 treatment subjects (35%) were currently diabetic. Having a family member with a chronic health condition could also influence the participant’s attitudes/beliefs about compliant behaviours. In the control group, 6 subjects (37.5%) had a family member living with diabetes or kidney failure and 6 subjects (35%) in the treatment group did. Clients with kidney disease can obtain information from a variety of sources. The distribution of the study participant’s sources of information about their kidney disease and its treatment were identified and presented in Table 3.

**Health Locus of Control**

Participant health locus of control (HLC) was evaluated in both groups to determine any differences. All study subjects were asked to complete the Form C MHLC during the pretest time. The scale results were scored according to the guidelines provided by K. Wallston (personal communication, April 1997). There is a score range of 6-36 for the internal, chance and powerful others HLC. Internal HLC subscale was measured by scale items 1, 6, 8, 12, 13, and 17. The chance HLC subscale was derived from scale items 2, 4, 9, 11, 15, and 16. The powerful others HLC subscales were determined by items 3, 5, 7, 10, 14 and 18. The powerful others subscale is separated into two 3-item subscales of **doctor-powerful other** and **other people-powerful other**.
<table>
<thead>
<tr>
<th>Source</th>
<th>Control (n = 16)</th>
<th>Treatment (n = 17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family doctor</td>
<td>3 (19)</td>
<td>6 (35)</td>
</tr>
<tr>
<td>Kidney doctor</td>
<td>15 (94)</td>
<td>17 (100)</td>
</tr>
<tr>
<td>Kidney nurse (PCN)</td>
<td>9 (56)</td>
<td>10 (59)</td>
</tr>
<tr>
<td>Kidney Foundation</td>
<td>11 (69)</td>
<td>6 (35)</td>
</tr>
<tr>
<td>Self (i.e. books, internet)</td>
<td>3 (19)</td>
<td>4 (23)</td>
</tr>
<tr>
<td>Other people with kidney disease</td>
<td>4 (25)</td>
<td>3 (18)</td>
</tr>
</tbody>
</table>
The score range for each of these subscales is 3 - 18. The score of each subscale is derived from the sum of the values circled for each item on the subscale, whereas 1 = strongly disagree and 6 = strongly agree.

Both the control and treatment groups demonstrated highest scores in the internal and powerful others HLC subscales. The treatment group had a slightly lower chance HLC score than the control group. The group mean for each subscale is outlined in Table 4. The distribution of subjects' scores for each HLC subcale is available in Appendix N.

**State-Trait Anxiety**

State-Trait anxiety scores were obtained for all study participants to consider the effect anxiety may have on their beliefs, attitudes, or knowledge. To score the test, each item was given a weighted score of 1 to 4. The scoring weights for the anxiety-present statements were the same as the corresponding numbers on the test Likert scale. For example, a response of 1 (almost never) would reflect a score of 1. Scoring for the anxiety-absent statements was reversed (i.e., response of 1 = score of 4).

The anxiety scores of both groups were very similar. The state-anxiety scores were within the "normal range" of 35 - 47, but the trait-anxiety scores for both groups were on the high side of the "normal range" of 34 - 41 (Speilberger, 1980, p. 13). The group mean scores for both state-anxiety and trait-anxiety are displayed in Table 5. The distribution of subjects' scores for state-anxiety and trait-anxiety is available in Appendix O.
Table 4

Health Locus of Control Results

<table>
<thead>
<tr>
<th></th>
<th>Control (n = 16)</th>
<th>Treatment (n = 17)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Internal HLC</td>
<td>22</td>
<td>6.67</td>
</tr>
<tr>
<td>Chance HLC</td>
<td>17</td>
<td>7.94</td>
</tr>
<tr>
<td>Powerful others HLC</td>
<td>27</td>
<td>4.72</td>
</tr>
<tr>
<td>Doctor powerful other</td>
<td>15</td>
<td>2.23</td>
</tr>
<tr>
<td>Other people powerful other</td>
<td>11</td>
<td>3.64</td>
</tr>
</tbody>
</table>
Table 5

State-Trait Anxiety Scores

<table>
<thead>
<tr>
<th></th>
<th>Control (n = 16)</th>
<th>Treatment (n = 17)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>State anxiety</td>
<td>36</td>
<td>12.52</td>
</tr>
<tr>
<td>Trait anxiety</td>
<td>37</td>
<td>10.54</td>
</tr>
</tbody>
</table>
Serum Creatinine Levels

Participant serum creatinine levels were recorded at pretest and posttest times (+/- 7 days) to reflect change in renal function and possible alteration in their cognitive ability. The participant creatinine levels ranged from 230 to 997 umol/L (normal is 50 - 110 umol/L). Although the control group had slightly higher creatinine levels as compared with the treatment group, this difference was not significant. The difference in creatinine levels between pretest and posttest times was not significant for the total group or within the control and treatment groups. These results are represented in Table 6.

Knowledge Scores

Client knowledge concerning end stage renal disease and its treatment was assessed using the Kidney Disease Questionnaire developed by Devins et al. (1990). The test and correct responses were obtained and used with permission (Gerald Devins, personal communication, January 1997). The individual scores represent the total number of correct responses with a maximum score of 11. A perfect score in both the pretest and posttest was attained by 2 control subjects and 1 treatment subject. One control subject answered 1 question wrong on the pretest and achieved a perfect score with the posttest. A score less than 54% (on either test) was obtained by 6 treatment and 1 control subject. The mean pretest and posttest scores of both control and treatment groups are displayed in Table 7. The treatment group demonstrated a 10% increase in score (between pretest and posttest) in comparison to only a 4% improvement with the control group, but this difference was not statistically significant ($p = .064$). Distribution of score changes between pretest and posttest is represented in Table 8.
Table 6

Serum Creatinine Levels

<table>
<thead>
<tr>
<th></th>
<th>Control group (n = 15)</th>
<th>Treatment group (n = 18)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Pretest time</td>
<td>589</td>
<td>179.3</td>
</tr>
<tr>
<td>Post test time</td>
<td>533</td>
<td>201.0</td>
</tr>
<tr>
<td>Difference</td>
<td>Unequal t = .432</td>
<td>Unequal t = .883</td>
</tr>
</tbody>
</table>
The control group attained 100% for questions 1, 2, and 3 in the pretest and posttest. The treatment group achieved 100% for questions 1, 2, 3, and 8 in the pretest. They retained 100% for questions 1 and 8 in the posttest, but went down to 94% for questions 2 and 3 in the posttest. The control group started with 36% for question 6, but went down to 33% in the posttest. All other question scores for both groups improved (2 – 38%) with the posttest. Question 10 showed the most improvement in posttest score with both control and treatment groups. The number of correct pretest and posttest responses per question is available in Appendix P.

There was no relationship between the difference in creatinine levels and the difference in knowledge scores for either control or treatment groups (Pearson correlation coefficient of .258 for the control group and -.298 for the treatment group).

**Theory of Reasoned Action Questionnaire**

The participants’ behavioural attitudes and subjective norms were calculated according to the specific directions from Ajzen and Fishbein (1980).

The participant’s behavioural intention was indicated by his or her self-evaluation of intending to perform the behaviour (questionnaire item #1). The control subject’s intention to follow a low-salt diet was relatively stable. Their mean pretest score of 79% went down 2% to 77% at posttest time. The treatment group demonstrated a 27% improvement in their intention to follow a low-salt diet (53% pretest and 80% with the posttest). This 27% increase, was not statistically significant \( p = .073 \). Both groups demonstrated high intentions to take their medications as prescribed. The control group started with 100% intention, then decreased slightly to 94% with the posttest.
Table 7

Knowledge Scores

<table>
<thead>
<tr>
<th></th>
<th>Control group (n = 16)</th>
<th>Treatment group (n = 17)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (%)</td>
<td>SD</td>
</tr>
<tr>
<td>Pretest score</td>
<td>8.43 (77)</td>
<td>1.70</td>
</tr>
<tr>
<td>Posttest score</td>
<td>8.93 (81)</td>
<td>1.44</td>
</tr>
<tr>
<td>Difference</td>
<td>4% improvement $p = .397$</td>
<td>10% improvement $p = .064$</td>
</tr>
</tbody>
</table>
Table 8

**Changes in Knowledge Scores**

<table>
<thead>
<tr>
<th></th>
<th>Control Group Subjects (n = 16)</th>
<th>Treatment Group Subjects (n = 17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved by 4 points</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Improved by 3 points</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Improved by 2 points</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Improved by 1 point</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Score remained same</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Score down by 1 point</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Score down by 2 points</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>
The treatment group’s intention to take medications as prescribed remained stable (97% pretest and 96% posttest). The pretest and posttest results of behavioural intention are displayed Appendix Q.

The participant’s general attitude about the behaviour was determined by summing the scores of each item that reflected their general feeling about the behaviour (items 2a + 2b + 2c on the questionnaire). Their personal attitude toward each behaviour was calculated by adding the products of the scores of the belief that performing the behaviour would lead to a given consequence, multiplied by the score of their evaluation of that consequence. The attitudes of following a low salt diet were calculated by 3a X 4a, 3b X 4b, 3c X 4c, 3d X 4d, and 3d X 4e. The treatment group demonstrated a significant improvement in their general attitude toward following a low-salt diet compared to the control group (p = .035), as reflected in Table 9.

Although subjects held a positive attitude that following a low-salt diet would regulate or decrease their blood pressure, the treatment group demonstrated significant improvement in their attitude as reflected in their posttest scores (p = .042). They also demonstrated a significant difference between their pretest and posttest scores as compared to the control group (p = .035). These results are demonstrated in Table 10.

The groups differed significantly in their posttest attitude that following a low-salt diet would mean having to eat bland tasting food, (p = .03), as demonstrated in Table 11. Control group subjects tended to agree with this statement and treatment group subjects disagreed with it. There was a significant difference between the groups’ difference in their pretest and posttest scores (p = .01).
Table 9

**General Attitude about Following a Low Salt Diet**

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>7.37 (82)</td>
<td>1.75</td>
<td>7.81 (87)</td>
<td>1.47</td>
<td>-0.44 (+3%)</td>
<td>1.41</td>
</tr>
<tr>
<td>Treatment</td>
<td>7.06 (78)</td>
<td>3.44</td>
<td>8.47 (94)</td>
<td>1.01</td>
<td>-1.41 (+16)</td>
<td>3.54</td>
</tr>
<tr>
<td>Unequal p</td>
<td>.739</td>
<td>.147</td>
<td></td>
<td></td>
<td>.035</td>
<td></td>
</tr>
<tr>
<td>(difference between groups)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 10

**Attitude: Following a Low-Salt Diet will Lower or Regulate my Blood Pressure**

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M %</th>
<th>SD</th>
<th>Post-test M %</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>5.75 (64)</td>
<td>2.79</td>
<td>5.62 (62)</td>
<td>3.05</td>
<td>.125 (-2)</td>
<td>2.30</td>
</tr>
<tr>
<td>Treatment</td>
<td>5.65 (63)</td>
<td>2.60</td>
<td>7.53 (84)</td>
<td>1.91</td>
<td>-1.88 (+21)</td>
<td>2.82</td>
</tr>
<tr>
<td>Unequal p</td>
<td>.913</td>
<td></td>
<td>.042</td>
<td></td>
<td>.032</td>
<td></td>
</tr>
<tr>
<td>(difference between groups)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 11

**Attitude: Following a Low-Salt Diet will Mean I Have to Eat Bland Tasting Food**

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>1.94 (21)</td>
<td>3.37</td>
<td>2.56 (28)</td>
<td>3.34</td>
<td>-.625 (+7)</td>
<td>3.11</td>
</tr>
<tr>
<td>Treatment</td>
<td>3.41 (35)</td>
<td>3.16</td>
<td>-.18 (-2)</td>
<td>3.71</td>
<td>3.58 (-40)</td>
<td>5.44</td>
</tr>
<tr>
<td>Unequal p (difference between groups)</td>
<td>.206</td>
<td>.03</td>
<td>.01</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The sum of attitudes regarding following a low salt diet decreased in the control group (7%) and improved in the treatment group (18%), although this difference was not statistically significant ($p = .35$). A table of the pretest and posttest mean attitude scores of both the treatment and control groups for following a low salt diet are displayed in Appendix R.

The subject’s attitudes towards taking medications as prescribed was calculated by summing the products of $3a \times 4b$, $3b \times 4a$, $3c \times 4c$ and $3d \times 4d$. This attitude decreased slightly for both groups (a 17% decrease with the control group and a 3% decrease with the treatment group between their pretest and posttest scores) although not statistically significant. A table of the pretest and posttest mean attitude scores of both the treatment and control groups for taking medications as prescribed are displayed in appendix S.

The participant’s subjective norm for each behaviour was determined by the product of their normative beliefs and their corresponding motivations to comply ($6a \times 7a$, $6b \times 7b$ and $6c \times 7c$) and then summing the weighted products. At pretest time, friends did not have much influence on subjects following a low-salt diet. As demonstrated in Table 12, this influence significantly increased with the treatment group posttest (21% increase, $p = .054$) and insignificantly decreased in the control group.

The influence of family members to follow a low-salt diet also increased in the treatment group (21%), but this was not statistically significant. The treatment group’s subjective norm demonstrated higher influence with their behaviour to follow a low-salt diet (see Table 13).
Table 12

Subjective Norm: Following a Low Salt Diet – Influence of Friends

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>.62 (7)</td>
<td>4.40</td>
<td>.12 (1.3)</td>
<td>2.80</td>
<td>-.062 (-6)</td>
<td>3.56</td>
</tr>
<tr>
<td>Treatment</td>
<td>.47 (5)</td>
<td>5.40</td>
<td>2.35 (26)</td>
<td>3.57</td>
<td>-1.88 (+21)</td>
<td>4.58</td>
</tr>
<tr>
<td>Unequal p (difference between groups)</td>
<td>.813</td>
<td>.054</td>
<td>.211</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 13

Subjective Norm Sum for Following a Low Salt Diet

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>8.25 (30)</td>
<td>9.39</td>
<td>8.69 (32)</td>
<td>6.21</td>
<td>-.44 (+2)</td>
<td>8.37</td>
</tr>
<tr>
<td>Treatment</td>
<td>11.11 (41)</td>
<td>11.24</td>
<td>14.0 (52)</td>
<td>6.65</td>
<td>-2.88 (+11)</td>
<td>10.0</td>
</tr>
<tr>
<td>Unequal p</td>
<td>.431</td>
<td>.024</td>
<td></td>
<td>.453</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(difference</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The influence of the treatment group’s subjective norm decreased regarding taking medications as prescribed (8% decrease) in their posttest, although this was not statistically. The influence of others remained stable for the control group. The subjective norm mean scores of both treatment and control groups are presented in a table in Appendixes T and U.

Correlations between behavioural intentions, attitudes, and subjective norm were assessed, using the Pearson correlation coefficients. For the total group, their intentions to follow a low-salt diet correlated with their subjective norm at both pretest \( (r = .528, p = .002) \) and posttest times \( (r = .331, p = .059) \). Their attitude toward the behaviours was consistent, since both groups’ behavioural attitudes regarding following a low-salt diet correlated with their attitude towards taking medications as prescribed at pretest \( (r = .418, p = .015) \) and posttest times \( (r = .347, p = .047) \). The influence of their subjective norm influence was stable, since their subjective norm influence for following a low-salt diet correlated with their subjective norm to take medications as directed at pretest \( (r = .540, p = .001) \) and posttest times \( (r = .714, p = .0001) \).

In the control group, intention to follow a low salt diet correlated with their subjective norm with the pretest only \( (r = .482, p = .059) \). There was a negative correlation between their intention and attitudes with the pretest and their intention and subjective norm in the posttest, although these were not statistically significant (see Table 14).

The treatment group’s intention to follow a low-salt diet remained stable, as their pretest score correlated with their posttest score \( (r = .503, p = .039) \).
Table 14

Relationship Between Total Subjective Norm, Attitudes and Behavioural Intention to Follow a Low-Salt Diet - Control Group

<table>
<thead>
<tr>
<th>Intention</th>
<th>Attitudes</th>
<th>Subjective norms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>$r = -0.471, p = 0.065$</td>
<td>$r = 0.482, p = 0.059$</td>
</tr>
<tr>
<td>Posttest</td>
<td>$r = 0.265, p = 0.322$</td>
<td>$r = -0.458, p = 0.074$</td>
</tr>
</tbody>
</table>
Their intention to follow a low-salt diet correlated with their subjective norm at pretest time only ($r = .648, p = .049$), but did not correlate with their attitudes (see Table 15).

For the intention to take medications as prescribed, all control subjects rated their intention as extremely likely (+3); therefore correlations between their intention and their attitudes or subjective norms could not be computed. With their posttest results, their intentions to take medications as prescribed did not correlate with their attitudes ($r = .267, p = .316$) or their subjective norms ($r = .197, p = .463$). There was a negative correlation between their intention to take medications as prescribed and their attitudes towards following a low salt diet ($r = -.021, p = .937$).

**Interpretation of the Findings - Participant Data**

The demographic data present the control and treatment group subjects to be very comparable. The distribution of males and females was equal. The subjects' range of age was similar, with a mean age of 59 (+/- 16 yrs.) of the treatment subjects and a mean age of 53 (+/- 16 yrs.) with the control group.

Most subjects in both groups were married. This could influence their HLC and contribute to the subjective norm influence of their behaviour. Perceived peer and family support has been associated with an absence of powerlessness (Zindler-Wernet & Weiss, 1987) and plays an important role in influencing compliance (Becker & Maiman, 1980). In their study of noncompliance with prescribed regimens among chronic hemodialysis ESRD patients, Hartman and Becker (1978) described the less adherent patient as young, female, unmarried, with minimal social support.
Table 15
Relationship Between Total Subjective Norm and Behavioural Intention to Follow a Low-Salt Diet - Treatment Group

<table>
<thead>
<tr>
<th>Intention</th>
<th>Attitudes</th>
<th>Subjective norms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>$r = -.199, p = .265$</td>
<td>$r = .648, p = .049$</td>
</tr>
<tr>
<td>Posttest</td>
<td>$r = .444, p = .074$</td>
<td>$r = .326, p = .200$</td>
</tr>
</tbody>
</table>
The control group members were slightly more educated, as 6 (37.5%) subjects attained a college or university education and only 4 (23.5%) people in the treatment group did. Conversely, 3 (18%) of individuals in the treatment group received only 1 to 8 years of education, while everyone in the control group received at least 8 years of education. Education may influence HLC, as Blackburn (1977) found that chronic hemodialysis ESRD clients with external HLC were more frequently women with minimal (10.9) years of education ($p < .05$).

The employment status of subject, in both groups was comparable, with 5 subjects (30%) currently working and approximately half retired. As Rasgon et al., (1993) point out, most ESRD clients find their employment status increases their self-esteem, contributes to a more positive attitude, and generally enhances the quality of life. Churchill (1995, p. 835) states that “ESRD clients who are employed or do housework either full or part time are more compliant than those who are not.”

Living with kidney failure was nothing new to 44% control and 53% treatment subjects. These subjects would have had the opportunity to receive information over time from multiple health care providers. Conversely, living with kidney disease was new to 37.5% control and 29% treatment clients who had been diagnosed with their kidney disease for less than one year. These clients may experience more apprehension and anxiety as they are learning to cope with a new condition. Living with another chronic health condition, such as diabetes, or having a family member with a chronic health condition could familiarize the client in living with dietary restrictions and alterations in lifestyle. This could affect their HLC, attitudes, subjective norm, and behavioural intentions. For both groups, 7 individuals had been diagnosed with diabetes at one time.
Five control subjects (31%) and 6 treatment subjects (35%) were currently diabetic. In the control group, 6 subjects (37.5%) had a family member living with diabetes or kidney failure and 6 subjects (35%) in the treatment group did.

Clients with kidney disease can obtain information from a variety of sources. The demographic data revealed that more subjects' in the treatment group (35% versus 19% of control group) had received information about their condition from their family physician. Considering most people have a trusting relationship with their family physician, this may have influenced their desire to attend the predialysis class. On the other hand, since more control group subjects identified receiving information from the Kidney Foundation (69% versus 35% treatment group subjects) they may have perceived this information to sufficiently meet their learning needs. This could have affected their decision to not attend the predialysis class.

Both group subjects demonstrated equally high internal and powerful others HLC scores. The combination of a high internal and powerful others HLC is consistent with the results of previous studies on the HLC of clients with chronic health conditions (Wallston & Wallston, 1980) and specifically ESRD clients (Ulrich, 1981). This reflects a realistic view of the ESRD client's life situation. These people believe that they have some control over their condition by being compliant with therapeutic regimes and making healthy lifestyle changes, but at the same time they recognize their dependence on the nephrology health care team and in some cases dialysis treatments to maintain their health. The control group scored a slightly higher chance HLC (mean of 17 versus 14 for the treatment group). This is significant as this it has been associated with perceived
helplessness, since it reflects the perception of absence of control and predictability
(Christensen et al.; Smith & Wallston, cited in Bremer, 1995).

Several studies have identified a negative correlation between age and powerful others HLC subscale scores (Brown & Fitzpatrick, 1988; Schneider, 1992). Even though the treatment group subjects were slightly older than the control group, this did not apply in this study.

The treatment group produced slightly higher state-anxiety and trait-anxiety scores, although still within the “normal” range. This may be related to their attending the predialysis class.

In summary, the demographic data present both groups as very similar. The data reveal that the treatment group subjects had a higher (10%) improvement in their knowledge scores as compared to the control group (4%), but this improvement was not statistically significant. There appeared to be no relationship between the subjects’ serum creatinine levels and their knowledge scores. After attending the class, subjects in the treatment group had improved intentions to follow a low-salt diet (27%) in comparison to a decrease in intention from the control group subjects (not statistically significant). For both groups, the intention to take their medications as prescribed remained relatively stable. There was minimal support for the predictability of the TRA, since the only subjects’ subjective norm at pretest time was related to their intentions to follow a low-salt diet.

In the next and final chapter, the study questions outlined in Chapter One as the "statement of the problem" will be addressed. The implications of the study results on practice, theory, and further research are outlined. In conclusion, several
recommendations regarding the organization and presentation of predialysis education are made that could impact client outcomes more significantly.
CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This was a quasi-experimental study to evaluate the effectiveness of a predialysis class offered at St. Joseph’s hospital in Hamilton, Ontario to clients with end stage renal disease. Using the Fishbein and Ajzen Theory of Reasoned Action (Fishbein and Ajzen, 1975) as a theoretical framework and a pretest posttest study design, the following questions were asked:

1. Did attending the class affect the subject’s knowledge scores regarding kidney disease and it’s treatment?

2. Did attending the class affect the subject’s attitude, subjective norm or intentions toward following a low-salt diet?

3. Did attending the class affect the subject’s attitude, subjective norm, or intentions toward taking medications as prescribed?

4. Did the subject’s attitudes or subjective norm correlate with their behavioural intentions?

5. Did the control and treatment groups significantly differ in relation to their: HLC, creatinine levels, state-anxiety, trait-anxiety, or demographic characteristics (i.e., age, gender, formal education, marital status, years of kidney disease, and history of diabetes)?

1. Did attending the class affect the subject’s knowledge scores regarding kidney disease and its treatment?

Attending the class did result in an increase in the client’s knowledge, as the treatment group demonstrated a 10% absolute increase in their score as compared with
the control group members who attained only a 4% improvement. Only 2 people in the
treatment group had a lower posttest score (down 1 point) and 4 subjects improved their
posttest score by more than 2 points. In comparison, 2 control group subjects decreased
their score by 2 points in their posttest and no one improved their score by more than 2
points. Although the treatment group demonstrated this improvement, the difference
between their pretest and posttest scores was not statistically significant ($p = .064$) and
did not reach the 30% increase anticipated in the study factor analysis. This could be
related to the small sample size. Also, the knowledge test questionnaire contained only 11
items. Better results may have been obtained if both Form A and Form B of the KDQ
had been utilized or if a knowledge test specific to this predialysis class was developed
and utilized. The changes in knowledge scores were not related to the subjects' creatinine
levels, which were used to reflect the degree of client renal failure and possible changes
in cognition. These outcomes may be clinically significant.

2. Did attending the class affect the subject's attitude, subjective norm, or
intentions toward following a low salt diet?

The treatment group increased their intentions to follow a low-salt diet by 27%
after attending the class in contrast to the control group whose intention decreased by 2%,
but this difference was not statistically significant ($p = .073$). The intention to take
mediations as prescribed decreased in both groups.

Attending the class significantly improved the treatment group's attitudes towards
following a low-salt diet. This was reflected by their 16% increase in general attitude
compared to control group ($r = .035$), a 21% increase in their belief that following a low
salt diet would lower or regulate their blood pressure ($r = .042$) and a 40% decrease in the
belief that following a low salt diet means having to eat bland-tasting food ($r = .03$). It also significantly increased their general subjective norm ($p = .024$) and influence of their friends ($r = .054$). This was different with the control group, as they decreased their intention by 2%, decreased their general attitude, and increased their beliefs of the negative outcomes of following a low-salt diet.

3. Did attending the class affect the subject's attitude, subjective norm, or intentions toward taking medications as prescribed?

Attending the class did not appear to have any effect on the subjects' intentions, attitudes or subjective norm relative to taking medications as prescribed. The general attitude towards taking medications improved slightly (4%) in both groups, but their intentions, attitudes, and subjective norms decreased with their posttest. The control group demonstrated larger decreases than the control group. The control subjects' belief that taking medications as prescribed would regulate their blood pressure or phosphate levels decreased by 65%! This is clinically significant since taking medications as prescribed is essential in maintaining the health and preventing complications of ESRD. In their study to determine effective teaching strategies for ESRD clients, Adler et al. (1983) likewise discovered renal patients held negative attitudes toward taking their medications. This was attributed to the belief that their medications were not helping them and that they simply did not like taking their medications. Some common barriers to compliance in taking prescribed medications that have been identified with ESRD clients include affordability, accessibility, taste, and incidence of gastrointestinal disturbances (Betts & Crotty, 1988). The subjects in this study could have also experienced negative outcomes (e.g., little therapeutic results, side effects) from taking their medications.
Since many ESRD clients are prescribed a variety of medications, the use of the nonspecific term “medications” in the questionnaire could have been open to interpretation and therefore reflect inconsistent attitudes with the subject’s responses.

4. **Did the subject’s attitudes or subjective norm correlate with their behavioural intentions?**

   For both groups, their behavioural intention to follow a low salt diet was related to their subjective norm at the pretest time only. The results of this study did not support the predictions of the TRA. This may be due to the small study sample size or the use of the non-specific term “medications”.

5. **Did the control and treatment groups significantly differ in relation to their:**
   - HLC, creatinine levels, state-anxiety, trait-anxiety, or demographic characteristics?

   The demographic data present the control and treatment group subjects to be very comparable. The distribution of males and females was equal. The subjects’ range of age was similar, with a mean age of 59 (+/- 16 yrs.) of the treatment subjects and a mean age of 53 (+/- 16 yrs.) with the control group.

   Most subjects in both groups were married. This could influence their HLC and contribute to the subjective norm influence of their behaviour. Perceived peer and family support has been associated with an absence of powerlessness (Zindler-Wernet & Weiss, 1987) and greater compliance with prescribed regimens among ESRD clients (Becker & Maiman, 1980; Hartman & Becker, 1978).

   The employment status of subjects in both groups was comparable, with 5 subjects (30%) currently working and approximately half retired. The subjects’
employment status could indirectly influence their attitudes or intentions, since most ESRD clients find their employment status increases their self-esteem, contributes to a more positive attitude, and generally enhances the quality of life (Rasgon et al., 1993). Churchill (1995, p. 835) states that “ESRD clients who are employed or do housework either full or part time are more compliant than those who are not.” Years of formal education were also similar with the subjects in both groups. An external HLC orientation was significantly related to sex (female) and lower education (p = .05) in a group of ESRD chronic hemodialysis patients (Blackburn, 1977).

Living with kidney failure was nothing new to 44% control and 53% treatment subjects. These subjects would have had the opportunity to receive information over time from multiple health care providers. Conversely, living with kidney disease was new to 37.5% control and 29% treatment clients who had been diagnosed with their kidney disease for less than one year. These clients may experience more apprehension and anxiety as they are learning to cope with a new condition.

Living with another chronic health condition, such as diabetes, or having a family member with a chronic health condition would familiarize the client to living with dietary restrictions and alterations in lifestyle. This could affect their HLC, attitudes, subjective norm and behavioural intentions. For both groups, 7 individuals had been diagnosed with diabetes at one time. Five control subjects (31%) and 6 treatment subjects (35%) were currently diabetic. In the control group, 6 subjects (37.5%) had a family member living with diabetes or kidney failure and 6 subjects (35%) in the treatment group did.

Clients with kidney disease can obtain information from a variety of sources. The demographic data revealed that more subjects’ in the treatment group (35% versus 19%
of control group) had received information about their condition from their family physician. Considering that most people have a trusting relationship with their family physician, their family physician may have influenced their decision to attend the predialysis class. On the other hand, since more control group subjects identified receiving information from the Kidney Foundation (69% versus 35% treatment group subjects) they may have perceived this as sufficient information to meet their learning needs and decided against attending the predialysis class.

Both group’s subjects demonstrated equally high internal and powerful others HLC scores. A combination of a high internal and powerful others HLC has also been reported in other studies evaluating the HLC of clients living with chronic health conditions (Wallston & Wallston, 1980) and specifically ESRD clients (Ulrich, 1981). This reflects a realistic view of their life situation, since ESRD is a chronic life-threatening condition in which personal control over a number of significant life dimensions is severely limited (Devins et al, 1982). These people believe that they have some control over their condition by being compliant with therapeutic regimes and making healthy lifestyle changes, but at the same time they recognize their dependence on the nephrology health care team and in some cases dialysis treatments to maintain their health. The control group scored a slightly higher chance HLC (mean of 17 versus 14 for the treatment group). A chance HLC has been associated with perceived helplessness, since it reflects the perception of absence of control and predictability (Bremer, 1995). This may have affected their decision to not attend the predialysis class. Several studies have identified a negative correlation between age and powerful others HLC subscale scores (Brown & Fitzpatrick, 1988; Schneider, 1992). Even though the
treatment group subjects were slightly older than the control group, this did not apply in this study.

The treatment group produced slightly higher state-anxiety and trait-anxiety scores, although still within the “normal” range. This may be related to their attending the predialysis class.

In summary, the treatment and control groups appeared to be basically similar. The treatment group demonstrated a larger improvement in their knowledge scores and intention, attitudes, and subjective norm toward following a low-salt diet. The lack of statistical significance may be attributed to the small sample size of the study. The clinical significance of the study results needs to also be considered when evaluating the effectiveness of health education programs. The results of this study provide useful information to consider when developing educational programs for clients with ESRD.

**Implications for Practice**

This study demonstrates that the predialysis class did improve the subjects’ knowledge regarding their condition and its treatment, but not to the extent the class presenters and this researcher predicted it would. Therefore the predialysis class as it was presented did not demonstrate the anticipated effect. These results could motivate the teaching group to reevaluate the class and implement changes that may produce more significant results. Possible changes to the predialysis class are reviewed under Recommendations. The class also improved the treatment group’s intentions, attitudes, and subjective norms towards following a low-salt diet, but not towards taking their medications as prescribed. This could prompt further investigation into the attitudes
and beliefs of ESRD clients towards taking medications and direct teaching strategies
towards resolving client misconceptions or assisting them to problem solve issues around
these negative beliefs. A preclass assessment of the clients' beliefs and attitudes towards
their condition and compliant behaviours could provide the educator with information
that could help direct learning objectives and teaching strategies. "To do a good job of
educating clients' about their health, we need to have an understanding of their attitudes,
since behaviour is directly related to knowledge and attitudes" (Dignan, 1986, p. 10).

Implications for Theory

The study results only partially supported the TRA as the study subjects’
intentions were determined by their subjective norms only with their pretest. There was
no correlation between their attitudes and behavioural intentions.

Implications for Further Research

To adequately evaluate the effectiveness of the predialysis class, this study should
be repeated, using a larger study sample. The long-term effects of the class could be
determined with a long-term follow-up.

The ability of the ESRD client to understand and retain information should be
evaluated to determine the need for reinforcement of information. Ley (1973) reports that
studies have shown that patients forget about half of the instruction they have received
after 5 minutes, and remember best the information presented in the first third of the
education session (cited in Becker & Maiman, 1980). Retention of information is even
more difficult for 22-27% of ESRD clients who experience confusion, impaired memory,
inability to concentrate, and decreased alertness due to the excessive fluid and uremic toxins in their blood (Martin-Lester, 1992). This can affect their ability to concentrate and achieve desired educational goals. The client’s inability to comprehend or remember information will also lead to deviations from their prescribed diet or therapeutic regimes, which may lead to increased complications and morbidity.

**Recommendations**

The anticipated effect of the predialysis class may have been attained with an alternative approach to client education. First of all, I would recommend adopting a more patient-centered approach to client education that places an emphasis on client self-empowerment and active participation. This differs from the more traditional “medico-centered” preventative approach to patient education, which focuses on client compliance (Tones, Tilford & Robinson, 1990, p. 120). Traditionally, “patients” are treated as passive participants receiving health information that is determined by the health care professionals. A client-centered approach facilitates client empowerment to take responsibility for managing and enhancing their condition by participating in their care. This is done in a collaborative relationship between the service providers and clients. The client and the educator jointly determine the educational objectives and teaching strategies. As Carl Rogers (1969) claims, “any student must become involved in the teaching-learning situation in order to benefit from the material presented” (cited in Tones et al., 1990, p. 122). The patient-centered approach could be used to assist clients in developing self-management behaviours and effective problem solving. To self-manage their health, these clients need to acquire knowledge relevant to their condition.
and its treatment, and more importantly, they need to be able to integrate the illness-related knowledge into their daily lives. This could be done through behavioural contracting and with a problem-solving orientation in the integration of illness-related knowledge into daily practices. Clients should be assisted to develop self-management skills by learning how to actively monitor their condition (i.e., using dietary diary, monitoring their blood pressure and weight changes) and practising effective problem solving (i.e., making appropriate choices of foods to eat, maintaining adequate sleep, or managing fatigue with energy conservation technique). For example, to follow a low-salt diet, the client not only needs to know what types of foods to avoid, but also how to correctly apply this knowledge when buying or preparing foods and knowing which foods to choose when eating out at a restaurant. According to Bloom’s (1956) Taxonomy on Educational Objectives, this requires higher levels of thought process since it involves applying the learned facts, an analysis and evaluation of the importance of dietary restrictions, and the problem impact of consuming each of the possible food choices (Wilson, 1995). The behavioural self-management approach to client education has promise in producing positive outcomes. Although it has been implemented for clients with a variety of chronic illnesses, it remains to be applied to ESRD clients (Devins & Binik, 1996).

Ideally, the client education should be individualized, since specific and individualized instructions are associated with better compliance (Becker & Maiman, 1980). This is difficult at times due to personnel and budget constraints; therefore the educational program should at least be flexible enough to accommodate the individual client needs. Client learning needs can be assessed via client interview. Measurable
learning outcomes should be established for each identified learning need. Group
teaching sessions could be provided to address common identified learning needs.

A client-centered approach would also support the use of peer educators. “Peer
educators are persons who currently or formerly have experienced the illness or condition
and have been recruited to assist in educational activities” (Bartlett, 1988, p. 52). Peers
would be a valuable resource, providing practical information, problem-solving
suggestions, and support for the new ESRD client. The use of peer support in teaching
ESRD clients has demonstrated positive effects. A study conducted by Friend,
Singletary, Mendell and Nurse (1986) discovered that hemodialysis clients who
participated in an innovative peer support group that taught new coping skills through
discussion and social activities demonstrated significant survival advantages (cited in
Devins & Binik, 1996). A component of peer support was included in the predialysis
class offered at St. Joseph’s Hospital with the “patient panel”. The patient panel
consisted of a small group of ESRD clients who shared some of their experiences and
insights with the clients attending the class. A significant group of ESRD clients
appeared to value the support from their peers. It was my observation that study subjects
attending the predialysis class listened attentively and asked questions during this session.
Also, The Kidney Foundation of Ontario reported good attendance (approximately 40
people) at the monthly peer support meetings they host for ESRD clients in Hamilton
(personal communication with Brenda Szabo, President of Hamilton Kidney Foundation
Chapter, April 20, 1997).

To be effective, an educational program needs to be sensitive to the client’s
condition, learning needs, and learning styles. Therefore, a complete client assessment
should be done to determine their readiness to learn since ESRD is frequently associated with physical distress, fatigue, and overall poor health, which can affect their cognition. The client’s cognitive functioning (i.e., orientation, memory, attention span, clarity of ideas, abstract thought, and judgment) should be determined as early as possible and periodically throughout the educational process to set realistic learning goals and plan appropriate educational strategies.

The educator should always assume that cognitive impairment is present with ESRD clients since studies have shown that many clients may experience poor short-term memory without any overt signs of cognitive impairment (Martin-Lester, 1997). To help meet this challenge, Martin-Lester suggests using the following strategies for educating ESRD clients: a limited number of objectives to no more than four of the most important items per each educational session, involve a family member or significant others, repeat all information, and evaluate the success of learning (i.e., via role playing). For these uremic clients, education sessions need to be short (i.e., 1 - 2 hours) and include frequent reinforcement and supplementary teaching strategies that assist in information processing. Each group educational session should be offered at various times of the day (i.e., some day and evening sessions) and topics need to be repeated (i.e., four times in a month) to give clients opportunity to attend. Since ESRD is frequently associated with feelings of physical distress, fatigue, and overall poor health, sessions that are offered repeatedly will provide the client an opportunity to attend a session when they feel well enough to do so. Clients should receive information during the early stages of ESRD to provide the best opportunity for client comprehension, understanding, and decision making (Pfettscher, 1995). Unfortunately, “only 20 -25% of clients with progressive renal failure are referred
to a renal physician before the initiation of dialysis is imminent” (Devins & Binik, 1996, p.51).

The educator needs to be aware of other factors that could affect their client’s learning such as their available social support, previous learning experiences, previous information, possible misconceptions, past and current coping patterns, HLC, and motivation to learn. Determining the client’s attitudes and beliefs about desired health behaviours and their perceptions of past adherence to their recommended regimes could reveal significant perceptions and misconceptions they hold. Group discussions could be arranged to encourage the sharing of information to address these perceptions and fundamental issues (i.e., death and dying, fear of the dialysis machine, lifestyle changes, difficulty with fluid, or diet management) with participants sharing their concerns, problems, and successes with other group members.

An assessment of the client’s HLC could be used to direct appropriate teaching strategies. Since feelings of helplessness have been strongly associated with external LOC, (Wallston, Stein & Smith, 1994), teaching should be directed toward facilitating client autonomy. For clients with an internal HLC, their need to seek information and be in control could be met by providing them with a wide variety of information resources and detailed explanations of their therapeutic regimes. Through behavioural modification techniques, such as keeping a diet diary, recording their blood pressure, weight gain, and laboratory values, could be used to help internally oriented clients obtain control of their condition in order that they could monitor their own behaviour. The educator would provide support and feedback to assist them in identifying and maintaining behaviours that promote their health. Externally oriented clients may have difficulty assuming
responsibility for their care and would initially require more direction. Teaching
strategies for this group would focus on their developing a more internal orientation to
their health. This could be done by methods such as contingency contracting. With a
contingency contract, the client and health care provider establish mutually agreed upon
goals, including the specific obligations of each party in attempting to achieve that goal,
and a time limit for its achievement (Becker & Maiman, 1980, p. 123). If the client has a
"powerful others HLC" and a strong subjective norm influence, their family members or
significant others should be included in their educational program.

Predialysis education is a valuable component of predialysis care that the ESRD
clients receive. Its positive effects have been demonstrated in several studies. Predialysis
education that promotes collaboration between the client and health care providers can
help to slow down the progression of renal failure, postpone the need for dialysis,
minimize health care expenditures, and maximize the client’s quality of life, such as:
potential to delay the need for dialysis, potential for client employment retention,
promoting client choice in their dialysis modality, decreased cost of dialysis treatment
initiation and decreased hospitalization time at the initiation of dialysis. There is
increasing evidence that behavioural interventions that combine client education with
psychosocial support and the acquisition of specific coping skills can exert a powerful
beneficial effect on the morbidity and mortality in ESRD (Devins & Binik, 1996).
Through education, health care providers can assist ESRD clients to attain knowledge and
understanding about their condition, to develop positive attitudes, and develop self-
management skills to adhere to their therapeutic regimes and maintain optimal health.
The ultimate goal of health education is to assist them to live as well as possible in the context of their personal situation and values.

To do a good job at educating clients about their health, we need to have an understanding of their attitudes, as people’s behaviours are directly related to their knowledge and attitudes (Dignan, 1986). This study examined the effect of a predialysis class on ESRD clients’ knowledge and attitudes towards compliant health behaviours in an attempt to appreciate the relationship between these variables and provide information to direct effective client education. As providers of health education, we need to evaluate the education services we provide and revise our goals, strategies and methods as needed to ensure that we effectively contribute to clients’ health care needs.
References


Appendix A
Numbers of ESRD Patients in Canada

All Patients by Type of Treatment, Canada, 1981-1994

Source: Canadian Organ Replacement Register Annual Report, 1996
Appendix B

Survival of ESRD Patients

Patient Survival of ESRD Patients by Diabetic Status,
All Treatments, to December 1994

Source: Canadian Organ Replacement Register Annual Report, 1996
March 21, 1997

Ms. Darlene Saratsiotis, Educator
Intensive Care Unit
St. Joseph’s Hospital

Dear Ms. Saratsiotis:

RE: R.P. #97-1457: EFFECTIVENESS OF THE PRE-DIALYSIS CLASS ON CLIENT: A) KNOWLEDGE, B) HEALTH LOCUS OF CONTROL AND C) ANXIETY

This project was reviewed by the Research Committee at its meeting of February 17, 1997 and approved with some conditions.

Those conditions have now been met and you have full approval to begin the project.

Sincerely yours,

Michael D. Coughlin, Ph.D.
Secretary, Research Committee

MDC:ag
Appendix D
Participant Data Form

1. Gender: male ☐ female ☐

2. Age: ______

3. Marital status: ☐ ☐ ☐ ☐
   single married/common law separated/divorced widow/widowed

4. Employment status: ☐ ☐ ☐ ☐
   work full time work part time unemployed retired

5. Years of formal education: ☐ ☐ ☐ ☐
   none 1-8 years 8-12 years college/university

6. Years diagnosed with kidney failure:
   ☐ ☐ ☐ ☐ ☐
   less than one 1 year 2 years 3 years more than 3 years

7. Currently on dialysis? ☐ ☐ ☐
   no yes, on peritoneal yes, on hemodialysis

8. Have you ever been diagnosed with a diabetic condition? ☐ ☐
   no yes

9. Do you currently have diabetes? ☐ ☐ ☐
   no yes, insulin dependent yes, non insulin

10. Does anyone in your immediate family have diabetes or kidney failure?
    ☐ ☐
    no yes

11. I have received information about my kidney disease and treatment from:
    ☐ ☐ ☐ ☐
    family doctor kidney doctor kidney nurse kidney foundation
    ☐ ☐
    self (ie. books, internet) other people with kidney disease
Appendix E
Kidney Disease Questionnaire

Please circle the answer to the questions listed:

1. People normally have two kidneys in their body.
   a) true
   b) false
   c) don't know

2. When a person has kidney diseases, his kidneys must be removed from his body before he can get treatment with a dialysis machine.
   a) true
   b) false
   c) don't know

3. Kidneys do many important things in the body, but they function only at night while the person is sleeping.
   a) true
   b) false
   c) don't know

4. What is the term used to describe the vibration or buzzing sensation that can be felt over the vein of a shunt or fistula?
   a) hypoplasia
   b) lobulation
   c) enervation
   d) thrill or bruit
   e) don't know

5. In CAPD, (continuous ambulatory peritoneal dialysis) waste substances pass from the blood, across the peritoneal membrane and into the dialysate fluid by a process called:
   a) diffusion
   b) transport
   c) excretion
   d) chemical breakdown
   e) don't know
6. In addition to removing wastes from the blood, the artificial kidney also functions to remove excess water from the blood. This water-removal process called:
   a) ultra-filtration
   b) ultra-refraction
   c) osmosis
   d) catharsis
   e) don't know

7. A patient with kidney disease can experience high blood pressure, swelling and rapid weight gain when his body becomes overloaded with:
   a) protein
   b) urea
   c) water
   d) don't know

8. Which one of these foods has a lot of potassium?
   a) rice
   b) ice cream
   c) bananas
   d) don't know

9. Approximately how many times a week do hemodialysis patients usually have their sessions on the kidney dialysis machine?
   a) once a week
   b) three times a week
   c) six times a week
   d) don't know

10. CAPD is a form of dialysis treatment which is used as an alternative to hemodialysis. One advantage of CAPD is that:
    a) it allows the patient to walk about freely during the treatment
    b) it only needs to be performed once a week
    c) it does not involve any surgical procedure preparation
    d) don't know

11. Patients with chronic kidney disease are advised to eat limited amounts of potassium rich foods. A high blood potassium level is dangerous because:
    a) it can cause fluid overload
    b) it can raise the patient's hematocrit
    c) it can decrease the making of white blood cells
    d) it can cause the heart to beat irregularly and even stop
    e) don't know

Devins et al., (1990)
### Appendix F

**Health Locus of Control Questionnaire**

Choose the score that best reflects your belief about each statement:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Moderately Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Moderately Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. If my kidney failure worsens, it is my own behaviour which determines how soon I will feel better again.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2. As to my kidney failure, what will be, will be.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3. If I see my doctor regularly, I am less likely to have problems with my kidney failure.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4. Most things that affect my kidney failure happens to me by chance.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5. Whenever my kidney failure worsens, I should consult a medically trained professional.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6. I am directly responsible for my kidney failure getting better or worse.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7. Other people play a big role whether my kidney failure improves, stays the same or gets worse.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8. Whatever goes wrong with my kidney failure is my own fault.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>9. Luck plays a big part in determining how my condition improves.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
# Choose the score that best reflects your belief about each statement:

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10. In order for my kidney failure to improve, it is up to other people to see that the right things happen.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. Whatever improvement occurs with my kidney failure is largely a matter of good fortune.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. The main thing that affects my kidney failure is what I myself do.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. I deserve the credit when my kidney failure improves and the blame when it gets worse.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. Following the doctor's orders to the letter is the best way to keep my kidney failure from getting worse.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. If my kidney failure worsens, it's a matter of fate.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. If I am lucky, my kidney failure will get better.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. If my kidney failure takes a turn for the worse, it is because I have not been taking proper care of myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. The type of help I receive from other people determines how soon my kidney failure improves.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Appendix G
The State – Trait Anxiety Questionnaire

**DIRECTIONS:** A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel right now, that is, at this moment.

There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel calm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I feel secure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I am tense</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I am regretful</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5. I feel at ease</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I feel upset</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I am presently worrying over possible misfortunes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I feel rested</td>
<td></td>
<td></td>
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<tr>
<td>9. I feel anxious</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. I feel comfortable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I feel self-confident</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. I feel nervous</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>13. I am jittery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. I feel &quot;high strung&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. I am relaxed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. I feel content</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. I am worried</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. I feel over-excited and &quot; rattled&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. I feel joyful</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. I feel pleasant</td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>
DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you generally feel.

There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I feel pleasant</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>I tire quickly</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>I feel like crying</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>I wish I could be as happy as others seem to be</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>I am losing out on things because I can't make up my mind soon enough</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>I feel rested</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>I am &quot;calm, cool, and collected&quot;</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>I feel that difficulties are piling up so that I cannot overcome them</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>I worry too much over something that really doesn't matter</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>I am happy</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>I am inclined to take things hard</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>I lack self-confidence</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>I feel secure</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>I try to avoid facing a crisis or difficulty</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>I feel blue</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>I am content</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Some unimportant thought runs through my mind and bothers me</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>I take disappointments so keenly that I can't put them out of my mind</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>I am a steady person</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>I get in a state of tension or turmoil as I think over my recent concerns and interests</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Speilberger, Gorsuch, & Luschene, 1970.
Appendix H
Theory of Reasoned Action Questionnaire

Please answer the following statements about low salt diets. (there is no correct answer)

1. At the present time, I intend to follow a low salt diet most of the time.
   likely  Quite  Slightly  Neither  Slightly  Quite  Extremely unlikely

2. Following a low salt diet is:
   a) good  Quite  Slightly  Neither  Slightly  Quite  Extremely bad
   b) wise  Quite  Slightly  Neither  Slightly  Quite  Extremely unwise
   c) beneficial  Quite  Slightly  Neither  Slightly  Quite  Extremely harmful

3. My following a low salt diet:
   a) will help to lower or regulate my blood pressure
      likely  Quite  Slightly  Neither  Slightly  Quite  Extremely unlikely
   b) helps to prevent fluid build up in my body
      likely  Quite  Slightly  Neither  Slightly  Quite  Extremely unlikely
   c) will mean I have to eat bland tasting food
      likely  Quite  Slightly  Neither  Slightly  Quite  Extremely unlikely
   d) will be difficult to follow if I am eating at a restaurant or buying prepared foods
      likely  Quite  Slightly  Neither  Slightly  Quite  Extremely unlikely

Turn Over ➞
4. a) Following a low salt diet that can help to regulate blood pressure is:

necessary □ □ □ □ □ □ □ unnecessary

b) Following a low salt diet to regulate body fluid build up and which may improve kidney and heart function is:

good □ □ □ □ □ □ □ bad

c) Low salt foods taste bland:

agree □ □ □ □ □ □ □ disagree

d) Having a kidney condition can make eating in restaurants difficult:

agree □ □ □ □ □ □ □ disagree

e) Having a kidney condition can make buying prepared (prepackaged) foods difficult:

agree □ □ □ □ □ □ □ disagree

5. Most people who are important to me think I should follow a low salt diet.

agree □ □ □ □ □ □ □ disagree
6. I think that following a low salt diet is something that:
   a) my close friends think I should do
      agree □ □ □ □ □ □ □ disagree  
         Extremely        Quite       Slightly    Neither    Slightly    Quite       Extremely

   b) members of my family think I should do
      agree □ □ □ □ □ □ □ disagree  
         Extremely        Quite       Slightly    Neither    Slightly    Quite       Extremely

   c) my doctor thinks I should do
      agree □ □ □ □ □ □ □ disagree  
         Extremely        Quite       Slightly    Neither    Slightly    Quite       Extremely

7. Generally speaking, I tend to do what:
   a) my close friends think I should do
      agree □ □ □ □ □ □ □ disagree  
         Extremely        Quite       Slightly    Neither    Slightly    Quite       Extremely

   b) members of my family think I should do
      agree □ □ □ □ □ □ □ disagree  
         Extremely        Quite       Slightly    Neither    Slightly    Quite       Extremely

   c) my doctor thinks I should do
      agree □ □ □ □ □ □ □ disagree  
         Extremely        Quite       Slightly    Neither    Slightly    Quite       Extremely
Please answer the following statements about taking medications. (There is no correct answer)

1. At the present time, I intend to take my prescribed medications as ordered:
   - likely ___________  ________  ________  ________  ________
   - quite                      slightly               neither               slightly    extremely
   - unlikely

2. Taking prescribed medications as ordered is:
   a) good ___________  ________  ________  ________  ________  bad
   - quite                      slightly               neither               slightly    extremely
   b) wise ___________  ________  ________  ________  ________
   - quite                      slightly               neither               slightly    extremely
   c) beneficial ___________  ________  ________  ________  ________  harmful
   - quite                      slightly               neither               slightly    extremely

3. a) Taking prescribed medications as ordered can help one feel better:
   - agree ___________  ________  ________  ________  ________  disagree
   - quite                      slightly               neither               slightly    extremely

   b) Prescribed medications can help regulate blood pressure or regulate phosphates
      (depending on the medication):
   - agree ___________  ________  ________  ________  ________  disagree
   - quite                      slightly               neither               slightly    extremely

   c) Taking prescribed medications can upset one’s stomach:
   - agree ___________  ________  ________  ________  ________  disagree
   - quite                      slightly               neither               slightly    extremely

   d) People tend to forget to take prescribed medications as ordered:
   - agree ___________  ________  ________  ________  ________  disagree
   - quite                      slightly               neither               slightly    extremely
4. Taking prescribed medication:
   a) will help to lower or regulate my blood pressure or phosphates
      likely □ □ □ □ □ □ unlikely
      Extremely    Quite    Slightly    Neither    Slightly    Quite    Extremely

   b) makes me feel better
      likely □ □ □ □ □ □ unlikely
      Extremely    Quite    Slightly    Neither    Slightly    Quite    Extremely

   c) upsets my stomach
      agree □ □ □ □ □ □ disagree
      Extremely    Quite    Slightly    Neither    Slightly    Quite    Extremely

   d) are difficult to remember to take as ordered
      agree □ □ □ □ □ □ disagree
      Extremely    Quite    Slightly    Neither    Slightly    Quite    Extremely

5. Most people who are important to me think I should take my medications as ordered:
   agree □ □ □ □ □ □ disagree
   Extremely    Quite    Slightly    Neither    Slightly    Quite    Extremely
6. I think that taking my medications as ordered is something that:
   a) my close friends think I should do
      agree □ □ □ □ □ □ □ disagree
         Extremely    Quite    Slightly   Neither   Slightly    Quite    Extremely

   b) members of my family think I should do
      agree □ □ □ □ □ □ □ disagree
         Extremely    Quite    Slightly   Neither   Slightly    Quite    Extremely

   c) my doctor thinks I should do
      agree □ □ □ □ □ □ □ disagree
         Extremely    Quite    Slightly   Neither   Slightly    Quite    Extremely

7. Generally speaking, I tend to do what:
   a) my close friends think I should do
      agree □ □ □ □ □ □ □ disagree
         Extremely    Quite    Slightly   Neither   Slightly    Quite    Extremely

   b) members of my family think I should do
      agree □ □ □ □ □ □ □ disagree
         Extremely    Quite    Slightly   Neither   Slightly    Quite    Extremely

   c) my doctor thinks I should do
      agree □ □ □ □ □ □ □ disagree
         Extremely    Quite    Slightly   Neither   Slightly    Quite    Extremely
Appendix I
Predialysis Class Outline- PCN component

PREDIALYSIS EDUCATION

1. WHAT IS KIDNEY FAILURE?

2. WHAT DO YOUR KIDNEYS DO?

3. WHAT HAPPENS WHEN YOUR KIDNEYS FAIL?

4. WHAT IS DIALYSIS?

5. WHAT ARE THE TWO TYPES OF DIALYSIS?

6. PERITONEAL DIALYSIS:
   HOW DOES IT WORK?
   ACCESS: TUBE / IRRIGATION / IPD
   ADVANTAGES
   -DISADVANTAGES

7. HEMODIALYSIS:
   HOW DOES IT WORK?
   ACCESS: FISTULA / GRAFT / SUBCLAVIAN
   TYPES: CENTRE / HOME / SELF-CARE
   ADVANTAGES
   DISADVANTAGES

8. TRANSPLANT:
   WHAT IS A KIDNEY TRANSPLANT?
   AM I A TRANSPLANT CANDIDATE?
   WHERE CAN I GET A KIDNEY TRANSPLANT?

9. CLOSING
Appendix J
Predialysis Class - Nutrition Session

All patients approaching dialysis will be assessed and instructed by a dietitian, or referral. Diets will be individualized in a one-on-one session which may precede or follow the group session.

The group session will provide general information on nutritional issues related to declining kidney function and approaching dialysis. It will help reinforce information for patients who have received individualized instructions as well as provide a forum for discussion.

The session consists of:

1) Slide - tape presentation 'Nutrition and the Kidney' developed at St. Joseph’s Hospital, Hamilton.

2) Presentation and Discussion.

Display: Food Products and Posters.

Handout package.

Presentation and discussion will focus on:

- **Protein**
  - Requirements Pre-dialysis.
  - Increased requirements on dialysis.
  - Individualized requirements.
  - Food sources.
  - Albumin.

- **Sodium**
  - Effect of declining kidney function.
  - Normal function.
  - Complications from excess or lack of.
  - Food sources.
  - Normal lab values.
  - Phosphate binders, K exchange resins.

- **Potassium**
- **Phosphorus**

- **Energy**
  - Height/weight tables, frame size.
  - Requirements. Maintain/gain/lose weight.
  - Food sources.

- **Diabetes**
  - Alteration in insulin requirements.
  - Safe food choices for hypoglycemic reactions.

- **Fluids**
  - Sources.
Presentation and Discussion (cont'd)

- Nutrition Supplements
- Vitamin Supplements
- Food Models  Portion sizes.
- Eating Out
- Cookbooks

The dietitian will function as a guide and a resource person to facilitate new learning and clarify misconceptions about diet.
Appendix K
Study Participant Consent

BROCK UNIVERSITY- DEPARTMENT OF GRADUATE STUDIES IN EDUCATION
ST. JOSEPH'S HOSPITAL

INFORMED CONSENT FORM

THE EFFECTS OF A PRE-DIALYSIS CLASS ON CLIENT KNOWLEDGE AND ATTITUDE TOWARD COMPLIANT BEHAVIOURS

Researcher: Darlene Saratsiotis, RN, BScN, MEd (candidate) phone: 522-1155 ext. 3045
Research Advisor: Dr. Richard Bond, (905) 689 - 3024

Name of Participant: ____________________________

I understand that this study in which I have agreed to participate will involves the evaluation of the effectiveness of the pre-dialysis class offered in the Nephrology program at St. Joseph's hospital. In signing the form, I am aware of the following:

* There are two groups being studied: one group will attend a class about kidney disease and its treatment and get information from members of the health care team and the other group will get information about kidney disease and its treatment only from members of the health care team.

* I will fill out four (4) small questionnaires, twice about 2 months apart.

* My score is not important to my treatment or management. It is only for the purpose of the evaluation of the teaching sessions.

* All information is confidential, or secret. It will not be shared with my doctor, my nurse or my family. The forms I fill out will only have a number on them, not my name.

* I may choose to stop filling out forms and quit the project at any time and this will not alter my treatment plans.

I agree to participate in the project.

Signature of Participant ____________________________ Date __________

Signature of Research Advisor ____________________________

Signature of Researcher ____________________________ Date __________
Appendix L  
Post-test Participant Data  

POST TEST DATA    #____
date:__________

Since ______ of this year, have you: (if yes, check box)

- started dialysis ☐
- have been trained for self care dialysis or peritoneal dialysis ☐
- seen the dietitian ☐
- obtained information about kidney disease and it's treatment ☐
## Table of Summary of Demographic Data

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Control Group (n=16)</th>
<th>Treatment Group (n=17)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td><strong>Age</strong></td>
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<td>16</td>
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<tr>
<td><strong>Gender</strong></td>
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<tr>
<td>male</td>
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<td>female</td>
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<td><strong>Marital Status</strong></td>
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<td>divorced/separated</td>
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<td>widow/widowed</td>
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<td>12</td>
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<td>8 - 12 years</td>
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<td>62.5</td>
</tr>
<tr>
<td>college/university</td>
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<td>37.5</td>
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<tr>
<td><strong>Years Since Diagnosis</strong></td>
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<td></td>
</tr>
<tr>
<td>less than one year</td>
<td>6</td>
<td>37.5</td>
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<td>2 years</td>
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<td>12.5</td>
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<td>3 or more</td>
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<td>44</td>
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<td><strong>Currently on Dialysis</strong></td>
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<td>37.5</td>
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<tr>
<td><strong>Ever Diabetic</strong></td>
<td>7</td>
<td>44</td>
</tr>
<tr>
<td><strong>Currently diabetic</strong></td>
<td>5</td>
<td>31</td>
</tr>
<tr>
<td><strong>Family with diabetes or kidney disease</strong></td>
<td>6</td>
<td>37.5</td>
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### Appendix N

**Table of Health Locus of Control Subscale Score Distribution**

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<th>Internal HLC score</th>
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<td>7</td>
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<tr>
<td>Score of 20 – 29</td>
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<td>6</td>
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<td>Score of 30 – 36</td>
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<td>3</td>
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<td>Score of 5 – 14</td>
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<td>7</td>
</tr>
<tr>
<td>Score of 15 – 24</td>
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<td>8</td>
</tr>
<tr>
<td>Score of 25 – 30</td>
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</table>

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<th>Treatment group (n = 17)</th>
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</thead>
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<td>Score of 16 – 22</td>
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<td>3</td>
</tr>
<tr>
<td>Score of 23 – 29</td>
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<td>6</td>
</tr>
<tr>
<td>Score of 30 – 34</td>
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<td>7</td>
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</table>

<table>
<thead>
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<th>Treatment group (n = 17)</th>
</tr>
</thead>
<tbody>
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<td>Score of 11 – 14</td>
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<td>5</td>
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<tr>
<td>Score of 15 - 18</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other people – Powerful other HLC Score</th>
<th>Control group (n = 16)</th>
<th>Treatment group (n = 17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score of 3 – 9</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Score of 10 - 16</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>
### Appendix O

**Table of State - Trait Anxiety Score Distribution**

<table>
<thead>
<tr>
<th>State Anxiety results</th>
<th>Control (n = 16)</th>
<th>Treatment (n = 17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>score of 20 – 34</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>score of 35 – 49</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>score of 50 – 65</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trait Anxiety results</th>
<th>Control (n = 16)</th>
<th>Treatment (n = 17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>score of 20 – 34</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>score of 35 – 49</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>score of 50 – 65</td>
<td>1</td>
<td>5</td>
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</tbody>
</table>
Appendix P

Table of Knowledge Test Scores –Correct Responses per Question

<table>
<thead>
<tr>
<th>Question</th>
<th>Control Group Responses</th>
<th>Treatment Group Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest ($n = 14$)</td>
<td>Posttest ($n = 15$)</td>
</tr>
<tr>
<td></td>
<td>% ($n$)</td>
<td>% ($n$)</td>
</tr>
<tr>
<td>Question 1</td>
<td>100 (14)</td>
<td>100 (15)</td>
</tr>
<tr>
<td>Question 2</td>
<td>100 (14)</td>
<td>100 (15)</td>
</tr>
<tr>
<td>Question 3</td>
<td>100 (14)</td>
<td>100 (15)</td>
</tr>
<tr>
<td>Question 4</td>
<td>57 (8)</td>
<td>73 (11)</td>
</tr>
<tr>
<td>Question 5</td>
<td>50 (7)</td>
<td>67 (10)</td>
</tr>
<tr>
<td>Question 6</td>
<td>36 (5)</td>
<td>33 (5)</td>
</tr>
<tr>
<td>Question 7</td>
<td>86 (12)</td>
<td>73 (11)</td>
</tr>
<tr>
<td>Question 8</td>
<td>93 (13)</td>
<td>93 (14)</td>
</tr>
<tr>
<td>Question 9</td>
<td>93 (13)</td>
<td>100 (15)</td>
</tr>
<tr>
<td>Question 10</td>
<td>50 (7)</td>
<td>80 (12)</td>
</tr>
<tr>
<td>Question 11</td>
<td>71 (10)</td>
<td>74 (11)</td>
</tr>
</tbody>
</table>
## Appendix Q

### Table of Pretest and Posttest Behavioural Intention Scores

1. **Intention to follow a low salt diet:**

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>2.375 (79)</td>
<td>1.02</td>
<td>2.31 (77)</td>
<td>.478</td>
<td>0.0625 (-2)</td>
<td>0.928</td>
</tr>
<tr>
<td>Treatment</td>
<td>1.588 (53)</td>
<td>1.97</td>
<td>2.41 (80)</td>
<td>1.06</td>
<td>-0.823 (+27)</td>
<td>1.70</td>
</tr>
<tr>
<td>Unequal p (difference between groups)</td>
<td>0.159</td>
<td></td>
<td>0.730</td>
<td></td>
<td>0.073</td>
<td></td>
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</table>

2. **Intention to take medications as prescribed**

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>3.00 (100)</td>
<td>0.00</td>
<td>2.81 (94)</td>
<td>0.40</td>
<td>0.187 (-6)</td>
<td>0.403</td>
</tr>
<tr>
<td>Treatment</td>
<td>2.94 (97)</td>
<td>2.42</td>
<td>2.88 (96)</td>
<td>0.33</td>
<td>0.058 (-1)</td>
<td>0.428</td>
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<tr>
<td>Unequal p (difference between groups)</td>
<td>0.33</td>
<td></td>
<td>0.592</td>
<td></td>
<td>0.381</td>
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Appendix R

Table of Attitude Scores for Following a Low-salt Diet

1. General belief about following low salt diet

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>7.37 (82)</td>
<td>1.75</td>
<td>7.81 (87)</td>
<td>1.47</td>
<td>-0.44 (+3)</td>
<td>1.41</td>
</tr>
<tr>
<td>Treatment</td>
<td>7.06 (78)</td>
<td>3.44</td>
<td>8.47 (94)</td>
<td>1.01</td>
<td>-1.41 (+16)</td>
<td>3.54</td>
</tr>
<tr>
<td>Unequal p (difference between groups)</td>
<td>0.739</td>
<td>0.147</td>
<td>0.035</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Unequal: Q 0.739 0.147 0.035
difference between groups

2. Following a low salt diet will lower or regulate my blood pressure

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>5.75 (64)</td>
<td>2.79</td>
<td>5.62 (62)</td>
<td>3.05</td>
<td>0.125 (-2)</td>
<td>2.30</td>
</tr>
<tr>
<td>Treatment</td>
<td>5.65 (63)</td>
<td>2.60</td>
<td>7.53 (84)</td>
<td>1.91</td>
<td>-1.88 (+21)</td>
<td>2.82</td>
</tr>
<tr>
<td>Unequal p (difference between groups)</td>
<td>0.913</td>
<td>0.042</td>
<td>0.032</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Unequal: Q 0.913 0.042 0.032
difference between groups

3. Following a low salt diet will help prevent fluid build up in my body

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>6.87 (76)</td>
<td>3.91</td>
<td>6.56 (73)</td>
<td>3.42</td>
<td>0.312 (-3)</td>
<td>3.45</td>
</tr>
<tr>
<td>Treatment</td>
<td>6.29 (70)</td>
<td>2.42</td>
<td>7.47 (83)</td>
<td>1.74</td>
<td>-1.17 (+13)</td>
<td>2.72</td>
</tr>
<tr>
<td>Unequal p (difference between groups)</td>
<td>0.615</td>
<td>0.351</td>
<td>0.181</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Unequal: Q 0.615 0.351 0.181
difference between groups

4. Following a low salt diet will mean I have to eat bland tasting food

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>1.94 (21)</td>
<td>3.37</td>
<td>2.56 (28)</td>
<td>3.34</td>
<td>-0.625 (+7)</td>
<td>3.11</td>
</tr>
<tr>
<td>Treatment</td>
<td>3.41 (38)</td>
<td>3.16</td>
<td>-0.18 (-2)</td>
<td>3.71</td>
<td>3.58 (-40)</td>
<td>5.44</td>
</tr>
<tr>
<td>Unequal p (difference between groups)</td>
<td>0.206</td>
<td>0.03</td>
<td>0.01</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. Following a low salt diet can make eating in restaurants difficult

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>2.00 (22)</td>
<td>3.81</td>
<td>2.31 (26)</td>
<td>3.11</td>
<td>-0.31 (+4)</td>
<td>4.30</td>
</tr>
<tr>
<td>Treatment</td>
<td>3.12 (35)</td>
<td>3.90</td>
<td>1.82 (20)</td>
<td>3.74</td>
<td>1.29 (-15)</td>
<td>5.63</td>
</tr>
<tr>
<td>Unequal p</td>
<td>0.412</td>
<td>0.685</td>
<td></td>
<td></td>
<td>0.362</td>
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</tr>
</tbody>
</table>

6. Following a low salt diet can make buying prepared foods difficult

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>1.00 (11)</td>
<td>5.05</td>
<td>2.81 (31)</td>
<td>3.19</td>
<td>-1.81 (+20)</td>
<td>6.34</td>
</tr>
<tr>
<td>Treatment</td>
<td>3.18 (35)</td>
<td>4.53</td>
<td>3.23 (36)</td>
<td>3.60</td>
<td>-0.058 (+1)</td>
<td>5.27</td>
</tr>
<tr>
<td>Unequal p</td>
<td>0.20</td>
<td>0.722</td>
<td></td>
<td></td>
<td>0.396</td>
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</tbody>
</table>

7. Sum of attitudes: sum of all attitudes of following a low salt diet

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre test M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>17.56 (77)</td>
<td>10.39</td>
<td>19.87 (70)</td>
<td>11.90</td>
<td>-2.31 (-7)</td>
<td>12.14</td>
</tr>
<tr>
<td>Treatment</td>
<td>21.65 (65)</td>
<td>9.78</td>
<td>19.88 (83)</td>
<td>8.34</td>
<td>1.76 (+18)</td>
<td>12.83</td>
</tr>
<tr>
<td>Unequal p</td>
<td>0.25</td>
<td>0.99</td>
<td></td>
<td></td>
<td>0.35</td>
<td></td>
</tr>
</tbody>
</table>
Appendix S
Table of Attitude Scores for Taking Medications as Prescribed

1. General attitude toward taking medications as prescribed

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>8.00 (89)</td>
<td>1.93</td>
<td>8.37 (93)</td>
<td>1.15</td>
<td>-0.375 (+4)</td>
<td>2.22</td>
</tr>
<tr>
<td>Treatment</td>
<td>8.47 (94)</td>
<td>1.17</td>
<td>8.82 (98)</td>
<td>0.52</td>
<td>-0.352 (+4)</td>
<td>1.22</td>
</tr>
<tr>
<td>Unequal p (difference between groups)</td>
<td>0.40</td>
<td>0.16</td>
<td></td>
<td></td>
<td>0.972</td>
<td></td>
</tr>
</tbody>
</table>

2. Taking medications as prescribed will make me feel better.

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>6.00 (67)</td>
<td>2.63</td>
<td>5.50 (61)</td>
<td>3.03</td>
<td>0.500 (-5)</td>
<td>2.36</td>
</tr>
<tr>
<td>Treatment</td>
<td>6.05 (67)</td>
<td>3.01</td>
<td>5.47 (61)</td>
<td>3.06</td>
<td>0.588 (-5)</td>
<td>3.92</td>
</tr>
<tr>
<td>Unequal p (difference between groups)</td>
<td>0.95</td>
<td>0.98</td>
<td></td>
<td></td>
<td>0.941</td>
<td></td>
</tr>
</tbody>
</table>

3. Taking medications as prescribed can help regulate my BP or phosphate

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>7.25 (80)</td>
<td>1.91</td>
<td>1.31 (14.5)</td>
<td>3.32</td>
<td>0.562 (-65)</td>
<td>2.36</td>
</tr>
<tr>
<td>Treatment</td>
<td>6.65 (74)</td>
<td>3.35</td>
<td>6.23 (69)</td>
<td>2.25</td>
<td>0.411 (-5)</td>
<td>3.91</td>
</tr>
<tr>
<td>Unequal p (difference between groups)</td>
<td>0.52</td>
<td>0.60</td>
<td></td>
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<td>0.893</td>
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</tr>
</tbody>
</table>

4. Taking medications as prescribed can upset my stomach

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>1.94 (21)</td>
<td>3.41</td>
<td>1.31 (14)</td>
<td>3.32</td>
<td>0.625 (-7)</td>
<td>2.82</td>
</tr>
<tr>
<td>Treatment</td>
<td>1.12 (11)</td>
<td>5.15</td>
<td>1.17 (12)</td>
<td>3.59</td>
<td>-0.125 (+1)</td>
<td>5.73</td>
</tr>
<tr>
<td>Unequal p between groups difference)</td>
<td>0.603</td>
<td>0.91</td>
<td></td>
<td></td>
<td>0.756</td>
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</tr>
</tbody>
</table>
5. Taking medications as prescribed can be difficult to remember to take as ordered

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/- %)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>2.31 (26)</td>
<td>5.33</td>
<td>1.81 (20)</td>
<td>3.41</td>
<td>0.500 (-6)</td>
<td>5.71</td>
</tr>
<tr>
<td>Treatment</td>
<td>1.87 (21)</td>
<td>4.83</td>
<td>1.88 (21)</td>
<td>5.65</td>
<td>-0.375 (0)</td>
<td>4.55</td>
</tr>
<tr>
<td>Unequal p</td>
<td>0.76</td>
<td></td>
<td>0.96</td>
<td></td>
<td>0.735</td>
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</table>

6. Sum of Attitudes of taking medications as prescribed

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/- %)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>17.5 (77)</td>
<td>6.52</td>
<td>15.31 (60)</td>
<td>8.61</td>
<td>2.18 (-17)</td>
<td>-8.67</td>
</tr>
<tr>
<td>Treatment</td>
<td>16.5 (78)</td>
<td>9.51</td>
<td>14.76 (74)</td>
<td>7.63</td>
<td>1.06 (-4)</td>
<td>9.85</td>
</tr>
<tr>
<td>Unequal p</td>
<td>0.720</td>
<td></td>
<td>0.85</td>
<td></td>
<td>0.734</td>
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</tr>
</tbody>
</table>
Appendix T

Table of Subjective Norm Scores for Following a Low-salt Diet

1. Following a low salt diet – influence of friends

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>0.62 (7)</td>
<td>4.40</td>
<td>0.12 (1.3)</td>
<td>2.80</td>
<td>-0.062 (-6)</td>
<td>3.56</td>
</tr>
<tr>
<td>Treatment</td>
<td>0.47 (5)</td>
<td>5.40</td>
<td>2.35 (26)</td>
<td>3.57</td>
<td>-1.88 (+21)</td>
<td>4.58</td>
</tr>
<tr>
<td>Unequal p</td>
<td>0.813</td>
<td>0.054</td>
<td></td>
<td></td>
<td>0.211</td>
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</tbody>
</table>

2. Following a low salt diet – influence of family

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>2.56 (28)</td>
<td>4.54</td>
<td>2.50 (28)</td>
<td>3.74</td>
<td>0.062 (0)</td>
<td>4.80</td>
</tr>
<tr>
<td>Treatment</td>
<td>0.47 (5)</td>
<td>5.40</td>
<td>2.35 (26)</td>
<td>3.57</td>
<td>-1.88 (+21)</td>
<td>4.58</td>
</tr>
<tr>
<td>Unequal p</td>
<td>0.52</td>
<td>0.07</td>
<td></td>
<td></td>
<td>0.57</td>
<td></td>
</tr>
</tbody>
</table>

3. Following a low salt diet – influence of doctor

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>5.62 (62)</td>
<td>2.73</td>
<td>6.06 (67)</td>
<td>3.09</td>
<td>-0.44 (+5)</td>
<td>2.34</td>
</tr>
<tr>
<td>Treatment</td>
<td>6.88 (76)</td>
<td>3.26</td>
<td>6.82 (76)</td>
<td>2.24</td>
<td>0.058 (0)</td>
<td>3.42</td>
</tr>
<tr>
<td>Unequal p</td>
<td>0.24</td>
<td>0.43</td>
<td></td>
<td></td>
<td>0.63</td>
<td></td>
</tr>
</tbody>
</table>

4. Subjective norm sum for following a low salt diet

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>8.25 (30)</td>
<td>9.39</td>
<td>8.69 (32)</td>
<td>6.21</td>
<td>-0.44 (+2)</td>
<td>8.37</td>
</tr>
<tr>
<td>Treatment</td>
<td>11.11 (41)</td>
<td>11.24</td>
<td>14.0 (52)</td>
<td>6.65</td>
<td>-2.88 (+11)</td>
<td>10.0</td>
</tr>
<tr>
<td>Unequal p</td>
<td>0.431</td>
<td>0.024</td>
<td></td>
<td></td>
<td>0.453</td>
<td></td>
</tr>
</tbody>
</table>
Appendix U
Table of Subjective Norm Scores for Taking Medications as Prescribed

1. Taking medications as prescribed- friends influence

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>1.37 (15)</td>
<td>4.67</td>
<td>2.37 (26)</td>
<td>2.96</td>
<td>-1.00 (+11)</td>
<td>5.36</td>
</tr>
<tr>
<td>Treatment</td>
<td>2.53 (28)</td>
<td>4.30</td>
<td>1.29 (14)</td>
<td>3.53</td>
<td>1.23 (-14)</td>
<td>4.10</td>
</tr>
<tr>
<td>Unequal p (difference between groups)</td>
<td>0.00</td>
<td>0.35</td>
<td>0.191</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

2. Taking medications as prescribed- family’s influence

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>3.62 (40)</td>
<td>3.91</td>
<td>2.81 (31)</td>
<td>4.32</td>
<td>.812 (-9)</td>
<td>3.50</td>
</tr>
<tr>
<td>Treatment</td>
<td>4.76 (53)</td>
<td>4.42</td>
<td>4.29 (48)</td>
<td>3.17</td>
<td>.470 (-5)</td>
<td>4.91</td>
</tr>
<tr>
<td>Unequal p (difference between groups)</td>
<td>0.43</td>
<td>0.27</td>
<td>0.818</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

3. Taking medications as prescribed- doctor’s influence

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>7.00 (78)</td>
<td>2.30</td>
<td>7.06 (78)</td>
<td>1.88</td>
<td>-.062 (0)</td>
<td>2.01</td>
</tr>
<tr>
<td>Treatment</td>
<td>7.70 (85)</td>
<td>2.64</td>
<td>7.12 (79)</td>
<td>1.88</td>
<td>.588 (-6)</td>
<td>2.73</td>
</tr>
<tr>
<td>Unequal p (difference between groups)</td>
<td>0.42</td>
<td>0.94</td>
<td>0.441</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Subjective norm sum for taking medications as prescribed

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M (%)</th>
<th>SD</th>
<th>Post-test M (%)</th>
<th>SD</th>
<th>Difference M (+/-%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>12.0 (44)</td>
<td>7.97</td>
<td>12.25 (45)</td>
<td>5.66</td>
<td>-0.250 (+1)</td>
<td>7.61</td>
</tr>
<tr>
<td>Treatment</td>
<td>15.0 (55)</td>
<td>8.37</td>
<td>12.70 (47)</td>
<td>5.72</td>
<td>2.29 (-8)</td>
<td>6.49</td>
</tr>
<tr>
<td>Unequal p (difference between groups)</td>
<td>0.30</td>
<td>0.82</td>
<td>0.311</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>