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**Health-Promoting Behaviors in Thai persons with
Chronic Renal Failure**

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Chronic Renal Failure**

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Dedication

To My Parents

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Health-Promoting Behaviors in Thai Persons with Chronic Renal Failure

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The purpose of this cross-sectional, descriptive, correlational study was to describe the relationships among demographic factors (age, gender, education, income), perceived severity of illness, perceived barriers to action, perceived self-efficacy, and interpersonal influences (social support) and health-promoting behaviors (HPB) and to identify predictors of HPB. A nonprobability sample of 110 participants with Chronic Renal Failure (CRF) was recruited from the outpatient clinic of Burirum hospital and Surin hospital located in north-eastern Thailand. All participants were individually interviewed by the principal investigator in a private area within an outpatient clinic.

Six variables were significantly correlated with the HPB. They were age, education, perceived severity of illness, perceived barriers to action, perceived self-efficacy and social support. According to the results from the analyses of demographic data and HPB, participants who were younger and had higher educational levels practiced

more HPB. From the analyses of perceived severity of illness, perceived barriers to action, perceived self-efficacy, and social support and HPB, the results showed that participants with lower levels of perceived severity of illness and lower levels of perceived barriers to action reported better HPB. In contrast, the participants with higher levels of perceived self-efficacy and social support reported better HPB.

By using a stepwise multiple regression analysis, two predictors were identified from 8 predictor variables, and those two accounted for 78.2% ($p < 0.01$) of the variance in HPB. Two variables that contributed significantly to the variance in the HPB were perceived self-efficacy ($\beta = .769$, $p < 0.01$), and social support ($\beta = .162$, $p < 0.01$); whereas age, gender, income, educational level, perceived severity of illness, and perceived barriers did not contribute to the variance in the HPB. The study found that participants who experienced better perceived self-efficacy and social support reported better HPB. In contrast age, gender, income, educational level, perceived severity of illness, and perceived barriers did not enter as predictors in this stepwise regression equation.

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CHAPTER 1: INTRODUCTION

The emphasis in the health care system is shifting from the treatment of illness and prevention of disease, to the promotion of health. Currently, the concept of health is more akin to the presence of physical health, mental health, and social well-being than to the absence of disease. Pender (1987) differentiated between health promotion and health protection describing distinct differences between health promotion and health protection. Health promotion is a proactive behavior, while protection is an avoidance-behavior. Health protection includes the actions a person takes to decrease his/her chance of becoming ill or injured. In contrast, the health promotion consists of deliberate actions to improve health and well-being (Pender, 1987). Health promotion is pursued because it is satisfactory, rewarding, and enjoyable, not solely because of a wish to avoid disease.

Health promotion has become an increasing concern to society and health care professionals all over the world, including Thailand. The Thai Ministry of Public Health uses a primary health care approach in promoting health and quality of life. The Thai Ministry of Public Health considers health promotion a key strategy for developing public health, to enhance the potential of individuals, families, and society. Furthermore, health promotion may result in an increase in positive health, quality of life, and longevity of the population as a whole. Recently, health promotion rather than illness management has become the emerging force shaping health care in Thailand. A focus on health promotion assumes that individuals are able to influence their own health and are responsible for improving the health of the nation (Orem, 1991; Pender, 1987).

Additionally, in an environment of economic constraints, the health care system in Thailand is working both to improve the quality of care and reduce health care costs. To achieve these goals, health care professionals in Thailand must work to promote and facilitate health-promoting behaviors (HPB) that are directed toward the growth and improvement of the well-being of Thai people. Through health promotion, morbidity, the need and demand for medical services, and the cost of health care may be reduced (Fries, Koop, Sokolov, Beadle, & Wright, 1998; O'Donnell, 2004). Because of its potential to enhance health and well-being, health promotion has been acknowledged as a major issue in the health care arena. In fact, health promotion is an extremely important concept for anyone, even those with serious chronic illnesses.

Due to longevity and other health care advances in the 21st century, there is an increase in chronic disease not amenable to cure (National Center for Health Statistics [NCHS], 2004). Modern technology has resulted in longevity but has also resulted in more persons living longer with higher numbers of chronic diseases. Chronic illness is one of the most significant issues facing society and health care professionals in the 21st century (Grumbach, 2003). The objective for health care is enrichment and/or maintenance of life, and chronic illness affects the entire human existence. Various personal dimensions affected by chronic illness include social, psychological, physical, and economic aspects of life. The impact of the chronic illness interacts with the psychological status, which, in turn influences social interactions and economic capabilities (Ellenwood & Jenkins, 2007).

Hibbard (2004) mentioned that chronically ill patients must take responsibility for their care. One of the important goals for people with chronic illness is engaging in HPB. Pender (1996) explained that individuals perform HPB not only to avoid disease, but also to increase their level of wellness, self-actualization, and fulfillment. Participating in HPB is not limited to healthy people. Any person, including an individual with chronic or serious illness, has the potential to participate in HPB with the aim of moving toward optimal health (Haas, 2000). Individuals with chronic illnesses may need additional effort to focus on health and illness simultaneously (McWilliam, Stewart, Brown, Desai, & Coderre, 1996). Consequently, promoting the health of individuals with a chronic illness is complex and challenging. In addition, engaging in HPB has been considered a valuable strategy to sustain the independence of persons with chronic conditions (Parcel, Bartlett, & Bruhn, 1986) and to improve or maintain their health status. Health promotion for people with a chronic illness emphasizes physical, mental, emotional, and spiritual well-being. As a consequence, HPB may help people with a chronic illness reduce the numbers of complications and medical expenses, and increase quality of life (Parcel et al., 1986). However, few empirical data are available to describe HPB in chronically ill patients.

Background of the Study

Chronic illness is the irreversible presence, accumulation, or latency of disease states or impairments that involve the total human environment for supportive care and self-care, maintenance of function, and prevention of disability (Bury, 2000). Individuals diagnosed with chronic renal failure (CRF) represent one of the chronically ill

populations. Many chronic illnesses are not curable, and almost all such health problems are aggravated by inappropriate health habits. Likewise, people with CRF who learn a lot about their disease and how to take care of themselves, stay healthier for a longer period of time (Portoles, 2001).

Currently, CRF is an important health challenge in Thailand. CRF is a slowly progressive illness which deteriorates renal function continuously and irreversibly. CRF disease is a world-wide health problem and its severity increases every year. Sands (1991) found that the death rate from CRF was about 60,000 per year. Moreover, the report shows that cases of this disease are increasing. For example, in the USA, CRF was found in 160,000 persons in 1993 and it was estimated that 200,000 persons would have CRF in 2000 (Goodman & Nissenson, 1996). Recently, the report shows that the rate of kidney disease mortality in the USA has increased by 52% in the past 16 years and continues to be higher (Centers for Disease Control and Prevention, 2007). Analysis of Vital Statistics data revealed that the death rate per 100,000 population rose from 10.1% (95% CI, 9.4-10.8) in 1989 to 15.4% (95% CI, 14.7-16.1) in 2005 (Centers for Disease Control and Prevention, 2007). In Thailand, in 1996, CRF was found in 20,693 persons and expected to increase to 24,112 persons in 2001 (Ministry of Public Health, 2001).

CRF is a disease that permanently reduces the glomerular filtration rate (GFR), resulting in detectable alterations in the person's well-being and organ function (Heiwe, Clyne, & Dahlgren, 2003). CRF is an irreversible and continuous process that leads to a final stage of renal failure. Despite recent advances in the treatment of CRF, the prognosis of persons with CRF remains poor. In addition, CRF is notable for its

unpredictability, the symptoms vary from person to person, and disease activity may vary from mild to a life-threatening. Without treatment, CRF can be fatal. Medical treatments also vary from person to person depending on the type and severity of the symptoms. Furthermore, persons with CRF are subjected to complex treatment regimes (Jacobs, 2006). These regimes involve not only disease management but also a wide range of radical lifestyle changes that significantly affect the individual's social and psychological functioning (Ford-Martin, 2001). Consequently, the treatment of CRF is a long process in which persons must manage their illness properly. If persons with CRF do not engage in appropriate HPB, it may result in more severe disease.

Individuals with chronic conditions often steadily lose their ability to fulfill their self-expectations (Revicki, 1989). Not only do they lose their ability to perform certain actions, they also face the possibility that they will never achieve personal goals in the future (Heiwe et al., 2003). Thus, a chronic condition often represents a radical disruption in the individual's life and activities. It is clear that persons with CRF face tremendous challenges. These challenges include decreased financial status, unemployment and/or decreased income, fluid and dietary restrictions, limitation of activities, fatigue, frequent hospitalizations, changes in family roles and responsibilities, loss of friends and social acquaintances, physical change, as well as a decreased ability to fulfill long-range life plans (Heiwe et al., 2003). Additionally, CRF imposes tremendous losses on patients and their families, especially a sense of normalcy. CRF inhibits the ability to form satisfying, intimate relationships, limits financial productivity, and restricts life-style. Thus, persons with CRF frequently experience psychological distress, physical problems from reduced

ability to function, recurring troublesome symptoms and social problems, all of which may lead to a diminished quality of life (Ford-Martin, 2001). Furthermore, CRF has numerous and varied clinical manifestations with potentially debilitating symptoms (Sands, 1991) that can adversely affect activities of daily living and thus reduce the person's ability to engage in HPB.

Thai persons with CRF have poor outcomes and present rising costs to the healthcare system. Kidney function may deteriorate to ESRD, and require renal replacement treatment in the form of dialysis or kidney transplantation. There are many ways to help delay or prevent CRF. Adoption of a healthy lifestyle or health promotion is an important intervention in CRF, since following a healthy lifestyle can significantly reduce risk and decrease the progression of renal disease (Renee & Lynn, 2000). It is evident that a healthy lifestyle or health promotion is an important factor that can possibly improve, reduce, or slow the progression of chronic disease. Hence, the concept of health promotion is very important in CRF.

Health promotion efforts have potential long-term benefits of enhancing the quality of life, increasing longevity, reducing health care costs, and increasing national productivity through reduced illness and absenteeism (O'Donnell, 2004). Health promotion is a concept involving practices of an individual that promotes a healthy lifestyle. A healthy lifestyle has been described in many different ways, specifically as avoiding bad health habits and broadly, as behaviors under personal control that have a significant impact on health status. Presumably, the adoption of a healthy lifestyle can slow the progression of disease and enhance the general physical and psychological well-

being of the individual affected by a chronic illness. A theoretical model of health promotion could provide a framework for understanding the dimensions of health promotion (Pender, Murdaugh, & Parsons, 2002). Engaging in HPB is a very important aspect of living with CRF. The goal is not to cure the disease, but rather to slow the progression of the disease and enhance quality of life. Furthermore, health promotion is considered the art and science of helping people change their lifestyle and reach a state of optimum health (O'Donnell, 1989).

The concept of health promotion has been a fundamental concept in nursing for decades. Evidence has shown that HPB have been successful in helping people improve their health practices and health conditions (Lannon, 1997; Stuijbergen & Rogers, 1997; Stuijbergen & Timmerman, 2003). Pender (1996) posits that by engaging in health-promoting lifestyles, individuals can maintain and enhance their well-being and prevent the early onset of disabling health conditions. Adoption of healthy lifestyles can slow physical decline from a chronic health problem and even improve general physical and mental well-being in chronic disease. Additionally, there are indications in the health care literature that chronic disease can be postponed through lifestyle changes and that health-promoting behaviors in particular can benefit persons with chronic illnesses such as CRF. Presently, there is awareness of the need for health promotion in CRF. In order to enhance the health of CRF patients, it is paramount to understand factors that may contribute to the decision of persons with CRF to implement healthy lifestyle practices.

Statement of the Problem

The concept of health promotion is widely employed in Western countries to examine health-promoting behaviors. However, health promotion has received far less research interest than the treatment of illness, and this neglect is particularly evident in the health-promotion research targeting persons with chronic illness. Unfortunately, few studies have explored the health-promoting behaviors of Thai CRF patients. Consequently, little is known about health promotion in Thai persons with CRF.

Emphasis in the healthcare system is shifting from the treatment of illness to the prevention of disease and promotion of health (Engebretson, 2003). In the past, nursing models have been oriented toward disease. As research knowledge accumulated, nursing practice moved from a framework addressing disease, to a framework addressing health (Hall & Allan, 1986). In effect, the nurse alone no longer bears the responsibility for the patient's health; instead, the nurse and the patient share that responsibility. This new thinking emphasizes self-care responsibility; that is, the person with the illness condition assumes responsibility for decisions about his or her own health care. Therefore, personal HPB should be examined for critical factors which may influence the life of people who have chronic illness, i.e., CRF. Factors that are related to health-promoting behavior in Thai persons with CRF have not been clearly identified. It is noted that there is a need for empirical studies about factors related to HPB in this group of chronically ill persons. Additionally, HPB and its related variables are important in the management of chronically ill patients, that is, to help them maintain or improve their lives, health, and

well-being. To provide that management, patients and healthcare workers must be aware of factors that influence HPB.

Purpose of the Study

To date, no research has been conducted to examine demographic characteristics, perceived severity of illness, perceived barriers to action, perceived self-efficacy and social support in relation to HPB in persons with CRF. These variables are potential predictors of healthy lifestyle behaviors. More importantly, although the variables have been studied for various chronic illnesses, most studies were conducted in Western countries. The contributions of HPB and the factors influencing HPB in chronic illness have rarely been reported in Thai literature. There are also no current studies assessing the influence of those factors in persons with CRF. To broaden knowledge about HPB and its related factors, research is needed on a population of Thai persons with CRF. Thus, the purpose of this study is to test a model of HPB and related variables in a sample of Thai persons with CRF.

Significance of the Study

The study of factors which are important in explaining HPB among persons with CRF is important for several reasons. First, factors influencing HPB not yet identified may be important among persons with CRF. In order to promote and facilitate HPB, it is essential to identify the factors that influence decisions to engage in or perform such behaviors. Therefore, the findings of this study may be useful in identifying variables that enhance HPB of Thai persons who have CRF. Second, findings on this issue can be added to the body of nursing knowledge related to the health promotion of individuals

with chronic illnesses. Third, understanding the relationship among influencing factors and HPB may be beneficial in improving quality of life for persons with CRF. Fourth, there is a need for the empirical validation of models of HPB. Improved theory in this area will lead to a better understanding of, and fruitful insights into, HPB. Finally, it is hoped that the findings in this study can be used as a basis for successful planning and provision of culturally appropriate health care services for Thai persons with CRF. Furthermore, it will provide a foundation for the development of intervention strategies for nurses and other health care professionals to assist those persons with CRF who are distressed or managing their illnesses relatively poorly. Data from this study may also guide research related to health-promotion activities in persons with chronic illnesses.

Conceptual Framework

Pender (1996) developed the Health Promotion Model (HPM) in 1982, revised it in 1987, and again in 1996. The HPM first appeared in the nursing literature in the early 1980s. The HPM is an attempt to depict the multifactorial dimensions of persons interacting with the environment as they pursue health. The model incorporates concepts from expectancy value theory and social learning theory. In this study, Pender's HPM (1996) will be used as the framework to examine the relationships among specific determinants of HPB with persons with CRF.

Health promotion is defined as specific behaviors that individuals perform on a daily basis to improve or preserve their health and well-being (Pender, 1996). Pender (1996) proposed that a person's behavioral outcome does not rely only on the person's perceptions as a primary source of health motivation, but also on individual

characteristics and experiences, as well as on cognitive and affective factors. Furthermore, Pender (1987) suggested that attention be given to the environmental, cultural, and social conditions that affect health and HPB of individuals and groups, because the factors that influence healthful behaviors are multidimensional. All of the factors are interrelated, and they produce results that exert both direct and indirect influences on HPB (Pender, 1996).

The revised version of Pender's HPM (1996) is depicted in Figure 1. The model addresses three major constructs that include: 1) individual characteristics and experiences, 2) behavior-specific cognitions and affect, and 3) behavioral outcome.

Individual Characteristics and Experiences

According to Pender et al. (2002), people have unique and individual characteristics. These unique characteristics will influence the way in which people engage in various behaviors. The individual characteristics or aspects of past experience allow the researcher to include variables that may be important for a particular health behavior but not include all possible variables for all possible populations (Pender et al., 2002). These can be described as follows.

Prior related behavior. Pender et al. (2002) state that prior experiences influence current behavior. Prior behavior is proposed as having both direct and indirect effects on engagement in health-promoting behaviors. For example, life-long habits may directly influence current health-promoting behaviors. Prior behavior is proposed as also having an indirect influence on health-promoting behavior because self-efficacy, current actions,

benefits, barriers, and activity-related affect may also influence current actions (Pender et al., 2002).

Personal factors. According to the HPM, it is proposed that inherited and acquired characteristics influence beliefs, affect, and enactment of health-promoting behaviors (Pender et al., 2002). Personal factors include biologic, psychologic, and sociocultural factors. Biologic factors include variables such as age, body mass index, pubertal status, menopausal status, aerobic capacity, strength, agility, or balance. Psychologic factors may include self-esteem, self-motivation, and perceived health status. Examples of sociocultural factors include race, ethnicity, acculturation, education, and socioeconomic status. Pender (1996) also points out that since there may be many relevant personal factors, those factors to be included in a study should be limited to the few that are theoretically important to the health-promoting behavior. Personal factors are proposed to have a direct effect on behavior-specific cognitions and affect as well as health-promoting behavior.

Behavior-Specific Cognitions and Affect

Behavior-Specific cognitions and affect are considered to be of major motivational significance. Thus, these variables serve a vital role in interventions, because they are modifiable through nursing actions. Six components in behavior-specific cognitions and affect have been identified and are discussed as follows.

Perceived benefits of action. There is empirical support for the importance of perceived benefits in influencing health behaviors. One's plan to engage in a particular behavior is based on benefits or positive outcomes that will occur (Pender et al., 2002).

These perceived benefits directly motivate behavior. Indirectly, perceived benefits influence behavior through commitment to the plan of action. In the HPM, anticipated benefits from the performance of health-promoting behaviors vary from person to person depending on an individual's previous experience or vicarious experience. Individuals tend to take action if that action is likely to bring about desired outcomes (Pender et al., 2002).

Perceived barriers to action. Perceived barriers to action directly affect health-promoting behavior by hindering action and indirectly by decreasing one's commitment to a plan of action. Barriers can be real or imagined (Pender et al., 2002). Unavailability, inconvenience, cost, difficulty, or time-consuming are frequently viewed as barriers to action, which affect health-promoting behaviors. When a person is unsure about action and barriers are high, action is less likely to occur. The more a person perceives barriers in practicing a particular behavior, the more likely that person will not be committed to engage in the behavior (Pender et al., 2002).

Perceived self-efficacy. Perceived self-efficacy is a judgment of one's abilities to perform specific behaviors in certain situations (Bandura, 1997; Pender et al., 2002). This perception is not necessarily based on the person's actual skills but their perceptions of their abilities. Persons who are feeling efficacious and skilled are more likely to be more vigorous and persistent in their efforts to perform given tasks (Pender et al., 2002). Self-efficacy is influenced by prior experiences or behavior. A person with high self-efficacy is more likely to adopt health-promoting behaviors which lead to healthier outcomes than a person with low self-efficacy. According to HPM, "perceived self-efficacy motivates

health-promoting behavior directly by efficacy expectation and indirectly by affecting perceived barriers and determining the level of commitment or persistence in pursuing a plan of action” (Pender et al., 2002, p. 71). Self-efficacy is also influenced by activity-related affect. The more positive the affect, the greater one’s perceived self-efficacy and vice versa.

Activity-related affect. Activity-related affect, one’s subjective feeling state, may change as a result of stimulus properties of the behavior itself. This change may occur at three different times; before, during, and after a behavior (Pender et al., 2002). Three components of activity-related affect are: affects related to the activity itself, affects related to the self, and affects related to the environment or context in which the behavior takes place (Pender et al., 2002). These emotional reactions may be either positive or negative. This resulting feeling is likely to influence whether a person will repeat a behavior or maintain the behavior long term (Pender et al., 2002). In the HPM, activity-related affect is proposed as influencing health behavior directly as well as indirectly through self-efficacy and commitment to a plan of action.

Interpersonal influences. Interpersonal influences are cognitions or perceptions concerning the behaviors beliefs or attitudes of others including expectations of significant others (social norms), instrumental and emotional support (social support), and vicarious learning experiences (modeling) (Pender et al., 2002). These sources of interpersonal influences may affect health-promoting behaviors directly or indirectly through social pressure or encouragement to commit to a plan of action (Pender et al., 2002). Social support networks including family, peers, and health care providers are

primary sources of interpersonal influence. According to HPM, these influences can be sources of encouragement for compliance with health-promoting behaviors and/or the cessation of negative health behaviors.

Situational influences. This final variable of behavior-specific cognitions and affect is described as environments that may impede or facilitate health behaviors depending on how the person reacts to the environment or situation (Pender et al., 2002). Situational influences include perceptions of available options, demand characteristics, and pleasing features of the environment in which a given behavior is proposed to take place (Pender et al., 2002). Individuals are more likely to engage in behaviors in an environment in which they feel safe, related, and compatible. Situational factors have both direct and indirect influences on health behavior. Individuals may want to behave in ways that promote health, but environmental constraints may prevent healthy actions.

Commitment to a Plan of Action

Commitment to a plan of action initiates a behavioral event. “This commitment will propel the individual into and through the behavior unless a competing demand that the individual can not avoid, or a competing preference that the individual does not resist, intervenes” (Pender et al., 2002, p. 73). Two important steps in making a commitment to a plan of action include being committed to the plan and to execute the behavior at a given time and place. A strong commitment to an action plan helps a person follow-through on or implement the desired health behavior.

Immediate Competing Demands and Preferences

Immediate competing demands and preferences represent “alternative behaviors that intrude into consciousness as possible courses of action immediately prior to the intended behavior” (Pender et al., 2002, p. 73). Competing demands are alternative or unanticipated behaviors, over which a person has little or no control, but he or she must respond to, such as work and family care responsibilities. Similarly, competing preferences are preferred behaviors or last minute urges to which a person has a high degree of self-control (Pender et al., 2002).

Behavioral Outcome

Health-promoting behavior is the outcome of the HPM (Pender et al., 2002). The behavior is directed towards gaining positive health outcomes, including improved health and enhanced quality of life.

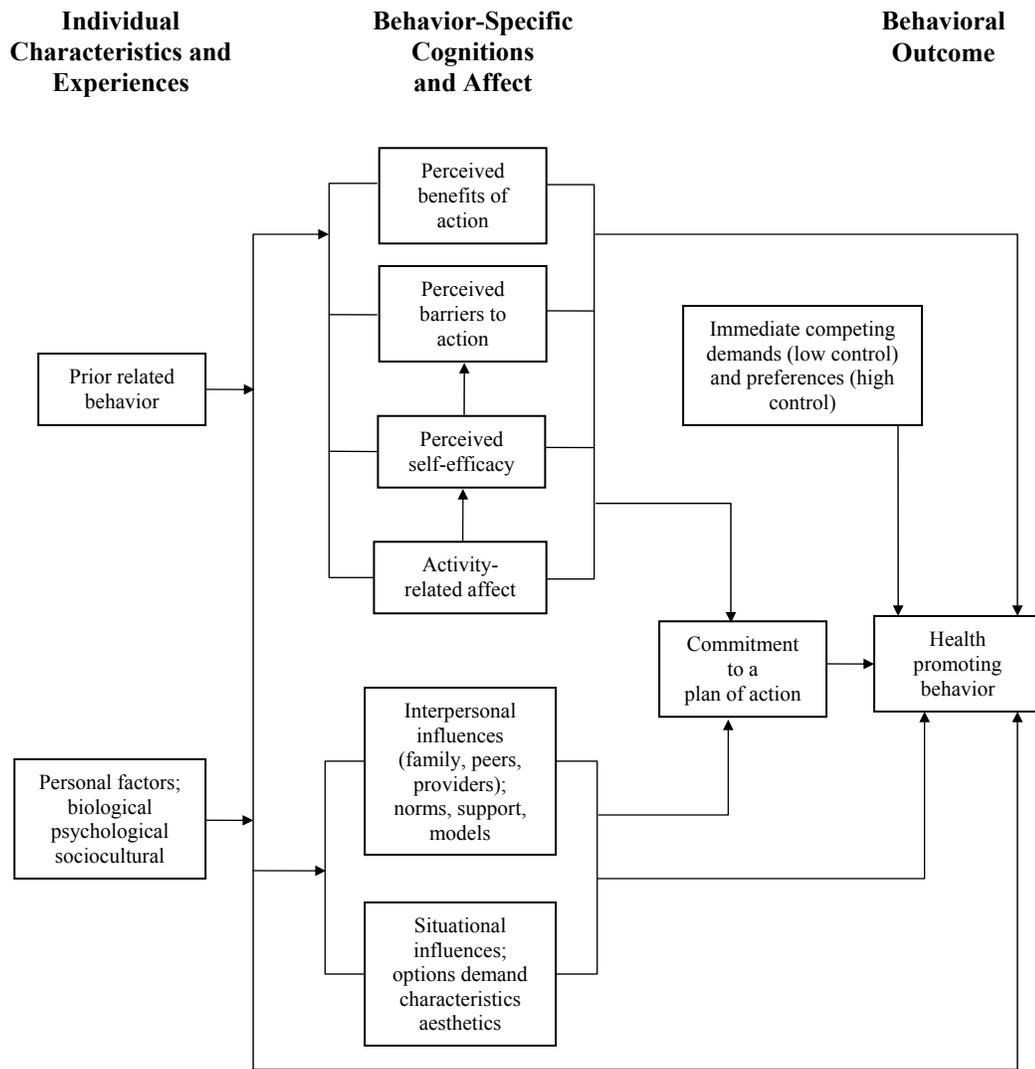


Figure1. Pender's Health Promotion Model

Source: Pender, N. J., Murdaugh, C. L., & Parsons, M. A. (2002). *Health promotion in nursing practice* (4th ed.). Prentice-Hall: New Jersey.

CRF is one of the major chronic diseases in Thailand. To foster HPB in Thai persons with CRF, it is necessary to understand their HPB, variables influencing their HPB, and the functional relationships among them.

A modified framework based on Pender's HPM is proposed for this study. A schematic is shown in Figure 2. The modified model is comprised of personal factors, perceived severity of illness, perceived barriers to action, perceived self-efficacy, interpersonal influences, and health promoting behavior. Pender (1996) postulated that personal factors, such as age, gender, income, and education affect HPB directly, as well as indirectly, through interpersonal influences. Because of the large number of potential personal factors, Pender (1996) suggested that factors be limited to the few that are theoretically relevant to the explanation or prediction of a given target behavior. Therefore, the personal factors included in this study are age, gender, education, and income. Empirical studies have shown that these variables affect the adoption of healthful behaviors (Chen, 1995; Garcia et al., 1995; Gillis, 1993; Martinelli, 1999; Stutts, 1997). Research has shown that perceived barriers to action, perceived self-efficacy, and interpersonal influences (social support) are key variables related to changes in behaviors (Chen, 1995; Jeffries, 1996; Lee et al., 2002; Pender, Walker, Sechrist, & Frank-Stromborg, 1990). They are of major motivational significance in this model. Finally, the behavioral outcome consists of HPB and will include physical exercise or activity, nutritional eating practices, the seeking of social support, and stress management in persons with CRF.

An additional concept not found in Pender's (2002) HPM is the perceived severity of the illness. Research shows perceived severity of illness has a potential influence on the model variables and on HPB (Stuifbergen, Seraphine, & Roberts, 2000). CRF can be divided into four stages (Stages 1 through 4) and each stage represents a different severity

of the signs and symptoms. Additionally, as the stages advance the severity of symptoms increases; therefore, perceived severity of illness in persons with CRF can influence HPB. For example, persons with CRF who are diagnosed stage 4 CRF are likely to experience more symptoms and may perceive their illness as more severe than persons with stage 2 CRF. Also, persons in stage 4 CRF may be more likely to perceive more barriers and perceive lower self-efficacy than persons with stage 2 CRF because of increasing numbers and severity of symptoms.

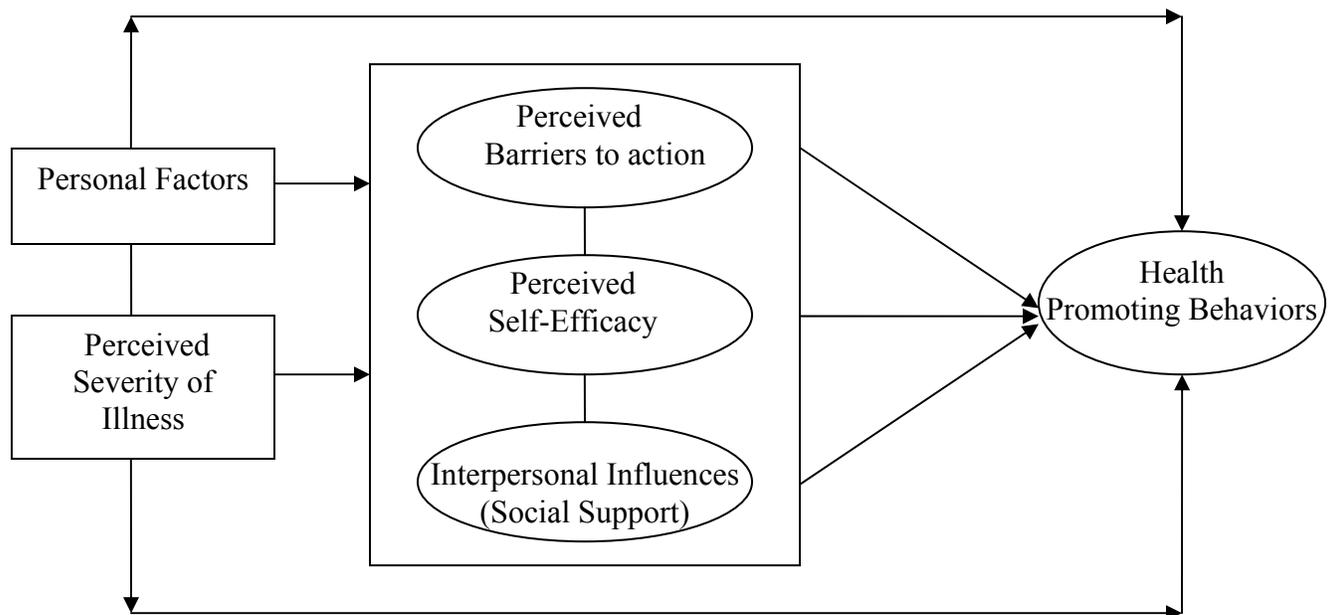


Figure 2. Theoretical Framework of HPM for Thai Persons with CRF

In summary, a modified version of Pender’s HPM will be used as the framework in this study for several reasons. First, Pender’s HPM helps healthcare professionals understand health behaviors from the perspective of nursing. Second, Pender’s HPM posits that health behavior is influenced by multiple factors that are both internal and

external to the individual. For that reason, the model is appropriate for investigating personal, cognitive, and environmental factors that influence health behavior in Thai persons with CRF. Pender's HPM also identifies relationship among those factors, and an awareness of those relationships further enhances our understanding of HPB in Thai persons with CRF. Moreover, Pender's HPM includes self-efficacy as a variable, which is crucial variable of social cognitive theory. Finally, Pender's HPM has been effectively used to guide several studies in different cultures (Jeffries, 1996; Lee et al., 2002; Shin, Jang, & Pender, 2001; Walker, Kerr, Pender, & Sechrist, 1990; Wu & Pender, 2005), and those precedents are further evidence that the model is an appropriate choice to guide a study on Thai persons with CRF. Because the severity of CRF varies from person to person depending on the stage of the disease; persons with CRF have different perceptions of their illness and thus, perceived severity of illness must also be considered.

Research Questions

Specifically, the study was designed to answer the following research questions:

1. What are the relationships among demographic factors (age, gender, education, income), perceived severity of illness, perceived barriers to action, perceived self-efficacy, and interpersonal influences (social support) and health-promoting behaviors in persons with CRF?
2. What are the predictors of health-promoting behaviors among persons with CRF?

Definitions of the Concepts

For the purpose of this study, the following definitions were used.

Thai Persons with Chronic Renal Failure

Thai men and women who had been diagnosed with CRF from stage 1 through stage 4 and who attend an outpatient nephrology clinic in two central hospitals in the north eastern region of Thailand, including Surin hospital and Burirum hospital.

Personal factors

Personal factors are age in years, highest educational level attained, gender, and income. These factors can affect the extent to which CRF patients can engage in HPB. Personal factors were obtained by personal background questionnaire developed by researcher.

Perceived severity of illness

Perceived severity of illness is the perception, assessment, and evaluation of persons with CRF about their disease. Perceived severity of illness varies from person to person depending on each stage of CRF. The perceived severity of illness was measured by a global single item indicator of perceived severity of illness (Youngblut & Casper, 1993).

Perceived barriers to action

Perceived barriers to action consist of perceptions of CRF patients concerning the unavailability, inconvenience, expense, difficulty, or time consuming nature of a particular action. Barriers may be described as the blocks, hurdles, and personal costs associated with undertaking a behavior (Pender, 1996). The barriers to HPB were assessed by use of an 18 item instrument which is designed to measure barriers to participation in health promotion behavior. The Barriers to Health Promoting Activities

for Disabled Persons Scale (Becker, Stuifbergen, & Sands, 1991) reflects barriers to taking care of one's health and how often the listed barriers keep them from taking care of their health, (e.g., too tired, other responsibilities, lack of transportation).

Perceived self-efficacy

Perceived self-efficacy is a judgment of one's abilities to accomplish a certain level of performance (Pender, 1996). Thus, perceived self-efficacy in this study is the degree of confidence CRF patients have in the ability to engage in HPB. The Self-Rated Abilities for Health Practice Scale (Becker, Stuifbergen, Oh, & Hall, 1993) was used as a measure of CRF patients' confidence about their ability to perform health-promoting practices in the domains of nutrition, physical activity/exercise, psychological well-being, and responsible health practices (e.g., "Figure out where to get information on how to take care of my health").

Interpersonal influence (Social support)

Social support is CRF patients' perceived level of materials, services, or aids, information, or emotional support from family, friends, significance others, and health care providers. The Personal Resource Questionnaire Part II (PRQ-85 Part II) consisting of 25 items developed by Brandt and Weinert (1981) was used in this study. The PRQ-85 Part II assesses the adequacy of the individual's perceived level of social support. The questionnaire includes five dimensional subscales: intimacy, social integration, nurturance, worth, and assistance.

Health-Promoting Behaviors

Health-promoting behavior is the end point or action outcome in the HPM, directed toward attaining a positive health outcome (Pender, 1996). In this study HPB is CRF patients' HPB including spiritual growth, health responsibility, physical activity, nutrition, interpersonal relations and stress management. These behaviors serve to help CRF patients sustain and improve health and well-being. The revised Health Promoting Lifestyle Profile II (HPLP II) composed of 52 items was used in this study to measure a subject's composite score based on the six subscale scores of the HPLP II: spiritual growth, health responsibility, physical activity, nutrition, interpersonal relations and stress management.

Assumptions

The following assumptions were made for this study:

1. Thai persons with CRF are able to understand the questionnaires by interview.
2. Thai persons with CRF are able to self-assess their personal factors, severity of illness, barriers, self-efficacy, and social support by interview.
3. Thai persons with CRF are able to recall the HPB of the past 3 months.
4. Thai persons with CRF honestly and accurately answer the interview questions.
5. Measures used in this study are culturally appropriate for Thai persons with CRF.

Limitations

1. The purposive sample of this study decreased the generalizability of the findings. The results of this study are not generalizable to persons beyond the study sample as a random sample was not obtained.

2. The design of the study was descriptive. The results of this study do not allow the researcher to make cause and effect inferences.
3. The findings may reflect a response bias in that persons who are interested in health promotion issues may have been more likely to participate.
4. Maturation may have occurred during the course of the study that may have resulted in inconsistent answers.
5. The explanation of some items in the instruments for participants who did not understand some questions may have caused the participants to answer differently than those who did not get an explanation.
6. Instrumentation bias may be an issue in this study because most of the instruments were developed in the western culture, thus there may be some cultural bias in the instrumentation.

Summary

The purpose of this study was to examine and identify the relationships among selected personal factors, perceived severity of illness, perceived barriers to action, perceived self-efficacy, social support, and HPB in Thai persons with CRF. This chapter provided an introduction to the proposed study, including background and significance of the study, conceptual framework, research questions, definitions of concepts, assumptions, and limitations. A conceptual model developed for this study was described. Finally, the findings of this study may assist nurses and other health care professionals to learn more about factors contributing to HPB in Thai persons with CRF. The study

enhances knowledge to guide effective nursing interventions aimed at helping Thai persons with CRF improve their HPB.

CHAPTER 2: LITERATURE REVIEW

The purpose of this chapter is to synthesize the literature relevant to the ideas, theories, and research related to health promotion in persons with various chronic illnesses. This chapter will begin with a brief history of the characteristics of chronic renal failure (CRF) and an overview of Pender's Health Promotion Model (HPM). Additionally, the relationship between health-promoting behavior and CRF will be reviewed. Finally, the chapter will present relevant literature and research findings that use the HPM as a theoretical perspective to explain health behaviors and factors that may be important in the prediction of an individual's decision to participate in health promoting practices. To compensate for the small number of studies guided by the HPM, however, other research has been included.

Overview of Chronic Renal Failure

CRF is a gradual and progressive loss of the ability of the kidneys to excrete wastes, concentrate urine, and conserve electrolytes because of massive destruction of nephrons (Ford-Martin, 2001). It is the result of irreversible damage to kidney tissue caused by several pathophysiological processes (Ford-Martin, 2001). The failure progresses slowly and may occur over the course of up to 20 years (Szromba, Thies, & Ossman, 2002). The constellation of signs and symptoms that occur with CRF is referred to as uremia, or the uremic syndrome (Szromba et al., 2002). The symptoms are related to fluid and electrolyte abnormalities, and disordered regulatory functions (e.g., anemia, hypertension, and the accumulation of uremic toxins) that cause physiologic changes and alter the function of various organ systems (Schaubel, Morrison, Desmeules, Parsons, &

Fenton, 1999). There are many different underlying causes of CRF, and its onset can be short term or it can last for years (Koch & Muthny, 1990; Thorp & Eastman, 2004). Kidney function can be impaired by infections; damaged by poisoning substances such as mercury or carbon tetrachloride; blocked by lesions, tumors, and stones; or halted by shock or many circulatory diseases (Ford-Martin, 2001; Koch & Muthny, 1990). Among the frequent causes are autoimmune and inflammatory processes of the kidney, especially glomerulonephritis and pyelonephritis, in which glomeruli become damaged (Agodoa, Norris, & Pugsley, 2005). Other common causes are vascular lesions of the kidney as a result of diabetes mellitus, continuance of an acute renal insufficiency and renal damage due to continued abuse of analgesics (Agodoa et al., 2005; Koch & Muthny, 1990). Furthermore, hypertension is associated with the development of kidney malfunctions (Thorp & Eastman, 2004). The above mentioned impairments may all lead to CRF. In many chronic kidney diseases, a progressive loss of renal function may eventually reach the stage of renal failure. Ultimately, the progression of CRF may continue to end-stage renal disease.

Decreased renal function can be measured by the glomerular filtration rate (GFR) (Ford-Martin, 2001). The symptoms of CRF are typically not evident until the disease has progressed to a level at which renal function has decreased significantly. Persons suspected of having CRF will need blood tests that include serum creatinine, blood urea nitrogen, uric acid, and sodium, and also a urine test for assessment of protein loss (Szromba et al., 2002). The National Kidney Foundation (NKF, 2002) has defined five stage of chronic kidney disease, ranging from evidence of kidney damage (such as

albuminuria) with no impairment in GFR (stage 1), to the nearly complete loss of kidney function, or end-stage renal disease (ESRD, Stage 5) (NKF, 2002). The stages of chronic kidney disease as defined by the Kidney Disease Outcomes Quality Initiative of the National Kidney Foundation are as follows:

Stage 1 Kidney damage with normal or increased GFR >90

Stage 2 Kidney damage with mild decreased GFR 60-89

Stage 3 Moderately decreased GFR 30-59

Stage 4 Severely decreased GFR 15-29

Stage 5 Kidney failure < 15 (or dialysis)

The aim in CRF management is to preserve the patient's remaining kidney function in order to prolong life and delay the progression to end-stage renal failure and dialysis (Storset, Smith-Erichsen, & Vaagenes, 1995). There is considerable evidence indicating that early identification can offer substantial benefits, including prolonged progression and even prevention of ESRD (NKF, 2002). Persons with end-stage renal failure suffer from a myriad of life-altering events once they are diagnosed with "renal failure." In Thailand, the number of persons with CRF is increasing dramatically (Ministry of Public Health, 2001). As such, a better understanding of the nature of CRF and how to slow the progression of this disease is necessary and requires extensive research.

In sum, CRF is an irreversible and continuous process that will lead to end-stage renal failure. The disease permanently reduces glomerular filtration rate (GFR) to a level sufficient to alter well-being and organ function. It occurs when kidneys cannot fully

perform their functions, including removing extra water and wastes, helping control blood pressure, and keeping body chemicals in balance (Bolton & Klinger, 2000). In CRF, the kidneys do not usually fail all at once. Instead, renal failure often progresses slowly and continuously. Thus, CRF can be considered a chronic illness that may take months or years to produce life-altering signs and symptoms. Since CRF is an irreversible condition, there is no treatment that completely cures the disease. To replace the lost function of the kidneys, hemodialysis, peritoneal dialysis, and kidney transplantation must be used (Ford-Martin, 2001). In addition, there are many ways to help delay or prevent CRF from progressing to end-stage renal failure. If diagnosed early, dietary management, medication, dietary supplements, and lifestyle changes can be employed to treat specific symptoms to slow the progression of the disease (Portoles, 2001).

Pender's Health Promotion Model

The Health Promotion Model (Pender, 1987; Pender, 1996; Pender, Murdaugh, and Parsons, 2002) is derived from the expectancy-value theory and the social cognitive theory, which emphasizes the importance of cognitive processes in the regulation of behavior.

In addition, Pender's Model of Health Promotion (1996) proposes that one's definition of health may provide a motivation to engage in a healthy lifestyle, because motivation is a key concept to promote behaviors that improve and maintain health (Pender et al., 2002). Also, health-promoting strategies could be developed to serve as primary management devices for improving psychological and physical health as well as quality of life for patients with chronic illness (Lawton, 1999). Positive health behaviors,

such as regular exercise, eating nutritious foods, managing stress, and avoiding toxic substances like tobacco, have a well-established relationship with well-being and reduced levels of morbidity and mortality (O'Donnell, 2004). As a result, the HPM may help researchers and practitioners better understand how persons with CRF can improve their health and live with fewer hospitalizations.

Health promotion emphasizes an increase in the level of well-being and self-actualization in an individual or group (Pender, 1996; Pender et al., 2002). The focus is on efforts to approach a state of high level health and well-being (Pender, 1987). According to Maben and Clark (1995), health promotion is not solely directed at the prevention of disease, since the concept of health encompasses more than the absence of disease. Several issues have contributed to the growing trend toward a preventive approach and away from traditional medicine's focus on symptom relief and/or minimizing the effects of disability. These issues include the chronic nature of health problems that are the leading causes of morbidity and mortality, the lack of curative therapies for chronic illnesses, and the expense of long-term measures for the control of chronic disease. Pender (1996) posits that by engaging in a health-promoting lifestyle, individuals can maintain and enhance their well-being and prevent the early onset of disabling health conditions. Adoption of healthy lifestyles can slow physical decline caused by a chronic health problem and even improve general physical and mental well-being (Renee & Lynn, 2000). Furthermore, The HPM depicts the multidimensional nature of persons interacting with their interpersonal and physical environments in the pursuit of health (Pender, 1987).

Health-Promoting Behaviors and CRF

Packard, Haberman, Woods, and Yates (1991) have demonstrated that chronic illness is a multidimensional stressful event and that the experiences associated with it are not disease specific. Chronic illness affects the entire human existence, often in cyclical manner. Personal factors affected include social, psychological, physical, and economic aspects of life (Heiwe et al., 2003). For instance, chronic illness may interfere with the client's ability to adapt to an altered state of health. In addition, most chronic illnesses are irreversible, incurable, and usually progressive in nature (Grumbach, 2003). Without appropriate long-term treatment, the condition of the individual may deteriorate rapidly, and the outcome is often premature death. Physical disability also interacts with and alters one's psychological status, which in turn impinges on social interactions and economic capabilities (Lancaster, 1988).

Persons with CRF live with a long-term and incurable disease. After diagnosis, they remain under medical care. Their quality of life is affected, as is their ability to participate in various health-promotion behaviors. Persons with CRF encounter both physiological and psychological problems and suffer from many stresses (Ford-Martin, 2001). Since this disease is irreversible, the main objective in caring for persons with CRF should include not only therapy based specifically on the underlying disease, but also nonspecific therapy to prevent or slow the loss of kidney function and to prevent and treat the complications of decreased kidney function (Manuel, 2002). In particular, adoption of a healthy lifestyle is one of the most effective ways to prevent chronic renal

failure, since following a basic healthy lifestyle can significantly reduce risk and slow the progression of renal disease (Renee & Lynn, 2000).

In CRF, people who learn a lot about their disease and how to take care of themselves stay healthier (Thorp & Eastman, 2004). It is evident that a healthy lifestyle is an important factor that can possibly improve, reduce, or slow the progression of chronic disease (Vupputuri & Sandler, 2003). Hence, education and awareness about the importance of a healthy lifestyle is crucial and can contribute significantly to reducing the loss of life and resources due to chronic disease. Although chronically ill persons are not viewed as healthy, they are capable of health and well-being within the context of their conditions.

Living with chronic conditions may make it difficult for chronically ill persons to implement health-promoting behaviors; however, Stuijbergen and Rogers (1997) conducted a qualitative study exploring health-promoting behaviors and quality of life in individuals with chronic disabling condition. Informants made it clear that the life circumstances and symptoms they experienced made it difficult for them to implement health-promoting behaviors, even when they possessed the necessary knowledge about good health practices. The researchers suggested that health-promoting behaviors should be viewed as essential to the process of rehabilitation and maintaining an acceptable quality of life.

Chronic conditions may affect the frequency and intensity of performing health-promoting behaviors (Pender, 1987). In a study of health-promotion practices of 629 women between the ages of 18 and 70 with multiple sclerosis (MS), Stuijbergen and

Roberts (1997) found that women with MS scored significantly lower on physical activity ($t = - 11.90, p < .001$) and spiritual growth ($t = - 2.84, p = .002$) than the normative sample ($N = 712$), and women with benign sensory MS ($M = 16.76$ on physical activity and 27.90 on spiritual growth) and relapsing-remitting MS ($M = 15.62$ on physical activity and 27.44 on spiritual growth) were more likely than women with progressive MS to engage in physical activity and spiritual growth behaviors. Thus, the researchers concluded that practicing health-promoting behaviors can maintain and enhance health, prevent premature death and secondary disability, maximize functional status, and improve quality of life of individuals with chronic conditions.

Gulick (1991) conducted a study to investigate whether self-assessment and monitoring of daily activities and symptom prevalence, with feedback and related information given to experimental subjects, resulted in less use of professional health services (hospitalization) among persons diagnosed with MS compared to control subjects. This prospective three-year study originally consisted of 60 experimental and 60 matched control subjects. The data collection periods for Year Two and Year Three consisted of 57 and 49 subject pairs, respectively. The data reported here consist of the 49 pairs of subjects who completed the three yearly assessments. Subjects were matched on gender, walking ability (within 5-point intervals on a scale from 0 to 25, where 25 represents good ability), MS duration in years since diagnosis, and present age in years. The mean walking score when subjects entered the study was 13.67 ($SD = 8.75$) for the experimental group and 13.22 ($SD = 8.27$) for the control sample. The mean duration of MS in years was 11.74 ($SD = 9.41$) for both samples. The mean age in years was 47.82

(SD = 12.69) for the control group and 47.37 (SD = 10.69) for the experimental sample. Of the subjects, 71% were female and 14.3% of subjects in each group lived alone. The researchers found that people with MS who performed self-assessment and monitored their health behaviors and disease symptoms had fewer hospitalizations than those who did not perform such activities. Results also showed that subjects in the control sample reported one or more hospitalizations compared to subjects in the experimental sample during the 27-month period ($\chi^2(1df) = 4.021, p = 0.044$). Six subjects from the experimental sample had 8 hospitalizations, ranging from 3 to 27 bed days, while 14 subjects from the control sample had 21 hospitalizations, ranging from 2 to 38 bed days. The seven acute hospitalizations for the experimental sample resulted in 65 bed days, or an average of 9.29 days per admission. The 18 acute hospitalizations for the control sample resulted in 175 bed days, on average of 9.78 days per admission.

Health-Promoting Behaviors in Various Chronic Illnesses

The HPM has been used to explore and predict the determinants of health behaviors in a variety of populations (Pender, 1996). The various health behaviors that have been explored using the variables of the HPM include hearing protection usage, exercise, life satisfaction, hope, and quality of life, as well as dimensions of a health-promoting lifestyle such as self-actualization, health responsibility, nutrition, exercise, interpersonal support, and stress management (Walker, Volkan, Sechrist, & Pender, 1988; Weitzel, 1989).

A review of the research literature using the HPM indicates that it has been used in various populations in the United States, China, Korea, and Australia to test the

relationships among major concepts such as individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcome. Most studies that have explored the determinants of health-promoting behaviors using Pender's HPM have studied relatively healthy populations such as midlife women (Duffy, 1988), older persons (Conn, 1998; Duffy, 1989; Duffy, 1993; Kim, Bramlett, Wright, & Poon, 1998; Speake, Cowart, & Pellet, 1989; Speake, Cowart, & Stephens, 1991), blue-collar workers (Weitzel, 1989), employees enrolled in health-promotion programs (Pender et al., 1990), the African-American elderly (Foster, 1992), adolescent females (Gillis, 1994), employed Mexican-American women (Duffy, 1997), and college students (Larouche, 1998).

There are few studies using the HPM in persons with chronic illness. A search of several computer databases for specific research related to CRF and health-promoting behaviors produced no results; however, the majority of research located explored the relationship between health-promoting behavior and various other chronic illnesses; those studies will be included in this review.

Additionally, health-promoting behaviors and related variables are important in the management of chronically ill patients, that is, helping them maintain or improve their lives, health, and well-being. To provide that management, patients and healthcare workers must be aware of factors that influence health-promoting behaviors. Thus, the literature review will also address research that has used the HPM as a theoretical perspective, testing a variety of variables to help explain health-promoting behaviors and identify variables that could impact health-promoting behaviors in patients living with chronic illness. In addition, very few studies have used the HPM to explore health-

promoting behaviors of Thai persons with chronic illness. Therefore, this review will include other literature on chronic illness that supports the linkages among the variables of interest.

Variables Influencing Health-Promoting Behaviors during Chronic Illness

A number of studies have identified variables that can influence health-promoting behaviors in persons living with chronic illness. Important areas include individual characteristics and experiences, and behavior-specific cognitions and affect.

Individual Characteristics and Experiences

According to Pender et al. (2002), every person has unique personal characteristics and experiences that affect that person's subsequent actions. Certain personal factors may promote or minimize healthful behaviors.

Several studies have documented how personal factors such as age, gender, educational level, and income significantly impact health behaviors; however, these findings—from many studies conducted on various chronic illnesses other than CRF—have shown mixed results.

Age. Yates, Price-Fowlkes, and Agrawal (2003) investigated the relationship between age and self-reported physical activity in a cross-sectional study of 64 cardiac patients of at least 45 years of age who had been hospitalized 6-12 months earlier for coronary artery bypass graft (CABG) surgery or with myocardial infarction. Participants ranged in age from 45 to 86 years ($M = 65.3 \pm 10.0$). Of the participants, 50 (78%) were male and 14 (22%) were female. Women in the sample were significantly older ($M = 72.1 \text{ years} + 8.9$) than men ($M = 62.5 \text{ years} + 9.4$, $t(62) = 3.43$, $p < .05$). In

addition, the women were less likely than the men to be married, have completed high school, be employed, and report an annual income greater than \$20,000. Physical activity was measured using the average activity score (AAS), which is defined as the average level of energy expenditure in daily activities. The raw AAS was converted to a percentile score, which took into account age differences in activity levels. The authors found that older patients, who had mean age of 72, reported significantly lower levels of physical activity (health-promoting behavior) ($M = 57.8$, $SD = 17.9$) than younger patients, who had mean age of 62.5 ($M = 67.0$, $SD = 12.2$).

Findings from a study of 260 older adults (aged ≥ 55 years) with type 2 diabetes also supported the conclusion that younger persons were more likely to report participating in physical activity (Hays & Clark, 1999). Among all the participants, the mean age was 67 years. The majority of the respondents were African-American (59.2%), female (63.2%), had < 12 years of education (66.2%), and had a monthly income of less than \$ 1,000 (78.5%). The findings revealed that the majority of the participants in the sample (54.6%) reported 0 minutes of weekly physical activity, while 22% reported engaging in 1-60 minutes of physical activity per week and 23% reported > 60 min of weekly physical activity. Participants aged 50-69 reported significantly more minutes of weekly physical activity when compared with participants aged > 70 . There was also some variation by age, with more persons in the older group agreeing with the statement: “as people get older they should exercise less” ($p < 0.05$) (Hays & Clark, 1999).

Wensing, Vingerhoets, and Grol (2001) conducted a study to determine the relationship between functional status and health problems, age, and comorbidity in primary care patients (N = 4112). Functional status was measured with the SF-36. Health problems were measured with a nationally developed and validated list of 25 problems, and co-morbidity was defined as reporting two or more health problems on this list. Of the participants, 67.6% were female, and 30.7% were male. All age groups (18-80 years) were well represented in the sample, but the number of subjects aged 80 or older was relatively small (2%). A little less than half of the subjects (45.8%) were 50 years or older. About half of the patients did not report any health problems, while about one-third reported only one health problem. The findings showed that the most common health problems were hypertension (7.5%); asthma/COPD (5.4%); infection of nose, sinus, or throat (5.1%); and chronic backpain or hernia (4.9%). The researchers also reported that in the multiple regression analysis age and health problems had a negative effect on functional status ($p < 0.001$). As age and the number of health problems increase, functional status becomes poorer and may contribute directly to the likelihood of using more hospital services.

Another study, which examined Thai persons with chronic obstructive pulmonary disease (COPD) by Oprasertsawad, measured health behaviors by the Life Styles and Health-Habits Assessment. The findings showed that age was significantly related to the clients' health behaviors (as cited in Sriyuktasuth, 2002). Similarly, Coonrod, Betschart, and Harris (1994) investigated the proportion of adults with diabetes (including insulin-dependent diabetes mellitus (IDDM), non-insulin-dependent diabetes mellitus (NIDDM)

treated with insulin, and NIDDM not treated with insulin) in the United States who had received diabetes patient education as well as the factors that determined whether patients received education among 2,405 people with diabetes greater than or equal 18 years of age. The majority or plurality in all groups of participants (IDDM, NIDDM treated with insulin, and NIDDM not treated with insulin) ranged in age from 18-39 years (62.3%, 58.5%, and 34.6%, respectively). In the IDDM group, 62.1% were male and 54.7% were female; 48.9% were male and 48.8% were female among those with NIDDM treated with insulin; and 23.5% were male and 23.9% were female among those with NIDDM not treated with insulin. The majority of each group had >12 years of education (63%, 59.9%, and 31.9%, respectively). Most participants in each group were never married (73.8%, 58.6%, and 29.5%, respectively). The findings showed that age was a predictor of participation in diabetes health services; younger persons were more likely to participate than older persons. The proportion who had received patient education was lower for those who were at an older age at diagnosis of diabetes among individuals with NIDDM treated with insulin and those not treated with insulin. The probability of having had patient education decreased with age. For example, subjects aged 40 years were ~ 80% more likely to have had a diabetes education class compared with subjects aged 70 years (OR 1.81, 95% CI 1.30-2.53).

Frank-Stromborg, Pender, Walker, and Sechrist (1990) examined the extent to which cognitive/perceptual and modifying variables in the HPM explain the occurrence of HPB in adults with cancer. Participants were obtained from a convenience sample of 385 ambulatory cancer patients undergoing treatment for their disease in 13 clinical sites

in the midwestern United States. Of the 385 subjects, 223 (57.9%) were females and 162 (42.1%) males. Their ages ranged from 21 to 85, with a mean of 53.7 years (SD = 12). The largest number, 155 (40.3%) were employed full time, and a smaller number were retired (94 or 24.4%) or homemakers (58 or 15.1%). The majority of the subjects were married (277 or 71%) and an overwhelming majority were Caucasian (375 or 97.4%). A diverse educational background was found in this sample: 19 (5%) had an 8th grade or lower education, 43 (11.2%) had some high school, 127 (33%) were high school graduates, 108 (28.1%) had some college, 51 (13.2%) were college graduates, and 36 (9.4%) had graduate or professional degrees. Family income was also diverse: 105 (27.3%) of the sample reported a family income below \$20,000, 153 (39.7%) between \$20,000 and \$40,000, 68 (17.7%) between \$40,001 and \$60,000, and 35 (9.1%) above \$60,000. The findings indicated that older ambulatory cancer patients were more likely to be involved in a health-promoting lifestyle ($F = 8.99, p = 0.003$). A total of 23.52% of the variance in health-promoting lifestyle was explained by three cognitive/perceptual and four modifying variables. Fifteen point eighty percent of the variance was explained by three cognitive/perceptual variables in the HPM, and an additional 7.7% was explained by four demographic variables (educational level, family income, age, and employment status). Of these modifying variables, age was a strong predictor of a health-promoting lifestyle ($\beta = 0.155, F = 8.99, p = 0.003$) (Frank-Stromborg et al., 1990).

Becker and Stuijbergen (2004) investigated perceptions of barriers to health promotion in three groups of individuals with disabilities: (1) those with multiple sclerosis (MS) (N = 557), (2) those with postpolio syndrome (PPS) (N = 1730), and (3)

polio survivors without postpolio syndrome (non-PPS) (N = 423). The average age of individuals with MS was 52 years. Eighty-four percent were female, 93% were Caucasian, and 48% had some postsecondary education. Twenty-nine percent of the MS group were presently working for pay (either part or full time), 16% were retired, and 35% were unemployed due to disability. Each of the two groups, the individuals with PPS and the individuals with non-PPS, had an average age of 62 years. The PPS group was 70% female and 97% Caucasian. Sixty percent had some postsecondary education. Twenty-three percent were currently working for pay, 39% were retired, and 24% were unemployed due to disability. The non-PPS individuals were 65% female and 98% Caucasian. Fifty-five percent had some postsecondary education. Thirty-nine percent were currently working for pay, 37% were retired, and 7% were unemployed due to disability. Persons with MS were more likely than those who had polio to be married, living with a significant other, divorced, or separated (89% for the MS group; 80% for those with PPS; 82% for those non-PPS). Conversely, the PPS group (21%) and the non-PPS group (18%) were more likely never to have been married or widowed than were those with MS (10%). The MS group was younger, less educated, and more likely to be female than the other two groups. The findings showed that among participants with PPS, those who were younger had more barriers to health promotion (Becker & Stuijbergen, 2004).

Anderson et al. (1995) investigated factors that influence daily management (diet, exercise, medication, and blood testing) in Chinese-Canadian (n = 48) and Euro-Canadian (n = 148) women with diabetes (N = 196). More of the Chinese-Canadian

women were in the older age categories (75% were 50 years of age or older, compared to 58% of the Euro-Canadian women, $p = 0.05$). The results revealed that the association between diet management and ethnicity was significant among women 50 years or older ($p = 0.003$). Additionally, the association between diet management and fluency was not significant for those under 50 years of age ($p = 0.16$) but was highly significant for those 50 years of age or older ($p < 0.001$). Moreover, strong associations were found between age and medication management ($p < 0.001$), and age and diet management ($p = 0.005$) and Chinese-Canadian women had received significantly less formal education than the Euro-Canadian women ($p < 0.001$). Almost 40% of the Chinese-Canadian women had an educational level of Grade 7 or lower, compared to only 14% of the Euro-Canadian women. A significantly ($p = 0.014$) higher proportion of Chinese-Canadian than Euro-Canadian women reported their occupation to be unskilled (42.6% vs. 27.0%) or homemaker (14.9% vs. 6.8%). By contrast, a greater proportion of Euro-Canadian women reported their occupation to be skilled (46.6% vs. 19.1%). More of the Euro-Canadian than Chinese-Canadian women reported their household income as \$40,000 or more per year (34.5% vs 18.7%); however, a higher percentage of the Chinese-Canadian than Euro-Canadian women (18.7% vs 6.8%) did not know their household income ($p = 0.04$). According to their self-reports, older women were found to manage their medications ($p < 0.001$) and diet management ($p = 0.005$) better than younger women. Similarly, in a quasi-experimental study that tested Pender's HPM (1987) in order to identify cognitive-perceptual and modifying factors linked to adherence to a low-fat, low-

cholesterol diet in patients with coronary heart disease (N = 109), older persons were more likely to achieve dietary goals (Moylean & Joyce, 1993).

Gender. Salyer, Sneed, Corley, and Virginia (2001) investigated the lifestyle and health status of long-term cardiac transplant recipients (N = 47) who were 18 years of age or older at the time of transplantation. Respondents were primarily male (76.6%) and Caucasian (74%) with a mean age of 56.5 years (SD = 10.3, range = 29-70) and a mean time of 75.6 months after transplantation (SD = 32.8, range = 15-147). Thirty-nine (82.9%) had at least a high school education. Only ten patients (21.3%) reported full-time employment, and five (10.6%) reported part-time employment. Twenty-seven (57.4%) reported they were disabled, and another 11 (23.4%) reported they were retired. Five patients (10.6%) who were neither retired nor disabled reported being unemployed. Thirty-eight patients (81%) were married. The findings indicated that women had a higher high-density lipoprotein (HDL) level (M = 65.8 vs 37.2, F = 32.9, p = 0.0001) than men and reported greater spiritual growth (M = 27.8 vs 23.8, F = 8.40, p = 0.006) and healthier nutrition (M = 26.9 vs 22.8, F = 5.69, p = 0.02) than men.

Similarly, a study by Fowler (1997) explored the relationship between hope and a health-promoting lifestyle in adults at varying stages of Parkinson's disease (4 stages). The researchers used a descriptive, correlational design. The study sample was composed of adults with Parkinson's disease (N = 42) who attended informational and emotional support group sessions. The majority of subjects were male (N = 30, 71%) and a majority were married (N = 33, 79%), with a mean age of 71 years (SD = 9.11). Nineteen (45%) participants completed high school, 13 (31%) graduated from 2-4 year colleges and 7

(17%) reported advanced education. Income levels ranged from less than \$20,000 (N = 14, 37%) to more than \$50,000 (N = 5, 13%). The results revealed that females reported significantly higher mean scores in physical activity than males ($t = -2.28, p = 0.03$).

Stuifbergen and Becker (1994) explored the predictors of health-promoting lifestyles among 117 adults with disabilities. The mean age of subjects was 44.1 years, with a range from 20 to 74. Fifty-four percent of the subjects were male, and 88% were Anglo. Thirty-three percent of the respondents were currently married, and 20% had dependent children. The majority (54%) of the sample was employed, with 46% employed full time and 8% employed part time. Eighty-three percent of the subjects had at least some college education. The majority (54%) reported that they had adequate financial resources to meet their needs, while 10% indicated very few financial resources. The results revealed that 46% of the variance was explained by the cognitive perceptual variables (self-rated abilities, general self-efficacy, and wellness definition of health) and an additional 4% of the variance was explained by the modifying factors of mechanical assistance needed and gender. The researcher also concluded that adults with disabilities were more likely to engage in a health-promoting lifestyle if they were female.

These findings were inconsistent with those of Yates et al. (2003), who investigated the relationship between gender and self-reported physical activity in a cross-sectional study of 64 cardiac patients. The findings showed that women reported significantly lower levels of physical activity than men ($p < 0.05$). Likewise, a study of gender-related differences in cardiac rehabilitation referral patterns and response to an aerobic conditioning program were examined in 226 hospitalized older coronary patients

(age greater than or equal to 62 years). Results demonstrated that women, especially older women were less likely to enter cardiac rehabilitation than were older men (15% vs 25%; $p = 0.06$), despite similar clinical profiles (Ades, Waldmann, Polk, & Coflesky, 1992).

O'Callaghan et al. (1984) conducted a comparative response of male and female patients with coronary artery disease ($N = 264$) to exercise rehabilitation. In this study, male (227) and female (37) participants undergoing a supervised, structured exercise training program were compared in the areas of attendance rate, training response, and gender. Of the male participants, 128 had myocardial infarction and 99 had coronary artery bypass graft surgery. Of the female participants, 27 post myocardial infarction and 10 post surgery. The mean age for both male and female participants was similar (52 years and 55 years, respectively). The findings showed that the drop-out rate was higher among females (18.9% vs 7.9%, $p < 0.05$) and that their attendance rate at sessions was lower (77% vs 87%, $p < 0.001$) than that of men.

In a study of older women's lifestyle changes after myocardial infarction, Crane and McSweeney (2003), explored the failure of older women ($N = 15$) to attend cardiac rehabilitation after myocardial infarction (MI) and examined facilitating and inhibiting factors in making lifestyle changes. The subjects comprised white (60%) and black (40%) women ranging in age from 66 to 88 years ($M = 74.5$, $SD = 6.5$). The majority had a high school education or less (66.7%), a majority were married (47%) or widowed (40%), and a majority had a yearly household income of less than \$20,000 (60%). Most of the women (80%) were interviewed 8 to 12 months after their MI. Qualitative data analysis

revealed that physiologic changes (decreased energy and physical symptoms) make it difficult for older women to attend cardiac rehabilitation. Fourteen of the 15 women (93%) experienced decreased energy after the MI. Women reported, “My energy wears out,” “I tire out faster,” or “I’m more exhausted.” Reported physical symptoms included shortness of breath (reported by 40%) associated with activities of daily living such as ironing or walking around in the house. One woman said, “That shortness of breath, I thought I would breathe kind of hard (when ironing) that’s when I noticed it the most, and when I vacuumed.”

Boogaard (1984) compared the cardiac rehabilitation experience of 10 females and 10 males after MI on return to physical activity. All patients were between 25 and 55 years of age and had had their first MI within the past three to six months. The findings showed that there were differences in the types and intensity of activities performed by both men and women after MI. At one week after hospital discharge, men reported “resting,” “relaxing,” and “walking in the house.” The women reported that they limited their activity but did begin light household work as early as one week after discharge. The household activities performed included “dusting,” “doing dishes,” “making beds,” and “general clean-up.” Many women did not view these activities as work or even increased activity. Furthermore, half of the women felt guilty during recovery because they were unable to perform their usual household roles, while men did not express guilt during rehabilitation.

Ades, Waldmann, McCann, and Weaver (1992) conducted a study of the predictors of cardiac rehabilitation participation in older coronary patients (N = 226). The

mean age of the study group was 70.4 ± 6 years (range 62 to 92 years). Men made up 57% of the study population (129/226), and women made up 43%. The diagnosis was coronary bypass surgery in 122 (53%) and myocardial infarction in 106 (47%). The findings showed that cardiac rehabilitation participants were younger than non-participants (68 ± 5 vs 71 ± 6 years, $p = 0.005$). Participants had more formal education than non-participants (13.9 ± 3 years vs 11.5 ± 3 years, $p < 0.001$). White collar workers were more likely to enter the program than blue collar workers (41% vs 13%) or housewives (20%, $p < 0.001$). Men were more likely to enter the cardiac rehabilitation program than women (25% vs 15%, $p = 0.06$) (Ades et al., 1992).

Simons-Morton et al. (2000) conducted cross-sectional analyses from 874 patients in the Activity Counseling Trial. Patients were categorized into three groups: (1) no moderate-to-vigorous physical activity (MVPA), (2) some moderate but no vigorous activity, and (3) some vigorous activity. In the ages of men and women were 35-44 years (135, 28% vs 101, 26%), 45-54 years (185, 39% vs 168, 43%), 55-64 years (103, 22% vs 79, 20%), and 65+ years (56, 12% vs 47, 12%). About 90% of the participants were under 65 years of age, with similar distributions for both men and women. Education among men and women was less than high school graduation (14, 3% vs 33, 8%), high school graduate (30, 6% vs 61, 15%), some college (87, 18% vs 158, 40%), college graduate (155, 32% vs 76, 19%), and some postgraduate education (193, 40% vs 67, 17%). The majority had some college education, and men had higher education levels than women. Household incomes were $< \$20,000$ (40, 8% vs 80, 21%), $\$20,000-29,000$ (16, 3% vs 55, 15%), $\$30,000-49,000$ (61, 13% vs 91, 24%), $\$50,000-75,000$ (97, 21% vs

63, 17%), and \$75,000+ (257, 55% vs 90, 24%) in men and women group respectively. Over 40% of respondents had household incomes of \$75,000 or more per year, and nearly 25% made \leq \$30,000; men had higher incomes than women. Employment among men and women included homemaker (1, 0% vs 46, 12%), employed (409, 85% vs 275, 70%), retired (46, 10% vs 43, 11%), and unemployed (23, 5% vs 30, 8%). Almost 80% of participants were employed, with more homemakers and unemployed among women than men. Marital status was previously married (divorced, separated, or widowed) (53, 11% vs 129, 33%), currently married or cohabiting (388, 81% vs 224, 57%), or never married (37, 8% vs 42, 11%) in men and women group respectively. Over 90% were, or had been married, with a greater proportion of men currently married than women. Results showed that men were more likely to engage in vigorous activity than women (37% vs 15%, $p = 0.001$).

Gerard (1993) conducted a study of factors related to long-term physical activity following coronary artery bypass graft surgery (N = 104). The mean age of the study sample was 63.24 years, with a range of 39-77 years. Seventy six (70.1%) subjects were married. Four (3.8%) subjects had never married, whereas nine (8.7%) subjects were separated or divorced, and 15 (14.4%) subjects were widowed. Eighty seven (83.7%) subjects reported at least a high school education. Thirty four (32.7%) subjects had completed some college, nine (8.7%) subjects were college graduates, and 14 (13.5%) subjects held graduate degrees. Income of participants ranged from under \$5,000 to over \$75,000. Fifty eight (55.8%) reported incomes of less than \$45,000 per year, while 34 (32.7%) reported incomes of over \$45,000 per year. Forty (38.5%) were employed at the

time of the study. Thirty-one (29.8%) were employed full-time, and nine (8.7%) were employed part-time. More male respondents were employed than female respondents. Gender differences were found in the types of activity that appealed to persons who had undergone coronary bypass graft surgery (Gerard, 1993). Reported levels of physical activity by male ($n = 42$) and female ($n = 62$) subjects differed for both the sports and exercise index and the total household activity index. The male subjects had more sports and exercise activity ($M = 174.93$, $SD = 128.75$, range = 0.0-571.84) than female subjects ($M = 102.86$, $SD = 107.80$, range = 0.0-605.10). By contrast, female subjects had more indoor and outdoor household activity ($M = 328.51$, $SD = 107.80$, range = 93.1-637.2) than male subjects ($M = 211.20$, $SD = 148.98$, range = 11.4-683.3).

Education. Health knowledge and awareness, associated with education, can prompt an individual to seek medical care, adopt preventive care measures, and avoid behaviors known to be harmful to one's health.

Frank-Stromborg et al. (1990) tested the HPM as an explanatory framework for a health-promoting lifestyle in a sample of 385 ambulatory cancer patients undergoing treatment in the United States. Data indicated that cancer patients who were better educated were more likely to engage in health-promoting behaviors ($F = 10.00$, $p = 0.002$). Likewise, in a study of barriers to health promotion experienced by people with MS ($n = 557$), post-polio syndrome ($n = 1,730$), and polio survivors ($n = 423$), Becker and Stuifbergen (2004) reported that patients with less education experienced more barriers to health promotion. These findings agree with those of a study by Kaewsawang (as cited in Sriyuktasuth, 2002), who investigated the relationship between hope and

health-promoting behavior in Thai persons with HIV infection. The findings revealed that among six demographic factors (age, gender, marital status, education, income, and occupation), only education made a contribution to lifestyle and health habits among 110 Thai persons with HIV infection.

Similarly, Kurtz (1996) examined the relationship between perceived health status, meaning of illness, demographic factors (education, income, and marital status), and health-promoting behaviors among 215 women with rheumatoid arthritis. Participants were mostly white (61.4%) and unmarried (54.9%), with a mean age of 54.6 ± 14.0 (range = 20-88). Educational levels of the subjects varied. Forty-five (20.9%) had not completed high school, 89 (41.4%) had completed high school and attended at least one year of college, and 81 (37.6%) had at least a college degree. Family income ranged from less than \$10,000 (25%) to \$70,000 or more (20.2%), with the median between \$20,000 and \$29,999. The findings showed that education had the strongest correlation with total Health-Promoting Lifestyle Profile scores ($r = .34$, $p = 0.0001$) (Kurtz, 1996).

Alinger and Dear (1993) investigated self-care agency in 60 persons with rheumatoid arthritis (47 females and 13 males). The mean age in this sample was 52 (SD = 11.9, range 27-79), and subjects had a mean of 14 years of education (SD = 3.16 years), with 14% having less than a high school education and 86% having completed high school. The majority of subjects lived with a spouse (45%). The remainder lived with a nuclear family (28%), lived alone (19%), or had some other living arrangement (8%). The findings showed that level of education was positively related to health-care

agency in persons with rheumatoid arthritis ($r = .25, p < 0.05$) and level of education also accounted for 12% of the variance.

Prigatano, Wright, and Levin (1984) examined quality of life and its predictions in patients with mild hypoxemia and chronic obstructive pulmonary disease (COPD) ($N = 985$). The mean age of the patients was 60.9 years ($SD = 7.8$ years), and they had a mean of 10.7 years of education ($SD = 3.4$ years); 79.1% were men, 86.9% were white, 22.2% were employed, 44.4% were retired, and 24.3% were considered disabled. In addition to the patients with COPD, the researchers studied 25 healthy controls, matched for age, sex, and education. The mean age of the control subjects was 59.6 years ($SD = 9.0$ years), they had a mean of education 10.5 years ($SD = 3.3$ years), and 84% were men. The Sickness Impact Profile (SIP), which is recognized as a reliable measure of the impact a disease or illness has on a wide range of daily activities, was used in this study as the operational measure of quality of life. Results demonstrated that the SIP total score had significant ($p < 0.05$) correlations with education. Education was related to both physical and psychosocial functioning: the more education a subject had, the less their limitation in both physical and psychological functioning.

Muntner et al. (2001) investigated predictors of participation and attendance in newly diagnosed asthma patients ($N = 253$) self-management education program. In multivariate analysis, a university education was a univariate predictor that was independently associated with higher levels of attendance at an educational program ($p < 0.05$). Persons who had a university education were 3.97 times (95% CI, 1.3 to 12.1 times) more likely to attend $\geq 50\%$ of the course (ie, two to three sessions) than persons

without a university education (Muntner et al., 2001). Similarly, a study of 260 low-income older adults with type 2 diabetes showed that individuals who had ≤ 12 years of education were less likely to be physically active (OR 0.47, 95% CI 0.27-0.80) (Hays & Clark, 1999).

Income. Only a few studies have examined the relationship of income to health-promoting behaviors in persons with chronic conditions.

Frank-Stromberg et al. (1990) reported that income was a predictor of health-promoting lifestyles in ambulatory cancer patients (N = 385), as patients with higher incomes were more likely to engage in health-promoting behaviors (F = 5.64, p = 0.01). In addition, a study addressing post-polio syndrome (n = 1,730), non-post polio syndrome (n = 423), and MS (n = 557) supported similar findings; respondents with PPS who perceived having fewer economic resources reported more barriers to health promotion (Becker & Stuijbergen, 2004). Furthermore, in a study of perceived barriers to employment in individuals with spinal cord injury (N = 97), Fiedler, Indermuehle, Drobac, and Laud (2002) found that approximately 82% and 18% were male and female, respectively, and the age range of age at the time of administration was between 15 and 65 years. Single participants comprised 53% of the group, 26% were married, and 22% were separated, widowed, or divorced. Of the participants, 20% had less than an 11th grade education, 28% had completed high school (or equivalent), and 53% had completed postsecondary education. The study revealed four distinct classes of employment status: employed (33%), unemployed and looking for work (26%), unemployed and not looking for work (32%), and other (students; 9%). The majority (52%) of respondents

reported annual income at or below the poverty level of \$10,000, and 10 % noted annual income between \$10,000 and \$19,999. Post-injury income in excess of \$39,999 was reported by 20% of the respondents. Results showed that differences in employment status (employed and unemployed) influenced perceived barriers to employment. The researchers concluded that unemployed participants perceived more barriers than employed participants ($p = 0.02$). This difference indicated that income can influence perceived barriers to action.

Habkonglek (as cited in Sriyuktasuth, 2002) found that income was a variable related to health-promoting activities among Thai persons with continuous ambulatory peritoneal dialysis. Likewise, Ades et al. (1992) examined predictors of cardiac rehabilitation participation in older coronary patients ($N = 226$) and found that both men and women from a higher socioeconomic status participated in more types of physical activities than those in a lower socioeconomic status ($p < 0.001$). Additionally, income and education, along with benefits, barriers, and self-efficacy, explained 50.5% of the variance in health-promoting behaviors in Thai women with systemic lupus erythematosus (Sriyuktasuth, 2002).

Crane and McSweeny (2003) conducted a qualitative study about facilitating and inhibiting factors in making lifestyle changes among older women after MI ($N = 15$). The most frequently reported facilitator was financial support (40%), defined as money provided directly to the women or as other assistance from social support programs. Financial support assisted the women in obtaining healthy food and medications. The women also reported financial support as a barrier. According to these women, the

financial burden associated with caring for their families limited their health decisions and actions. One woman who provided total care to her incapacitated husband stated, “I can’t buy two different sets of food. Maybe a wiener which I know is full of salt, but it’s soft and my husband doesn’t have teeth.” Another woman reported, “I can’t afford unsalted canned food. He (husband) got a medicine list just as long as mine. I’m sure we doing \$300 in meds (per month). I filled a prescription for him yesterday, \$79, one little bottle.”

Keller (1986) undertook a study to predict the performance of daily activities among patients with chronic lung disease, 40 men and 60 women aged between 40 and 59 years of age (N = 100). Functional ability was measured by the Sickness Impact Profile (SIP), which has 136 items describing activities involved in carrying on one’s life and reflects the individuals’ perception of performance of these activities. The 136 items fell into 12 categories. Three scores can be obtained from the profile: a Physical score composed of motor activities, a Psychosocial score composed of emotional and social behaviors, and a Composite score. Self-reporting of symptoms was measured by the Medical Research Council Questionnaire (MRC). Respiratory impairment was measured by pulmonary function testing (F_{ev1}). The findings showed that socioeconomic status and self-report of breathing difficulty contributed 28% of the total variability in functional ability scores.

Perceived severity of illness. The chronically ill individual evaluates the degree of threat based on the characteristics of the illness and its potential to interfere with personal lifestyle, not just the physical effects of the disease (Braden, 1986). According to the

revised HPM, individuals' perceptions about their illness or health status affects their engagement in health-promoting behaviors (Pender, 1996), because experiencing a health alteration may induce fear and avoidance, resulting in a decrease in the performance of health-promoting behaviors (Pender, 1996).

McWilliam et al. (1996) reported that the priority for health promotion in chronically ill people was generally related to illness as well as to the patient's physical, social, emotional, and spiritual well being. In addition, the perceived severity of an illness is important in the case of chronic disabling conditions, because it is a key determinant of the quality of life (Stuifbergen, Seraphine, & Roberts, 2000). As a consequence, the perceived severity of an illness can affect perceived barriers to action, perceived self-efficacy, interpersonal influences, and health-promoting behaviors. Furthermore, Stuifbergen et al. (2000) tested an explanatory model of variables influencing health promotion and quality of life in 786 persons with MS (630 women and 156 men). The participants were 18 to 70 years of age ($M = 47 \pm 9.8$ years). The average education was 14.25 years, and 84% had at least a high school diploma and 36% a college degree. Most respondents (71%) were married. Thirty-four percent reported being unemployed because of their disability, and only 30% were working full-time for pay. The results showed that the effects of the severity of an illness on quality of life were mediated partially by health-promoting behaviors, resources, barriers, self-efficacy, and acceptance.

Stuifbergen and Rogers (1997) conducted a qualitative study of health promotion in persons with chronic and disabling conditions. The sample consisted of 20 adults, aged 32 to 65 years ($M = 43.3$, $SD = 8.7$). Most of the subjects in the sample were female

(75%) and married (65%). Twenty percent were high school graduates, 35% had some college, 25% held a college degree, and 20% had a graduate degree. Forty percent of subjects were unemployed. The findings showed that women with MS who have more severe symptoms, especially fatigue, weakness, poor coordination, and limited mobility, have more difficulty incorporating physical activity into their lives.

Pierce (2005) found similar results in a study of health-promoting behaviors among 45 older rural women with heart failure. The ages of the participants ranged from 65 to 98 ($M = 77.7$, $SD = 8.4$ years). The majority of women were widowed (48%), while 29 (42.2%) were married, two (4.4%) were single, and two (4.4%) were divorced. One (2.2%) had less than 6 years of education, 26 (57.8%) had 7 to 12 years, 14 (31.1%) had 12-16 years, and 4 (8.9%) had greater than 16 years. Twenty five (55.5%) reported their yearly incomes at less than \$20,000, ten (22.2%) reported their yearly income above \$20,000, and ten (22.2%) did not respond to this question. Twenty one (46.7%) of the subjects lived alone, while 19 (42.2%) lived with one other person. The researchers used the New York Heart Association classification level based on the women's report of symptoms, consisting of Class 1 (persons with cardiac disease without any resulting physical limitation) through Class 4 (persons with cardiac disease having an inability to perform any physical activity without symptoms). The findings revealed a negative association between health-promoting behaviors and the New York Heart classification, which appeared to indicate that persons with less severe impact from cardiac symptoms were more likely to perform health-promoting behaviors.

In a survey of exercise habits among persons with arthritis (N = 68), the participants ranged in age from 27 to 80, with a mean age of 57 and 68% over 50 years of age. The subjects were 75% female. Almost half (47%) had an education at or below the high school level. Forty-one percent had completed some college or were college graduates. The remaining 12% had a post-undergraduate education. The findings showed that severity of disease was the only variable that distinguished exercisers from non-exercisers ($p = 0.08$). The researchers suggested that persons with severe disease may need special encouragement to take advantage of exercise opportunities (Gecht, Connell, Sinacore, & Prohaska, 1996).

Summary of Individual Characteristics and Experiences Variables

An analysis and synthesis of the literature shows that personal factors play a role in the frequency and intensity with which a person performs health-promoting behaviors and acts to make lifestyle changes. Empirical evidence supports the observation that health-promoting behaviors in patients living with chronic illness is affected consistently by income and perceived severity of illness. Income appears to be consistently important in the prediction of health promotion (Ades et al., 1992; Becker & Stuifbergen, 2004; Crane and McSweeney, 2003; Fiedler et al., 2002; Frank-Stromborg et al., 1990; Keller, 1986; Sriyuktasuh, 2002). Persons who have lower income are less likely to engage in health-promoting behaviors.

Among studies of chronically ill populations, five demonstrated that perceived severity of illness was an important variable influencing health-promoting behaviors (Gecht et al., 1996; McWilliam et al., 1996; Pierce, 2005; Stuifbergen et al., 2000;

Stuifbergen & Rogers, 1997). The more severe a person's perception of his or her symptoms, the more difficult it was for that person to engage in health-promoting behaviors. In addition, a person evaluates the severity of an illness by forming a perception about the course and progression of the illness, the degree to which it disrupts normal activities of life, and the controllability of the disease. If a person determines an illness to be at least partially controllable, an increase in the perceived severity of the illness may stimulate self-help attitudes and health-promoting behaviors. When the course and the progression of the illness is perceived as uncertain and uncontrollable, an increase in the perceived severity of that illness may increase dependency and decrease the performance of health-promoting behaviors.

Personal factors such as, age, gender, and education were most frequently studied in the literature review; however, the findings from several studies of these factors and their influence on health-promoting behaviors have produced mixed results and thus warrant further study.

Studies investigating the impact of three personal factors—the impact of age, gender, and education on health-promoting behaviors—have shown varied results. Four studies showed that older patients reported having significantly lower levels of physical activity than younger patients (Coonrod et al., 1994; Hays & Clark, 1999; Wensing et al., 2001; Yate et al., 2003). Four other studies, however, showed that patients were more likely to report a healthy lifestyle if they were older (Anderson et al., 1995; Becker & Stuifbergen, 2004; Frank-Stromborg et al., 1990; Moylan & Joyce, 1993). Moreover, three studies showed that men reported lower levels of physical activity than women

(Fowler, 1997; Salyer et al., 2001; Stuijbergen & Becker, 1994), yet eight studies revealed that women reported significantly lower levels of participating in health-promoting behavior than men (Ades et al., 1992; Ades et al., 1992; Boogaard, 1984; Crane & McSweeney, 2003; O'Callaghan et al., 1984; Simons-Morton et al., 2000; Wilhelm et al., 2002; Yate et al., 2003). In addition, there is ample evidence that higher levels of education are associated with health-promoting behaviors (Alinger & Dear, 1993; Becker & Stuijbergen, 2004; Hays & Clark, 1999; Frank-Stromborg et al., 1990; Kurtz, 1996; Muntner et al., 2001; Prigatano et al., 1984; Sriyuktasuth, 2002). No studies were found investigating individual characteristics in Thai persons with CRF. Thus, the linkages among age, gender, education, and health-promoting behaviors in Thai persons with CRF remain unclear and further research is needed.

Behavior-Specific Cognitions and Affect

This set of variables within the HPM is considered to be of major significance. Many researchers have focused on examining the relationships between these variables and health-promoting behaviors in patients living with chronic illness.

Perceived barriers to action. Perceived barriers, according to Pender (1996), are viewed as blocks, hurdles, and personal costs that impede participation in a health-promoting behavior. Barriers, which may be imagined or real, consist of perceptions concerning the unavailability, inconvenience, expense, or difficulty of the given behavior (Pender et al., 2002). Perceived barriers to performing health-related behaviors must be considered when one attempts to motivate a person to participate in those behaviors

(Rosenstock, 1974). The greater the perceived barriers, the less likely the individual will participate and continue to practice health-promoting behaviors.

Many studies reveal that perceived barriers to engaging in health-promoting behavior often powerfully affect a person's engagement in health-promoting behaviors. Yates et al. (2003) investigated the relationships of barriers (symptom distress and negative well-being) and facilitators (self-efficacy to exercise and positive well-being) in 64 cardiac patients 6 to 12 months after their cardiac events. The researchers found that barriers and facilitators were significantly correlated with physical-activity levels. In addition, the findings showed that symptom distress and negative well-being, as barriers to being physically active, accounted for 21.6% of the variance in daily physical activity levels.

Similarly, Stuijbergen (1999) examined barriers and health behaviors of rural and urban persons with MS. The sample for this study included 807 community-residing persons; 603 (75%) lived in 33 metropolitan counties (urban) and 204 (25%) lived in 79 different non-metropolitan counties (rural). Of the participants, 75% were aged 35-64, 73% were female, 95% were Caucasian, 85% were married, and 71% were no longer in the work force. Rural participants had significantly fewer years of education ($M = 13.35$, $SD = 2.59$, $p < 0.01$), perceived their economic resources as less adequate ($M = 2.91$, $SD = .62$, $p < 0.05$), had been diagnosed longer ($M = 11.83$, $SD = 8.27$, $p < 0.05$), and had greater impairment ($M = 19.42$, $SD = 8.16$, $p < 0.01$) than did urban participants. The findings showed that the most frequent barriers for the urban sample were tiredness, impairment, lack of time, conflicts with other responsibilities, and lack of money. For the

rural sample, tiredness, impairment, lack of money, lack of convenient facilities, and safety concerns were the most frequently experienced barriers. For urban and rural persons with MS, barriers were most strongly associated with reports of physical activity ($r = -.39$, $r = -.25$, $p < 0.01$), spiritual growth ($r = -.39$, $r = -.31$, $p < 0.01$), and interpersonal relationships ($r = -.35$, $r = -.19$, $p < 0.01$), respectively (Stuifbergen, 1999).

Using qualitative methods, Stuifbergen and Rogers (1997) investigated factors influencing health-promoting behaviors and quality of life in persons with chronic conditions. Twenty adults with MS were interviewed. The participants reported fatigue as a major problem. Other barriers included demands related to illness, time constraints, other responsibilities, safety concerns, and lack of facilities. Embarrassment, lack of money, lack of motivation, procrastination, effects of disease, lack of transportation, and hot weather were also barriers to engaging in health behaviors.

Similar barriers were indicated by persons with polio ($N = 31$). The mean age of participants was 55.5 years, with a range from 41-74 (Harrison & Stuifbergen, 2001). Most of the participants were female (71%), Caucasian (87.1%), married (71%), and college graduates (58%). Twenty-three percent worked full time for pay, and 23% reported that they were unemployed due to their disability. Scores from the measurement of barriers to health promotion ranged from 20 to 49, with a mean of 35.2 and SD of 7.8. Of the 18 barrier items on the scale, fatigue and impairment had the highest mean scores. Inconvenient buildings, feelings of helplessness, lack of safety, and lack of support from healthcare providers were also reported as frequent barriers to health promotion in this sample.

Neuberger, Kasal, Smith, Hassanein, and DeViney (1994) investigated the determinants of exercise behavior and aerobic fitness in a convenience sample of 100 persons (28 male and 72 female) with rheumatoid arthritis or osteoarthritis. Subjects ranged in age from 21 to 76, with a mean age of 53 years (SD = 12.6). Educational level ranged from grade 9 to graduate school, with 58.7% having at least one year of college. Median annual income was \$20,000 to \$25,000 (range = \$5,000 to > \$65,000). Findings showed that the lack of energy, time, convenient facilities, and support from family were all barriers to exercise.

Additionally, Chen (2003) conducted a qualitative study of health promotion practices of Taiwanese elders with chronic illness (N = 76). Participants were 65 years of age or older. The mean age of participants was 73.31 ± 4.17 years. Females comprised 22.4% of the sample. The number of chronic illnesses ranged from 1 to 8, with a mean of 2.68 ± 1.41 . The five most frequently reported diagnoses were hypertension (61%), heart disease (53.3%), gastrointestinal disorders (26%), diabetes mellitus (18.2%), and cataracts (18.2%). Results revealed that lack of energy, time, and companions were barriers to engaging in health-promoting behaviors.

Crane and McSweeny (2003) conducted qualitative study about facilitating and inhibiting factors in making health-related lifestyle changes in older women after MI (N = 15). The findings showed that the women reported lack of family/friend support and financial support as barriers. Family/friend support was identified by most women as crucial to their recovery, as was an encouragement to care for themselves. Women also

said that their fear of falling, the weather, safety, comorbidities, and transportation were barriers to physical activity.

Perceived barriers to physical activity have been documented for chronically ill persons. Perceived barriers (time/physical environment) were predictive of home exercise performance among myocardial infarction patients (Johnson & Heller, 1998). The sample for this study included 459 persons aged 75 years or less who had been discharged from six public hospitals. The findings showed that participants included in the analyses were, statistically, significantly more likely to be male (73% vs 63%, $p = 0.03$), to have completed high school or higher education (39% vs 28%, $p = 0.04$), and to have reported being regularly active prior to their admission to the hospital (71% vs 58%, $p = 0.01$) than those not included. Results also showed that cardiac patients' perceptions of the physical environment and time barriers to home exercise while in hospital were predictive of non-adherence to regular home exercise six months after discharge from the hospital. In addition, six weeks after discharge from the hospital, patients' perceptions of the enjoyment of and time barriers to home exercise were predictive of non-adherence at follow-up. The researchers concluded that if patients perceive barriers as high, exercise performance (adherence) tends to be low (Johnson & Heller, 1998).

Those findings were inconsistent, however, with Pierce's study of the influence of socioecological factors—including social support, perceived barriers, perceived health status, and demographic variables—on health-promoting behaviors in 45 older rural women with heart failure. The findings showed that perceived barriers were not significant predictors of health-promoting behaviors. The researcher explained that the

subjects in this study may have been unwilling to identify issues of barriers because of past experiences of futility when dealing with obstacles, or because of a perceived need to remain positive about health care providers (Pierce, 2005).

Stuifbergen and Becker (1994) explored the predictors of health-promoting lifestyles among 117 adults with disabilities. The mean age of participants was 44.1 years, with a range from 20-74. Approximately 33% of the subjects were currently married and 54% of the sample was employed, with 46% employed full time and 8% employed part time. Eighty-three percent of participants had at least some college education. The majority (54%) indicated that they had adequate financial resources while 10% reported very few financial resources. The data showed perceived barriers were associated with reported health-promoting behaviors; however, the perception of barriers was not a predictor in presence of other variables of engagement in health-promoting behaviors among people with disabilities. Similarly, findings from a survey of exercise habits among persons (75% female) with arthritis (N = 68) showed that perceived barriers to exercise were not a significant predictor of physical activity behavior (Gecht et al., 1996).

Perceived self-efficacy. Self-efficacy is defined as an individual's conviction or belief that he or she can successfully engage in a given behavior required to produce a desired outcome (Bandura, 1986). The perception of self-efficacy can influence all aspects of behavior change, including the adoption of health-promoting behaviors, the cessation of unhealthy behaviors, and the maintenance of behavior change (Maddux, Brawley, & Boykin, 1995). Self-efficacy has been used to predict health-promoting

behaviors not only in general populations, but also in people with chronic illness. In fact, self-efficacy has been reported as a very successful method of behavioral modification across a wide variety of chronic diseases (Maibach & Murphy, 1995).

A review of the literature reveals that self-efficacy is consistently identified as a significant predictor of health-promoting behaviors within a variety groups, including people with disabilities, MS, arthritis, and coronary artery disease.

Becker, Stuifbergen, Ingalsbe, and Sands (1989) examined self-efficacy and other factors associated with the likelihood of engaging in health-promoting behaviors in disabled adults who received the services of two Southwestern independent living centers. The sample was composed of 135 young and middle-aged adults whose most common disabilities were head injury, cerebral palsy, visual or hearing impairment, paralysis, and/or amputation. The average age of the total sample was 36.4 years, with a range from 18 to 85. The sample was 56% male and 62 % Anglo. Thirty percent of the subjects was currently employed part- or fulltime and 53% had at least some post-secondary education. The reported yearly family income ranged from zero to \$75,000 per/yr. The findings showed that a high self-efficacy score was a significant predictor of engaging in health-promoting behaviors.

Stuifbergen and Becker (1994) investigated the potential of various cognitive-perceptual factors to predict health-promoting lifestyles in persons with disabilities. A sample of 117 adults with disabilities responded to a mailed questionnaire containing items that measured the cognitive-perceptual factors of a definition of health, perceived self-efficacy (both general and specific to health behaviors), barriers to health promotion,

health-promoting behaviors, and perceived health status. The findings revealed that the likelihood of engaging in health-promoting behaviors was significantly related to general self-efficacy ($r = .44$) and self-efficacy specific to health practices ($r = .62$). Multiple regression analyses showed that adults with disabilities were more likely to engage in health-promoting behaviors if they had higher scores on general and specific self-efficacy. Likewise, in a study testing an explanatory model of variables influencing health promotion and quality of life in 786 persons with MS (630 women and 156 men), Stuifbergen, Seraphine, and Roberts (2000) concluded that participants were more likely to take health-enhancing actions if they had higher levels of self-efficacy.

Jeng and Braun (1997) examined the influence of self-efficacy on exercise intensity, compliance rate, and cardiac rehabilitation outcomes among 33 coronary artery disease patients. A one-group pre-test/post-test design was used. Most subjects were men (81.8%), married (87.9%), and 65 years or older (51.5%). The mean age of the sample was 65.9 ($SD = 8.3$). The range of education for the participants was 12 to 23 years. The mean number of years of education was 15.5 ($SD = 2.3$). Sixteen subjects (48.4%) were retired. The results of the study revealed a negative correlation between self-efficacy before exercise training and the improvement of self-efficacy after 12 weeks of exercise training ($r = -0.755$, $p < 0.0001$). Changes in self-efficacy after a 12-week exercise training program positively correlated with the improvement of fatigue ($r = 0.45$, $p = 0.009$) and quality of life ($r = 0.41$, $p = 0.018$).

Stuifbergen (1995) explored factors related to the performance of health-promoting behaviors in a study of 61 persons with MS. The mean age of the subjects was

42.5 years (range 20-76), and most were female (77%), married (67%), and college graduates (61%). Only two participants (3%) had not completed high school. Almost half (46%) of the participants were unemployed, and 21% indicated that they work 20 or fewer hours a week. A majority of the sample (54%) reported that they had adequate financial resources to meet their needs, while 15% indicated they had very few financial resources. The findings showed that self-efficacy influences engagement in health-promoting behaviors. Higher scores on the Health-Promoting Lifestyle Profile were significantly ($p < 0.05$) correlated with increased specific self-efficacy ($r = .67$) and general self-efficacy ($r = .37$).

Lee et al. (2002) constructed a structural model for health-promoting behavior in patients with various chronic diseases. They collected data from 1748 patients with hypertension, peptic ulcer, pulmonary disease including COPD and asthma, diabetes mellitus, and chronic kidney disease. The findings showed that self-efficacy had a significant, direct effect on health-promoting behavior.

Oh (1993) investigated factors related to health-promotion activities and quality of life in Korean women with arthritis. The sample was composed of 96 women who had arthritis. The mean age of the sample subjects was 46 years ($SD = 10.8$), and the age of the sample ranged from 22 to 70 years. The majority of the subjects were married (82.3%), followed by those who were widowed (8.3%), single (7.3%), and separated (2.1%). Most of women were housewives, and only 13% had an occupation outside of the home. The majority of the subjects (65.6%) had either a high school education or higher education beyond high school. Results showed that self-efficacy mediated the

relationship between uncertainty in illness and health-promoting behavior. Other investigators also found that perceived self-efficacy in people with arthritis was related not only to health-promoting behaviors, but also to perceived health status (Lorig, Chastain, Ung, Shoor, & Holman, 1989).

Gecht et al. (1996) investigated exercise beliefs and exercise habits among people with arthritis (N = 68) and found that exercise participation was significantly associated with beliefs about self-efficacy for exercise ($t = 2.04$, $p = 0.047$); those who were most likely to exercise had higher self-efficacy for exercise. Hays and Clark (1999) examined correlates of physical activity in a sample of 260 older adults with Type 2 diabetes. The findings showed that persons with a higher confidence in their ability to perform activities were more likely to report participation in physical activity. Robertson and Keller (1992) examined relationships among health beliefs, self-efficacy, and exercise adherence in patients with coronary artery disease (N = 51). The sample was predominantly men (74.5%). The age range of the participants was 37 to 84 years, with a mean of 61.39 years. The majority of the sample had completed either high school (45.1%) or one to four years of college (43.1%). Results showed that self-efficacy was related to exercise adherence in this group. Those patients who had high self-efficacy were more likely to adhere to an exercise regimen.

Williams and Bond (2002) examined the roles of self-efficacy, outcome expectancies, and social support in the self-care behaviors of diabetics (N = 94). Participants' age ranged from 22 to 86 years ($M = 62.2$, $SD = 12.0$), and almost half of the sample subjects (46.2%) were aged 65 years or older. There were 53 female and 41

male participants. Most ($n = 77$, 81.9%) were married. The findings revealed that diabetes self-efficacy had a significant, positive association with self-care in diet, exercise, and blood testing, contributing 26.2% of the variance in self-care behavior. The researchers also measured diabetes-related self-efficacy, outcome expectancies, social support, and diabetes self-care, and found that self-efficacy had a greater effect when combined with strong beliefs in outcomes. Interestingly, low levels of self-efficacy and strong outcome beliefs were associated with poorer self-care. This suggests that a belief that behaviors associated with a diabetes regimen will lead to desired outcomes is likely to promote self-care, but only when combined with a high level of self-efficacy. The authors suggested that programs designed to increase confidence in self-care abilities may be effective for improving diabetic self-care.

Jeng et al. (2002) investigated the difference between treadmill self-efficacy and actual performance in 48 Taiwanese patients with COPD (43 male and 5 female). The mean age of the sample was 69.83 years ($SD = 7.08$). Most subjects (92%) were married and retired. The mean number of years of education was 8.79 ($SD = 5.04$). The findings showed a positive, significant relationship between treadmill self-efficacy and actual performance ($t = -4.28$, $p < 0.0001$). A patient's past performance accomplishment explained 35% of the variance of treadmill self-efficacy ($F = 24.82$, $p < 0.0001$) and was the strongest predictor of actual treadmill performance. Similarly, Lorig et al. (2001) assessed the one- and two-year health status, health-care utilization, and self-efficacy outcomes in 831 participants, 40 years and older, with heart disease, lung disease, stroke, and arthritis. Results showed that health-care utilization (physician and emergency visits

combined) declined at one and two years; therefore, the researchers explored the relation between self-efficacy and outpatient utilization and found that reduced utilization at one year was associated with the higher the level of self-efficacy at baseline ($p < 0.0001$) and the greater the 6-month improvement in self-efficacy ($p = 0.0203$), the lower the health-care utilization at one year.

The role of self-efficacy in health behavior has been well documented in a number of studies that contribute to the literature. Self-efficacy has been associated with management of chronic disease and the use of health-promoting behaviors and has been found to be a very powerful behavioral determinant.

Interpersonal influences. For this study, “interpersonal influences” refers to the social support a person receives that affects his or her ability to engage in health-promoting behaviors (Pender, 1996). Social support is considered one of the significant factors in promoting health-related behaviors (Pender, 1996; Sarason, Sarason, Shearin, & Pierce, 1987; Zimmerman & Cornor, 1989). Social support is also important to health-promoting behaviors because it provides a positive feedback mechanism that promotes positive adaptive behaviors and fosters a sense of well-being (Cobb, 1976). In a number of studies, persons who received social support were more likely to take advantage of opportunities to gain competency and self-confidence (Lough & Schank, 1996; Morse, 1997; Riffle, Yoho, & Sams, 1989; Tang & Chen, 2002).

Many studies indicate that patients who suffer from chronic illnesses such as hypertension, diabetes, coronary artery disease, MS, chronic illnesses of old age, and

post-polio syndrome and have received high levels of perceived social support have practiced significantly more health-promoting behaviors.

A study by Chen (2003) examined the meaning of health and health promotion practices of Taiwanese elders with chronic illness (N = 76). The mean age of participants was 73.31 ± 4.17 years, ranging from 66 to 86. Females composed 22.4% of the sample. The number of chronic illnesses ranged from 1 to 8, with a mean of 2.68 ± 1.41 . The most frequently reported diagnoses were hypertension (61%), heart disease (53.3%), gastrointestinal disorders (26%), diabetes mellitus (18.2%), and cataracts (18.2%). Results indicated that support from spouses, neighbors, and friends was strongly associated with engagement in health-promoting behaviors. Likewise, in their study of barriers to health promotion experienced by people with MS and polio, Becker and Stuijbergen (2004) found that nurses and other health care providers play a key role in providing the information and support needed by many persons with disabilities to overcome the barriers to health-promoting behaviors.

In a study to construct a structural model for health-promoting behavior in patients (N = 1748) with various chronic diseases, including hypertension, peptic ulcer, pulmonary disease, diabetes mellitus, and chronic kidney disease (Lee et al., 2002), results showed that social support influenced a patient's plan of action and thus had an indirect effect on health-promoting behavior (N = 1748). In addition, data collected from 61 individuals with MS showed that perceived social support was significantly correlated with increases in health-promoting behaviors (Stuijbergen, 1995). This result is similar to the qualitative study of 20 individuals with MS by Stuijbergen and Rogers (1997), in

which family members, particularly spouses and friends, were key sources of both emotional and instrumental support for persons with chronic disabling conditions. Likewise, among 226 older persons with coronary artery disease, patients who had more hospital visitors ($p = 0.068$) were more likely to participate in cardiac rehabilitation. Furthermore, the most powerful predictor of participation was the strength of the primary physician's recommendation. When the physician's recommendation, as perceived by the patient, was 1 to 3 ("not mentioned" to "moderately supportive"), the entry rate was 1.8% (2/114). When the physician's recommendation was strong, scored 4 to 5, the entry rate was 66% (43/65), $p < 0.0001$ (Ades et al., 1992).

Stuifbergen et al. (2000) tested an explanatory model of variables influencing health promotion and quality of life in 786 persons living with MS. Results revealed that social support had significant, direct effects on quality of life, barriers, self-efficacy, and acceptance, as well as indirect effects on health-promoting behaviors through self-efficacy and acceptance. The strength of these direct and indirect paths suggests that interventions to enhance social support, decrease barriers, and increase self-efficacy for health-promoting behaviors could result in an increase in health-promoting behaviors and an improvement of quality of life.

Several researchers have identified social support as a beneficial source for health behavior change and adherence. Specifically, the strength of a patient's support system has been associated positively with an individual's compliance with diabetic regimes, including diet, urinary and blood glucose testing, foot care, medication adherence and exercise (Lloyd, Wing, Orchard, & Becker, 1993; Nagasawa, Smith, & Barnes, 1990).

Connell, Storandt, and Lichty (1991) also found that social support was highly predictive of self-care behavior in older adults with diabetes. Anderson-Loftin (2000) reported that social support improved self-management in patients with type 2 DM and contributed to increases in positive lifestyle changes.

Willoughby, Kee, and Demi (2000) examined the extent to which social support, personal resources, coping styles, and psychosocial adjustment to illness differ among women with diabetes (N = 115). The mean age of participants was 48 years (SD = 11), with ages ranging from 22 to 70 years. Most (57%) were married or living with a partner and had at least a high school education (33%). Annual incomes varied from less than \$10,000 to greater than \$60,000, with about half having incomes of \$30,000 or less. The majority of participants worked full time (50%), with lower numbers unemployed (21%) and retired (19%). The findings showed that higher levels of social support and more adequate personal resources were associated with more effective coping and better psychosocial adjustment. Multiple regression also showed that 47% of the variance in adjustment was explained by personal resources and social support (Willoughby et al., 2000).

Another study provides evidence that social support is a factor in determining adjustment to a chronic illness and longevity of life after a myocardial infarction or other cardiac events (N = 194) (Berkman, Leo-Summers, & Horwitz, 1992). Results from the study revealed that the number of sources of emotional support was a predictor of mortality in both younger and older age groups, among both men and women, and across varying levels of severity of myocardial infarction and comorbidity. Lack of emotional

support was related to both early, in-hospital mortality and later mortality over the 6-month period. Thirty-eight percent of patients who reported having no support died in the hospital, compared with 12% of those who reported having two or more sources of support (Berkman et al., 1992).

Xiaolian et al. (2002) conducted a study of 98 Chinese people (66.32% men) with COPD living in China with a family member. The age of the subjects ranged from 23 to 83 years, with a mean of 54.73 years. All subjects were married, with 76 of the subjects had spouses who were alive (77.55%). The majority of participants had completed primary school (22.45%), held a diploma/associate degree (21.43%), or had completed an undergraduate degree (18.37%). Results showed that there was a statistically significant positive relationship between family support and total self-care behavior ($r = 0.252$, $p = 0.012$) (Xiaolian et al., 2002).

Crane and McSweeny (2003) conducted a qualitative study on facilitating and inhibiting factors in lifestyle changes among older women after MI ($N = 15$). The study examined the factors older women perceived as facilitating or inhibiting health-related lifestyle changes after MI. The most frequently reported facilitator was family/friend support (73%), evidenced by statements such as “My husband stays behind me all the time,” or “my son is so supportive... he’s my strength.”

When Pierce (2005) conducted a study of health-promoting behaviors of 45 older rural women with heart failure, however, the findings showed contrary results, namely, that social support was not a significant predictor of health-promoting behaviors. The researchers explained that the lack of effect from social support in this sample may be

related to the impact of rural life on the social support network. It is also possible that rural women have different attitudes about the presence or quality of the social support they receive.

Summary of Behavior-Specific Cognitions and Affect Variables

The behavior-specific cognitions and affect variables including perceived barriers to action, perceived self-efficacy and interpersonal influence (social support) and health promoting behaviors have been investigated in chronic illness literature that supports the linkage among the current study variables.

Research on the influence of perceived barriers on health-promoting behaviors has been inconsistent. In eight studies out of eleven, perceived barriers to action were found to have a strong relationship with health-promoting behaviors and were found to be a significant predictor of individuals' participation in health-promoting behaviors (Chen, 2003; Crane & McSweeney, 2003; Harrison & Stuifbergen, 2001; Johnson & Heller, 1998; Neuberger et al., 1994; Stuifbergen, 1999; Stuifbergen & Rogers, 1997; Yates et al., 2003). Two studies (Gecht et al., 1996; Pierce, 2005), found that barriers were not significant predictors of health-promoting behaviors among persons with arthritis and rural women with heart failure. Perceptions regarding the barriers to taking care of one's health have not been explored in Thai persons with CRF. Thus, there is a need to explore the perceived barriers in Thai persons with CRF.

Fourteen studies have demonstrated that perceived self-efficacy for health-promoting behaviors is a significant positive predictor of health-promoting behavior (Becker et al., 1989; Gecht et al., 1996; Hays & Clark, 1999; Jeng & Braun, 1997; Jeng et

al., 2002; Lee et al., 2002; Lorig et al., 1989; Lorig et al., 2001; Oh, 1993; Robertson & Keller, 1992; Stuijbergen, 1995; Stuijbergen & Becker, 1994; Stuijbergen et al., 2000; Williams & Bond, 2002). Although self-efficacy has been examined and its potential impact on health-promoting behaviors in several health promotion studies has been consistently reported, no studies have included Thai persons with CRF. Self-efficacy among Thai persons with CRF needs to be studied, because the results may prove useful in enhancing the health of this population.

Finally, social support is a logical predictor of health-promotion activities for patients living with chronic illness, and indeed fifteen studies have found strong relationships between social support and health-promoting behaviors (Ades et al., 1992; Anderson-Loftin, 2000; Becker & Stuijbergen, 2004; Berkman et al., 1992; Chen, 2003; Connell et al., 1991; Crane & McSweeney, 2003; Lee et al., 2002; Lloyd et al., 1993; Nagasawa et al., 1990; Stuijbergen, 1995; Stuijbergen & Rogers, 1997; Stuijbergen et al., 2000; Willoughby et al., 2000; Xiaolian et al., 2002). Only one study did not demonstrate that social support has a significant predictor of health-promoting behaviors (Pierce, 2005). Social support is also positively correlated with the psychosocial adjustment of persons with chronic illness; their partners, families, and friends seem to be significant sources of support. The role of social support in Thai persons with CRF specifically requires further exploration.

In conclusion, the studies discussed in this literature review reflect the variables included in the proposed study. In addition, the research supports the contention that these variables have an impact on the practice of health-promoting behaviors among

patients living with chronic illness. The findings are not consistent, however, regarding the relationships between personal factors (age, gender, and education) and health-promoting behaviors, between perceived barriers and health-promoting behaviors, and between social support and health-promoting behaviors. Because the studies conflict or the findings are weak, further research is warranted in these areas.

Variables Influencing Health-Promoting Behavior in Thai Persons with CRF

A review of the literature has revealed no studies of health-promoting behaviors and factors influencing health-promoting behaviors among patients with CRF in either Western countries or Thailand. Thus, variables that can be shown empirically to be determinants of health-promoting behaviors among patients with various chronic illnesses are justified in the proposed study.

The researcher is particularly interested in individual characteristics and experiences, including personal factors, which are believed to have a potential influence on health-promoting behaviors. For example, Pender et al. (2002) mentioned that the context in which persons live their lives can either sustain and expand their health potential or inhibit the emergence of health and well-being. In addition, Pender (1987) found that, in general, demographics significantly affect the likelihood of participation in health-promoting behaviors. In the proposed study, the researcher starts from the premise that personal factors (age, gender, education, and income) are among the factors that may affect the extent to which Thai CRF patients can achieve their optimum potential in regard to health-promoting behaviors. One final factor is the perceived severity of illness, which can influence health-promoting behaviors in CRF patients.

In addition, behavior-specific cognitions and affect, which include perceived barriers, perceived self-efficacy, and interpersonal influences, are considered to have an important influence on participation in health-promoting behaviors. Barriers may be an especially crucial factor for certain groups of chronically ill persons, and indeed physical limitations and the lack of accessibility, time, and resources have been found in the literature on Western subjects to be barriers to health-promoting behaviors. Those variables may be barriers to engaging health-promoting behaviors among Thai CRF patients as well. For that reason, the proposed study investigated the relationship between perceived barriers among Thai CRF patients and health-promoting behaviors. In addition, numerous studies have shown self-efficacy to be a significant predictor of health-promoting behaviors; therefore, this study addressed the degree to which perceived self-efficacy is a determinant of health-promoting behaviors among Thai CRF patients. Finally, a number of studies have shown that interpersonal influences, defined as social support, can affect individuals' predispositions to engage in health-promoting behaviors, and this variable was included in the proposed study.

Summary

In summary, all of the studies cited above suggest the usefulness of the HPM in explaining the occurrence of health-promoting behaviors. A review of the research literature indicates that the HPM has been used in relation to various chronic illnesses to study variables that could impact health-promoting behaviors. The results from previous studies cannot be generalized to CRF patients, however, because of the different nature of

the disease, symptoms, and difficulties. In addition, some studies have been limited by small sample sizes, convenience sample selections, and the use of cross-sectional designs.

More importantly, although the variables have been studied in relation to a variety of chronic illnesses, most studies were conducted in Western countries. The contributions of health-promoting behaviors and the factors influencing health-promoting behaviors in chronic illness have not been reported in Thai literature. There are also no current studies assessing the influence of those factors in persons with CRF. To broaden our knowledge about health-promoting behavior and its related factors, research is needed that applies Pender's HPM to a sample of Thai persons with CRF. Such research could provide data regarding the usefulness of the HPM in understanding health-promoting behaviors. In addition, the research could provide a foundation for the development of intervention techniques to help persons with CRF increase their health-promoting behaviors and guide research related to health-promotion activities for persons with CRF. Moreover, such research could provide cross-cultural testing of the HPM, thus improving its predictive value in explaining health-related behaviors across cultures. Eventually, increased predictability could lead to a comprehensive theory with culture-specific constructs.

CHAPTER 3: METHODS

Chapter three focuses on the research method, including research design, sample, data collection procedures, protection of human subjects, instruments, and statistical analysis of data.

Research Design

This study used a descriptive correlational design. Although there were some studies related to the variables of interest in persons with chronic illnesses, none focused on relationships among factors proposed in this study and HPB in Thai persons with CRF. This lack of knowledge makes the descriptive design for this study appropriate. The HPM is the theoretical framework for this study. Brink and Wood (1994) stated that a correlational, descriptive study is an appropriate research design to use when the researcher seeks to examine and explain relationships among variables based on a theoretical or conceptual model. It is also useful when previous literature has not clarified the relationships concerning the concepts and population of interest.

Population and Sample Selection

The population of interest for this research was suburban Thai persons with CRF who attended an outpatient nephrology clinic in 2 central hospitals in the north eastern region of Thailand, including Surin hospital and Burirum hospital. This setting was selected because it was accessible to the researcher and because it would yield sufficient numbers of persons who meet the criteria for inclusion in this study.

This study included non-hospitalized adults with CRF (both men and women) who visited the hospitals described above and met the following inclusion criteria of the

study: (a) age 21 or older; (b) not in the end-stage chronic renal failure (stage 5); (c) agree to participate in the study; (d) can speak, read, and understand Thai, and (e) not hospitalized during the time of study. The exclusion criteria of this study is adult with end-stage chronic renal failure (stage 5).

The desired sample size was calculated by using a Goodman-Kruskal's measure of predictability or lambda (λ) (Cohen, 1988). Based on an alpha of 0.05, a power of 0.80, and eight independent variables, a lambda of 15.9 was derived from Cohen's lambda tables for multiple regression analysis (Cohen, 1988). Based on Cohen's formula used to determine a sample size for multiple regression analysis and a medium effect size of 0.15, a sample size of 110 was needed.

Procedures for Data Collection

Data were collected after approval was received from the Institutional Review Boards (IRBs) of the data collection sites and from the Departmental Review Committee (DRC) of school of nursing, and the IRB at the University of Texas at Austin.

Once approval was obtained, the researcher contacted the chiefs and staff members who provided services to persons with CRF. The researcher provided information about the study, including exclusion and inclusion criteria, to the chiefs and staff members in nephrology clinic. Additionally, the chiefs and staff members were given a handout that described specific identifiers of inclusion and exclusion criteria. To identify CRF patients who were not in the end-stage renal disease, the chart was reviewed by the clinic staff for the diagnosis and laboratory values that showed those patients not in end-stage renal disease. The staff member then approached the patients, explained the

study to the patients and determined if they would like to learn more about the study. If the patients were interested in this study, the staff members obtained the potential participants' contact information and permission from the person to be contacted by the researcher. The researcher contacted the potential participants, gave them a brief overview of the study, answered all questions about the study and invited them to participate. If they were interested in taking part in the study, the researcher informed them of time involved, confidentiality, and anonymity issues and informed consent was obtained (see appendix A).

A copy of consent form with the principal investigator's information was given to each potential participant. Participants were then individually interviewed in a private area by the researcher while they were waiting for clinic services. When participants had difficulties understanding the questionnaires for any reasons, the researcher explained the items to the participants. However, the participants who were explained the questionnaires may have responded differently from the participants who did not get an explanation. Participants were encouraged to ask the researcher if they had questions associated with the questionnaires at any time. Completing the questionnaires took approximately 30-60 minutes.

Instrumentation

Six instruments were included in this study: Demographic Data, The Health Promoting Lifestyle Profile II (HPLP II), The Self-Rated Abilities for Health Practice Scale (SRA), The Barriers to Health Promoting Activities for Disabled Persons Scale

(BHADP), The Personal Resource Questionnaire Part II (PRQ-85 Part II), and The Global single item indicator of perception of illness (**see appendix B**).

The Health-Promoting Lifestyle Profile II (HPLP II)

The HPLP II was developed by Walker, Sechrist, and Pender (Walker, Sechrist, & Pender, 1995) and is a revision of the extensively used HPLP (Walker, Sechrist, & Pender, 1987). The revised HPLP II is a 52-item summated rating scale that employs a 4-point response format from 1 (never) to 4 (routinely). It measures six dimensions of health promoting lifestyle; spiritual growth— focuses on the development of inner resources and is achieved through transcending, connecting, and developing (9 items), health responsibility—includes paying attention to one’s own health, educating oneself about health, and exercising informed consumerism when seeking professional assistance (9 items), physical activity—involves regular participation in light, moderate, and/or vigorous activity (8 items), nutrition—involves knowledgeable selection and consumption of foods essential for sustenance, health, and well-being (9 items), interpersonal relations—entails maintaining relationships that consist of a feeling of intimacy (9 items) and stress management—entails the identification and mobilization of psychosocial and physical resources to effectively control or reduce tension (8 items). Scores are computed for the total scale and for each of the six subscales. Construct validity and reliability of the HPLP II was assessed in a sample of 712 adults aged 19 to 92 residing in Midwestern communities (Walker et al., 1995). Principal axis factor analysis with oblique rotation yielded six factors consistent with the dimensions. Confirmatory factor analysis with LISREL supported the loading of the six subscales

onto a single latent factor, health-promoting lifestyle. Cronbach's alpha was 0.941 for the total scale and ranged from 0.792 to 0.871 for the subscales. Criterion-related validity was established by moderate correlation with measures of health status and quality of life.

The Self-Rated Abilities for Health Practice Scale (SRA)

An original pool of 50 items was developed for the SRA. The items were generated from a review of the literature and the authors' experience (Becker, Stuifbergen, Oh, & Hall, 1993). The tool was then refined to 32 items. The tool was distributed to a group of expert reviewers (two doctorally prepared nurses, an expert in instrument development, and an education specialist) to establish face validity. The instrument was also pilot tested with 15 adults. Feedback from a group of expert was used to modify the instrument. The instrument currently consists of 28 individual items.

The SRA is used as a measure of participants' beliefs about their ability to perform health-promoting practices in the domains of nutrition, physical activity/exercise, psychological well-being, and responsible health practices (e.g., "Figure out where to get information on how to take care of my health"). This 28-item scale asks respondents to rate how well they are able to perform each health practice on a 5-point scale ranging from 0 (not at all) to 4 (completely). Ratings for the 28 items are summed to yield a total score, with higher scores indicating greater self-efficacy for health practices. This instrument was tested on three groups (Becker et al., 1993), a sample of health fair attendees (N= 188), a sample of undergraduate students taking a course on health promotion (N= 111), and a sample of adults with disabilities (N= 117).

In the sample of health fair attendees, a principal component factor analysis with varimax rotation was performed. Using the criterion that each factor account for at least 5% of the variance, a four factor solution was achieved. These four factors accounted for 61% of the variance. These four factors were identified as: exercise, nutrition, responsible health practice, and psychological well being. The cronbach's alpha were as follows: total scale .94, exercise subscale .92, nutrition subscale .81, psychological well-being .90, and responsible health practices .86. Validity was supported by comparisons of the scores with a general measure of self-efficacy. Correlations between this instrument and the general self-efficacy measure were significant at $p < .01$.

Using a sample of undergraduate students, the following estimates of reliability and validity were derived. Test-retest reliability was demonstrated by administering the instrument on two occasions (two weeks apart) and the following Pearson correlation coefficients were computed: total scores .70; nutrition .63; psychological well-being .63; exercise .69; and responsible health practices .73. Cronbach's alpha in the undergraduate student sample for the total scale was .94. Alphas for the subscales were: nutrition .81; psychological well-being .86; exercise .89; and responsible health practices .88. Pearson correlation coefficients were computed to assess the relationship among scores on the SRA and the HPLP. The correlation between the total scores was .69 ($p < .01$). Among a sample of adults with disabilities internal consistency reliabilities were .91, .76, .90, .86, and .77 for total scores, and nutrition, exercise, psychological well-being, and health practices subscales respectively. Empirical evidence supports the discriminant, concurrent, and predictive validity of the tool (Becker et al., 1993).

The Barriers to Health Promoting Activities for Disabled Persons Scale (BHADP)

The development of early versions of the barriers scale has been described by Becker et al. (1991) and Stuijbergen, Becker, and Sands (1990). The items for the barriers scale were derived from three sources: review of the literature, content analysis of interview data from a pilot study, and expert consultation. The BHADP was originally a 16 item summated rating scale. Individual items were summated to yield a total score. One hundred thirty-five individuals participated in the phase one of the study used to test the instrument. Participants reported a wide range of disabilities, including hearing, neuromuscular, and neurocognitive impairment as well as chronic medical conditions. Internal consistency reliability (Cronbach's alpha) for the 16 item scale was .82. A principal components factor analysis revealed a three factor solution that accounted for 48% of the variance. Scores on the BHADP scales were significantly correlated ($p < .01$) with five other attitudinal measures that were assessed in a larger study: perceived health status (-.29), perceived self-efficacy (-.48), HPLP (-.29), powerful others health locus of control (.25), and chance health locus of control (.22) (Stuijbergen et al., 1990).

Further testing of the BHADP (Becker, Stuijbergen, & Sands, 1991) yielded an 18-item, 4-point scale asking respondents to indicate how often the listed barriers keep them from taking care of their health, and environmental barriers (e.g., too tired, other responsibilities, lack of transportation). Responses are scaled from 1 (never) to 4 (routinely). Higher scores on this summated rating scale indicate greater perceived barriers.

In a study of 135 adults with disabilities living in two southwestern cities, internal consistency reliability was reported to be .82, and there is evidence that the tool discriminates between disabled and nondisabled individuals in terms of barriers to health promotion (Becker et al., 1991). Additionally, the barrier scores were negatively correlated to the health-promoting behavior scores, self-efficacy scores, and perceived health status scores (Becker et al., 1991). Becker et al. (1991) stated that the BHADP is a valid and useful measure of perceived barriers to health promotion among person with disabilities. Stuifbergen and Becker (1994) reported data from the use of the BHADP among a group of adults with disabilities. Two week test-retest reliability was .75 and internal consistency reliability (Cronbach's alpha) was .82. Discriminant validity of the scale was supported by t-test analyses that showed significant differences in scores between a disabled sample (N = 135) and a comparison group of nondisabled adults (N = 144). The alpha reliability coefficient was .87. For the present study, the BHADP was modified. Since subjects in the present study were persons with CRF who did not have disability, one item was deleted from original scale; that is, impairment. Consequently, the present study scale consisted of 17 items and the scores ranged from 17 to 68. The higher score indicating the greater barriers.

The Personal Resource Questionnaire Part II (PRQ-85 Part II)

PRQ-85 Part II developed by Brandt and Weinert (1981) was used to measure social support in this study. The PRQ-85 was initially developed by Brandt and Weinert (1981) and has since undergone several revisions. The PRQ-85 Part II assesses the adequacy of the individual's perceived level of social support. The instrument

emphasizes the multidimensional nature of social support based on the Weiss (1974) model of relational functions. The questionnaire included five dimensional subscales: intimacy, social integration, nurturance, worth, and assistance. The scale consists of 25 items rated on 7-point Likert scale ranging from strongly disagree (1) to strongly agree (7). The scores range from 25 to 175 with higher scores representing higher degrees of perceived social support.

A series of methodological studies were used by the instrument developers to evaluate the psychometric properties of the PRQ. Strong estimates of reliability were obtained using both internal consistency and test-retest methods. Evidence of content, criterion, and construct validity was also obtained and presented by the instrument developers (Weinert & Tilden, 1990). Cronbach's alpha for the PRQ II has been reported as .87 in adults samples (Weinert, 1987). The reliability of the scale was also tested in Thai adolescent and Thai women with prenatal care, the Cronbach alpha reliability coefficient was .83 and .84, respectively.

Evidence of construct validity of the PRQ was obtained by correlating the scores on the perceived social support with the scores from instruments measuring depression and anxiety. According to Camines and Zeller (1979), construct validity pertains to the extent to which a particular measure relates to other measures consistent with theoretically derived hypotheses concerning the concepts that are being measured. Weinert (1987) reported significant moderate correlations were obtained between the PRQ II and the Beck Depression Inventory and the Trait Anxiety Scale. Since PRQ-85

Part II was translated into Thai version by Cananub (Cananub, 2004), the researcher asked for permission to use Thai version of PRQ-85 Part II in the present study.

The Global single item indicator of perception of illness

The subjective perception of illness was assessed by: a single item indicator of perceived severity of illness. Subjects were asked to identify their perception of the severity of their CRF on a scale of 1 to 10, with verbal anchors of “very mild” and “very severe”. Youngblut and Casper (1993) suggested that single item indicators provide a holistic assessment of a phenomenon that allows for individual interpretation and is sensitive to individual differences. Global single item indicators have demonstrated good reliability and validity when used to measure a variety of phenomena, including quality of life, dyspnea, success in managing chronic illness, satisfaction with health care, sleepiness, and pain (Youngblut & Casper, 1993). Test-retest reliability was acceptable, $r = .703$ ($n=91$), as measured by a Pearson correlational of responses to the item pre and post-study. Construct validity of the item was supported by a positive correlation with the consequences subscale of the Illness Perception Questionnaire ($r=.482$, $n=114$) and a negative correlation between the percent FEV1 score of spirometry and perception of severity, ($r=-.337$, $n=114$).

Even though the global single item indicator was developed in a western country, it was selected as a measure of perception of severity of illness in Thai persons with CRF because it allows the subject to define the concept in a way that is personally meaningful to individual differences. The scale is also a simple, widely applicable method for measuring subjects’ perceptions of many concepts that are of interest to nursing

(Youngblut & Casper, 1993). The investigator learned from this procedure pilot study that it was difficult for the subjects to select a level of severity on the scale after being asked the question from the instrument. They required more time and some more explanation about the scale. Therefore, a broader guideline such as low, medium, or high was outlined to them before going on to instructing them to assign specific number (0-10) on the scale.

Personal Information

To assess the participant's personal information, data were collected on a questionnaire developed by the investigator. Questions regarding age, gender, marital status, education level, working status, income and satisfaction of income, years of diagnosis, influence of CRF on work or career, and other health conditions of persons with CRF were asked in the personal background questionnaire.

Translation of Instruments to Thai

In order to use the instruments with Thai people, a translation-back-translation method was carried out by two translators working independently. First, the investigator translated all instruments into the Thai language excluding PRQ-85 Part II. Second, three Thais evaluated the Thai versions of the instruments for clarity in language. All three evaluators were Thai and familiar with the culture in Thailand. They were given all instruments to assess semantic and cultural equivalence between the original instruments and the Thai version instruments. These well-educated, bilingual experts were asked to identify the appropriateness of translation from English to Thai and the appropriateness of the instruments for Thai persons with CRF. Additionally, the experts were encouraged

to write suggestions for improvement below each item to make them more suitable for persons with CRF in Thailand, and a few words were revised. Third, two Thai-English bilingual doctoral students were asked to back-translate the questionnaires from Thai to English. They had no familiarity with the study or with the questionnaires. Finally, two American nurses who were current doctoral students evaluated the meaning equivalency between the initial translations and the back-translated versions of the questionnaires. They were asked to answer a single question about each item: “How similar do you think is the meaning between these two sentences?” They then scored each item by using 4-rating scale from 1 (not even close) to 4 (very similar). The acceptance average of scores for each item was 2.5. Most items had average higher than 2.5, and only two items had average scores of 2.0 or below. The researcher revised these two items and sent them to be re-evaluated by the expert until the average scores were equal to or higher than 2.5.

In addition, to ensure the appropriateness of the Thai version, a pilot study with 30 Thai persons with CRF, tested the internal consistency and test-retest reliability of each instrument. For internal consistency, a Cronbach’s alpha coefficient of the HPLP II was .91; the Self-Rated Abilities for Health Practice Scale was .89; the Barriers to Health Promoting Activities for Disabled Persons Scale was .90; the Personal Resource Questionnaire Part II was .84. A test-retest reliability, with an interval of 2 weeks, was found to be .98 for the HPLP II, .89 for the SRA, .94 for BHADP, .86 for the PRQ-85 Part II, .90 for the Global single item indicator. The results of the tests of reliability in the 30 Thai persons with CRF were satisfactory.

Protection of Human Subjects

The proposal was reviewed and approved by the Institutional Review Board (IRB) for the Protection of Human Subjects at the University of Texas at Austin and the Thai hospitals before data collection began. A copy of consent form which included the study purpose, study procedure, risks and benefits of participation, payment and cost, confidentiality information, rights of participants, and the researcher's contact information was given to the participants with the questionnaires. All participants had the right to discontinue their participation in the study at any time or they could refuse to answer any question if they so chose without penalty.

Two potential risks existed for participants in this study. The first was that participants might feel tired or anxious, because of the 30 to 60 minutes needed to fill out the questionnaires. To avoid this, participants were told that they could rest at any time, and they were not pressured to complete the questionnaires within a minimum time limit. The second risk related to the content of the questionnaires. It was possible that the participants might feel uncomfortable about answering some items. To avoid this, the participants were told that they could omit those items that made them feel uncomfortable. The participants also were told that they could withdraw from the study at anytime without explanation or penalty. The potential risk for harm to the participants was minimal. However, the potential risks did not occur in this study.

The data were identified on the questionnaires and entered into the research database using code numbers instead of names to protect confidentiality. All of questionnaires and codebook were stored in a locked cabinet in the principal

investigator's home. Data were kept locked at all times when not in use. In every stage of the study, all individual information remained confidential and no personal healthcare information was disclosed. The list of participants' contact information was stored in a locked pen drive and only the researcher had access to the pen drive and the file. Any identifying information, data, questionnaires and codebook will be destroyed after the study is published. In addition, results and findings of this study will be reported as group information, not as individual data.

Data Analysis

Data analysis strategies included descriptive statistics, Cronbach's alpha coefficient, correlation, and multiple regression analysis. Data error checking and cleaning were done and also the data were checked for distributions, normality, homogeneity of variance, homoscedasticity, and linearity for each statistic procedure before data analysis. Data were entered into the SPSS twice, in two separate files, and randomly checked to identify coding and entry errors.

Demographic data were analyzed with descriptive statistics such as frequencies, means, percentage, range and standard deviations. Other statistical analyses were done to answer research questions.

Question 1. What are the relationships among demographic factors (age, gender, income, and educational level), perceived severity of illness, perceived barriers to action, perceived self-efficacy, and interpersonal influences (social support) and health-promoting behaviors in persons with CRF?

Bivariate correlations were used to explore the relationship among these variables.

Question 2. What are the predictors of health-promoting behaviors among persons with CRF?

Multiple regression analyses were computed to determine the amount of variability of health-promoting behaviors for Thai persons with CRF that could be explained by personal factors (age, gender, income, and educational level), perceived severity of illness, perceived barriers to action, perceived self-efficacy, and interpersonal influences (social support). After it was determined that the assumption of linearity, normality, homogeneity of variance and homoscedasticity were met, multiple regression analysis were then used.

Because the purpose of this study was not only to determine which variables were predictive of HPB but also to find the best set of predictors; thus, stepwise regression analysis was chosen. The stepwise regression analysis was conducted to determine the contributions of the selected variables to the total variance of the HPB. According to the stepwise procedure, the F test was the criterion used to decide whether to add or delete independent variables from the model in order to arrive at the best set of independent variables to explain the variance in the HPB.

Summary

This chapter provided a description of the methodology used for this study. This study used a descriptive correlational design to answer the proposed research questions.

The population and sample were Thai persons with CRF. Information about psychometric properties for instruments, including the HPLP II, SRA, BHADP, PRQ-85 Part II, and The Global single item indicator of perception of illness were described. In addition, procedure for data collection, translation of instruments to Thai, and protection of human subjects were described. Finally, a detailed explanation of data collection procedures and data analysis were provided.

Chapter 4: Results

The purpose of this study was to describe the relationships among demographic factors (age, gender, income, and educational level), perceived severity of illness, perceived barriers to action, perceived self-efficacy, and interpersonal influences (social support) and HPB in Thai persons with CRF. Two research questions were identified and addressed through data analysis using the Statistical Package for Social Sciences (SPSS). The theoretical framework for the study was Pender's Health Promotion Model (Pender et al., 2002).

Data for the study were collected through a purposive sample of 110 Thai persons with CRF at two hospitals in north-east Thailand. This chapter consists of a description of the sample and findings related to the two research questions of the study. Descriptive statistics were used to describe the sample by summarizing the range and frequency distribution. Correlation and regression analysis were used to describe the relationships between the variables. This chapter presents results of statistical analyses that are organized according to the specific research questions posed in Chapter One.

Description of the sample

One-hundred and sixteen people volunteered to participate in the study, however data from six people were not included for the following reasons: one did not meet the age requirement, three chose not to participate, two were unable to complete the instruments because of their health conditions, such as eye problems and fatigue. As a result, the study sample consisted of 110 Thai persons with CRF. Of the 110 subjects, 60 (54.55%) were recruited from Burirum hospital, 50 (45.45%) were recruited from Surin

hospital. Most participants were in stage 3-4, thus the sample lacks variability in this area which may be a limitation to the study findings.

Demographic Characteristics of Participants

The demographic data for the final sample of 110 Thai persons with CRF are summarized in Table 1. The sample consisted of 110 CRF persons who were primarily male ($n= 52.73\%$). The ages of the participants ranged from 21 to 89 years. The mean age for the sample was 58.68 years old ($SD = 16.99$) with a median of 62, indicating on average the subjects were elderly.

The majority of the participants 80 (72.73%) were married, and 22 (20.00%) were divorced, 6 (5.45%) participants reported being single, and 2 (1.82%) participants reported being widowed. Educational levels varied; the large majority of 85 participants (77.27%) had completed compulsory level of education (elementary school), 18 (16.37%) had completed un-compulsory level of education (junior high school, senior high school, and baccalaureate degree), and 7 (6.36%) had no schooling. Eighty-eight participants (80.0%) were homemaker, 15 (13.64%) were unemployed, and 5 (4.55%) were working full-time. Ninety-seven participants (88.18%) answered that CRF disease interrupted their career or their work.

Regarding income, the majority of participants 101 (91.82%) had a monthly income less than 5,000 bahts. Nine participants (8.18%) had an income more than 5,000 bahts. Currently, the exchange rate for Thai baht is approximately 31 baht per one U.S. dollar. Seventy-seven participants (70.0%) answered that their economic conditions were

not sufficient for them to meet daily expenses, whereas 33 (30.0%) perceived their financial status as adequate to meet their daily expenses.

The time since the CRF diagnosis ranged from 0.02 to 16 years, with a mean of 2.85 years ($SD = 2.73$). Approximately 39% of the sample reported they had been diagnosed with CRF for 1 to 3 years, 35.45% for less than or equal 1 years, and 17.27% for 3 to 6 years. The majority of participants 58 (52.73%) reported no other health conditions, whereas 52 (47.27%) participants reported they had other health conditions.

Approximately 29% of the participants reported they had had a diabetes mellitus, 3.64% had hypertension, 1.82% had heart disease, and 12.72% had other health conditions such as systemic lupus erythematosus (SLE), gout, and arthritis.

Table 1

Demographic Characteristic of Participants		(n = 110)
Variable	n	%
Age in years		
21-29 years	6	5.46
30-39 years	17	15.45
40-49 years	5	4.55
50-59 years	22	20.00
60-69 years	21	19.09
>70 years	39	35.45
Gender		
Female	52	47.27
Male	58	52.73

Variable	n	%
Education		
No schooling	7	6.36
Compulsory	85	77.27
Uncompulsory	18	16.37
Marital Status		
Single	6	5.45
Married	80	72.73
Divorced	22	20.00
Widowed	2	1.82
Income per month		
less than 5,000 baht	101	91.82
more than 5,000 baht	9	8.18
Income (adequate to meet your needs)		
Yes	33	30.00
No	77	70.00
Employed status		
Working full-time	5	4.55
Working part time	2	1.82
Homemaker	88	80.00
Unemployed, laid off, or looking for work	15	13.64
Interruption of disease		
Yes	97	88.18
No	13	11.82

Variable	n	%
Disease duration		
≤ 1 year	39	35.45
1-3 years	43	39.09
3-6 years	19	17.27
6-9 years	3	2.73
>9 years	6	5.45
Other disease		
Yes	52	47.27
No	58	52.73
Other disease		
Heart disease	2	1.82
Diabetes mellitus	32	29.09
Hypertension	4	3.64
Others	14	12.72

In the present study, the sample also reported their perceptions of severity of illness, perceived barriers to action, perceived self-efficacy, and social support. They had high levels of perceived severity of illness and social support, but a moderate level of perceived barriers to action and perceived self-efficacy. The mean score for perceived severity of illness (as measured by one item) was 6.50. The mean score for the perceived barriers to action was reported as 37.51 (with possible scores that could have ranged from 17 to 68 on the 17 item scale). In addition, the mean score for the perceived self-efficacy and social support were 76.26 and 102.33, respectively. Table 2 presents the means scores, standard deviations, and range of scores for these variables.

In this study the researcher also found that lack of money, too tired, lack of transportation, and lack of time were most frequently reported as barriers to HPB. The sample reported lack of money as one of the major problems. According to the results of this study, perceived barriers to participating in HPB are not much different among people with chronic or disabling conditions (Harrison & Stuijbergen, 2001).

Table 2

Summary of the Scores of Perceived Severity of Illness, Perceived Barrier to Action, Perceived Self-efficacy, and Social Support

Variable	Possible range	Actual range	M	SD
Perceived severity of illness	1-10	1-10	6.50	1.60
Perceived barriers to action	17-68	25-58	37.51	5.34
Perceived self-efficacy	28-140	52-103	76.26	12.53
Social support	25-175	75-128	102.33	12.58

Research Questions

This study was designed to answer the following research questions:

Question 1. *What are the relationships among demographic factors (age, gender, education, and income), perceived severity of illness, perceived barriers to action, perceived self-efficacy, and interpersonal influences (social support) and health-promoting behaviors in persons with CRF?*

Bivariate correlations were used to examine this research question. Analyses for the relationships between each demographic factor, perceived severity of illness, perceived barriers to action, perceived self-efficacy, social support and the HPB are as follows.

As shown in Table 3, four demographic factors (age, gender, education, and income) were measured. Level of education had small but significant relationship with HPB ($r = .22, p = < 0.05$). Age had negative relationships with the HPB ($r = -.30, p < 0.01$). Gender and income showed no substantial associations with HPB scores. Correlation coefficients for the relationships between age, education, perceived severity of illness, perceived barriers to action, perceived self-efficacy, social support and the HPB ranged from .22 to .88.

Perceived severity of illness and perceived barriers to action were negatively correlated with HPB ($r = -.27, p < 0.01$ and $r = -.62, p < 0.01$ respectively). Perceived self-efficacy and social support were positively correlated with HPB ($r = .88, p < 0.01$ and $r = .68, p < 0.01$ respectively). Among the relationship between all independent variables and HPB, the strongest correlation was between perceived self-efficacy and HPB ($r = .88, p < 0.01$), and the weakest relationship was between educational level and HPB ($r = -.22, p < 0.05$)

In summary, six variables were significantly correlated with the HPB. They were age, education, perceived severity of illness, perceived barriers to action, perceived self-efficacy and social support. Correlation coefficients ranged from .22 (educational level) to .88 (perceived self-efficacy). A summary of the correlates of HPB is shown in Table 3. According to the results from the analyses of demographic data and HPB, participants who were younger and had higher educational levels reported better HPB. From the analyses of perceived severity of illness, perceived barriers to action, perceived self-efficacy, and social support and HPB, the results showed that participants with lower

levels of perceived severity of illness and lower levels of perceived barriers to action reported better HPB. In contrast, the participants with higher levels of perceived self-efficacy and social support reported better HPB.

Table 3

Bivariate Correlation Matrix for the HPB and the Eight Independent Variables (n=110)

Variable	1	2	3	4	5	6	7	8	9
1. Age	1								
2. Sex	.203*	1							
3. Educational level	-.044	.093	1						
4. Income	.006	.254 **	.105	1					
5. Perceived severity of illness	-.068	.046	.075	.068	1				
6. Perceived barriers to action	-.059	-.221 *	-.264 **	-.212 *	.355 **	1			
7. Perceived self-efficacy	-.317 **	.202 *	.175	.123	-.337 **	-.692 *	1		
8. Social support	-.253 **	.205 *	.083	-.017	-.296 **	-.479 **	.670 **	1	
9. HPB	-.304 **	.125	.217 *	.131	-.270 **	-.617 **	.878 **	.678 **	1

*p< 0.05 level, **p<.01 level.

Question 2. *What are the predictors of health-promoting behaviors among persons with CRF?*

This question was addressed through the application of multiple regression analyses. Before initiating the multiple regression analysis to identify the predictors of HPB in Thai persons with CRF, the data were examined to ensure that they meet the assumptions of multiple regression analysis to ensure that the findings from the analyses could be generalized to the general population. The assumption of normality was supported by an analysis of a stem-and-leaf chart and histogram of the Studentized residual (Norusis, 2004). Likewise, a Q-Q plot showed that the Studentized residuals fell close to a straight line, indicating that the sample was drawn from a normal distribution (Norusis, 2004). The assumption of independence was met according to a Durbin-Watson statistic of 1.51 (within a range of 1.5 to 2.5) (Norusis, 2004). The linearity assumption was supported by a linear relationship between the Studentized residual and the HPB score. Additionally, the plots of the Studentized residuals and predicted values showed that the residuals were randomly scattered along a horizontal line through zero, indicating that the homoscedasticity assumption was met (Norusis). The correlation matrix, tolerance of variance, and variance inflation factor (VIF) were consulted to determine multicollinearity (Hutcheson & Sofroniou, 1999). In this study the correlation coefficients, which ranged from .20 to .69, are less than 0.8. Moreover, the tolerance values, which ranged from 0.520 to 0.992, are equal or greater than 0.2. The VIFs, which ranged from 1.075 to 1.654, are less than 5. These results indicated that multicollinearity was not present.

At the beginning all independent variables were entered simultaneously to regress on the HPB. The independent variables included age, gender, income, educational level, perceived severity of illness, perceived barriers to action, perceived self-efficacy, and social support.

A stepwise multiple regression analyses showed that when eight independent variables were regressed on the dependent variable HPB the results of the final regression equation showed that 78.2% of the variance, $F(2,107) = 196.08, p < 0.01$, in the HPB of Thai persons with CRF could be explained by perceived self-efficacy and social support. As shown in Table 4, two variables that contributed significantly to the variance in the HPB were perceived self-efficacy ($\beta = .769, p < 0.01$), and social support ($\beta = .162, p < 0.01$); whereas age, gender, income, educational level, perceived severity of illness, and perceived barriers did not contribute to the variance in the HPB. Participants who experienced better perceived self-efficacy and social support reported better HPB. In contrast age, gender, income, educational level, perceived severity of illness, and perceived barriers were not predictors of HPB in the stepwise regression.

Table 4

Summary of Stepwise Regression Model (n=110)

Variable	B	β	t	p
Perceived self-efficacy	.947	.769	12.752	.000
Social support	.199	.162	2.693	.008

R = .886, $R^2 = .786$, Adjusted $R^2 = .782$

Note p < 0.01

Additional Analysis

Finding related to research questions

What are the HPB, including the six specific dimensions of physical activity, nutrition, interpersonal relations, stress management, spiritual growth, and health responsibility, of Thai person with CRF?

The HPLP II was administered to measure those HPB of the sample. A total possible score on the HPLP II and its subscales ranges from 1 to 4. To answer the question, descriptive statistics including means, standard deviations, and ranges of scores were performed. The results of the analyses are presented in Table 5.

Table 5

Summary of the Scores of the Overall HPB and Six Subscales (n =110)

HPB	Range of Scores		M	SD	% mean
	Possible	Actual			
Overall HPB	52-208	62-195	107.94	15.43	55.35
Interpersonal relations	9-36	12-36	20.70	3.07	57.50
Nutrition	9-36	9-36	17.22	2.63	47.53
Spiritual growth	9-36	10-36	18.21	3.57	50.58
Stress management	8-32	8-32	17.23	2.80	53.84
Health responsibility	9-36	9-35	18.80	3.26	52.22
Physical activity	8-32	8-32	13.87	2.60	43.34

Participants' actual scores were distributed across the possible range of scores. The overall HPB reported by the sample were in the middle range (M= 55.35, SD= 15.43). Health-promoting activities in the six dimensions also were moderately practiced. Interpersonal relations had the highest means (M = 57.50, SD = 3.07). The lowest mean score was physical activity (M= 43.34, SD = 2.60).

Scores indicated that getting exercise during usual-daily activities, engaging in stretching exercises at least 3 times per week, and taking part in light to moderate physical activity were the most frequently performed physical activities. The least practiced activities were reaching a target heart rate during exercise, checking the pulse, and engaging exercise vigorously for 20 or more minutes at least three times a week. However, scores indicated that touch and am touched by people I care about, find it easy

to show concern, love, warmth to others, get support from a network of caring people, and praise other people easily for their achievements were the most frequently selected from interpersonal relations.

Summary

One hundred and ten Thai persons with CRF who met all criteria from Burirum hospital and Surin hospital, Thailand were subjects. Descriptive statistics was used to describe the demographic characteristics of samples. Bivariate correlations were employed to examine correlation among variables. The multiple regression analysis was performed to identify the predictors of HPB in Thai persons with CRF.

In the present study, the sample had high levels of perceived severity of illness and social support, but a moderate level of perceived barriers to action and perceived self-efficacy. Analyses for the relationships between each demographic factor, perceived severity of illness, perceived barriers to action, perceived self-efficacy, social support showed that age, education, perceived severity of illness, perceived barriers to action, perceived self-efficacy and social support were significantly correlated with the HPB. The sample showed moderate participation in the overall HPB. The persons with CRF in the study were more likely to engage in HPB related to interpersonal relations, while less likely to engage in physical activity. In addition, a stepwise multiple regression analysis was used to analyze significant predictors of HPB. Two predictors were identified from 8 predictor variables, and those two accounted for 78.2% ($p < 0.01$) of the variance in HPB. Two variables that contributed significantly to the variance in the HPB were perceived self-efficacy ($\beta = .769, p < 0.01$), and social support ($\beta = .162, p < 0.01$); whereas age,

gender, income, educational level, perceived severity of illness, and perceived barriers did not contribute to the variance in the HPB.

Chapter 5: Summary, Implications, and Recommendations

In this chapter, a summary of the study is presented as well as a discussion of issues related to the sample, the findings, and the methodology. In addition, the chapter includes the implications of the findings and provides recommendations for future research.

Summary of the Study

The purpose of this cross-sectional, descriptive, correlational study was to describe the relationships among demographic factors (age, gender, education, income), perceived severity of illness, perceived barriers to action, perceived self-efficacy, and interpersonal influences (social support) and health-promoting behaviors in Thai persons with CRF. A conceptual model that incorporated Pender's Health Promotion Model provided a guide for the study. A nonprobability sample of 110 participants with CRF was recruited from the outpatient clinic of Burirum hospital and Surin hospital located in north-eastern Thailand. Inclusion criteria for participants were as follow: (a) age 21 or older; (b) not in the end-stage chronic renal failure (stage 5); (c) agree to participate in the study; (d) can speak, read, and understand Thai, and (e) are not hospitalized during the time of study. All participants were individually interviewed by the principal investigator in a private area within an outpatient clinic. The period for data collection was approximately four months, from January 2009 to April 2009.

The study instruments used to measure the independent variables were: Demographic Data, The Health Promoting Lifestyle Profile II (HPLP II), The Self-Rated Abilities for Health Practice Scale (SRA), The Barriers to Health Promoting Activities

for Disabled Persons Scale (BHADP), The Personal Resource Questionnaire Part II (PRQ-85 Part II), and The Global single item indicator of perception of illness. The completion time for the instruments was 30 to 60 minutes. Data were analyzed by using the SPSS Version 14.0 for Windows.

Descriptive statistics were generated including means, frequencies, and standard deviations of demographic factors and the major variables. The purpose of this research was a correlational study; therefore, bivariate correlations were used to determine correlates of HPB. Predictors of HPB were identified by using a multiple regression analysis. Before the data analysis, normality and normal distribution of the major variables and assumptions of the multiple regression analysis for predictor variables of HPB were checked.

Six predictor variables showed significant correlations with HPB. Correlation coefficients ranged from .22 (education) to .88 (perceived self-efficacy). According to the results from the analyses of HPB and demographic factors, age and education were significantly associated with HPB, but not gender and income. According to the findings from the analyses of perceived severity of illness and perceived barriers to action, these variables were significantly related to HPB in a negative direction. Additionally, perceived self-efficacy and social support were significantly related to HPB in a positive direction.

Two predictors of HPB were identified from eight predictors by using stepwise multiple regression analysis. Those predictors were perceived self-efficacy and social support and together they accounted for a total of 78.2% of the variance in HPB. Overall,

Thai persons with CRF who reported better HPB were those who were younger, had higher level of education, higher perceived self-efficacy, higher social support, lower perceived barriers to action and lower perceived severity of illness. Variables that did not act as predictors of HPB included age, education, gender, income, perceived severity of illness and perceived barriers to action.

Discussion of Findings

Issues Related to Demographics

Over 35% of the participants in this study were older than 70 years. As shown in Table 1, the trend in the distribution of CRF for different ages supports the view that the prevalence of CRF increases with age (Feest, Mistry, Grimes, & Mallick, 1990; Mc Geown, 1990). This result is congruent with a study that CRF is more common in older person (Jolly et al., 2009). An explanation could be the fact that aging is associated with subtle losses of glomeruli due to vascular ischemia and scarring which lead to inevitable loss of glomerular function measured by decreasing glomerular filtration rate (Anderson & Brenner, 1986). This finding is also consistent with a study conducted by Lindeman and Goldman (1986) which indicated that most persons experience at least some decline in glomerular filtration rate approximately 1cc/year after the age of 50.

In terms of gender and marital status, of the sample, 52.73% were primarily male and most of the persons with CRF in this study (72.73%) were married. These findings are congruent with those of previous studies in other chronically ill populations reported in the literature. The previous studies of HPB in coronary patients (Ades et al., 1992), adults with disabilities (Becker et al., 1989), spinal cord injury (Fiedler et al., 2002),

adults with Parkinson disease (Fowler, 1997), myocardial infarction patients (Johnson & Heller, 1998), arthritis patients (Oh, 1993), COPD (Prigatano et al., 1984), cardiac patients (Salyer et al., 2001; Yates et al., 2003), and coronary artery disease (Jeng & Braun, 1997; O'Callaghan et al., 1984) also showed the majority of subjects were male. Additionally, the findings are similar to those of studies of persons with other chronic conditions by Crane and McSweeney (2003), Fowler (1997), Frank-Stromborg et al. (1990), Gerard (1993), Jeng and Braun (1997), Moore et al. (2003), Oh (1993), Salyer et al. (2001), Simons-Morton et al. (2000), Stuijbergen (1995), Stuijbergen (1999), Stuijbergen and Becker (1994), Stuijbergen and Rogers (1997), and Stuijbergen et al. (2000), who reported the majority of subjects in each study were married. _

In this study, the average number of years since diagnosis was 2.85 (SD = 2.73), with approximately 91.81% of the subjects having experienced living with CRF less than 6 years. However, the longest disease duration reported by the subject was 16 years, indicating that persons with CRF may be living longer. Life expectancy for persons with CRF has been increasing over the past decades due to medical advancement. Perhaps persons with CRF have learned to better manage their health conditions as well as how to properly take care of themselves.

Diabetes mellitus was the most frequent underlying disease in the sample (29.09%), which was similar to the findings of several studies (Carter, 2006; Lucove et al., 2008). The reason for that high frequency might be that the majority of the participants were elderly. As individuals grow older, such individuals are more likely to experience more chronic conditions.

Issues Related to Perceived Severity of Illness, Perceived Barriers to Action, Perceived Self-efficacy, and Social Support

Perceived Severity of Illness

The Global single item indicator of perception of illness was used to assess the sample's perception of severity of illness. Of the 10 points, the mean score of perceived severity of illness in this study was 6.50 (SD = 1.60), indicating that the sample perceived their severity of illness as moderate. CRF is considered an untreatable disease and is notable for its unpredictability. The subjects who were in all stages still needed to receive medical attention, monitor their health, and avoid factors that might trigger the disease become worse. The symptoms vary from person to person. However, the participants in this study may have experienced a radical disruption in their life from their symptoms such as unemployment, decreased income, limitation of activities, and fatigue. In this study most of persons with CRF reported their disease interrupted their career or work (88.18%). These ideas may explain why the participants in this study perceived their severity of illness as moderate.

Similar results were found by Stuijbergen and Rogers (1997), who used the Incapacity Status Scale (ISS) to investigate perceived severity of illness. Results showed that symptoms experiences made it difficult for persons with MS to implement HPB, even when they possessed the necessary knowledge about good health practices. This finding is consistent with results from Gecht et al. (1996) who examined exercise beliefs and exercise habits among people with arthritis and found that only perceived disease severity distinguished exercisers from non-exercisers. Gecht and colleagues also

suggested that people with arthritis who have moderate to severe disease limitations need special encouragement to take advantage of exercise opportunities. This finding also supports Pender's HPM (1996) that individual's perception about their illness or health status affects their engagement in HPB because experiencing a health alteration may induce fear and avoidance resulting in a decrease in the performance of HPB.

Perceived Barriers to Action

Perceived barriers to action were evaluated using the Barriers to Health Promoting Activities for Disabled Persons Scale. The mean score of the sample was 37.51 (SD = 5.34), indicating a moderate level of perceived barriers to action. The findings of this study indicated that the most frequent barriers reported by persons with CRF was lack of money, too tired, lack of transportation, and lack of time. These results are most likely due to the disease that these persons with CRF have which interrupt their career or their work. Similar results were found in the study of Harrison and Stuifbergen (2001) and of Stuifbergen and Becker (1994), who used the same instrument as the present study to investigate perceived barriers. Harrison and Stuifbergen's study of persons with polio reported a mean score of 35.20 (SD = 7.80). This mean score is comparable to that of persons with disabilities which was 33.50 (SD = 8.86). Being too tired and too impaired were also the two barriers most frequently identified by persons with disabilities. However, concern about money, time, and lack of transportation were frequent problems for the sample in this study, but they were not for the persons with disabilities (Stuifbergen & Becker, 1994). These contradictory results may have been caused by geographic locations. The majority of the sample in the current study (91.82%)

had lower income and resided in a rural area which is far from public hospitals located in town, therefore, money, time, and transportation were their concerns that interfered with levels of participation in the HPB.

Perceived Self-efficacy

The Self-Rated Abilities for Health Practice Scale (SRA) was used to determine how the participants in this study perceived their abilities to perform the HPB. A possible score ranged from 28 to 140 with higher scores indicating greater perceived self-efficacy. In the present study, the mean perceived self-efficacy score was 76.26 (SD= 12.53). The persons with CRF in the study were more likely to engage in HPB if they felt confident in their ability to perform those activities. The greater the level of perceived self-efficacy, the more likely HPB will occur.

The mean score of self-efficacy in this study was compared with that of previous studies that had used either the SRA or other instruments to investigate perceived self-efficacy. Burckhardt and colleagues (1994) examined perceived self-efficacy of women with fibromyalgia who participated in an education and physical training program by using ASED. The finding showed that the women in a control group and those in two other groups who received interventions had mean self-efficacy scores ranging from 38.45 to 42.72. Obviously, those women with fibromyalgia had perceived self-efficacy considerably lower than the persons with CRF.

There is a possibility that these different levels of perceived self-efficacy among the populations are due to health conditions. It is possible the persons with CRF in this study had few physical symptoms whereas women with fibromyalgia reported severe

symptoms of muscle pain, fatigue, and stiffness (Burckhardt et al., 1994). Because they were suffering with these symptoms, the women with fibromyalgia may have perceived their abilities to control the symptoms in order to perform HPB as low. This finding is supported by results from a number of studies indicating that greater self-efficacy is associated with better health (Lorig et al., 1989; Mannerkorpi & Ekdahl, 1997).

The study findings further illustrated that among all independent variables, perceived self-efficacy had the strongest relationship with practicing HPB in persons with CRF. When perceived self-efficacy is high, the performance of HPB is likely to occur. “Knowing my rights and stand up for myself effectively” was the component of perceived self-efficacy cited most frequently in this study. These results may have been due to the nature of the sample. The sample was patients aged between 21 to 89 years. Persons of these ages have many responsibilities, both to themselves and to their families, and they may have more tendency to participate in the activities needed to improve their health conditions.

However, it must be noted that there is possible overlap between self-efficacy to engage in HPB and the actual practice of HPB. Theoretically, there should be a high correlation between these variables, but it is also possible that the concept of being able to perform was confused by the participants with actual performance.

Social Support

Social support was evaluated using The Personal Resource Questionnaire Part II (PRQ-85 Part II). A possible total score ranged from 25 to 175. The mean score of the sample was 102.33 (SD = 12.58), indicating a high level of social support.

According to data, all subjects had lived in suburban provinces. In suburban provinces, communication and local transportation were convenient, which might lead to the likelihood of persons with CRF maintaining consistent contact with their family, parents, and friends who might provide support and advice. This explanation is also consistent with the studies of other chronic illnesses, indicating that participants were more likely to engage in HPB if they had support from support networks (Ades et al., 1992; Anderson-Loftin, 2000; Becker & Stuifbergen, 2004; Berkman et al., 1992; Chen, 2003; Connell et al., 1991; Crane & McSweeney, 2003; Lee et al., 2002; Lloyd et al., 1993; Nagasawa et al., 1990; Stuifbergen, 1995; Stuifbergen & Rogers, 1997; Stuifbergen et al., 2000; Willoughby et al., 2000; Xiaolian et al., 2002). Thus, it is not surprising that, in this study, social support significantly correlated with HPB.

Findings of Health Promoting Behaviors

The study findings indicated that Thai persons with CRF reported a moderate level of HPB. The mean HPB overall summary score in the sample was 55.35 ($SD = 15.43$). Interpersonal relations had the highest score, and the physical activity was the lowest.

Scores indicated that getting exercise during usual-daily activities, engaging in stretching exercises at least 3 times per week, and taking part in light to moderate physical activity were the most frequently performed physical activities. The least practiced activities were reaching a target heart rate during exercise, checking the pulse, and engaging exercise vigorously for 20 or more minutes at least three times a week. It is not surprising that the sample in this current study scored lowest in the physical activity

subscale. Common symptoms of CRF such as fatigue and weakness may have caused the participants difficulty in participating in physical activities. Moreover, being too tired and having a lack of convenient facilities would be barriers that would affect engaging in physical activity. In addition, the participants may not have been familiar with some activities in the HPLP II, such as checking pulse rate during exercise. Several participants, however, stated that the reason they did not engage in physical activity was that they were exercise intolerant. Therefore, appropriate interventions to enhance physical activity have to be considered when persons with CRF are being encouraged to engage in physical activity.

These findings are congruent with those of previous studies in other chronically populations reported in the literature. The overall HPB mean score of the sample was similar to that reported for persons with disabilities (Stuifbergen & Becker, 1994), Parkinson's disease (Fowler, 1997), women with MS (Stuifbergen & Roberts, 1997), and ambulatory cancer (Frank-Stromborg et al., 1990). When six dimensions were considered, the previous studies of HPB in persons with MS, Parkinson's disease, ambulatory cancer revealed the highest means in interpersonal relations. Similarly these previous studies reported that their sample performed the HPB of physical activity least frequently. This finding should be of great concern to health care professionals. The persons with CRF were more likely to need assistance to increase their health practices to enhance their optimal health and well-being. Thus, it is challenging and important for nurses to keep in mind about the importance of types and levels of physical activity that reflect the interests and life stages of elderly persons with CRF to enhance their long-term

health. In addition, further research is needed to develop physical activity programs for older adults with chronic conditions that are appropriate, accessible, and affordable.

The persons with CRF sustained interpersonal relations at a high level. In Thai culture, Thai people tend to avoid any personal conflict that might be caused by interactions with others. As a result, it may be easy for the sample to maintain good relationships with other people. In addition, a possible explanation may be that, the majority of the subjects in the study were married. According to the data, 72.73% of subjects were married; therefore, they may have had a network of support from their family. Additionally, Thai older people, especially who were chronically ill and lived with families members tended to have less proactive HPB. The Thai family members usually support older people by asking them to be physically inactive while providing more social support. This may due to older persons as well as family members own values and attitudes toward aging and illness. Thus, it is not surprising that why the sample reported higher social support than engaging in physical activity.

Another possible explanation is that spouses of married participants may have helped them to perform various activities, such as preparing a meal, reminding participants about time of taking medications, and so on which may influence initiation and maintenance of social relationships. Additionally, most of subjects might not be able to perform their regular work because of their health conditions. Of the sample, 13.64% were unemployed and stayed home and 80% were homemaker. Most of them stayed home, did household work as well as took care of their children and other family

members. It is likely that these participants had more time to spend with people close to them which may have enhanced their interpersonal relations.

Discussion Related to Research Questions

Research Question 1. *What are the relationships among demographic factors (age, gender, education, and income), perceived severity of illness, perceived barriers to action, perceived self-efficacy, and interpersonal influences (social support) and health-promoting behaviors in persons with CRF?*

Demographic Factors and HPB

Analyses revealed that age and education were significantly correlated with HPB. Persons with CRF who were younger reported higher HPB, which is consistent with the majority of previous studies in which younger participants reported better HPB than elderly people (Coonrod et al., 1994; Hays & Clark, 1999; Wensing et al., 2001; Yates et al., 2003). This finding supports the common perception in Thai society that people who are older are more likely to have lower HPB. In the current study, participants were more likely older, poorly educated, unemployed, and low income. Researchers found that low social status (low educational level, low income, and unemployment) could hinder older participants from taking part in HPB, such as self-care activities and acquisition of medical information (Ades et al., 1992; Fiedler et al., 2002), and they therefore reported lower HPB. This finding also supports Pender's HPM (1996). According to the model, age can impact thoughts, feelings, and behaviors promoting good health. However, this finding is different from the findings of Anderson et al. (1995), Becker and Stuijbergen

(2004), Frank-Stromborg et al. (1990), and Moylan and Joyce (1993), which indicated that participants who were older were more likely to have higher HPB.

In addition, in this study, there was a small significant relationship between education level and HPB. As expected, Thai persons with CRF who had higher education tended to have better HPB than those who had low education. This finding is not surprising and confirms what others have found in numerous studies conducted in other chronic illness which indicated that higher education was found to be associated with more frequent performance of HPB (Alinger & Dear, 1993; Becker & Stuijbergen, 2004; Hays & Clark, 1999; Frank-Stromborg et al., 1990; Kurtz, 1996; Muntner et al., 2001; Prigatano et al., 1984; Sriyuktasuth, 2002). In addition, this finding is consistent with previous studies conducted by Frank-Stromborg et al. (1990), Alinger & Dear (1993), and Muntner et al. (2001) which indicated that educational level was a significant determinant of HPB. The possible reasons for the significant relationship between education and HPB might be that participants with higher education have less difficulty in receiving medical information, have more skills than those with less years of education to seek useful health information, to understand that information, and to utilize facilities promoting health. Accordingly, they have better resources and greater ability to adjust their lifestyle and they can employ better critical thinking in making decision about their treatments. Additionally, those participants who identified a higher educational level may read more often about the benefits of appropriate health activities and understand the implications of frequent or routine practice of the HPB than those with less education.

Contrary to expectations, gender and income, however, did not significantly correlate with HPB of this current study. These findings contrast with findings from the majority of the literature that addresses other chronic illness. A possible explanation of a lack of relationship between income and HPB could be the fact that this study was conducted at Burirum and Surin hospital which are run by the Thai government. All such care is provided for a low cost regardless of the patient's socioeconomic status. Thus, it would be reasonable to assume that participants' income did not significantly affect their HPB. Furthermore, it should be noted that the extremely skewed income variable, which may attenuate correlations with other variables.

Perceived Severity of Illness, Perceived Barriers to Action, Perceived Self-efficacy, Social Support and HPB

Correlational findings indicated that more frequent performance of HPB was associated with higher perceived self-efficacy, higher social support, lower perceived severity of illness, and lower perceived barriers to action.

In the current study, the persons with CRF who had greater perceived self-efficacy were more likely to practice the HPB. Self-efficacy beliefs affect behavioral setting, efforts to perform behavior and overcome obstacles, the length of time to continue behavior, and one's emotional reaction to performing behavior (Bandura, 1977). Therefore, persons with high self-efficacy are likely to select appropriate health activities that lead to their optimal health and well-being, initiate and maintain those activities, and have great commitment to pursue anticipated outcomes. These findings are similar to those of Becker et al. (1989) who also found that a high self-efficacy score was a

significant predictor of engaging in HPB in disabled adults, and of Stuijbergen and Becker (1994), who found that adults with disabilities were more likely to engage in HPB if they had higher scores on general and specific self-efficacy. Furthermore, these findings are also consistent with those of previous studies. Stuijbergen et al. (2000) reported that among persons with MS, participants were more likely to take health-enhancing actions if they had higher levels of self-efficacy. Jeng and Braun (1997) also concluded that perceived higher of self-efficacy after 12-week exercise training program positively correlated with improvement of fatigue and quality of life among coronary artery disease patients. Moreover, these results are consistent with those found in a study of HPB and other chronic illnesses (Stuijbergen, 1995; Lee et al., 2002; Gecht et al., 1996; Williams & Bond, 2002; Jeng et al., 2002; Robertson & Keller, 1992). In those studies, findings showed that self-efficacy had a significant, direct effect on HPB. In the present study, it is possible that the persons experiencing CRF and having high level of self-efficacy may have more tendency to engage in the activities needed to enhance their health conditions, which may explain why the persons with CRF who had greater perceived self-efficacy were more likely to practice the HPB.

The other variable in the category of behavior-specific cognitions and affect having a significant contribution to HPB was social support. In this study the persons with CRF who had more social support were more likely to engage in HPB. The findings of this study is also consistent with that of Chen (2003) which reported that support from spouses, neighbors, and friends was strongly associated with engagement in HPB. Furthermore, this finding is also consistent with those of previous studies. Becker and

Stuifbergen (2004) found that nurses and other health care providers play a key role in providing the information and support needed by many persons with disabilities to overcome the barriers to health-promoting behaviors. Lee et al. (2002) also concluded that that social support influenced a patient's plan of action and had an indirect effect on HPB. Moreover, Stuifbergen (1995) indicated that perceived social support was significantly correlated with increases in HPB among persons with MS. Stuifbergen and Rogers (1997) found that family members, particularly spouses and friends, were key sources of both emotional and instrumental support for persons with chronic disabling conditions. Stuifbergen et al. (2000) indicated that social support had significant as well as indirect effects on HPB through self-efficacy and acceptance. In addition, the finding is similar with studies (Anderson-Loftin, 2000; Connell et al., 1991; Xiaolian et al., 2002) indicating that social support was highly predictive of self-care and self-management in older adults with diabetes, in patients with type 2 DM and in persons with COPD. On the contrary, the finding is not consistent with that of Pierce (2005), who found social support was not a significant predictor of HPB in rural women with heart failure.

Perceived barriers to action were significantly correlated with HPB, a finding that is similar with those of previous studies (Stuifbergen, 1999; Yates et al., 2003). Similarly, Stuifbergen and Becker (1994) found that perceived barriers to action was associated with HPB, although perceived barriers to action was not a predictor of HPB in their study when other related predictors entered the equation. The finding, however, was somewhat different from other studies showing that perceived barriers were not significant predictors of HPB among persons with arthritis and rural women with heart failure

(Gecht et al., 1996; Pierce, 2005). Interestingly, four barriers to action (lack of money, too tired, lack of transportation, and lack of time) were the most frequently reported by the sample. These findings were similar to those reported by previous studies (Neuberger et al., 1994; Chen, 2003; Crane & McSweeney, 2003; Johnson & Heller, 1998; Harrison & Stuijbergen, 2001; Stuijbergen, 1999; Stuijbergen & Rogers, 1997) which found fatigue, impairment, lack of energy, time, financial support, support from family, and conflicts with other responsibilities were all barriers to engaging in HPB.

From the analyses of perceived severity of illness, the result showed that participants with lower levels of perceived severity of illness reported better HPB. This finding is also consistent with previous studies. Stuijbergen et al. (2000) found that the perceived severity of illness can affect HPB and the effects of the severity of illness on quality of life were mediated partially by HPB. Stuijbergen and Rogers (1997) also concluded that women with MS who have more severe symptoms have more difficulty incorporating physical activity into their lives. Moreover, Gecht et al. (2005) found that persons with arthritis who had severe disease need special encouragement to take advantage of exercise opportunities.

Research Question 2. *What are the predictors of health-promoting behaviors among persons with CRF?*

The stepwise multiple regression analyses showed perceived self-efficacy, and social support to be the significant variables predicting HPB in Thai persons with CRF. The most powerful variable was in the behavior-specific cognitions and affect component: perceived self-efficacy. This finding confirms Pender's (2002) idea that

variables in the behavior-specific cognitions and affect category are considered major factors influencing the performance of HPB. Participants who had higher perceived self-efficacy and social support engaged more in HPB, which was consistent with the previous research. Study findings indicated that perceived self-efficacy and social support are important predictors of HPB in persons with CRF. This suggests that nursing assessment of persons with CRF should include these cognitive appraisals to evaluate and screen for the performance of HPB in this population. Understanding the factors that influence individual's perception of self-efficacy and social support is essential for planning and incorporating HPB in their lifestyles. A better understanding of factors influencing their HPBs may lead to more effective health promotion programs aimed at maximizing the health potential of Thai persons with CRF. Such nursing interventions may include educational programs and supportive groups that would help persons with CRF develop the behaviors shown to enhance well-being and quality of life.

Issues Related to Conceptual Model

HPB is a key to maintaining and improving people's health. Pender's HPM is a helpful nursing model to enhance understanding of human behaviors because the model incorporates internal and external factors that influence human behaviors. The findings of this study supported Pender's HPM that individual characteristics and experiences and behavior-specific cognitions and affect are related to explain HPB among persons with CRF. The study findings supported some aspects of the model. For example, the data showed that demographic characteristics, including age, education, and perceived severity of illness, perceived barriers to action, perceived self-efficacy, and social support

were correlates of HPB. On the other hand, the data did not support relationships between gender and income and HPB, and further research is required to clarify those associations. Among these variables, perceived self-efficacy and social support presented the strongest association with HPB.

Implications and Recommendations

This research study has several implications for nursing practice, nursing education, and for future research. Each of these will be described below.

Nursing Practice

1. From the research findings, perceived severity of illness, perceived barriers to action, perceived self-efficacy, and social support played an important role in HPB. Assessing patients' perceptions of these variables is important as a part of CRF care and teaching. CRF is a long-term illness, often associated with certain functional difficulties and characterized by life-threatening exacerbations that result in multiple problems for patients and their families.
2. Nurses should use a holistic perspective to help patients understand and manage the impact of CRF on their daily lives. Effective interventions for improving HPB should be designed based on patients' needs.
3. Nurses and other healthcare providers should pay particular attention to the needs of illiterate or nearly illiterate patients. The study findings supported the position that healthcare providers need to direct more educational efforts toward health promotion and maintenance within the illiterate or poorly educated population.

4. Many of the participants in this study lacked physical activity in their lives. Sometimes the inactivity was in response to family member request to restrict activities to prevent the recurrence of symptoms. Nurses should provide safely designed exercise plans and should communicate with family members about the importance of physical activity to promote patients' safety in engaging physical activity.

5. Nurses should consider the importance of self-efficacy and social support in HPB. Thus, effective interventions to enhance perceived self-efficacy and social support should be designed to promote HPB. Nursing interventions should emphasize the importance of HPB among persons with CRF. Enhanced teaching and strengthening the delivery of health knowledge pertinent to perceived self-efficacy and social support could enrich the HPB for persons with CRF. Nurses and other health care professionals can encourage and assist persons with CRF to practice healthy behaviors, giving emphasis of the impact and control they have upon their own health. The finding related to the importance of social support suggests nurses and other health care providers, as well as family members, peers and friends can influence positive health behavior. Those persons who are considered influential need teaching in reinforcement strategies, allowing them to provide support and encouragement to those (persons with CRF) in need of commitment to the practice of HPB.

6. The results of the study suggest that counseling and health promotion programs may be tailored to suit persons with CRF. The present study may also have implications for preventive interventions such as educational workshops and counseling for individuals

who are at risk for developing health problems or those simply desiring more information about health and wellness.

Nursing Education

HPB is an important concept that should be included in nursing education to prepare future nurses to address the importance of HPB and the factors that influence HPB of people with chronic conditions, such as CRF. In addition, nursing students need to know how to assess HPB and factors influencing HPB and how to promote HPB in persons with CRF.

Nursing Research

1. CRF is a chronic disease that requires long-term treatment and can result in changes in HPB over time, thus findings from this cross-sectional correlational study could serve as a baseline for further longitudinal studies of HPB and factors that influence HPB in Thai persons with CRF. The use of longitudinal study designs would be helpful in identifying predictors of HPB over time and ascertaining relationships among factors influencing HPB.

2. The study examined the relationships between age, gender, education, income, perceived severity of illness, perceived barriers to action, perceived self-efficacy, social support and HPB in people with CRF. Future research should include replicating this study by increasing sample size, developing new instruments based on the Thai culture, and comparing HPB in persons with CRF with other cultures.

3. Interventions are needed to promote HPB among persons with CRF. Researchers should consider using the significant variables from this study to guide their future

interventions development to promote HPB for Thai persons with CRF. For instance, researchers may develop an intervention which promotes physical activity, perceived self-efficacy, and social support for Thai persons with CRF. Additionally, researchers may also develop an intervention which decreases perceived barriers to HPB.

4. Future qualitative research studies are needed to explore patients' subjective perception about HPB and factors influencing HPB in persons with CRF.

5. Factors influencing HPB in this population should be further clarified. Furthermore, increased use of objective measures of some of the variables such as physical activity would help to explore the extent to which CRF patients engage in HPB.

6. Studies that test the effects of specific interventions for enhanced perceived self-efficacy and social support and HPB are highly recommended. Persons with CRF may improve their condition if they can improve HPB.

Limitations of the study

The study was limited by the particular sample characteristics. All participants were primarily Thai male and females, from one geographical region that limits the generalizability of the results. In addition, voluntary participation limits generalizability. Some instrument items regarding physical activity in particular did not appear to concur with the routine exercise-related behaviors commonly practiced by the older persons in this study. Statements related to vigorous exercise, sustained for 20 or more minutes, such as aerobic dancing, using a stair climber, or bicycling might not be appropriate to effectively assess physical activity behaviors of the elderly, particularly those in this study.

Maturation may have occurred during the course of the study, relating to mental fatigue during the completion of questionnaires, that may have resulted in inconsistent answers. Some participants stated they exerted more concentration than anticipated to answer the questions. The study participants completed questionnaires during a customary social time of day, which could have interfered with many respondents' concentration.

Attempts were made by the investigator to control internal and external threats to validity. The study was conducted in a quiet room, with tables to accommodate answering, writing and the completion of questionnaires. The instruments were enlarged to accommodate easier reading of the printed questions.

These findings also bring attention to the instruments used in the study. Most of the instruments used in this study were developed in the western culture. Although the researcher used a translation procedure which is accepted as the suitable method, the differences between eastern and western culture still exist and thus, there may be some cultural bias in the instrumentation.

Summary

This chapter has presented a summary and discussion of the study findings. Additionally, the chapter included the implications and recommendations in three areas: nursing practice, nursing education, and nursing research. Overall, the study has added to the knowledge of HPB and factors influencing HPB in Thai persons with CRF. In particular, the study findings supported the existence of relationships between age, education, perceived severity of illness, perceived barriers to action, perceived self-

efficacy, social support and HPB in Thai persons with CRF. From those findings, interventions may be designed to help improve HPB for this population.

Appendix A
Consent Form

CONSENT FORM

IRB APPROVED ON:

EXPIRES ON:

Title: Health-promoting behavior in Thai persons with Chronic Renal Failure (CRF)

Conducted By: Sarinya Polsingchan
The University of Texas at Austin: School of Nursing
Email address: king_srn@mail.utexas.edu

IRB PROTOCOL #
Telephone: 044-612-304

Sponsor: Gayle Acton, PhD, RN, CS, Associate Professor,
Telephone: 512-475-7334 Email address: gayle.action@mail.utexas.edu

You are being asked to participate in a research study. This form provides you with information about the study. Please read the information below and ask any questions you might have before deciding whether or not to take part. Your participation is entirely voluntary. You can refuse to participate without penalty or loss of benefits to which you are otherwise entitled. You can stop your participation at any time and your refusal will not impact current or future relationships with UT Austin or participating sites. To do so simply tell the researcher you wish to stop participation.

The purpose of this study is to understand health-promoting behavior and factors influence health-promoting behavior in Thai persons with CRF.

If you decide to participate, I will invite you to fill out a set of questionnaires, which include personal information, such as age, gender, marital status, education level, income and satisfaction of income. At your convenience, you can answer the questionnaires in the clinic or at your home. If you choose to do it at home, a stamped pre-addressed envelope will be given to you to mail it back.

Total estimated time to participate in the study will take approximately 30-60 minutes.

Risks: The risk associated with this study is no greater than everyday life. There are no known discomforts, physical or psychological distress for participating in this study. You are free to stop or postpone the participation if you experience a temporary increase in discomforts such as fatigue. You can also withdraw voluntarily from the study at any time. Participating in or not participating in the study will not disrupt your health care.

Benefits: There are no benefits for participation in this study. However, you may gain some awareness about your chronic renal failure and its influence on your health-promoting behavior after participating in the study. You may also benefit from thinking about ways to take care of your health. In addition, the information you provide may be helpful in the future to other Thai CRF patients because it will help health care

professionals better understand ways persons with CRF take care of their health.

Compensation: No compensation will be given for participation in this study.

Confidentiality and Privacy Protections: The data will be identified on the questionnaires and entered into the research database using code numbers instead of names to protect confidentiality. All of questionnaires and codebook will be stored in a locked cabinet in the principal investigator's home. Data will be kept locked at all times when not in use. In every stage of the study, all individual information will remain confidential and no personal healthcare information will be disclosed. The list of participants' contact information will be stored in a locked pen drive and only the researcher will have access to the pen drive and the file. Authorized persons from The University of Texas at Austin and members of the Institutional Review Board have the legal right to review your research records and will protect the confidentiality of those records to the extent permitted by law. Any publications or presentation will exclude any information that will make it possible to identify you as a subject. Any identifying information, data, questionnaires and codebook will be destroyed after the study is published.

Contacts and Questions:

If you have any questions about the study please ask me. If you have questions later, want additional information, or wish to withdraw your participation call the researchers conducting the study. Our phone numbers and e-mail addresses are at the top of this page. If you have questions about your rights as a research participant please contact Lisa Leiden, PhD, Chair, The University of Texas at Austin Institutional Review Board for the Protection of Human Subjects at +1-512-232-4383.

Statement of Consent:

I have read the above information and have sufficient information to make a decision about participating in this study. I consent to participate in the study.

Signature: _____ Date: _____

Signature of Person Obtaining Consent Date: _____

Signature of Investigator: _____ Date: _____

Appendix B
Questionnaires—English

Demographic Data

Please fill in the blank or check the item in each category. Thanks.

1. Age: _____ . (in years)

2. Gender:

Male Female

3. Education:

Doctorate Master's degree or above Baccalaureate degree

Senior high school Junior high school

Elementary school No schooling

4. Marital Status:

Single Married Divorced Widowed

5. Average personal income for each month:

4,999 bahts or below 5,000 - 9,999 bahts

10,000 - 19,999 bahts 20,000 - 29,999 bahts

30,000 bahts or above

6. Do you feel that your incomes are adequate to meet your needs?

Yes No

7. During the last 30 days, were you

Working full-time

Working part-time

Homemaker

Unemployed, laid off, or looking for work

- Retired
- Not working because of disability
- None of above (Please specify.....)

8. Does your kidney disease interrupt your career/work?

- Yes No

9. How long have you been diagnosed CRF? _____

10. Do you have any other chronic medical problems in addition to your CRF?
(Check all that apply):

- Asthma Arthritis Heart disease Cancer
- Diabetes mellitus Hypertension Lung disease
- Others (Please specify.....)

LIFESTYLE PROFILE II

DIRECTIONS: This questionnaire contains statements about your *present* way of life or personal habits. Please respond to each item as accurately as possible, and try not to skip any item. Indicate the frequency with which you engage in each behavior by circling:

N for never, S for sometimes, O for often, or R for routinely

- | | |
|--|---------|
| 1. Discuss my problems and concerns with people close to me. | N S O R |
| 2. Choose a diet low in fat, saturated fat, and cholesterol. | N S O R |
| 3. Report any unusual signs or symptoms to a physician or other health professional. | N S O R |
| 4. Follow a planned exercise program. | N S O R |
| 5. Get enough sleep. | N S O R |
| 6. Feel I am growing and changing in positive ways. | N S O R |
| 7. Praise other people easily for their achievements. | N S O R |
| 8. Limit use of sugars and food containing sugar (sweets). | N S O R |
| 9. Read or watch TV programs about improving health. | N S O R |
| 10. Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber). | N S O R |
| 11. Take some time for relaxation each day. | N S O R |
| 12. Believe that my life has purpose. | N S O R |
| 13. Maintain meaningful and fulfilling relationships with others. | N S O R |
| 14. Eat 6-11 servings of bread, cereal, rice and pasta each day. | N S O R |
| 15. Question health professionals in order to understand their instructions. | N S O R |
| 16. Take part in light to moderate physical activity (such as sustained walking 30-40 minutes 5 or more times a week). | N S O R |
| 17. Accept those things in my life which I can not change. | N S O R |
| 18. Look forward to the future. | N S O R |
| 19. Spend time with close friends. | N S O R |
| 20. Eat 2-4 servings of fruit each day. | N S O R |
| 21. Get a second opinion when I question my health care provider's advice. | N S O R |
| 22. Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling). | N S O R |
| 23. Concentrate on pleasant thoughts at bedtime. | N S O R |
| 24. Feel content and at peace with myself. | N S O R |
| 25. Find it easy to show concern, love and warmth to others. | N S O |
| 26. Eat 3-5 servings of vegetables each day. | N S O R |
| 27. Discuss my health concerns with health professionals. | N S O R |
| 28. Do stretching exercises at least 3 times per week. | N S O R |
| 29. Use specific methods to control my stress. | N S O R |
| 30. Work toward long-term goals in my life. | N S O R |
| 31. Touch and am touched by people I care about. | N S O R |

32. Eat 2-3 servings of milk, yogurt or cheese each day.	N	S	O	R
33. Inspect my body at least monthly for physical changes/danger signs.	N	S	O	R
34. Get exercise during usual-daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walking).	N	S	O	R
35. Balance time between work and play.	N	S	O	R
36. Find each day interesting and challenging.	N	S	O	R
37. Find ways to meet my needs for intimacy.	N	S	O	R
38. Eat only 2-3 servings from the meat, poultry, fish, dried beans, eggs, and nuts group each day.	N	S	O	R
39. Ask for information from health professionals about how to take good care of myself.	N	S	O	R
40. Check my pulse rate when exercising.	N	S	O	R
41. Practice relaxation or meditation for 15-20 minutes daily.	N	S	O	R
42. Am aware of what is important to me in life.	N	S	O	R
43. Get support from a network of caring people.	N	S	O	R
44. Read labels to identify nutrients, fats, and sodium content in packaged food.	N	S	O	R
45. Attend educational programs on personal health care.	N	S	O	R
46. Reach my target heart rate when exercising.	N	S	O	R
47. Pace myself to prevent tiredness.	N	S	O	R
48. Feel connected with some force greater than myself.	N	S	O	R
49. Settle conflicts with others through discussion and compromise.	N	S	O	R
50. Eat breakfast.	N	S	O	R
51. Seek guidance or counseling when necessary.	N	S	O	R
52. Expose myself to new experiences and challenges.	N	S	O	R

BARRIERS SCALE

People sometimes have problems doing what they want to do to stay healthy. Please circle the number which best indicates how much each of these problems keeps you from taking care of your health.

1 = Never 2 = Sometimes 3 = Often 4 = Routinely

- | | | | | |
|--|---|---|---|---|
| 1. Lack of convenient facilities..... | 1 | 2 | 3 | 4 |
| 2. Too tired..... | 1 | 2 | 3 | 4 |
| 3. Lack of transportation..... | 1 | 2 | 3 | 4 |
| 4. Feeling what I do doesn't help..... | 1 | 2 | 3 | 4 |
| 5. Lack of money..... | 1 | 2 | 3 | 4 |
| 6. No one to help me..... | 1 | 2 | 3 | 4 |
| 7. Not interested..... | 1 | 2 | 3 | 4 |
| 8. Lack of information about what to do..... | 1 | 2 | 3 | 4 |
| 9. Embarrassment about my appearance..... | 1 | 2 | 3 | 4 |
| 10. Concern about safety..... | 1 | 2 | 3 | 4 |
| 11. Lack of support from family/friends..... | 1 | 2 | 3 | 4 |
| 12. Interferes with other responsibilities..... | 1 | 2 | 3 | 4 |
| 13. Lack of time..... | 1 | 2 | 3 | 4 |
| 14. Feeling I can't do things correctly..... | 1 | 2 | 3 | 4 |
| 15. Difficulty with communication..... | 1 | 2 | 3 | 4 |
| 16. Bad weather..... | 1 | 2 | 3 | 4 |
| 17. Lack of help from health care professionals..... | 1 | 2 | 3 | 4 |

SELF-RATED ABILITIES FOR HEALTH PRACTICES SCALE

The previous items asked how often you do different health practices. The following statements ask whether you are able to perform various health practices within the context of your lifestyle and any disabilities. This includes any assistance you have available to you (for example, an attendant to help with stretching exercises). Read each statement and use the following scale to indicate **how well you are able to do each of the health practices, not how often you actually do it.**

- 0 = Not at all**
- 1 = A little**
- 2 = Somewhat**
- 3 = Mostly**
- 4 = Completely**

I AM ABLE TO:

1. Find healthy foods that are within my budget	0	1	2	3	4
2. Eat a balanced diet	0	1	2	3	4
3. Figure out how much I should weigh to be healthy	0	1	2	3	4
4. Brush my teeth regularly	0	1	2	3	4
5. Tell which foods are high in fiber content	0	1	2	3	4
6. Figure out from labels what foods are good for me	0	1	2	3	4
7. Drink as much water as I need to drink every day	0	1	2	3	4
8. Figure out things I can do to help me relax	0	1	2	3	4
9. Keep myself from feeling lonely	0	1	2	3	4
10. Do things that make me feel good about myself.....	0	1	2	3	4
11. Avoid being bored.....	0	1	2	3	4
12. Talk to friends and family about the things that are bothering me	0	1	2	3	4

0 = Not at all
1 = A little
2 = Somewhat
3 = Mostly
4 = Completely

I AM ABLE TO:

13.	Figure out how I respond to stress	0	1	2	3	4
14.	Change things in my life to reduce my stress	0	1	2	3	4
15.	Do exercises that are good for me.....	0	1	2	3	4
16.	Fit exercise into my regular routine	0	1	2	3	4
17.	Find ways to exercise that I enjoy.....	0	1	2	3	4
18.	Find accessible places for me to exercise in the community	0	1	2	3	4
19.	Know when to quit exercising	0	1	2	3	4
20.	Do stretching exercises	0	1	2	3	4
21.	Keep from getting hurt when I exercise.....	0	1	2	3	4
22.	Figure out where to get information on how to take care of my health.....	0	1	2	3	4
23.	Watch for negative changes in my body's condition (pressure sores, breathing problems)	0	1	2	3	4
24.	Recognize what symptoms should be reported to a doctor or nurse	0	1	2	3	4
25.	Use medication correctly	0	1	2	3	4
26.	Find a doctor or nurse who gives me good advice about how to stay healthy	0	1	2	3	4
27.	Know my rights and stand up for myself effectively	0	1	2	3	4
28.	Get help from others when I need it	0	1	2	3	4

Personal Resource Questionnaire (PRQ-85)

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1987

Instructions:

Below are some statements with which some people agree and others disagree. Please read each statement and circle the response most appropriate for you. There is no right or wrong answer.

- 7 Strongly agree
- 6 Agree
- 5 Somewhat agree
- 4 Neutral
- 3 Somewhat disagree
- 2 Disagree
- 1 Strongly Disagree

-
- | | | | | | | | | |
|----|---|---|---|---|---|---|---|---|
| 1. | There is someone I feel close to who makes me feel secure | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 2. | I belong to a group which I feel important | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 3. | People let me know that I do well at my work (job, homemaking) | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 4. | I can't count on my relatives and friends to help me with problems | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 5. | I have enough contact with the person who makes me feel special | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 6. | I spend time with others who have the same interest that I do | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 7. | There is little opportunity in my life to be giving and caring to another person | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 8. | Others let me know that they enjoy working with me (job, committees, projects) | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 9. | There are people who are available if I need help over an extended period of time | 7 | 6 | 5 | 4 | 3 | 2 | 1 |

	7	6	5	4	3	2	1	
	Strongly agree							
	Agree							
	Somewhat agree							
	Neutral							
	Somewhat disagree							
	Disagree							
	Strongly Disagree							
10.	There is no one to talk to about how I am feeling	7	6	5	4	3	2	1
11.	Among my group of friends we do favors for each other	7	6	5	4	3	2	1
12.	I have the opportunity to encourage others to develop their interests and skills	7	6	5	4	3	2	1
13.	My family lets me know that I am important for keeping the family running	7	6	5	4	3	2	1
14.	I have relatives or friends that will help me out even if I can't pay them back	7	6	5	4	3	2	1
15.	When I am upset, there is someone I can be with who lets me be myself	7	6	5	4	3	2	1
16.	I feel no one has the same problems as I	7	6	5	4	3	2	1
17.	I enjoy doing little "extra" things that make another person's life more pleasant	7	6	5	4	3	2	1
18.	I know that others appreciate me as a person	7	6	5	4	3	2	1
19.	There is someone who loves and cares about me	7	6	5	4	3	2	1
20.	I have people to share social events and fun activities with	7	6	5	4	3	2	1
21.	I am responsible for helping provide for another person's needs	7	6	5	4	3	2	1
22.	If I need advice there is someone who would assist me to work out a plan for dealing with the situation	7	6	5	4	3	2	1
23.	I have a sense of being needed by another person	7	6	5	4	3	2	1

- 7 Strongly agree
- 6 Agree
- 5 Somewhat agree
- 4 Neutral
- 3 Somewhat disagree
- 2 Disagree
- 1 Strongly Disagree

- | | | | | | | | | |
|-----|--|---|---|---|---|---|---|---|
| 24. | People think that I'm not as good a friend as I should be | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 25. | If I got sick there is someone to give me advice about caring for myself | 7 | 6 | 5 | 4 | 3 | 2 | 1 |

References

- Ades, P. A., Waldmann, M. L., McCann, W. J., & Weaver, S. O. (1992). Predictors of cardiac rehabilitation participation in older coronary patient. *Archives of Internal Medicine*, *152*, 1033-1035.
- Ades, P. A., Waldmann, M. L., Polk, D. M., & Coflesky, J. T. (1992). Referral patterns and exercise response in the rehabilitation of female coronary patients aged > 62 years. *American Journal of Cardiology*, *69*, 1422-1425.
- Agodoa, L., Norris, K., & Pugsley, D. (2005). The disproportionate burden of kidney disease in those who can least afford it. *Kidney International*, *68*(97), S1-S3.
- Alinger, R. L., & Dear, M. R. (1993). Self-care agency in persons with rheumatoid arthritis. *Arthritis Care and Research*, *6*, 134-140.
- Anderson, J. M., Wiggins, S., Rajwani, A., Holbrook, C., Blue, C., & Ng, M. (1995). Living with a chronic illness: Chinese-Canadian and Euro-Canadian women with diabetes—exploring factors that influence management. *Social Science & Medicine*, *41*(2), 181-195.
- Anderson-Loftin, W. (2000). Long-term disease management needs of southern African Americans with diabetes. *The Diabetes Educator*, *26*(5), 821-832.
- Anderson, S., & Brenner, B. M. (1986). Effects of aging on the renal glomerulus. *American Journal of Medicine*, *80*(3), 435-442.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

- Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. New York: W. H. Freeman & Company.
- Becker, H. A., & Stuifbergen, A. K. (2004). What makes it so hard? Barriers to health promotion experienced by people with multiple sclerosis and polio. *Family & Community Health, 27*(1), 75-85.
- Becker, H. A., Stuifbergen, A. K., Ingalsbe, K., & Sands, D. (1989). Health promoting attitudes and behaviors among persons with disabilities. *International Journal of Rehabilitation Research, 12*, 235-250.
- Becker, H. A., Stuifbergen, A. K., Oh, H. S., & Hall, S. (1993). Self-rated abilities for health practices: A health self-efficacy measure. *Health Values, 17*(5), 42-50.
- Becker, H. A., Stuifbergen, A. K., & Sands, D. (1991). Development of a scale to measure barriers to health promotion activities among persons with disabilities. *American Journal of Health Promotion, 5*(6), 449-454.
- Berkman, L. F., Leo-Summers, L., & Horwitz, R. I. (1992). Emotional support and survival after myocardial infarction: A prospective, population-based study of the elderly. *Annals of Internal Medicine, 117*, 1003-1009.
- Blair, S. N., Kohl, H., Paffenbarger, R. S., Clark, D. G., Cooper, K. H., & Gibbons, L. W. (1989). Physical fitness and all-cause mortality: A prospective study of healthy men and women. *The Journal of the American Medical Association, 262*(17), 2395-2401.

- Bolton, W. K., & Kligler, A. S. (2000). Chronic renal insufficiency: current understandings and their implications. *American Journal of Kidney Disease*, 36, S4-S12.
- Bohle, A., Wehrmann, M., Bogenschütz, O., Batz, C., Müller, C. A., & Müller, G. A. (1991). The pathogenesis of chronic renal failure in diabetic nephropathy: Investigation of 488 cases of diabetic glomerulosclerosis. *Pathology- Research and Practice*, 187, 251-259.
- Boogaard, M. A. K. (1984). Rehabilitation of the female patient after myocardial infarction. *Nursing Clinics of North America*, 19(3), 433-440.
- Brandt, P., & Weinert, C. (1981). The PRQ-A social support measure. *Nursing Research*, 30, 277-280.
- Brink, P. J., & Wood, M. J. (1994). *Basic steps in planning nursing research: From question to proposal* (4th Ed.). Boston: Jones and Bartlett.
- Burckhardt, C. S., Mannerkorpi, K., Hedenberg, L., & Bjelle, A. (1994). A randomized controlled clinical trial of education and physical training for women with fibromyalgia. *The Journal of Rheumatology*, 21, 714-720.
- Bury, M. (2000). On chronic illness and disability. In C. Bird, P. Conrad, & A. Fremont (Eds.), *Handbook of medical sociology*, 5th ed. (pp. 173-183). Upper Saddle, NJ: Prentice Hall.
- Cananub, P. (2004). Factor that influence prenatal care utilization among Thai women. *Dissertation Abstracts International*, 65(09), (UMI No. 3148114).

- Camines, E., & Zeller, R. (1979). *Reliability and validity assessment*. Beverly Hills, CA: Sage Publications.
- Carter, E. A., MacCluer, J. W., Dyke, B., Howard, B. V., Devereux, R. B., & Ebbeson, S. O. et al. (2006). Diabetes mellitus and impaired fasting glucose in Alaska Eskimos: The genetics of coronary artery disease in Alaska Natives (GOCADAN) study. *Diabetologia*, 49(1), 29-35.
- Centers for Disease Control and Prevention. (2004). *The burden of chronic diseases and their risk factors: National and state perspectives 2004*. Atlanta, GA: U.S. Department of Health and Human Services. Retrieved March 1, 2006, from <http://www.cdc.gov/nccdphp/burdenbook2004>
- Centers for Disease Control and Prevention (CDC). (2007). Kidney disease mortality—Michigan, 1989-2005. *Morbidity and Mortality Weekly Report*, 56(10), 225-227.
- Chen, C. H. (1995). *Physical exercise and sense of well-being among Chinese elderly in Taiwan*. Unpublished Doctoral Dissertation, The University of Texas at Austin, Texas.
- Chen, Y. M. (2003). The meaning of health and health promotion practices of Taiwanese elders with chronic illness. *Home Health Care Management & Practice*, 15(6), 505-510.
- Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic Medicine*, 38, 300-313.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

- Conn, V. S. (1998). Older adults and exercise: Path analysis of self-efficacy related constructs. *Nursing Research, 47*, 180-189.
- Connell, C. M., Storandt, M., & Lichty, W. (1991). Impact of health belief and diabetes-specific psychosocial context variables on self-care behaviors, metabolic control, and depression of older adults with diabetes. *Behavior, Health and Aging, 1*, 63-75.
- Coonrod, B. A., Betschart, J., & Harris, M. L. (1994). Frequency and determinants of diabetes patient education among adults in the U.S. population. *Diabetes Care, 17*(8), 852-858.
- Crane, P. B., & McSweeney, J. C. (2003). Exploring older women's lifestyle changes after myocardial infarction. *MEDSURG Nursing, 12*(3), 170-177.
- Duffy, M. E. (1988). Determinants of health promotion in midlife women. *Nursing Research, 37*(6), 358-362.
- Duffy, M. E. (1989). Determinants of health status in employed women. *Health Values, 13*(2), 50-57.
- Duffy, M. E. (1993). Determinants of health-promoting lifestyles in older persons. *IMAGE: Journal of Nursing Scholarship, 25*(1), 23-28.
- Duffy, M. E. (1997). Determinants of reported health promotion behaviors in employed Mexican American women. *Health Care for Women International, 18*, 149-163.
- Ellenwood, A. E., & Jenkins, J. E. (2007). Unbalancing the effects of chronic illness: Non-traditional family therapy assessment and intervention approach. *The American Journal of Family Therapy, 35*, 265-277.

- Engebretson, Joan. (2003). Cultural constructions of health and illness. *Journal of Holistic Nursing, 21*(3), 203-227.
- Feest, T. G., Mistry, C. D., Grimes, D. S., & Mallick, N. P. (1990). Incidence of advanced chronic renal failure and the need for end-stage renal replacement treatment. *British Medical Journal, 301*, 897-900.
- Fiedler, I. G., Indermuehle, D. L., Drobac, W., & Laud, P. (2002). Perceived barriers to employment in individuals with spinal cord injury. *Top Spinal Cord Injury Rehabilitation, 7*(3), 73-82.
- Ford-Martin, P. A. (2001). Chronic kidney failure. *The Gale Encyclopedia of Medicine*(2nd ed). Farmington Hills, MI: Gale Group.
- Foster, S. B. (1992). Health promotion and life satisfaction in elderly black adults. *Western Journal of Nursing Research, 14*(4), 444-463.
- Fowler, S. B. (1997). Hope and a health-promoting lifestyle in persons with Parkinson's disease. *Journal of Neuroscience Nursing, 29*(2), 111-116.
- Frank-Stromborg, M., Pender, N. J., Walker, S. N., & Sechrist, K. R. (1990). Determinant of health-promoting lifestyle in ambulatory cancer patients. *Social Science and Medicine, 31*(10), 1159-1168.
- Fries, J. F., Koop, C. E., Sokolov, J., Beadle, C. E., & Wright, D. (1998). Beyond health promotion: Reducing need and demand for medical care. *Health Affairs, 17*(2), 70-84.
- Garcia, A. W., Norton-Broda, M. A., Frenn, M., Coviak, C., Pender, N. J., & Ronis, D. (1995). Gender and developmental differences in exercise beliefs among youth

- and prediction of their exercise behaviors. *Journal of School Health*, 65(6), 213-219.
- Gecht, M. R. Connell, K. J., Sinacore, J. M., & Prohaska, T. R. (1996). A survey of exercise beliefs and exercise habits among people with arthritis. *Arthritis Care & Research*, 9, 82-88.
- Gerard, M. S. (1993). Factors related to long-term physical activity following coronary artery bypass graft surgery. *Dissertation Abstracts International*, 54 (07), 3550B. (UMI No. 933243)
- Gillis, A. J. (1993). Determinants of health-promoting lifestyle: An integrative review. *Journal of Advanced Nursing*, 18, 345-353.
- Gillis, A. J. (1994). Determinants of health promoting lifestyles in adolescent females. *Canadian Journal of Nursing Research*, 26(2), 13-28.
- Goodman, W.G., & Nissenson, A.R. (1996). *Options for patients with end stage renal disease: Handbook of kidney transplantation*. New York: Little Brown.
- Grumbach, K. (2003). Chronic illness, comorbidities, and the need for medical generalism. *Annals of Family Medicine*, 1, 4-7.
- Gulick, E. E. (1991). Self-assessed health and use of health services. *Western Journal of Nursing Research*, 13, 195-219.
- Hall, B., & Allan, J. (1986). Sharpening nursing's focus by focusing on health. *Nursing and Health Care*, 7, 315-320.
- Harrison, T., & Stuijbergen, A. K. (2001). Barriers that further disablement: A study of survivors of polio. *Journal of Neuroscience Nursing*, 33, 160-166.

- Hass, B. K. (2000). Focus on health promotion: Self-efficacy in oncology nursing research and practice. *Oncology Nursing Forum*, 27, 89-97.
- Hays, L. M., & Clark, D. O. (1999). Correlates of physical activity in a sample of older adults with type 2 diabetes. *Diabetes Care*, 22, 706-712.
- Heiwe, S., Clyne, N., & Dahlgren, M. A. (2003). Living with chronic renal failure: patients' experiences of their physical and functional capacity. *Physiotherapy Research International*, 8(4), 167-177.
- Hibbard, J. H. (2004). *New roles for patients and consumers in assuring high quality care*. Retrieved August 1, 2007, from <http://virtualmentor.ama-assn.org/2004/06/msoc1-0406.html>
- Hutcheson, G. D., & Sofroniou, N. (1999). *Introductory statistics using generalized linear models*. Thousand Oaks, CA: SAGE Publications.
- Jacobs, C. (2006). Cost and benefits of improving renal failure treatment—Where do we go? *Nephrology Dialysis Transplantation*, 21(8), 2049-2052.
- Jeffries, P. R. (1996). Predictor variables of exercise and nutrition for expatriates in Indonesia utilizing Pender's health promotion model. Unpublished Doctoral Dissertation, Indiana University at Indianapolis, Indiana.
- Jeng, C., & Braun, L. T. (1997). The influence of self-efficacy on exercise intensity, compliance rate and cardiac rehabilitation outcomes among coronary artery disease patients. *Progress in Cardiovascular Nursing*, 12, 13-24.
- Jeng, C., Yang, H.C., Wai, P. M., Tsai, J. C., Wei, L. L., & Chen, S. R. (2002). Investigation of the difference between treadmill self-efficacy and actual

- performance in Taiwanese patients with chronic obstructive pulmonary disease. *Heart and Lung, 31*, 150-156.
- Johnson, N. A., & Heller, R. F. (1998). Prediction of patient nonadherence with home-based exercise for cardiac rehabilitation: The role of perceived barriers and perceived benefits. *Preventive Medicine, 27*, 56-64.
- Jolly, S. E., Li, S., Chen, S. E., Narva, A., Jurkovitz, C. T., & Norris, K. C. et al. (2009). Risk factors for chronic kidney disease among American Indians and Alaska Natives findings from the Kidney Early Evaluation Program. *American Journal of Nephrology, 29*(5), 440-446.
- Keller, C. (1986). Predicting the performance of daily activities of patients with chronic lung disease. *Perceptual and Motor Skills, 63*, 647-651.
- Kim, J. S., Bramlett, M. H., Wright, L. K., & Poon, L. W. (1998). Racial differences in health status and health behaviors of older adults. *Nursing Research, 47*, 243-250.
- Koch, U., & Muthny, F. A. (1990). Quality of life in patients with end-stage renal disease. *Psychotherapy and Psychosomatics, 54*, 161-171.
- Kurtz, A. C. (1996). Correlates of health-promoting lifestyles among women with rheumatoid arthritis. *Dissertation Abstracts International, 57* (02), 989B. (UMI No. 9620157).
- Lancaster, L. E. (1988). Impact of chronic illness over the life span. *ANNA Journal, 15*, 164-193.
- Lannon, S. L. (1997). Using a Health Promotion Model to enhance medication compliance. *Journal of Neuroscience Nursing, 29*(3), 170-178.

- Larouche, R. (1998). Determinants of college students' health promoting lifestyles. *Clinical Excellence for Nurse Practitioners*, 2(1), 35-44.
- Lawton, M. P. (1999). Quality of life in chronic illness. *Gerontology*, 45(4), 181-183.
- Lee, S. J., Kim, S. I., Lee, P. S., Khim, S. Y., Park, E. S., & Park, Y. J., et al. (2002). Construct a structural model for health promoting behavior of chronic illness. *The Journal of the Korean Society of Nursing Science*, 32(1), 62-76.
- Lindeman, R. D., & Goldman, R. (1986). Anatomic and physiologic age changes in the kidney. *Experimental Gerontology*, 21, 379-406.
- Lloyd, C. E., Wing, R. R., Orchard, T. J., & Becker, D. J. (1993). Psychosocial correlates of glycemic control: The Pittsburgh Epidemiology of Diabetes complications (EDC) study. *Diabetes Research and Clinical Practice*, 21, 187-195.
- Lorig, K., Chastain, R. L., Ung, E., Shoor, S., & Holman, H. R. (1989). Development and evaluation of a scale to measure perceived self-efficacy in people with arthritis. *Arthritis and Rheumatism*, 32, 37-44.
- Lorig, K. R., Ritter, P., Stewart, A. L., Sobel, D. S., Brown, B. W. Jr., & Bandura, A. et al. (2001). Chronic disease self-management program: 2-year health status and health care utilization outcomes. *Medical Care*, 39, 1217-1223.
- Lough, M., & Schank, M. (1996). Health and social support among older women in congregate housing. *Public Health Nursing*, 13, 434-441.
- Lucove, J., Vupputuri, S., Heiss, G., North, K., & Russell, M. (2008). Metabolic syndrome and the development of CKD in American Indians: The strong heart study. *American Journal of Kidney Disease*, 57(1), 21-28.

- Maben, J., & Clark, J. M. (1995). Health promotion: a concept analysis. *Journal of Advanced Nursing*, 22(6), 1158-1165.
- Maibach, E., & Murphy, D. A. (1995). Self-efficacy in health promotion research and practice: conceptualization and measurement. *Health Education Research*, 10, 37-50.
- Manuel, P. (2002). Slowing the progression of renal failure. *Kidney International*, 61 (80 Suppl.), S18-S22.
- Martinelli, A. M. (1999). An exploratory model of variables influencing health promotion behaviors in smoking and nonsmoking college students. *Public Health Nursing*, 16, 263-269.
- Mc Geown, M. G. (1990). Prevalence of advanced renal failure in Northern Ireland. *British Medical Journal*. 301, 900-903.
- McWilliam, C. L., Stewart, M., Brown, J. B., Desai, K., & Coderre, P. (1996). Creating health with chronic illness. *Advances in Nursing Science*, 18(3), 1-15.
- Ministry of Public health. (2001). *Statistic data of public health*. Bangkok Thailand Veteran Institute.
- Moore, S. M., Dolansky, M. A., Ruland, C. M., Pashkow, F. J., & Blackburn, G. G. (2003). Predictors of women's exercise maintenance after cardiac rehabilitation. *Journal of Cardiopulmonary Rehabilitation*, 23(1), 40-49.
- Morse, G. (1997). Effect of positive reframing and social support on perception of perimenstrual changes among women with premenstrual syndrome. *Health Care of Women International*, 18, 175-193.

- Moylan, G. C., & Joyce, P. (1993). The achievement of dietary goals in patients with documented CAD: A test of Nola Pender's Health Promotion Model. *Nursing Scandinavian in Research*, 6(6), 3-4.
- Muntner, P., Sudre, P., Uldry, C., Rochat, T., Courteheuse, C., Naef, A. F., et al. (2001). Predictions of participation and attendance in a New Asthma Patient Self-Management Education Program. *Chest*, 120(3), 778-784.
- Nagasawa, M., Smith, M., & Barnes, J. (1990). Meta-analysis of correlates of diabetes patients' compliance with prescribed medications. *The Diabetes Educator*, 16(3), 192-200.
- National Kidney Foundation. (2002). K/DOQI clinical practice guidelines for chronic kidney disease: evaluation, classification, and stratification. *American Journal of Kidney Disease*, 39(2 Suppl.), S46-S75.
- Neuberger, G. B., Kasal, S., Smith, K. V., Hassanein, R., & DeViney, S. (1994). Determinants of exercise and aerobic fitness in outpatients with arthritis. *Nursing Research*, 43, 11-17.
- Norusis, M. (2004). *SPSS 12.0 guide to data analysis*. Upper Saddle River, New Jersey: Prentice Hall.
- O'Callaghan, W. G., Teo, K. K., O'Riordan, J., Webb, H., Dolphin, T., & Horgan, J. H. (1984). Comparative response of male and female patients with coronary artery disease to exercise rehabilitation. *European Heart Journal*, 5(8), 649-651.
- O'Donnell, M. P. (1989). Definition of health promotion: Part III: Expanding the definition. *American Journal of Health Promotion*, 3, 5.

- O'Donnell, M. (2004). Health-promotion behaviors that promote self-healing. *The Journal of Alternative and Complementary Medicine*, 10(1 Suppl.), S49-S60.
- Oh, H. S. (1993). *Health promoting behaviors and quality of life of Korean women with arthritis*. Unpublished doctoral dissertation, The University of Texas at Austin, Texas.
- Orem, D. E. (1991). *Nursing: Concepts of practice* (4th ed.). St. Louis: Mosby Year Book.
- Packard, N. J., Haberman, M. R., Woods, N. F., & Yates, B. C. (1991). Demands of illness among chronically ill women. *Western Journal of Nursing Research*, 13, 434-457.
- Parcel, G. S., Bartlett, E. E., & Bruhn, J. G. (1986). The role of health education in self-management. In K. A. Holroyd & T. L. Creer (Eds.). *Self-management of chronic disease* (pp. 3-27). Orlando, FL: Academic Press.
- Pender, N. J. (1987). *Health promotion in nursing practice* (2nd ed.). Norwalk, CT: Appleton & Lange.
- Pender, N. J. (1996). *Health promotion in nursing practice* (3rd ed.). Stamford, CT: Appleton & Lange.
- Pender, N. J., Murdaugh, C. L., & Parsons, M. A. (2002). *Health promotion in nursing practice* (4th ed.). Prentice-Hall: New Jersey.
- Pender, N. J., Walker, S. N., Sechrist, K. R., & Frank-Stromborg, M. (1990). Predicting health-promoting lifestyles in the workplace. *Nursing Research*, 39, 326-332.

- Pierce, C. (2005). *Health promotion behaviors of rural women with heart failure*. Retrieved January 25, 2005, from http://rno.org/journal/issues/Vol-5/issue-2/Pierce_article.htm
- Portoles, J. (2001). The beneficial effects of intervention in early renal disease. *Nephrology Dialysis and Transplantation*, 16(2 Suppl.), 12-15.
- Prigatano, G. P., Wright, E. C., & Levin, D. (1984). Quality of life and its predictors in patients with mild hypoxemia and chronic obstructive pulmonary disease. *Archives of Internal Medicine*, 144, 1613-1619.
- Renee, L. & Lynn, L. (2000). *Healthy lifestyle: Strengthening the effectiveness of lifestyle approaches to improve health*. The Atlantic Health Promotion Research Centre Dalhousie University and The Canadian Consortium of Health Promotion Research Centres.
- Revicki, D. A. (1989). Health-related quality of life in the evaluation of medical therapy for chronic illness. *Journal of Family Practice*, 29, 377-380.
- Riffle, K., Yoho, J., & Sams, J. (1989). Health-promoting behaviors, perceived social support, and self-reported health of Appalachian elderly. *Public Health Nursing*, 6, 204-211.
- Robertson, D., & Keller, C. (1992). Relationships among health beliefs, self- efficacy, and exercise adherence in patients with coronary artery disease. *Heart & Lung: Journal of Critical Care*, 21(1), 56-63.
- Rosenstock, I. M. (1974). Historical origins of the health belief model. *Health Education Monographs*, 2, 328-335.

- Salyer, J., Sneed, G., Corley, M. C., & Virginia, R. (2001). Lifestyle and health status in long-term cardiac transplant recipients. *Heart & Lung, 30*(6), 445-457.
- Sands, J. K. (1991). *Clinical manual of medical-surgical nursing: Concepts and clinical practice*. St. Louis, MO: Mosby.
- Sarason, I. G., Sarason, B. R., Shearin, E. N., & Pierce, G. R. (1987). A brief measure of social support: Practical and theoretical implications. *Journal of Social and Personal Relationships, 4*, 497-510.
- Schaubel, D. E., Morrison, H. I., Desmeules, M., Parsons, D. A., & Fenton, S. S. A. (1999). End-stage renal disease in Canada: prevalence projection to 2005. *Canadian Medical Association Journal, 160*(11), 1557-1563.
- Shin, Y. H., Jang, H. J., & Pender, N. J. (2001). Psychometric evaluation of the Exercise Self Efficacy Scale among Korean adults with chronic diseases. *Research in Nursing & Health, 24*, 68-76.
- Simons-Morton, D. G., Hogan, P., Dunn, A. L., Pruitt, L., King, A. C., & Levine, B. D. et al. (2000). Characteristics of inactive primary care patients: Baseline data from the activity counseling trial. *Preventive Medicine, 31*, 513-521.
- Speake, D. L., Cowart, M. E., & Pellet, K. (1989). Health perceptions and lifestyles of the elderly. *Research in Nursing & Health, 12* (2), 93-100.
- Speake, D. L., Cowart, M. E. & Stephens, R. (1991). Healthy lifestyle practices of rural and urban elderly. *Health Values, 15*(1), 45-51.

- Sriyuktasuth, A. (2002). Utility of Pender's model in describing health-promoting behaviors in Thai women with systemic lupus erythematosus. *Dissertation Abstracts International*, 63(10), 4599B. (UMI No. 3066344)
- Storset, P., Smith-Erichsen, N., & Vaagenes, P. (1995). Organ function during early acute renal failure does not predict survival in long-term intensive care. *Intensive Care Medicine*, 21, 797-801.
- Stuifbergen, A. K. (1995). Health-promoting behaviors and quality of life among individuals with multiple sclerosis. *Scholarly Inquiry for Nursing Practice*, 9, 31-55.
- Stuifbergen, A. K. (1999). Barriers and health behaviors of rural and urban persons with MS. *American Journal of Health Behavior*, 23(6), 415-425.
- Stuifbergen, A. K., & Becker, H. A. (1994). Predictors of health-promoting lifestyles in persons with disabilities. *Research in Nursing and Health*, 17(1), 3-13.
- Stuifbergen, A. K., Becker, H. A., & Sands, D. (1990). Barriers to health promotion for individuals with disabilities. *Family & Community Health*, 13(1), 11-22.
- Stuifbergen, A. K., & Roberts, G. J. (1997). Health promotion practices of women with multiple sclerosis. *Archives of Physical Medicine and Rehabilitation*, 78 (5 Suppl.), 3-9.
- Stuifbergen, A. K., & Rogers, S. (1997). Health promotion: An essential component of rehabilitation for persons with chronic disabling conditions. *Advances in Nursing Science*, 19(4), 1-20.

- Stuifbergen, A. K., Seraphine, A., & Roberts, G. (2000). An explanatory model of health promotion and quality of life in chronic disabling conditions. *Nursing Research*, 49, 122-129.
- Stuifbergen, A. K., & Timmerman, G. (2003). A randomized clinical trial of a wellness intervention for women with multiples sclerosis. *Archives of Physical Medicine and Rehabilitation*, 84, 467-476.
- Stutt, W. C. (1997). *Use of the health promotion model to predict physical activity in adults*. Unpublished Doctoral Dissertation, The University of North Carolina at Chapel Hill, North Carolina.
- Szromba, C., Thies, M. A., & Ossman, S. S. (2002). Advancing chronic kidney disease care: new imperatives for recognition and intervention. *Nephrology Nursing Journal*, 29(6), 547-559.
- Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). New York: Harper Collins College.
- Tang, Y. Y., & Chen, S. P. (2002). Health promotion behaviors in Chinese family caregivers of patients with stroke. *Health Promotion International*, 17(4), 329-339.
- Thorne, S., McCormick, J., & Carty, E. (1997). Deconstructing the gender neutrality of chronic illness and disability. *Health Care for Women International*, 18(1), 1-16.
- Thorp, M. L., & Eastman, L. (2004). Potential application of the National Kidney Foundation's chronic kidney disease guidelines in a managed care setting. *The American Journal of Managed Care*, 10, 417-422.

- Vupputuri, S. & Sandler, D. P. (2003). Lifestyle risk factors and chronic kidney disease. *AEP*, *13*(10), 712-720.
- Walker, S. N., Kerr, M. J., Pender, N. J., & Sechrist, K. R. (1990). A Spanish language version of the Health-Promoting Lifestyle Profile. *Nursing Research*, *39*(5), 268-273.
- Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The Health-Promoting Life Style Scale: Development and psychometric characteristics. *Nursing Research*, *36*, 76-81.
- Walker, S. N., Sechrist, K. R., & Pender, N. J. (1995). *Health-Promoting lifestyle Profile II*. University of Nebraska Medical Center, College of Nursing. Omaha, Nebraska. USA.
- Walker, S. N., Volkan, K., Sechrist, K. R., & Pender, N. J. (1988). Health-promoting life styles of older adults: Comparisons with young and middle-aged adults, correlates and patterns. *Advanced in Nursing Science*, *11*(1), 76-90.
- Wang, H. (1999). Predictors of health promotion lifestyle among three ethnic groups of elderly rural women in Taiwan. *Public Health Nursing*, *16*(5), 321-328.
- Weinert, C. (1987). A social support measure: PRQ85. *Nursing Research*, *36*, 273-277.
- Weinert, C., & Tilden, V. P. (1990). Measures of social support: Assessment of validity. *Nursing Research*, *39*, 212-216.
- Weiss, R. S. (1974). The provisions of social support relationship. In Z. Rubin. *Doing unto others* (pp. 17-26). Englewood Cliffs: Prentice Hall.

- Weitzel, M. H. (1989). A test of the health promotion model with blue collar workers. *Nursing Research, 38*(2), 99-104.
- Wensing, M., Vingerhoets, E., & Grol, R. (2001). Functional status, health problem, age and comorbidity in primary care patients. *Quality of Life Research, 10*, 141-148.
- Williams, K. E., & Bond, M. J. (2002). The roles of self-efficacy, outcome expectancies and social support in the self-care behaviors of diabetes. *Psychology, Health, and Medicine, 7*, 127-141.
- Willoughby, D. F., Kee, C., & Demi, A. (2000). Women's psychosocial adjustment to diabetes. *Journal of Advanced Nursing, 32*(6), 1422-1430.
- Wu, T. Y., & Pender, N. J. (2005). A panel study of physical activity in Taiwanese youth: Testing the revised Health-Promotion Model. *Family & Community Health, 28*, 113-124.
- Xiaolian, J., Chaiwan, S., Panuthai, S., Yijuan, C., Lei, Y., & Jiping, L. (2002). Family support and self-care behavior of Chinese chronic obstructive pulmonary disease patients. *Nursing and Health Sciences, 4*, 41-49.
- Yates, B. C., Price-Fowlkes, T., & Agrawal, S. (2003). Barriers and facilitators of self-reported physical activity in cardiac patients. *Research in Nursing & Health, 26*, 459-469.
- Youngblut, J. M., & Casper, G. R. (1993). Single-item indicators in nursing research, *Research in Nursing & Health, 16*(6), 459-465.

Zimmerman, R. S., & Cornor, C. (1989). Health promotion in context: The effects of significant others on health behavior change. *Health Education Quarterly*, 16, 57–75.

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