# A MODEL OF FACTORS CONTRIBUTING TO PERCEIVED ABILITIES FOR HEALTH-PROMOTING SELF-CARE OF COMMUNITY-DWELLING THAI OLDER ADULTS

by

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**A MODEL OF FACTORS CONTRIBUTING TO PERCEIVED ABILITIES FOR HEALTH-PROMOTING SELF-CARE OF COMMUNITY-DWELLING THAI OLDER ADULTS**

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***Dedication***

*To my respected parents for their unwavering, unconditional love and support*

*To my beloved husband for his love, understanding, and great encouragement*

*To my adorable daughter for making my life meaningful as a mother*

*To all of my teachers and friends for their help and support*

*To the Thai older adults who shared their thoughts with me*

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The purpose of this descriptive correlational study was to examine factors contributing to perceived abilities for health-promoting self-care of community-dwelling Thai older adults. An integration of selected concepts from Orem's (1995) self-care theory and Bandura's (1997) self-efficacy theory is established to generate a conceptual model for this study. The study variables included age, education, perceived family support, perceived friend support, chronic health problems, functional ability, perceived health status, and perceived abilities for health-promoting self-care.

A survey-interview method was used for data collection. Perceived family support, perceived friend support, chronic health problems, functional ability, perceived health status, and perceived abilities for health-promoting self-care were measured by the Family APGAR Questionnaire, the Friend APGAR Questionnaire,

the Chronic Health Problem Checklist, a composite on the Modified Barthel ADL Index and the Chula ADL index, the Self-Rated Health Scale, and the Self-Rated Abilities for Health Practices Scale, respectively. Stratified random sampling, based on age and gender, was employed to recruit a sample of 211 older adults living in rural areas in Thailand. Pearson's product-moment correlation coefficient was used to examine the relationships among the study variables. All hypothesized relationships were supported except for the relationship between age and chronic health problems and between age and perceived health status.

The hypothesized model was tested by path analysis through the EQS6 program. The initial hypothesized model did not fit the data, and so was modified until the goodness-of-fit indices were adequate (>.90). The robust comparative fit index (robust CFI = 1) indicated that the final modified model fit the data well. In summary, five exogenous variables in the final modified model (age, education, perceived family support, perceived friend support, and chronic health problems) contributed to perceived abilities for health-promoting self-care, directly and/or indirectly through two mediating variables (functional ability and perceived health status). Mediating variables in the model also contributed to perceived abilities for health-promoting self-care. Sixty-one percent of the total variance in perceived abilities for health-promoting self-care was explained by all study predictors. Using the multisample structural equation modeling approach to test the modified model across groups, gender differences were not found in this study.

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# CHAPTER 1

## INTRODUCTION

Health in the aging population is concerned with not only the quantity of life, but also the quality of life. Although advanced medical technology has extended human life expectancy by 15-20 years, undesirable conditions, such as pain and suffering, are major problems for older people (Spirduso, 1995). The compression of morbidity hypothesis proposed that healthy lifestyles may delay the onset of chronic infirmity and shorten the duration of morbidity (Fries, 1993; Vita, Terry, Hubert, & Fries, 1998). Although this hypothesis is controversial and additional studies are needed, it addresses the goal to increase the duration of a healthy, disability-free life. Health promotion has recently gained recognition of health care professionals all over the world as an effective way to achieve a healthier life (Lindsey & Hartrick, 1996).

Because the aging population is growing globally (U.S. Census Bureau, Population Division, 2000), escalating health care costs for this population are of concern (Watt, Roberts, Browne, & Gafni, 1997). Thailand is a country in a demographically transitional period. The aging population in Thailand has increased from 1.21 million in 1960 (4.6% of the total population) to 4.02 million in 1990 and may reach 10.78 million in 2020 (15.28% of the total population) (Human Resources Planning Division, National Economic and Social Development Board, Thailand, 1995). The increase in the aging population in Thailand is a result of decreases in

death rates, associated with improved health interventions and the greater use of medical technology.

The decline in age-specific death rates also contributes to longevity of the older population in Thailand. In 1960, the life expectancy at birth of males and females was 53.64 and 58.74 years respectively. In the period during 1985-1990, life expectancy had increased to be 62.24 years for males and 66.19 years for females. These numbers are expected to be 68.15 years for males and 72.39 years for females by 2000-2005 (Division of Health Statistics, Office of the Permanent Secretary, Ministry of Public Health, Thailand, 1994).

Increases in both the number and life span of Thai older adults produce considerable health care demands, which concern national policy makers. Demands for formal health care services are increasing, particularly when health problems of older people become serious (Haug, Wykle, & Namazi, 1989). Consequently, a way must be found to help older people maintain their health for as long as possible. Education and self-care have great potential for reducing risk factors associated with diseases within the older population, which in turn, lead to reduced dependence on health care professionals, thereby reducing health care costs (Ory, DeFriese, & Duncker, 1998).

Hartweg (1990) asserted that self-care and health promotion are logically congruent and used the term “health promotion self-care” to denote self-care in health promotion. Although self-care and health promotion have different roots, they are

bound to each other both philosophically and practically because they move away from reliance on medical care to reliance on structural, social, and behavioral determinants of health behaviors (Dean & Kickbusch, 1995). In addition, one's health-promoting behavior must be performed on behalf of oneself, not others. In this study, the term "health-promoting self-care" refers to self-care processes and actions that are directed toward health promotion.

Self-care ability is a pre-requisite of self-care (Orem, 1995). In this study, self-care ability refers to perceived ability or self-efficacy for health-promoting self-care. Previous research provides evidence that self-care ability is predictive of self-care (Anderson, 1996; Davidson, 1988; Wang, 1998). A number of studies reported that self-efficacy is a strong predictor of health-promoting behavior among older adults (Conn, 1997; Conn, 1998; Homnan, 1996; McAuley, 1993). However, little is known about what factors contribute to abilities in health-promoting self-care among community-dwelling Thai-older adults. According to an integrative review of self-care research in Thailand (Hanucharurnkul, Leucha, Wittya-Sooporn, & Maneesriwongkul, 2000), few studies have been conducted with Thai older adults. There is a huge gap in the literature related to self-care ability for health promotion among older adults in Thailand. Currently, national health policies focus on the health of older adults and self-care; thus, factors contributing to abilities in health-promoting self-care of Thai older adults would be useful to guide health-promoting interventions appropriate for Thai older adults.

## Purpose of the Study

The purpose of this study is to examine factors related to perceived abilities for health-promoting self-care of community-dwelling Thai older adults. Factors to be examined include demographic characteristics (age, education), perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status.

Previous studies showed the relationships between self-care ability and age (Conn, 1998: Söderhamn et al., 2000), education (Homnan, 1996; Panawattanakul, 1991), social support (Eyler, Brownson, Donatelle, King, Brown, & Sallis, 1999; Jirovec & Kasno, 1993; La Greca et al., 1995; Schott-Baer, 1989), and health status (Denyes, 1988; Jirovec & Kasno, 1993; Lakin, 1988; Söderhamn et al., 2000; Thompson, 1992) in different populations. However, much of the research did not focus on abilities for health promoting self-care in the older population; thus, further study is needed to determine their influences.

## Background and Significance of the Study

### Older Adults in Thailand

Thailand is a country located in Southeast Asia covering a land area of 513,115 square kilometers (The National Identity Office under Royal Thai Government, 1997). The number of population in Thailand is approximately 61 million people (U.S. Census Bureau, International Data Base, 2000). In the past three decades, Thailand has reformed the economy and transformed from being agriculture-

based to industry-oriented, called a newly industrialized country (NIC). The national revenue had increasingly come from manufactured exports instead of agricultural products (Kauffman & Myers, 1997). From 1961 to 1995, the per capita Gross National Product of Thai people increased by 32 times (Ministry of Public Health, Thailand, 1997). Unfortunately, in 1997, the recession in Thailand greatly influenced the health care policy. Self-care became an essential and economical way under the circumstances.

Demographic transition in Thailand is associated with declines in fertility rates and in mortality rates. While the child dependency ratio has decreased, the aged dependency ratio has increased. The proportion of the old-old (70 years old and over) over the young-old (60-69 years old) is mounting. Approximately, 18% of Thai older adults experience long-term disability (Jitapunkul et al., 1999). It is projected that the total dependency ratio will substantively increase by 2010 (Jitapunkul & Bunnag, 1998). When the growth of the aging population is rapid, health professionals in Thailand must deal with the consequences of these demographic changes, particularly with the health of older adults.

Regarding chronic health problems of Thai older people, degenerative diseases, mental illnesses, and accidental injuries are currently increasing, while communicable diseases are diminishing. The leading causes of death among Thai older people are cardiovascular diseases, malignant neoplasms, cerebrovascular diseases, septicemia, and diabetes mellitus. From a national survey, about 43% of

Thai older adults, particularly in rural areas, were not hospitalized when they were ill (Jitapunkul & Bunnag, 1998).

Concerning health behavior and health status of Thai older people, more than one-third of them have a body mass index less than 20 and about 25-50% of them have a low concentration of serum hemoglobin. About 16% of Thai elders have less than three meals per day. These findings indicate that malnutrition is an important problem in Thai older adults. Additionally, the rate of smoking in Thai older adults is 27.3% and the rate of alcohol consumption is 22.6% (Jitapunkul & Bunnag, 1998). Accordingly, disease prevention and health promotion programs are needed to improve health among Thai older adults. Jitapunkul and Bunnag (1998) suggested that monitoring disability-free life expectancy would be highly useful for establishing national policy and that a model of health service should be developed and tested.

## Social and Health Resources for Thai Older Adults

In Thailand, the Ministry of Labor and Social Welfare is the primary organization taking responsibilities for social services for Thai older people. This organization provides both institutional care and community care. However, community services are insufficient because of limitation of personnel, financial resources (Jitapunkul & Bunnag, 1998; Ratanakul, 1990), and facilities for elders, such as geriatric outpatient departments or inpatient units, in most of the government hospitals (Pothibal, 1996).

Another health issue of older adults is that health care services for Thai elders in the past decades has focused on curing diseases, rather than preventing illnesses or promoting health (Intarasombat, 1996). Therefore, health care costs for older adults are high because characteristics of illnesses in older adults tend to include: (1) multiple pathological conditions; (2) nonspecific presentation of diseases; (3) rapid deterioration if no treatment is provided; (4) high incidence of complications of diseases and treatments; and (5) requirement for rehabilitation. Consequently, older people tend to be at risk of functional decline (Report of a WHO Expert Committee, 1989).

Functional decline may increase rates of mortality, costs, length of hospital stay, and nursing home placement (Palmer, Landefeld, Kresevic, & Kowel, 1994). Frequently, irrevocable deterioration in functional status and alteration in quality of life and life style are consequences of hospitalization (Creditor, 1993). These features have implications for health and social services to modify a model of care for older adults. More attention should be directed toward disease prevention and health promotion. Disease prevention and health promotion might reduce health care costs and promote health and well-being in Thai older adults.

Although the Thai government has provided free health care for Thai older people since 1991, a national survey in 1995 found that only 52.8% of Thai older adults used health services in community health centers and state hospitals (Jitapunkul et al., 1999). This fact might indicate that a large number of Thai older

people are self-treating or practicing self-care, rather than using formal services to relieve their symptoms. However, when their health condition becomes serious, they have to rely on health care services. Thai older adults were so-called “bed-blockers” in the hospital because of the greater number of chronic illnesses and disability (Thamprechavai, Jitapunkul, Somerville, Bunnag, & Ebrahim, 1992). This information may reflect that self-care actions among Thai older people may be insufficient to fulfill their health needs; thus, additional knowledge, useful resources, and support from the government for health promotion might strengthen Thai older adults’ abilities to take care of their health.

The National Long-Term Plan of Action for the Elderly of Thailand considers self-care, in addition to health care services, as an important approach to prevent diseases and promote health of Thai older people (Jitapunkul & Bunnag, 1998). According to Orem (1985, 1991, 1995), self-care agency or self-care ability is necessary for an individual to engage in self-care. However, factors influencing self-care abilities for health promotion in Thai older adults are not well understood. This study aims to clarify what factors might contribute to the ability to engage in health-promoting self-care of Thai older adults.

## Significance of the Study

Findings from this study are expected to provide information related to factors contributing to perceived abilities in health-promoting self-care of Thai older adults. This knowledge may be useful for nurses and other health professionals in designing

plans that maximize the self-care potential of older adults for health promotion and meet health care demands. Self-care abilities for health promotion of older adults would enhance the pursuit of independent lifestyles, maintain the highest possible functional level, and shorten disability (Ruffing-Rahal, 1991). Self-care may be able to reduce health care costs and increase clients' satisfaction, autonomy, compliance (Kickbusch, 1989; Roberts & Krouse, 1990) and wellness (Walker, 1997); thus, factors affecting self-care abilities of Thai older adults should be explored.

## Statement of Problem/Research Questions

Although Thai older adults use self-care as a strategy for taking care of themselves, little is known about factors contributing to self-care abilities for health promotion. Most of the self-care research in Thailand has been conducted in the context of self-care in response to illnesses, rather than self-care in health promotion. Additionally, the number of studies related to self-care in older adults is limited. Currently, the national health policies in Thailand state that preparing people for old age is important. One of the national policies for older persons is to improve ability of self-care among older adults in aspects of health promotion, disease prevention, curative care, and rehabilitation (Jitapunkul & Bunnag, 1998).

Research questions are presented as follows.

1. What are the relationships among basic conditioning factors (age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status) and self-care agency

(perceived abilities for health promoting self-care) among community-dwelling Thai older adults?

2. What are the coefficients of the paths in the operational model of factors contributing to perceived abilities for health-promoting self-care of community-dwelling Thai older adults?

3. Does the hypothesized model of factors contributing to perceived abilities for health-promoting self-care of community-dwelling Thai older adults adequately fit the data?

## Conceptual/Theoretical Framework

The proposed model (Figure 1.1) for guiding this study was synthesized from Orem's (1995) self-care model extended by the inclusion of self-care directed toward health promotion and by Bandura's (1997) self-efficacy theory. The congruence between the concepts of self-care and health promotion is seen in Orem's (1995) work, although Orem does not specially address self-care in health promotion. Orem (1995) describes health promotion as a movement of individuals toward the improvement of specific structural and functional health states. Health promotion is a concept based on an assumption that human beings have the potential for improvement.

Although critiques of Orem's self-care theory have expressed concern for its illness focus, Hartweg (1990) argued that health promotion is implicitly included in Orem's model because "well-being" and "health" are optimal goals of self-care and

have been used throughout Orem's work. These goals of self-care within Orem's self-care theory are congruent with the goals of health promotion: health and wellness (Pender, 1996). In addition, Denyes (1988) tested a model of self-care and supported the notion that self-care agency and self-care contributed to health promotion, defined as a general positive state of integrity and soundness.

In the proposed conceptual model (see Figure 1.1), two major constructs based on Orem's self-care model are basic conditioning factors and self-care agency. According to Orem (1995), basic conditioning factors are conditions that "affect the values or ways of meeting persons' existent self-care requisites or bring about new self-care requisites or affect the development, operability, or adequacy of persons' capabilities to care for themselves or their dependents" (p. 456). Self-care agency is "the complex acquired ability of mature and maturing persons to know and meet their continuing requirements for deliberate, purposive action to regulate their own human functioning and development" (Orem, 1995, p. 461). Selected variables in this model under the basic conditioning factors include age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status. Perceived abilities for health-promoting self-care is a concept under the construct of self-care agency.

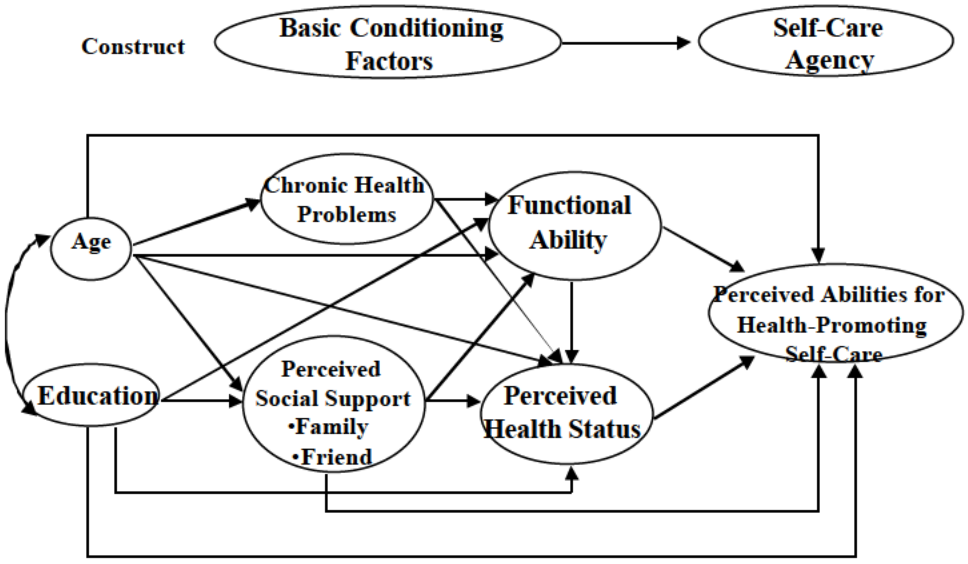



**Figure 1.1.** **A conceptual model of factors contributing to perceived abilities for health-promoting self-care of community-dwelling Thai older adults.**

Variables under the basic conditioning factors are proposed to contribute to perceived abilities for health-promoting self-care. In this study, exogenous variables, variables independent of any influence from other variables (Munro, 1997), include age and education. Endogenous variables, variables influenced by other variables (Munro, 1997), include five mediating factors (perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status) and one outcome variable (perceived abilities for health-promoting self-care).

## Conceptualizations of Health-Promotion

Health promotion is a relatively new concept among health professions. It is viewed diversely in the literature. Redland and Stuifbergen (1993) noted that people who deal with a medical diagnosis and treatment of a certain disease tend to view health promotion differently than those who are nondisease-oriented. Downie, Tannahill, and Tannahill (1996) stated that some people equate health promotion only with health education, whereas others use the terms "health promotion and disease prevention" interchangeably, resulting in confusion of the terms.

A number of authors (Gott & O'Brien, 1990; Downie, Tannahill, & Tannahill, 1996) view health promotion as a broader concept than health protection or health education. Gott and O'Brien (1990) stated that health promotion includes not only disease prevention, but also health protection and health education. Downie, Tannahill, and Tannahill (1996) proposed a model of health promotion that includes the three overlapping spheres of health education, disease prevention, and health protection.

Others, such as Pender (1996) differentiated health promotion and health protection. Pender defined health promotion as activities "directed toward increasing the level of well-being and self actualization" (p. 34), whereas health protection was defined as activities "directed toward decreasing the probability of experiencing health problems by active protection against pathologic stressors or detection of health problems in the asymptomatic stage" (p. 34). In other words, health promotion

is motivated by well-being and actualization, but health protection is motivated by avoidance of illness.

There is agreement among authors that health promotion exceeds and incorporates prevention of disease and protection of health because it is directed toward positive health rather than away from health threats (Pender, 1996; Smith, 1990; Stachtchenko, & Jenicek, 1990). Some actions, such as exercise, may be viewed as either health promotion or disease prevention because it promotes physical fitness and prevents certain diseases, such as coronary heart disease and non-insulin-dependent diabetes mellitus. However, older persons tend to have at least one chronic illness (Kutner, Ory, Baker, Schechtman, Hornbrook, & Mulrow, 1992; Young, 1994); therefore, both health promotion and disease prevention are vital components of health in this population (Walker, 1997).

In addition, health promotion focuses, not only on providing information and skills for individuals to maintain healthy lifestyles, but also on developing the environment that supports health-promoting behaviors (Redland & Stuifbergen, 1993). This notion is congruent with triadic reciprocality: the interplay among human behavior; personal factors in terms of cognitive, affective and biological events; and external environment (Bandura, 1997) and with the metaparadigm in nursing, focusing on the interactions among person, health, environment, and nursing (Fawcett, 1984).

## Conceptualizations of Self-Care

Self-care has been viewed as a theoretical framework, a perspective, a process, a phenomenon, and as a political movement (Gantz, 1990). Within the medical perspective, self-care occurs when a person performs self-assessment, self-monitoring, self-treatment, and prevention of disease (Gantz, 1990). Levin (1978) defined self-care as "a process whereby a layperson can function on his/her own behalf in health promotion and prevention and in disease detection and treatment" (p. 11). The field of psychology views self-care as a phenomenon in the context of health beliefs, locus of control, values clarification, and components of self, whereas the field of sociology focuses on social, legal, political, and organizational factors that increase or decrease self-care (Gantz, 1990).

Barofsky (1978) defined self-care as "a form of self-control and a primary outcome (and measure) of any health care process" (p. 370). Barofsky classified self-care into four types: (1) regulatory self-care; (2) preventive self-care; (3) reactive self-care, and (4) restorative self-care. In other words, self-care covers health maintenance, prevention of disease, response to symptoms not diagnosed by doctors, and compliance with regimens of treatment. Although the component of health-promotion was not explicitly identified, it may be implicit.

Within the field of nursing, Orem (1995) defines self-care as "the practice of activities that maturing and mature persons initiate and perform, within time frames, on their own behalf in the interests of maintaining life, healthful functioning,

continuing personal development, and well-being" (p. 461). Woods (1989) went beyond Orem's definition to describe self-care as health-oriented and dependent on four major health models (Smith, 1981): (1) clinical; (2) role-performance; (3) adaptive; and (4) eudaemonistic models. In the clinical model, self-care involves illness-related behaviors, health-deviation self-care requisites, and the prevention and early detection of disease. In this model, taking medication for a specific disease would be an example of self-care. In the role performance model of health, self-care encompasses universal self-care requisites, developmental self-care requisites, and performance of activities of daily living. Within this model, getting enough sleep to enable one to perform activities of daily living would be an example of self-care. Self-care strategies in the adaptive model encompass stress management and self-management. Taking time to relax each day to alleviate stress is an example of adaptive self-care. Within the eudaemonistic model, self-care includes health promotion and wellness activities, such as participating in an exercise club for health and enjoyment.

Although the concept of self-care is viewed differently by multiple disciplines, shared characteristics can be seen. Gantz (1990) noted that self-care is situation- and culture-specific and influenced by personal knowledge, skills, values, and personal traits. Further, self-care includes the capacity to make choices, and focuses on the aspects of health care that are under individual control. In brief, the concept of self-care as described in literature covers a wide range of behaviors in

relation to illness, restoration, disease prevention, and health promotion. This study will focus on self-care directed toward health promotion. As aforementioned, because of the congruence of the concepts of self-care and health promotion, "health-promoting self-care" is used in this study to denote processes and actions for self-care that are deliberately performed by an individual or a group of people to promote better health and well-being from an existing condition.

## Conceptualizations of Basic Conditioning Factors

According to Orem (1995), basic conditioning factors are "factors internal or external to individuals that affect their abilities to engage in self-care or affect the kind and amount of self-care required" (p. 203). These factors in Orem's (1995) theory include age, gender, development state, health state, socio-cultural orientation, health care system factors, pattern of living, including activities regularly engaged in, environmental factors, and resource availability and adequacy. Basic conditioning factors selected for Thai older adults in this study include age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status. The rationale for selecting these basic conditioning factors is based on Orem's self-care theory integrated with knowledge about sources of self-efficacy (Bandura, 1977, 1986, 1997) and will be discussed as follows.

Perceived ability for health promoting self-care in this study refers to self-efficacy in health-promoting self-care. Bandura (1997) stated that self-efficacy comes from (1) physiological and affective states; (2) verbal persuasion; (3) vicarious

experiences; and (4) enactive mastery experiences, the most powerful source of self-efficacy belief.

In the proposed model, age may affect chronic health problems, health status, strength, and stamina. These factors are physiological states that may influence self-efficacy beliefs. Older adults tend to experience at least one chronic illness (Kutneret al., 1992; Young, 1994). With advancing age, frequency of chronic illnesses tends to increase (Padula, 1992; Watt et al., 1997; Young, 1994). One's perception of physiological states has a direct effect on self-efficacy (Bandura, 1997; Simons-Morton, Greene, & Gottlieb, 1995).

Education is fundamental for cognitive processes, which enable people to take control over situations; thus, it should influence ones' self-efficacy beliefs (Green & Simons-Morton, 1991). Older people who retain high levels of intellectual functioning tend to be those who have educated themselves, sought intellectual activities, demonstrated adaptability and satisfaction with their life attainments in midlife, and continued lifestyles that maintain physical health (Schaie, 1995). Bandura (1997) argues that achievements in knowledge, skills, and expertise can counterbalance for losses in reserve capacity. Characteristics (such as reasoning, problem-solving, and wisdom) that rely on accumulative knowledge may remain constant or expand in advanced age among people who have educated themselves.

Support from social networks, as an environmental factor, can increase knowledge and strengthen personal efficacy to engage in health practices (Bandura,

1997). It is hypothesized that verbal persuasion of family and friends may increase older adults' beliefs in their abilities for engaging in health-promoting self-care. Older adults might need encouragement to modify their behavior or recognize their potential abilities or skills (Moore, 1990). Simons-Morton and colleagues(1995) stated, "One's confidence in his or her ability to perform a specific task can be markedly increased or reduced by the encouraging or discouraging remarks of other persons whose opinions are respected" (p. 310). Persuasive enhancement in perceived self-efficacy directs people to attempt accomplishment. Self-affirming belief encourages development of skills and efficacy beliefs. However, one's past experiences also affect the impact of persuasion. Persuasive efficacy will affect people who believe that they can reasonably produce outcomes through their actions (Bandura, 1997).

Functional ability, a basic conditioning factor, can facilitate an individual to master tasks directed toward health promotion, which in turn, promote self-efficacy beliefs. Individuals with independent health status should have a better chance to perform tasks than ones with dependent health status. Orem (1995) stated that one of the ten power components of self-care agency is "ability to control the position of the body and its part in the execution of the movements required for the initiation and completion of self-care operations" (p. 221). In short, this ability in performing physical functioning should be basic to form self-efficacy in self-care.

Social comparison functions as an important factor in self-evaluation of capabilities. Perception of physical declines in aging may reflect low efficacy beliefs in physical functioning (Bandura, 1997). An individual's interpretation of physiological states is a complex process that gives meaning based on his/her perceptions about the context (Conn, 1998). In everyday life, older adults may compare themselves to their associations, such as friends at their age. Perceived health status reflects individuals' evaluation of their general health (Speake, Cowart, & Pellet, 1989), which is hypothesized to affect self-efficacy beliefs.

In conclusion, age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status are proposed as basic conditioning factors affecting self-efficacy beliefs for health promotion of older adults by an integration of knowledge from Orem's (1985, 1991, 1995) self-care theory and from Bandura's (1997) self-efficacy theory.

## Conceptualization of Self-Care Agency

Self-care agency is a major construct in Orem's self-care model. Orem (1995) defined self-care agency as "the complex acquired capability to meet one's continuing requirements for care of self that regulates life processes, maintains or promotes integrity of human structure and functioning and human development, and promotes well-being" (p. 212). Self-care agency is conceptualized as abilities: to understand relevant objects and their meaning in a particular situation; to acquire knowledge or appropriate courses of actions for regulation; to make decisions on

what to do; and to act for change or regulation of objects and situation. However, one's self-care ability in terms of power "can be exercised or not exercised" (Orem, 1995, p. 244); therefore, ones' self-care abilities should include their potentials not yet exercised or perception toward their abilities.

Orem (1995) explained that self-care agency consists of a three-part structure:

(1) a broad conceptual structure established from capabilities for performing estimative, transitional, and productive self-care operations;

(2) a set of power components enabling self-care operations (e.g., abilities to maintain attention, to reason, to make decision, to perform discrete self-care actions, and to perform self-care operations relevant to the context of personal, family, and community living, etc.); and

(3) five sets of foundational capabilities and dispositions: conditioning factors and states (e.g., genetic factors, health state, social organization, culture experience); basic capabilities (e.g., sensation, learning, exercise or work); knowing and doing capabilities (e.g., rational agency, operational knowing); dispositions affecting goals sought (e.g., self-awareness, self-concept, future directedness); and significant orientative capabilities and dispositions (e.g., orientations to time, health, other persons, events, objects, priority system, etc.).

Self-care agency may vary over time depending on basic conditioning factors (e.g., age, health state) and self-care demands. The adequacy of self-care agency is

determined in terms of the relationship of an individual's capabilities and the operations required to meet existing or projected self-care requisites (Orem, 1995).

Perceived Abilities for Health-Promoting Self-Care

In this study, perceived abilities for health-promoting self-care are conceptualized as part of self-care agency and referred to as perceived self-efficacy in self-care directed toward health promotion. Bandura (1977, 1986, 1997) developed the concept of self-efficacy, a central concept in social cognitive theory. Although self-care agency and self-efficacy are not the same construct, linkages between them can be seen.

The assumptions of self-care agency and self-efficacy are both based on beliefs that human behaviors are purposive and human potentialities are substantive to perform required actions. Bandura (1997) defined perceived self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). This definition is consistent with the construct of self-care agency, which refers to an estimative capability and a productive capability for self-care aimed at achieving self-care requirements (Orem, 1995). In the context of self-care for this study, perceived self-efficacy is conceptualized as a human disposition motivating an individual to engage in self-care. In other words, perceived self-efficacy may be viewed as a potential attribute of a person to perform self-care. Orem (1995) explains that human dispositions can affect individuals' willingness to

accept themselves as self-care agents to be able to perform particular self-care measures.

The strong point of Orem's self-care theory is that it clearly states the goal of self-care directed toward maintaining health and well-being. However, this theory may not explain the link how self-care agency affects self-care behavior. Self-efficacy theory may fill this gap. Yet, self-efficacy theory may delineate a specific goal or an outcome in performing each task in terms of outcome expectancies, not the global goal directed toward health. Combining the two theories is expected to better explain the phenomenon of health-promoting self-care among older adults.

Bandura (1997) identified two types of expectancies that influence behavior: efficacy and outcome expectancies. Efficacy expectation is the belief that one can perform a particular behavior to generate a specific outcome. Outcome expectation is a judgment that behavior can produce the desired outcome. Expectations of self-efficacy are influential determinants of behavior change because they determine the initial decision to execute a behavior, the amount of effort employed, and the persistence when challenges are encountered. The stronger the self-efficacy, the more active the efforts.

Additionally, Bandura (1977, 1986, 1997) said that judgments regarding self-efficacy are based on four sources of information: (1) enactive attainment or performance accomplishment; (2) vicarious experience; (3) verbal persuasion; and (4) physiological and affective state. Bandura identified performance accomplishment as

the most powerful source because it is based on the mastery experience. Vicarious experience refers to experiences that one appraises their abilities in relation to the attainments of others. Verbal persuasion is a source of self-efficacy because it strengthens ones' beliefs that they have capabilities to attain goals that they are seeking. Finally, physiological and affective states, such as health functioning, physical accomplishments, and coping with stressors, also affect people's perceived self-efficacy.

Bandura (1997) explained that self-perception of efficacy is collected through these four sources of information but is dependent on cognitive processing. Once formed, self-efficacy beliefs contribute to the accomplishment of human functioning in diverse ways by cognitive, motivational, affective, and decisional processes through which qualifications are obtained. The way in which people use this information is contingent upon the types of evidence that people have learned to use as indicators of personal efficacy. The same information concerning personal capabilities may be interpreted differently by various people. Knowledge about self-efficacy, integrated with basic conditioning factors of Orem's self-care theory, can be applied in this study to explore what factors predict perceived abilities for health-promoting self-care of Thai older adults.

In summary, the proposed conceptual model has two exogenous variables (age, education) and six endogenous variables (chronic health problems, perceived family support, perceived friend support, functional ability, perceived health status,

and perceived abilities for health-promoting self-care). Specifically, the variable "perceived abilities for health-promoting self-care" is also called an outcome variable. The proposed model is recursive because it has no reciprocal causation (Munro, 1997; Pedhazur, 1982) (Figure 1.1).

## Research Hypotheses

According to the paths in the proposed model, 22 hypotheses were tested (see Figure 1.2) and grouped as follows. Each path represents one hypothesis.

1. Age is negatively associated with perceived family support, perceived friend support, functional ability, perceived health status, and perceived abilities for health-promoting self-care, but positively associated with chronic health problems.

2. Education is positively associated with perceived family support, perceived friend support, functional ability, perceived health status, and perceived abilities for health-promoting self-care.

3. Perceived family support is positively associated with functional ability, perceived health status, and perceived abilities for health-promoting self-care.

4. Perceived friend support is positively associated with functional ability, perceived health status, and perceived abilities for health-promoting self-care.

5. Chronic health problems are negatively associated with functional ability and perceived health status.

6. Functional ability is positively associated with perceived health status and perceived abilities for health-promoting self-care.

7. Perceived health status is positively associated with perceived abilities for health-promoting self-care.

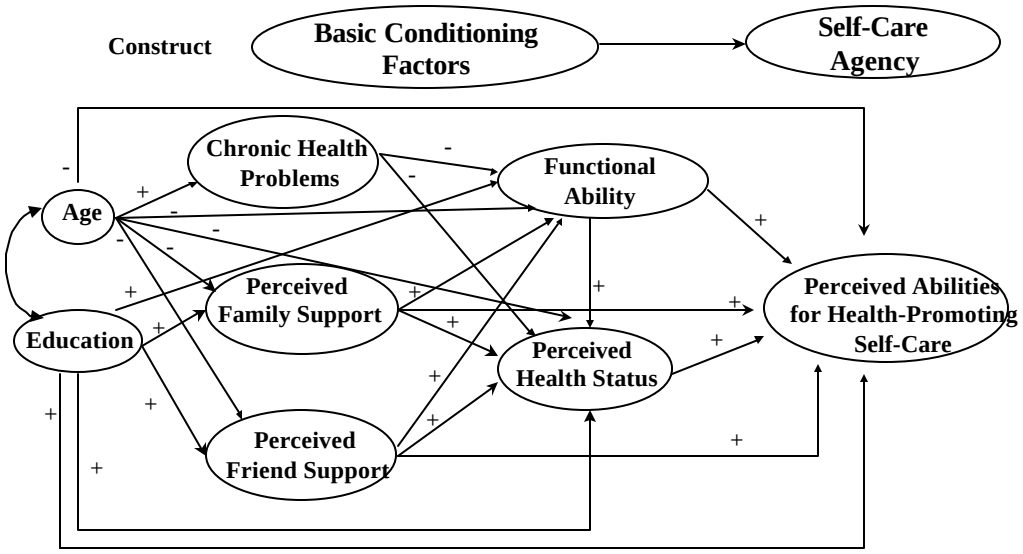



**Figure 1.2.** **A hypothesized model of factors contributing to perceived abilities for health-promoting self-care of community-dwelling Thai older adults.**

**Note.** **Correlation,** **Path or structural effect**

## Operational Definitions

Demographic characteristics are defined as a group of variables of individuals, which are either inborn or acquired, that can affect their thoughts, values, and behaviors. Demographic characteristics to be measured in this study include age and education.

Age is defined as the number of years from birth to the last birthday.

Education is defined as the number of years in formal education.

Perceived family support is defined as an individual's perception of the provision of assistance given by family members in various categories, including five aspects: adaptation, partnership, growth, affection, and resolve/commitment (Smilkstein, 1978). Norwood (1996) equated Adaptation and Resolve/Commitment as Aid; Partnership and Growth as Affirmation; and Affection as Affect. Perceived family support was measured by the Family APGAR Questionnaire developed by Smilkstein (1978).

Perceived friend support is defined as an individual's perception of the provision of assistance given by friends in various categories, including five aspects: adaptation, partnership, growth, affection, and resolve/commitment (Smilkstein, 1978). Perceived friend support was measured by the Friend APGAR Questionnaire developed by Smilkstein et al. (1982).

Chronic health problems are defined as the number of chronic symptoms, diseases, or impairment that the participant identifies. Chronic health problems were measured by the Chronic Health Problem Checklist developed by Erickson, Kinney, Becker, Acton, Irvin, and Hopkins (1991).

Functional ability is defined as the self-reported ability to perform activities of daily living both inside and outside the home over the past month. Functional ability was measured by the Modified Barthel Activities of Daily Living Index (Thai version) and the Chula ADL Index developed by Jitapunkul, Kamolratanakul, and Ebrahim (1994).

Perceived health status is an evaluation of the participant of his/her general health, which was measured by a self-rated health question, “In general, how would you rate your health over the past month: 1 = very poor, 2 = poor, 3 = fair, 4 = good, and 5 = excellent?”

Perceived abilities for health-promoting self-care are defined as ones’ beliefs in their capabilities to engage in self-care directed toward health promotion and were measured by the Self-Rated Abilities for Health Practices developed by Becker, Stuifbergen, Oh, and Hall (1993).

## Assumptions

The following theoretical and methodological assumptions were made for this study.

1. Individuals are active and capable to perform self-care and take control of their health.

2. Beliefs and confidence in performance ability will affect performance goals.

3. Individuals act deliberately in performing health-promoting self-care.

4. Self-care ability of Thai older adults is cultural-specific; however, it can be studied and understood based on the participants’ perspectives.

5. Participants will honestly answer the survey questions.

## Limitations

The possible limitations in this study include:

1. The findings from this study may not be generalizable to all Thai older adults because the sample was drawn from older adults in only three selected sub-districts in Suphanburi Province.

2. Some research instruments used in this study were developed in English and based on the western data. The validity of the translation might be compromised because some English words could not be translated to Thai in the identical meaning.

3. Because the research hypotheses were mostly based on western research and culture, they may not entirely transfer to the Thai culture.

4. The causation in the path model cannot be made because an experimental design was not used. At best, it may answer the question of whether the hypothesized model is consistent with the data (Bollen, 1989; Pedhazur, 1982).

5. A recursive path model was used in this study. However, the recursive model may not reflect phenomena in the natural setting because the relationships among variables are diagramed to the same direction. In other words, there is no interaction among variables assumed (Polit & Hungler, 1999; Thanawiboonchai, 1994).

## Summary

In this chapter, the purpose of the study, background and significance, statement of problem and research questions, theoretical framework, definitions, assumptions, and limitations were presented. The purpose of the study is to examine factors related to perceived abilities for health-promoting self-care of community-dwelling Thai older adults. The purpose of the study consisted of two aims: (1) to examine the relationships of demographic variables (age, education), perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health to perceived abilities for health-promoting self care; and (2) to test a model of selected factors contributing to perceived abilities for health-promoting self-care of community-dwelling Thai older adults, applied from Orem's (1995) self-care theory and integrated with Bandura's (1997) self-efficacy theory, by examining the direct and indirect effects of age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status on perceived abilities for health-promoting self-care of Thai older adults. The findings of this study may assist nurses and other health professionals to learn more about factors contributing to abilities for health-promoting self-care of Thai older adults. Knowledge from this study is expected to be a basis for nurses and other health professions who work for Thai older people to design interventions appropriate for Thai older adults.

# CHAPTER 2

# REVIEW OF THE LITERATURE

The variables in the proposed model are divided into two major groups: exogenous variables (age and education) and endogenous variables (perceived family support, perceived friend support, chronic health problems, functional ability, perceived health status, and perceived abilities for health-promoting self-care). Endogenous variables are divided into two subgroups: mediating variables of the relationships among the two exogenous variables and perceived abilities for health-promoting self-care (perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status) and an outcome variable (perceived abilities for health-promoting self-care).

Chapter 2 begins by presenting research on perceived abilities for health-promoting self-care because this variable is the main outcome in the study model. Next, research on the relationships of the two exogenous variables to the mediating variables and the outcome variable is presented. Third, research on the relationships among endogenous variables is presented. This last discussion addresses the relationship of each mediating variable to the outcome variable as well as the relationships among mediating variables. It is important to note that because the amount of research among Thai older adults is limited, studies presented in this chapter are mostly based on Western literature. Findings in the literature may differ

from what is found out about the Thai population. Self-care is culture-specific; therefore, self-care among Thai older adults should be explored.

## Perceived Abilities for Health-Promoting Self-Care

The term "perceived abilities for health-promoting self-care" is not found in the literature reviewed. In the present study, this variable refers to "self-care agency" and "self-efficacy" in health-promoting self-care because perceived abilities for health-promoting self-care are conceptualized as abilities, which individuals believe that they can follow certain courses of action for certain tasks (Bandura, 1997) to promote their health and well-being (Orem, 1995). Self-efficacy is a significant concept in the study of aging. Brandstadter (1992) states that self-referential beliefs of efficacy and control are important factors for maintaining an optimistic view of personal development during middle and later adulthood. He postulates that perceived self-efficacy may contribute to optimal development and successful aging.

In the literature, self-care agency and self-efficacy have been used as independent variables, mediating variables, and dependent variables. Self-care agency has been used as an independent variable to predict self-care behavior (Anderson, 1996; Carroll, 1995; Gallegos, 1998; Horsburgh, 1999), health-promoting behaviors (Davidson, 1988; Edwards, 1997), and quality of life (Panawattanakul, 1991). As a dependent variable, self-care agency has been predicted by basic conditioning factors of the family system and family support (Eyler et al., 1999; Jirovec & Kasno, 1993;

La Greca et al., 1995; Schott-Baer, 1989), health states (Jirovec & Kasno, 1993; Söderhamn et al., 1992), and socioeconomic status (Jirovec & Kasno, 1993).

Self-efficacy has primarily been used as an independent variable, rather than as a dependent variable. Where self-efficacy appears as an independent variable, it has been used to predict general health behavior (Conn, 1997; Duffy, Rossow, & Hernandez, 1996; Martin, 1992), exercise behavior (Conn, 1998; McAuley, 1993; Resnick, Palmer, Jenkins, & Spellbring, 2000; Schuster, Petosa, & Petosa, 1995), independent living of older adults (Abler & Fretz, 1988), self-care in illness (Dilorio, Hennessy, & Manteuffel, 1996; Hurley & Shea, 1992), and health-protective behavior (Gonzalez, 1990; Orleans et al., 1989). In an integrative review, Gillis (1993) reports that self-efficacy is the strongest predictor of a health-promoting lifestyle.

Furthermore, self-efficacy has been used as a mediating variable between self-care agency and self-care behavior for recovery from surgery (Carroll, 1995), between socioeconomic status and health (Grembowski et al., 1993), and among age, barriers, lifelong exercise behavior, and present exercise behavior (Conn, 1998).

As a dependent variable, self-efficacy has been studied in a correlational design in older adults (McAvay, Seeman, & Rodin, 1996) and persons with spinal cord injuries (Horn, Yoels, Wallace, Macrins, & Wrigley, 1998). In the experimental design, an educational or training program including knowledge about sources of self-efficacy was used as an intervention to increase self-efficacy related to improved outcomes—for example, in persons with chronic obstructive pulmonary disease

(Scherer & Schmieder, 1996; Scherer & Schmieder, 1997; Zimmerman, Brown, & Bowman, 1996) and in persons with arthritis (Lorig, Konkol, & Gonzalez, 1987; O'Leary, Shoor, Lorig, & Holman, 1988).

Scherer and Schmieder (1996, 1997) support Bandura's (1977, 1986, 1997) four sources of self-efficacy. The researchers designed an intervention incorporating knowledge about these self-efficacy sources: performance accomplishments, vicarious experiences, verbal persuasion, and emotional or physical arousal. By this means, they hoped to increase self-efficacy to manage breathing difficulty in persons with chronic obstructive pulmonary disease (COPD). The results of the two studies showed a significant improvement in the scores on the COPD Self-Efficacy Scale from pre-program to post-program performance ($\underline{N} = 29$, $\underline{p} < .05$ in 1996; $\underline{N} = 60$, $\underline{p} < .01$ in 1997). The lack of a control group might limit the generalizability of these results; however, these studies lend support to the logic of the self-efficacy theory.

The studies related to self-care that were examined in the literature review tend to associate certain variables or predictors with self-care behavior, rather than with self-care ability. Orem's (1985, 1991, 1995) self-care theory might imply that once individuals perform a given task or engage in a health behavior, they should have some extent of self-care ability despite the fact that self-care ability is not the only source of self-care behavior. This notion is congruent with the self-efficacy theory. Bandura (1997) states that successful experiences are the most powerful source of self-efficacy belief, meaning that once an individual successfully performs a

task or behavior, perceived self-efficacy should already exist and further increase. Based on the assumption that self-care ability is a prerequisite for self-care behavior, research studies pertaining to self-care behavior were included in the review.

In summary, self-care ability or self-efficacy was seldom used as a dependent variable in previous research, particularly among older adults. In Thailand, no research related to perceived abilities for health-promoting self-care of older adults was found. Most Thai studies focused on self-care in illnesses. There is a huge research gap in the area of health-promoting self-care in this population; therefore, factors contributing to perceived abilities for health-promoting self-care of older adults should be explored. Knowledge gained from this study is expected to provide a basis for understanding and intervention planning.

The next section presents the exogenous variables in the proposed model and examines their relationships to the endogenous variables in the model: the mediating variables and the outcome variable.

## Exogenous Variables

Age and education are exogenous variables in the study model. Research on the relationships of each exogenous variable to the mediating variables and to an outcome variable is presented in this section.

### Age

In general, "age" refers to chronological age, the simplest measure of this variable (Spirduso, 1995). Nowadays, several scientists pay attention to biological

age or functional age—"a person's general condition at a particular time of the chronological age" (Ries, 1994, p. 173)—characterized by measurements in physical, psychological, and social aspects. Individual differences in functioning are great among older people. The chronological and biological ages of an individual may, but do not necessarily, correspond (Ries, 1994). In any case, no consensus exists on the meaning of the term, "biological age" (Heikkinen, Suominen, Era, & Lyyra, 1994; Spirduso, 1995).

Although biological perspectives view advancing age as involving loss of physical endurance, sensory functions, intellectual capacity, and memory, Bandura (1997) argues that self-efficacy in older people is based on their appraisals of their abilities. Bandura further explains that some loss of reserve physical capacity with aging does not necessarily entail that the level of psychosocial functioning is impaired.

In the study model, age is hypothesized to relate to perceived social support (perceived family and friend support), chronic health problems, functional ability, perceived health status, and perceived abilities for health-promoting self-care. A discussion of each of these five relationships follows.

Age and Perceived Social Support

Social support in older adults tends to decrease with advancing age (Due, Holstein, Lund, Modvig, & Avland, 1999; Holahan & Holahan, 1987). In a large sample of a longitudinal study (N = 2,011), Due and co-investigators (1999) divided a

random sample into different age groups (25–49, 50–59, 60–69, and 70 years and older) and found that advancing age was negatively associated with social network and instrumental support. The pattern of social contacts among the 25-year-olds and among the 70-year-olds was different. The 25-year-olds tended to have contact with friends, while the 70-year-olds had more contact with children, friends, and people they knew from formal associations. This result is similar to that of van Tilburg's (1998) longitudinal study in a sample of 2,903 older adults, aged 55–85. Because the number of close relatives increased and the number of friends decreased, the total network size did not change much. However, the number of networks and contacts does not necessarily indicate the degree of social support.

In a longitudinal study, McCamish-Svensson, Samuelsson, Hagberg, Svensson, and Dehlin (1999) found that the number of friends of people in a single cohort of 80-year-olds decreased significantly from when the subjects were 80 to when they were 83 years of age even though the subjects were well integrated with family and friends. The number of people who reported no close friends at all approximately doubled between the ages of 80 and 83. These findings showed that advancing age may be associated with fewer social networks, which in turn, results in less social support.

Regarding social networks, Glass, Mendes de Leon, Seeman, and Berkman (1997) proposed and tested a set of measures of social networks for use in the older population. This set of measures comprised four subnetworks corresponding to four

primary social roles: ties with children, ties with other close relatives, ties with close friends, and ties with a confidant. The investigators found that persons aged 75 and older had significantly lower social network scores for relatives ($p < .001$), friends ($p < .001$) and for the summary network index ($p < .001$), when compared to younger persons (aged 60–74). However, this study used only measures of social networks; therefore, the quantity or quality of support may be not indicated.

In addition to the notion of reduced social networks among older adults, Fredrickson and Carstensen (1990) proposed a selectivity theory to explain why older individuals became more selective in choosing their social partners. Selectivity performs at least two functions: (1) it helps individuals preserve their energy as they age; and (2) it works as a mechanism for affect regulation, meaning that older people maximize contact with their closest relationships and minimize interaction with less familiar social partners. Fredrickson and Carstensen conducted two studies. Study One showed that people's cognitive appraisals of potential social partners vary with the age of the appraiser. Compared to their younger counterparts, older adults placed more importance on the level of affection anticipated in the interaction than on the likelihood of future contact. Study Two showed that middle-aged and older adults selected familiar social partners more often than did younger persons. In brief, fewer social networks and a process of choosing social partners that is more selective than their younger counterparts characterize older people and may be related to their reduced social support.

Age and Chronic Health Problems

In the literature, it has been noted that 80% of people aged 65 or older have at least one chronic health problem (Katz, 1983; Kutner, Ory, Baker, Schechtman, Hornbrook, & Mulrow, 1992; Miller, 1995; Walker, 1997). Most common chronic health problems in older adults include arthritis, hypertension, cardiac problems, and hearing or vision impairment (Coroni-Huntley et al., 1992; Krach, DeVaney, DeTurk, & Zink, 1996). Although some conditions such as arthritis and visual impairment are not terminal, they are seriously disabling (Miller, 1995).

Studies showed that the number of chronic health problems vary with age (Dunkle, Kart, & Lockery, 1994; Laukkanen, Sakari-Rantala, Kauppinen, & Heikkinen, 1997; Swaddiwudhipong et al., 1996). Laukkanen et al. (1997) reported the changes that occurred in morbidity, symptoms of illness, and disability in a large sample of older adults, aged 75 and 80 years old over a 5-year period. Chronic conditions were assessed by using a combination of self-report, respondents' prescriptions, and medical information cards. The authors found that the number of diseases and the proportion of persons with co-morbidity increased during the follow-up.

In addition, Dunkle, Kart, and Lockery (1994) reported from the 1984 Supplement on Aging (SOA) data that respondents aged 75 to 84 were twice as likely as the group aged 55 to 64 to have two or more of the following illnesses: osteoporosis, coronary heart disease, stroke, cancer, and Alzheimer's disease. In a

similar manner, using data from a national survey of the elderly in Thailand, common diseases found were hypertension, osteoarthritis, heart disease, diabetes mellitus, and major stroke (Jitapunkul & Bunnag, 1998).

Swaddiwudhipong and colleagues (1996) conducted a survey to determine the prevalence of social and medical problems in an elderly population in rural Thailand in 1993 and 1994. The sample consisted of 3,302 persons aged 60 and older from 54 villages in Mae Sot District, Tak Province. The age range was divided into three groups: 60–69, 70–79, and 80 years and older. The investigators found that the prevalence of hypertension, incontinence, and falls was positively associated with advancing age ($p < .01$). Through logistic regression analyses, the probability of hypertension was 1.04 times for one year of increased age (95% CI = 1.03–1.06).

These data show that health conditions that older adults experience may include chronic illnesses and symptoms, disability, or age-related changes (visual impairment).

Age and Functional Ability

As people age, functional decline can be seen, although the rate of the decline among older people is heterogeneous (Spirduso, 1995). Functional decline may be associated with chronic conditions (Mann, 1994) and such age-related changes as impairments in hearing, vision, mobility, cardiovascular functioning, and other physiological functioning (Miller, 1995). Existing studies show that age and functional ability are correlated (Barberger-Gateau, Fabrigoule, Rouch, Letenneur, &

Dartigues, 1999; Heikkinen et al., 1994; Mendes de Leon, Seeman, Baker, Richardson, & Tinetti, 1996; Swaddiwudhipong et al., 1996; Wu, Leu, & Li, 1999).

Wu and colleagues (1999) studied selected predictors (socio-demographic factors, health status, adverse lifestyle, and leisure-time physical activity) of chronic disability in activities of daily living among a random sample of 1,321 community-dwelling Taiwanese people, aged 65 years or older, with intact ADLs at the baseline in 1993. The participants' functional ability was assessed annually until 1996. Participants who were unable to perform independently at least one of six functions (eating, bathing, dressing, using the toilet, transfers, and walking inside the house) were considered to be chronically ADL-disabled. Results showed that during the three-year period, 11% developed chronic ADL disability, 4.4% dropped out, and 6.3% died. Using Cox's multiple hazard regression analyses, the investigators found that persons aged 70 to 79 and those older than 80 had an increased risk of ADL disability, compared to those younger than 70 years of age (relative risk, RR = 2.05, 95% CI = 1.35–3.11 and RR = 3.89, 95% CI = 2.33–6.50, respectively). Age was the strongest predictor of chronic ADL disability in the study.

Barberger-Gateau et al. (1999) examined the relationships between neuropsychological tests and four instrumental activities of daily living (IADLs) in a sample of 1,792 adults, aged 65 and older, who were included in the Personnes Agees Quid (PAQUID) study. The IADL assessment included the ability to use the telephone, access transportation, manage medication, and handle finances. At a 1-year

follow-up, the sample consisted of 1,424 older adults. Results showed that age was negatively associated with the level of functional performance, meaning that as age increased, functional performance decreased. Using stepwise logistic regression, the investigators found that as age increased, functional performance significantly declined in accessing transportation (OR = 0.91, 95% CI = 0.88–0.93) and handling finances (OR = 0.99, 95% CI = 0.95–1.04).

Similarly, in a survey study in rural Thailand, Swaddiwudhipong et al. (1996) found that Thai older adults, aged 60 years and older, were more likely to have difficulties with activities of daily living such as using the toilet, bathing, transfer, dressing, preparing meals ($p < .01$), and feeding ($p < .05$) than the younger groups, less than 60 years old (N= 3,302). Also, Litwin (1998) found that the old-old group (aged 75 and older) reported higher levels of disability in basic activities of daily living and instrumental activities of daily living than did the young-old group (aged 60–74) (N = 4,214, $p < .01$).

Heikkinen and colleagues (1994) found that the decline from the middle-aged group (51 to 55 years) to the elderly group (71 to 75 years) was larger than the decline from the youngest (31 to 35 years) to the middle-aged group under normal laboratory conditions in several tests, including cognitive performance, sensory performance, psychomotor and motor capacity, anthropometric properties, status of musculoskeletal system, physician's assessment of health status, strength of muscles, and anaerobic and aerobic power.

For activities of daily living among older adults, approximately 42% of older adults in the United States had some degree of functional limitation. Disability among people aged 75 and older was twice as high as among those aged 45 to 64 (Katz, 1983). Also, Mendes de Leon et al. (1996) found that advancing age, considered with other variables (demographic data, functional ability, and level of social support) jointly predicted decreased ADL levels at follow-up in a sample of 846 community-dwelling older adults ($p < .001$). Approximately 17% of the sample experienced a decline in performing activities of daily living and 46% had at least some decline in physical capacity. Previous findings support the negative relationship between age and functional ability.

Age and Perceived Health Status

There is evidence that age has a negative association with perceived health status, although some authors (Ferraro, 1984; Idler, 1993; Mossey, 1995; Stoller, 1984) reported that older people are more likely to rate their health optimistically. Stoller (1984) reports that older adults are more likely than younger adults to rate their health better than their age-group peers. Damian, Ruigomez, Pastor, and Martin-Moreno (1999) found that persons aged 85 and older rated their health higher than those aged 65–74 (adjusted OR = 0.37, 95% CI = 0.18–0.77) among a sample of 677 adults aged 65 and older.

In contrast, a number of studies (Chayovan & Knodel, 1996; Dunn & Dyck, 2000; Johnson & Wolinsky, 1993, 1994; Piano, 1997) found that older adults tended

to rate their health poorer than did younger adults. Chayovan and Knodel (1996) found that older Thai adults (older than 60) rated their health poorer than did the younger group (50–59 years of age). Likewise, in a large sample size (N = 15,781), Dunn and Dyck (2000) found that the respondents with advancing age were more likely to report their health as poor or fair.

It should be noted that different research designs yield different results. Orfila, Ferrer, Lamarca, and Alonso (2000) examined perceived health status among older adults and compared estimates obtained from cross-sectional and longitudinal approaches. The sample consisted of a cohort of non-institutionalized persons aged 65 years and older. At the baseline in 1986, a sample of 1,315 people was interviewed. At the follow-up, 7.5 years later, (1993-1994), a sample of 754 was re-assessed. The age groups of two years (65–66, 67–68, 69–70, and so on) were stratified into 14 groups. Perceived health status was assessed by a question, "In general, how would you rate your health: very good, good, fair, poor, or very poor?" Results revealed that in the cross-sectional approach, the estimates of change did not increase with advancing age.

In contrast, the longitudinal approach showed that the pattern of decline significantly changes with advancing age. The average estimate of change in perceived health status in the longitudinal analysis was 8.7 times greater than that in the cross-sectional analysis. In the cross-sectional approach, the differences in perceived health of various age groups were probably masked by a cohort effect,

which was influenced by social factors. This result supports the notion that the estimate of change cannot be made by the cross-sectional design (Pedhazur & Schmelkin, 1991). However, this study excluded older persons with poor function in the community and in the long-term care institutions; thus, selection biases are some of concern. In addition, the 15% attrition rate in this study is one of the threats to internal validity, although it was considered by the authors to be a low rate.

In addition, in a random sample of 179 community-dwelling older adults, Piano (1997) found a negative but weak significant relationship between age and perceived health status ($\underline{r} = -.15$). Likewise, through a structural equation modeling approach, age was found to have a negative effect on perceived health status in a large sample of 5,151 older adults from the four-wave Longitudinal Study on Aging (LSOA) ($\beta = -.31$ to $-.34$ across races and genders, except for black males, $\underline{p} < .001$) (Johnson & Wolinsky, 1994).

In a meta-analysis of 37 studies regarding age effects and health appraisal, G. Roberts (1999) found that younger adults (younger than 60 years) were more likely to be more optimistic about their health than were older adults (older than 60 years), when a global item was used to measure perceived health, particularly in the studies that used probability samples. On the other hand, when an age-comparative item was used, older adults tended to rate their health more optimistically. In brief, the meta-analysis revealed that the global and age-comparative items yielded different results (Roberts, G., 1999).

This notion has been supported by Orfila et al. (2000). In their study, a single question for rating global health was used, and findings showed that in longitudinal study, perceived health status declines with advancing age. Orfila and colleagues commented that both questions are valid, but they have different uses and can generate different results. These findings show how an assessment tool can alter findings about the way older adults perceive their health. In this study, global health status is the focus; thus, the global item was used to measure perceived health status.

Age and Perceived Abilities for Health-Promoting Self-Care

Findings have been inconsistent in the literature regarding the relationship between age and self-care ability. Some studies report a negative relationship between age and self-care ability (Söderhamn et al., 2000) and self-efficacy (Clark, Patrick, Grembowski, & Durham, 1995; Conn, 1998; Wilcox & Storandt, 1996), while others do not find a significant relationship between age and self-care ability (Jirovec & Kasno, 1993; McDermott, 1993).

Using multiple regression analyses, Söderhamn and colleagues (2000) found that age was negatively associated with self-care ability to maintain health and well-being in a sample of 125 home-dwelling older people ($\beta = -.43$, $p < .0001$). Participants who were 75 years of age and older had lower self-care ability than those who were younger than 75 years. These findings are congruent with Wilcox and Storandt (1996) and Conn's (1998) study.

Wilcox and Storandt (1996) examined the relationships among age, exercise status, and exercise self-efficacy in a community sample of 121 women aged 20 to 85. Findings showed that age was negatively associated with exercise self-efficacy. Conn (1998) tested the predictive ability of a model of exercise self-efficacy in a sample of 147 persons aged 65 to 100 years. The model's self-efficacy and exercise constructs consisted of outcome expectancy, perceived barriers to exercise, perceived health, age, and lifelong leisure exercise in a non-probability sample of 147 older adults who were 65 to 100 years old. Conn found that age had a negative effect on self-efficacy of exercise among older adults ($\beta = -.25$, $\underline{p} < .01$). Persons with advancing age had lower exercise self-efficacy beliefs. However, confounding variables in the relationship between age and health status were left unexplained in the path analysis; therefore, it was difficult to conclude that low self-efficacy was influenced by age alone.

Clark and colleagues (1995) examined factors influencing exercise self-efficacy among people aged 65 and older who were enrolled in the Group Health Cooperative of Puget Sound (GHC) in Washington in 1989. Sequential regression analyses showed that age had a negative relationship with exercise self-efficacy when the variables of social support, health status, previous experience with exercise, and outcome expectation in exercise were entered in the model sequentially. Although the partial regression coefficients of age were gradually reduced, they remained significant.

On the other hand, McDermott (1993) examined the relationship between basic conditioning factors and self-care agency in 309 adults between 21 and 65 years of age. The investigator found that age was not significantly associated with self-care agency. Failure for there to be a significant relationship between age and self-care agency might have resulted because the age range was divided into eight categories, which produced a small number in each group (5 to 32 subjects); this made significant associations difficult to find. Likewise, Jirovec and Kasno (1993) did not find a significant relationship between age and self-perceptions of self-care agency among 83 institutionalized elders. Generalizations from their results must be made cautiously because of a small sample size (N = 83) and the lack of random sampling.

In conclusion, age was found to be negatively related to perceived ability regarding health behavior. However, some studies do not support this link. Possible reasons for the lack of relationship were discussed.

Summary

In the literature, age has been found to be negatively related to social support and to functional ability, but positively related to chronic health problems. Previous studies mostly address social support in terms of social networks (e.g., size, density, and frequency of contact), rather than in terms of satisfaction with support. Functional ability refers to the ability to perform activities of daily living, basic ADLs as well as instrumental ADLs. The relationship of age to perceived health status and to perceived abilities for self-care is inconsistent. Different tools used to assess

perceived health status (e.g., the age-comparative items or the global item) yielded different results regarding the relationship of age to perceived health status. Further, though some studies do not find a significant relationship between age and self-care ability or self-efficacy, a negative association is reported by a number of studies.

## Education

This section presents the relationship of education to perceived social support, functional ability, perceived health status, and perceived abilities for health-promoting self-care.

### Education and Perceived Social Support

Few studies have explored the relationship between education and social support. Green and Simon-Morton (1991) explained that education may influence the process of social support because it is an extremely important component of the social system. Cutrona (1986) found that social network characteristics were the best predictors of perceived social support among older adults, accounting for 30% of the variance in perceived social support ($N = 50$). This finding may support the notion that people with more education build a more extensive social network than do those with less education, or perhaps that the better-educated tend to have access to more persons. However, the small sample size limits the study's generalizability.

In a sample of 112 Thai patients aged 19–76 with cancer receiving radiotherapy, Hanucharurnkul (1989) found a positive but weak relationship between education and social support ($r = .21$, $p < .01$). In contrast, Taylor (1985) found that in

581 African Americans, education was negatively related to support received ($\chi^2$ = 14.9, $p < .05$, Cramer's V = $.13^{ns}$); that is, the more education the respondents had, the less support they received. However, the chi-square value depends on the sample size; it tends to be significant if the sample size is large. The strength of association of the chi-square statistic is therefore difficult to interpret (Norusis, 1995). In Taylor's (1985) study, the level of significant association between education and social support was not strong (< .05), and Cramer's V value was not significant. The significant finding of the chi-square statistic in the Taylor's study may be due to the sample size issue. In addition, social support was measured in terms of frequency of informal support from family members; therefore, it might not reflect overall support to older adults.

Education and Functional Ability

The relationship of education to functional ability has been established in the literature (Green & Simons-Morton, 1991), but its association may not be straightforward. Katz (1998) views education as a surrogate marker for a group of factors affecting health. The mechanism through which education is associated with health (e.g., functional ability) is not well understood (Katz, 1998). Green and Simons-Morton (1991) conceptualized that education may affect the process of social support, which in turn has a direct effect on health, including functional ability; education can also guide people who have the power and authority to modify health care environments, which can directly affect health.

Though they are few, previous studies (Litwin, 1998; Ross & Mirowsky, 1999) show a positive association between education and functional ability. Through multiple classification analysis (MCA), Litwin (1998) found that persons with more education reported lower scores on disability in basic activities of daily living (BADLs) and instrumental activities of daily living (IADLs) in a sample of 4,214 older adults ($\beta$ = .10 and .07, respectively; $p < .01$). In other words, more education was associated with higher levels of functional ability in performing BADLs and IADLs. Although the strength of the relationship between education and functional abilities in performing BADLs and IADLs was weak, it was significant because the sample size was large. The level of significance is highly affected by the sample size (Munro, 1997).

In brief, an association between education and functional ability has seldom been reported. Rather, the relationship of education to perceived health status is more predominant, although still not prevalent in the literature. Nevertheless, it is logical to propose that education may affect functional ability. For instance, instrumental activities of daily living (e.g., handling money, accessing transportation) are relatively complex tasks, and performing them requires higher cognitive abilities, which may be enhanced by education.

Education and Perceived Health Status

Existing studies show a positive relationship between education and perceived health status (Grembowski et al., 1993; Johnson, Ratner, Bottorff, & Hayduk, 1993;

Johnson & Wolinsky, 1993; Orfila et al., 2000; Ross & Mirowsky, 1999; Stronks, De Mheen, Looman, & Mackenbach, 1997; Veenstra, 2000).

Orfila and colleagues (2000) found that in a large sample of older adults (N = 1,315), persons who were illiterate had a higher probability of rating their health status as poor (OR = 1.9, 95% CI = 1.1–3.2). The authors noted that low educational levels may be a barrier to accessing health care services, which in turn may influence health status. Additionally, persons with little or no education may be unable to rate an abstract concept such as health correctly.

In a sample of 534 adults, Veenstra (2000) found that education was significantly associated with perceived health status, as measured by the age-comparative item of self-rated health, in both the middle aged (39–65) (Cramer's V = .14, $p < .05$) and the older group (over 65) (CV = .26, $p = .004$). Furthermore, education was positively related to perceived health status among total respondents (CV = .21, $p < .001$), as well as among men (CV = .20, $p = .001$) and women (CV = .21, $p < .001$). However, Cramer's V is a chi-square-based measure of association, and its interpretation is difficult because of the sample size issue (Norusis, 1995).

Stronks et al. (1997) assessed the importance of psychosocial stressors for socioeconomic inequalities in perceived health among a large sample of persons aged 15 to 74 who were not institutionalized (N = 2,802). Educational level was used as an indicator of socioeconomic status and was grouped into seven categories: from primary school to university. Self-rated health was assessed by a single question:

"How do you rate your health in general?" The answer was divided into two groups: good and less than good (fair, sometimes good/bad, and bad). The researchers found that persons who had only primary school education reported poorer health status than those with a university education (OR = 7.76, 95% CI = 5.71–10.53, $p < .001$). The odds of persons with a university education rating their health as good were almost 8 times greater than for those with no more than a primary school education. This difference is quite large.

Grembowski et al. (1993) found that socioeconomic status, including education, family income, and occupation, had a weak positive association with perceived health status in a sample of 2,524 older adults ($\beta = .16$, $p = < .001$). Although socioeconomic status, as a composite variable, was used in the study, the result indicated that education may partly contribute to perceived health status.

Johnson et al. (1993) tested Pender's health-promotion model in a sample of 3,025 non-institutionalized adults using LISREL. Modifying factors, as exogenous variables, included education, among others. The mediating variables included perceived health status. Johnson et al. found that education has a weak positive effect on perceived health status ($\beta = .15$, $p < .001$). In brief, previous studies showed that education was positively associated with perceived health status.

Education and Perceived Abilities for Health-Promoting Self-Care

Education has been found to be associated with self-care ability and self-efficacy. Previous studies have shown a positive relationship between education and

self-efficacy (Clark et al., 1995; Homnan, 1996; Horn et al., 1998; Johnson et al., 1993; Kubzansky, Berkman, Glass, & Seeman, 1998), self-care agency (Panawattanakul, 1991), and self-care (Katz, 1998).

Green and Simons-Morton (1991) explained that education influences health in at least four ways: "(1) expanding opportunities for the individual; (2) increasing knowledge of the world and the options it offers; (3) building self-confidence; and (4) increasing specific skills and capabilities" (p. 190). These may be fundamental means for an individual to increase his/her self-efficacy. According to Green and Simons-Morton (1991), education can enhance self-efficacy, which may have an independent effect on health with or without behavioral change.

Horn et al. (1998) examined determinants of self-efficacy for self-care in a sample of 104 persons with spinal cord injuries. Self-efficacy was assessed by an index of seven items measuring participants' confidence in performing specific tasks without assistance on a scale of 1 to 5, ranging from "definitely can't do it" to "definitely can do it." The tasks included eating, dressing, indoor mobility, getting in and out of the bed and standing on the floor, getting in and out of the bathtub, getting in and out of the shower, and using the toilet. Through logistic regression, it was determined that persons with at least a high-school education were 1.7 times as likely to have high self-efficacy in performing self-care activities than were persons with less than a high-school education (95% CI = 0.53–5.68). However, the result was insignificant. Although self-care activities in this study were limited to the ability to

perform activities of daily living, they may be important for persons with spinal cord injuries to master for independence. Bandura (1997) suggested that a task be first broken down into smaller goals of low magnitude. Once the smaller goals are mastered, the feeling of success enhances self-efficacy.

In a sample of 150 Thai older adults, Homnan (1996) found a weak positive association between education and perceived self-efficacy in general ($\underline{r} = .17$, $\underline{p} < .05$). Together, education, self-efficacy, and self-esteem accounted for 20% of the variance in self-care behavior, yet the degree of variance in self-care might have been higher if a health-specific measure of self-efficacy had been used. Also, in a structural equation model, Johnson et al. (1993) found a weak direct effect of education on perceived self-efficacy in a sample of 3,025 non-institutionalized adults ($\beta = .12$, $\underline{p} < .001$).

Clark and colleagues (1995) examined the relationship between socioeconomic status and exercise self-efficacy among people aged 65 and older, in the Group Health Cooperative of Puget Sound (GHC). Sequential regression analyses showed that the probability of exercise self-efficacy in older adults with a grade school education was 1.26 times lower than in those with a high school education. The probability of exercise self-efficacy in older adults with some post-college graduate education was 0.6 times greater than in those with a high school education. Although two measures of health status—satisfaction with health, and depression—reduced the direct association of socioeconomic status with self-efficacy when

entered in the model, the association between education and self-efficacy remained significant. In short, educational levels were positively associated with exercise self-efficacy among older adults.

Panawattanakul (1991) found a moderate relationship between education and self-care agency in a sample of 106 community-dwelling Thai older adults who were members of clubs for the elderly ($r = .51$, $p < .001$). Self-care agency was measured by the Appraisal of Self-Care Agency (ASA) scale. Through multiple regression analyses, formal education, marital status, income, and self-esteem mutually predicted self-care agency and accounted for 44% of the variance in self-care agency. However, the participants in this research setting may not represent the general population of Thai elders because the participants had joined a club for the elderly, which may indicate a tendency to be interested in health and self-care.

Katz (1998) examined the relationship between education and self-care activities among a sample of 471 persons with rheumatoid arthritis drawn from the 1994 interview data. The mean age was 62.2 years. Education was categorized into six groups: 0–8 years, 9–11 years, 12 years, 13–15 years, 16 years, and 17 or more years. Self-care activities consisted of 15 activities (e.g., exercising; using a heated pool, tub or shower; using joint protection; resting; adjusting daily routine or work schedule; participating in arthritis support groups; avoiding certain foods; using methods to help control stress; using relaxation methods). After controlling for demographic characteristics (age, race, gender, marital status, and work status) and

clinical characteristics (duration of rheumatoid arthritis, the presence of any major comorbidities, the number of painful joints, and functional ability), findings revealed that persons with higher education tended to perform significantly more self-care activities. Persons with at least 13 years of education were more likely to perform five activities: using a heated pool (OR = 3.09), participating in arthritis support groups (OR = 13.56), avoiding certain foods (OR = 2.14), using stress control methods (OR = 2.84), and using relaxation methods (OR = 2.66). These results demonstrated that people with more education were more likely to seek ways to deal with their chronic illness. This is congruent with the notion of "deliberate actions" in Orem's self-care theory, which proposes that self-care is a "purposeful goal-or result-seeking activity" (Orem, 1995, p. 229).

Summary

Existing studies of the relationship between education and social support in older adults are very few, but both positive and negative relationships between education and perceived social support have been found. Education has been found to be positively associated with functional ability, perceived health status, and self-care ability or self-efficacy. The relationship of education to health may not be simple. Education may be a surrogate marker for a set of variables that influence health (Green & Simons-Morton, 1991; Katz, 1998).

## Endogenous Variables

Endogenous variables in the hypothesized model include mediating factors (perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status) and an outcome variable (perceived abilities for health-promoting self-care). This section presents the conceptualizations of the endogenous variables and their relationships with other variables in the study model.

### Social Support

According to Kahn and Antonucci (1980), social support is "interpersonal transactions that include one or more of the key elements: affect, affirmation, and aid" (p. 267). Likewise, House (1981) describes aspects of social support as emotional, instrumental, informational, and appraisal support. Emotional support involves providing caring and comfort; sharing emotional burdens through sympathy or empathy; providing encouragement, love and trust; and expressing concerns (House, 1981; Ragsdale, Yarbrough, & Lasher, 1993). Instrumental support is the providing of tangible materials, services, or aids. This kind of support may cover a wide range of activities such as providing assistance with household tasks, transportation, money, materials, and the like (Wills, 1985; Wilcox, & Vernberg, 1985).

According to Wills (1985), informational support is defined as a process through which other persons provide information, advice, and guidance. This type of

support may operate mainly as a buffering process. Network members may provide valuable assistance when environmental stress exceeds the person's knowledge and problem-solving ability (Wills, 1985). Lastly, appraisal support involves the communication of information which is correlated with self-evaluation rather than problem solving (House, 1981). Kahn and Antonucci (1980) define appraisal support as affirmational support, including expressions that assure the appropriateness of acts or statements made by another. In this study, social support refers to the perception of support provided by family members and friends.

Family Support

Taylor and Renpenning (1995) identified the family within Orem's theory as a basic conditioning factor, a setting for dependent care systems, and a unit of service in the health context. Family is defined as "a system or unit of interacting persons related by marriage, birth, or other strong social bonds with commitment and attachment among unit members that includes future obligations and whose central purpose is to create, maintain, and promote the social, mental, physical, and emotional development of each of its members" (Taylor & Renpenning, 1995, p. 361). The members of the family may not be related by blood, but may be emotionally bonded through common characteristics (Friedemann, 1991).

The family is the major support system for older persons because it functions as a significant resource for older people when they deal with life stresses. This function buffers the effect of stresses on health (Norbeck, 1988). The family can also

be a substitute for formal care and a bridge linking the older person to other resources and services (Brubaker & Brubaker, 1984; Logan & Spitze, 1994). Support can be provided in several ways, such as regular communication, home maintenance, food preparation, transportation, physical care, financial resources, and affection (Miller, 1982). The family, per se, can be viewed as a structure or resource providing support from family members to the focal person—older adults in this context.

Friend Support

Similar to the family support discussed above, friend support refers to any aspect of social support (e.g., emotional, instrumental, informational, and appraisal support) given by friends, as a social structure, to older adults. Although the family is the main source of support for older adults, it was found that the friend group is also important to Thai older adults, particularly regarding emotional support (Yodpeth, Pattanasri, Sombat, Kumhom, & Sutheesorn, 1998). According to Sukrung's (2000) report, Banloo, a Thai expert in geriatrics, suggests that community-based services for older adults (e.g., a club or a center) be established in every village around the country. He also encourages Thai older people to socialize with people their own age through different means, such as joining senior citizens' clubs near their homes.

Friend networks have been shown to be important to older adults. In a sample of 2,812 non-institutionalized older adults, Glass, Mendes de Leon, Seeman, and Berkman (1997) found that most participants (82% of total sample) identified friends as confidants, whereas only 13.9% of total sample reported the spouse as the

confidant. This pattern demonstrates the importance of friend networks among older adults.

Relationship of Social Support to Health

Social support is an environmental resource affecting health in aging (Holahan & Holahan, 1987). Social support has direct (main) and indirect (buffering) effects on physical and mental health (Cohen & Wills, 1985). Cohen and Wills further explain that social support directly promotes health and well-being by completing fundamental social needs and social integration. The buffering effect of support guards individuals against potential harm from acute stressful events, and increases coping abilities (Cobb, 1976). Norbeck (1988) proposed a basic conceptual model of stress, social support, and health, which explains that stress is negatively related to health outcomes and that social support buffers the effect of stress on health. Norbeck states that social support has a negative direct effect on stress but has a positive direct effect on health outcomes.

A number of studies found a positive relationship between social support and health behavior (Muhlenkamp & Sayles, 1986), self-care behavior (Hubbard, Muhlenkamp, & Brown, 1984; Wang & Fenske, 1994; Wangwiwake, 1994), and health status (Chalearnkusol, 1991; McAvay et al., 1996; Ninlert, 1996; Reinhardt, 1996; Sangwatchara, 1994). In this review, social support from family and that from friends were discussed together because most studies did not separate the two variables.

Perceived social support and functional ability. In Thailand, the family serves as the central role of support for older adults. The value of filial piety among Thai adult children for older parents is strong because a Thai culture of "parent repayment" is related to Buddhist-based beliefs (Choowattanapakorn, 1999). This phenomenon suggests that when younger Thai people perceive that their parents' health could benefit from health-promotion, their actions may strengthen older parents' resolve to perform health-promoting self-care. For example, family members may encourage older parents to engage in physical activities if they perceive that this will promote the health of their parents. Positive family actions can also reinforce persons' participation and encourage them to be independent (Kernich & Robb, 1988). In dealing with chronic health problems, family members can urge health behaviors and encourage elders to perform good health practices (Miller, 1982).

Michael, Colditz, Coakley, and Kawachi (1999) examined the relationships of social network characteristics, health behaviors, and health aging among a sample of 56,436 American women aged 55 to 72. After controlling for health behaviors (e.g., current smoking, alcohol consumption, sedentary behavior, and being overweight), findings showed that social networks were significantly associated with functional ability. Network characteristics (having close friends, relatives, and confidants) were strong predictors of high functioning among older women. The absence of a confidant was related to a 4.44 point decline in physical functioning (95% CI = -7.0, -1.9).

Litwin (1998) examined the relationship between social support networks and health measures in a probability sample of adults, aged 60 and older. Litwin divided the support networks into five types: (1) the diversified networks, the greatest variety of support potentials (e.g., from a spouse, siblings, friends, neighbors, and a social club); (2) the friend and neighbor networks; (3) the narrow family-focused network; (4) the religious family network; and (5) the attenuated network, the lowest rate of contact with siblings, friends, neighbors and the social club. Three measures for functional ability were used: basic activities of daily living (BADLs), instrumental activities of daily living (IADLs), and incontinence.

Through multiple classification analyses (MCA), findings showed that older people in the diversified networks, as well as those in the friend and neighbor networks, had a lower rate of disabilities in BADLs and IADLs, whereas the elders with religious family and attenuated networks had a greater rate of disabilities in BADLs and IADLs. After controlling for age, gender, and education, the associations of the network type and disabilities in BADLs and IADLs remained moderate and significant ($\beta = .21$ and $\beta = .23$ respectively, $p < .01$). Although it cannot be concluded that the more diversified social networks produce better social support quality, such a suggestion may lend support to the hypothesis that social support, which is embedded in social networks, influences functional ability. More diversity in social networks may convey a greater extent of social support. This statement is

supported by Cutrona's (1986) study, showing that network characteristics were a good predictor of perceived social support among older adults.

Glass, Matcher, Belyea, and Feussner (1992), in a prospective cohort study, examined the effect of social support on outcomes after the first stroke. Forty-six patients who had suffered a stroke were monitored for 6 months. Their functional ability was measured by the Modified Barthel Index of Activities of Daily Living. Perceived social support was measured by the Inventory of Socially Supportive Behaviors (ISSB) at 1, 3, and 6 months after the stroke. Using a repeated-measures multivariate analysis of variance, the researchers found that the interaction between perceived social support and time was significant ($p = .002$), indicating that patients who perceived more social support had improved functional ability over time. Before hospital discharge, functional ability of patients across levels of social support did not differ significantly. However, 6 months after the stroke, graphical analysis showed that functional ability of patients with high social support improved considerably and quickly. Further exploration revealed that the interaction among time, levels of support, and severity of stroke was found, indicating that the benefit of social support was not equivalent among those with more severe strokes. Graphical data showed that in the group of patients who had suffered a moderate-to-severe stroke, the functional ability of those with high support improved the fastest (steepest slope). This study supports the idea that there are beneficial and differential effects of social support on

functional ability. However, the small sample limits the generalizability of these findings.

Anderson (1990) studied factors related to stroke rehabilitation outcomes finding that good family support had a positive effect on rehabilitation outcomes. This result lends support to the hypothesis that family support might promote the functional ability of people who have had a stroke. Among nursing home residents, independence in activities of daily living increased when nursing personnel encouraged the residents to perform ADLs (Roberts, B.L., 1999). Roberts, Anthony, Matejczyk, and Moore (1994) found that greater mobility was related to greater perceived tangible support and emotional support among community-dwelling older adults.

Perceived social support and perceived health status. Several studies found a positive relationship between social support and perceived health status in older adults (Chalearnkusol, 1991; Litwin, 1998; McAvay et al., 1996; Ninlert, 1996; Piano, 1997; Reinhardt, 1996; Sangwatchara, 1994); however, a few studies showed an opposite finding.

Piano (1997) found a moderate positive relationship between social support and perceived health status ($r = .30$, $p = .05$) in a random sample of 179 community-dwelling persons 85 years and older. In addition, Litwin (1998) found that older adults in the diversified network group reported the best subjective health, followed by those in the friend and neighbor network, whereas those in the attenuated network

reported the poorest subjective health. After adjusting for age, gender, and education, the more diversified network type was still significantly associated with better subjective health ($N$ = 4,199, $\beta$ = .11, $p$ < .01).

McAvay et al. (1996) found that lower levels of social network contact with family and friends and the absence of instrumental support were associated with a decline in health status in a sample aged 62 and older. Ninlert (1996) found that family support was associated with perceived health status among a sample of 404 community-dwelling Thai older adults. Older adults with a lower quality of family support rated their health poorer than those with a better quality of family support ($r$ = .24, $p$ = .05).

Sangwatchara (1994) found that emotional support, informational support, and instrumental support were positively associated with good mental health in a sample of 120 Thai older adults who visited a geriatric outpatient clinic at a hospital in Thailand ($p$ = .01). Also, Chalearnkusol (1991) found a weak positive relationship between social support and health status in a sample of 100 Thai older adults ($r$ = .31, $p$ < 01). However, because the respondents were selected from among attendees at a health-promotion center, selection bias cannot be eliminated. Persons who attended the health-promotion center may have higher social support or health status than non-attendees. Because of the study's limited generalizability, it is prudent to re-explore this relationship in another sample of community-dwelling Thai older adults.

Reinhardt (1996) examined the importance of friendship and family support in adaptation to chronic vision impairment in a sample of 241 elderly people. Friendship support and family support were measured by the 24-item Social Provision Scale (SPS), based on Weiss's (1974) theory of social provision. The results from hierarchical regression analyses revealed that older people who had higher perceived support quality from close family members and higher perceived support quality from close friends, had higher scores on psychological health, operationalized by life satisfaction and depression. This finding lends support to the hypothesis that family support and friend support may influence perceived health status because psychological health should affect an individual's appraisal of global health.

In contrast, through path analysis, Stoller (1984) found that the amount of help from the informal network had a negative indirect impact on perceived health because the level of help weakened psychological morale. Older adults who received more help, in both scope and amount, were those who had greater impairment. However, the cross-sectional data does not allow the researcher to conclude that a change in objective indicators will produce a change in self-rating health for older adults. Previous studies reporting the positive effect of social support on health seem to outnumber those reporting the negative effect of social support on health.

Perceived Social Support and Perceived Abilities for Health-Promoting Self-Care

A number of studies demonstrated the relationships of social support to self-efficacy (Stuifbergen, Seraphine, & Roberts, 2000), ability for health-promoting self-

care (Chalearnkusol, 1991), health behavior (Eyler et al., 1999), exercise behavior (Schuster, Petosa, & Petosa, 1995), and self-care in response to illness (Brugge, 1982; Wang & Fenske, 1996).

Stuifbergen, Seraphine, and Roberts (2000) tested an explanatory model of factors affecting health promotion and quality of life in persons living with multiple sclerosis. The investigators found that resources, operationalized as social support, had a large direct effect on self-efficacy ($\beta = .44$), measured by the Self-Rated Abilities for Health Practices Scale (Becker, Stuifbergen, Oh, & Hall, 1993), which further had a direct effect on health-promoting behaviors and quality of life. Although the sample in this study was not older adults, this finding lends support to the idea that there is a positive relationship between social support and self-efficacy in health-promoting self-care.

Chalearnkusol (1991) found a moderate and positive relationship between social support and self-care agency in a sample of 100 Thai older adults who took part in health-promotion programs ($\underline{r} = .63$, $\underline{p} = .05$). As mentioned earlier, generalization of this study may be made only across older adults who participate in health-promotion programs. Similarly, Brugge (1982) found that family as a social support system was moderately and positively related to self-care agency, measured by the Exercise of Self-Care Agency, in a sample of 51 adults with chronic disease. Although the small sample size limits the generalizability, this study supports the use

of family as a basic conditioning factor (Orem's 1995) and demonstrates the importance of the family role.

Schott-Baer (1989) examined the relationship between the family system factors and self-care agency of caregivers providing dependent-care to a spouse with cancer. The sample was composed of 119 spouses of cancer patients, who were receiving radiation and chemotherapy treatments at a Midwestern hospital. The family system factors included family culture and family resources. Using correlational and multiple regression analyses, the researcher found that the family resource, as a conditioning factor, was the best predictor of self-care agency.

Other reserachers have reported the relationship of social support to health behavior. Eyler and colleagues (1999) explored the relationship between physical activity-related social support and physical activity in a national sample of minority women (N = 2,912). A modified-random cluster sampling technique was employed. The authors found that persons with high levels of social support for physical activity were significantly less likely to be sedentary than were those with low support, after race/ethnicity was adjusted for (OR = 0.33, 95% CI = 0.24–0.45). This finding lends support to the notion that social support may strengthen persons to perceive themselves as better at performing physical activities, an aspect of health-promoting self-care. The authors explained that social support for physical activity may be instrumental (e.g., giving a ride to an exercise site); informational (e.g., giving information about an exercise program); emotional (e.g., asking about how a new

exercise program turned out); or appraisal (e.g., giving encouragement for learning a new skill). However, this study reported that the contribution of family support versus that of friend support for physical activity was not significant.

Schuster, Petosa, and Petosa (1995) tested the ability of constructs in social cognitive theory to predict intentional exercise among a sample of 108 post-retirement adults aged 60 and older. Using hierarchical multiple regression analyses, the investigators found that perceived barriers, perceived social support, perceived self-efficacy, perceived benefits, and perceived enjoyment jointly accounted for 52% of the variance in intentional exercise. Perceived social support for exercise increased the explained variance in intentional exercise by 17.5% ($p < .001$).

In self-care responses to illness, previous studies found a relationship between social support and self-care (Brugge, 1982; Hanucharurnkul, 1989; Hubbard, Muhlenkamp, & Brown, 1984; La Greca et al., 1995; Schott-Baer, 1989; Wang & Fenske, 1996). In a descriptive correlational design, Wang and Fenske (1996) examined the relationships among the source of support, universal self-care, and health-deviation self-care behaviors in adults with non-insulin-dependent diabetes mellitus. The findings showed that people who received support from friends and family members reported higher universal and health-deviation self-care behaviors than did those without support. Support systems explained 23% of the variance in universal self-care and 17% of the variance in health-deviation self-care.

La Greca et al. (1995) evaluated the support provided by family members and friends for adolescents' diabetes care. A structural interview was used to assess support provided by family members and friends for diabetes management, such as handling insulin shots, monitoring blood glucose, insuring that the adolescents eats proper meals, promoting exercise, and encouraging the adolescent to "feel good" about the diabetes. Results revealed that families provided more support than friends for such management tasks as insulin injections, blood glucose monitoring, and proper meals. Friends provided more emotional support for adolescents than did families. Higher levels of family support were associated with better treatment adherence. This finding lends support to the relationship of family support and friend support to self-care and may explain how family and friends influence self-care. However, the study focused on self-care in response to illness rather than as health promotion. Additionally, the patterns and processes of family and friend support of older adults might be different from those for adolescents.

Hanucharurnkul (1989) used Orem's conceptual model to explore self-care, social support, basic conditioning factors (age, marital status, and socioeconomic status), living arrangements, and stage and site of disease in patients with cancer. A convenience sample of 112 adult patients with cervical and head/neck cancer was recruited from radiotherapy outpatient clinics in three hospitals in Thailand. Through hierarchical multiple regression, the findings revealed that social support was a strong predictor of self-care ($\beta = .47$, $p < .01$). Stage and site of cancer predicted self-care

indirectly through social support. In other words, social support had a buffering effect on the relationship between stage and site of cancer and self-care. Together, the variables of socioeconomic status, social support, and stage/site of cancer accounted for 48% of the variance in self-care.

### Summary

Filial responsibility of Thai people to older adults is grounded in the Thai culture; thus, in the context of health, the family may play a significant role in promoting the health of Thai older adults. The majority of the literature has shown that social support has a positive relationship with health—functional ability and perceived health status. However, few studies examined the association between social support and self-care ability in health promotion, particularly among older adults. Although limited in number, existing studies show a positive relationship between social support and self-care ability or self-efficacy. Unfortunately, though, most studies focused on self-care ability in response to illness. Further research is therefore needed on self-care ability for health-promotion among older adults.

## Health Status

The concept of health is abstract and multidimensional. In this study, health status comprises chronic health problems, functional ability, and perceived health status. The World Health Organization's (WHO) definition of health has been widely quoted in the literature. According to WHO (as cited in Simons-Morton, Greene, & Gottlieb, 1995), health is "a state of complete physical, mental, and social well-being

and not merely the absence of disease or infirmity" (p. 6). It has been stated that no one can achieve such an ideal state of health; however, Simons-Morton et al. (1995) argue that the definition provides guidelines for health professions.

Orem (1995) defined health as " a state of a person that is characterized by soundness or wholeness of developed human structures and of bodily and mental functioning" (p. 101). However, "well-being" in Orem's view seems to differ from "well-being" in the WHO definition. Orem states that individuals may experience well-being under conditions of adversity that involve disorders of human structure and functioning. In other words, perceived well-being is independent of health within the clinical model focusing on absence of disease. The concept of health in Orem's self-care theory may not be exclusively categorized into a particular model identified by Smith (1981) because health is a multidimensional concept (Lau, 1997). Health, in Orem's self-care theory, may involve health actions related to role-performance, clinical, and eudaemonistic health because health encompasses promotion of human functioning and well-being, as well as response to health deviation.

Measuring health is not straightforward because it is difficult to define the concept of health. In the health field, traditional indices include mortality rates, morbidity rates, disability measures, and life expectancy. Recently, more positive health indices have been used. These include years of healthy life, quality-adjusted life years, perceived health, and health risk appraisal (Simons-Morton et al., 1995). Wanich, Sullivan-Marx, Gottlieb, and Johnson (1992) assert that conventional

disease-specific clinical outcomes such as mortality and morbidity rates do not explain the influence of health conditions on quality of life; therefore, they are insufficient indicators of the necessity of care for older people. In this study, three measures (chronic health problems, functional ability, and perceived health status) were conceptualized as indicators of health status because they may reflect different dimensions of health among older adults.

The following section presents research on the relationships among chronic health problems, functional ability, and perceived health status as well as the relationship of each of these to the outcome variable, perceived abilities for health-promoting self-care.

Chronic Health Problems

In this study, the term "chronic health problems" refers to the number of chronic conditions a person has. People who report more chronic conditions tend to consider these significant to their health and well-being. In addition, the number of chronic illnesses has been found to be associated with the presence and severity of a disability (Fried, Bandeen-Roche, Kasper, & Guranik, 1999).

Chronic health problems and functional ability. As life expectancy increases, older adults are at greater risk for chronic illnesses (Duncan, Brown, & Ramsey, 1996; Ryan & Austin, 1989). The relationship between chronic health problems and functional ability has been found in previous studies (Cho et al., 1999; Guranik &

Kaplan, 1989; Liang, 1986; Orfila et al., 2000; Perkowski et al., 1998; Tucker, Falcon, Bianchi, Cacho, & Bermudez, 2000; Woo, Ho, Yu, Lau, & Yuen, 1998).

Tucker et al. (2000) examined the relationship of self-reported health history to disability, measured by ADLs and IADLs, among a sample of Puerto Rican and Dominican older adults in Massachusetts and in a comparison group of non-Hispanic whites (NHWs). After adjusting for age, gender, body mass index (BMI), income, education, living pattern, smoking, and alcohol consumption, the researchers found that the presence of smoking, former heavy alcohol consumption, arthritis, cataracts, respiratory disease, and high BMI was significantly associated with at least two disability measures among the NHWs. However, among Puerto Rican older adults, the conditions of stroke, arthritis, diabetes, and depression had the strongest association with disability, followed by a history of heart attack, high BMI, cataracts, poverty status, and respiratory disease. Among Dominican older adults, arthritis and depression were significantly associated with disability. Although the patterns of chronic conditions in relation to disability are different across the groups, results showed that chronic conditions are associated with functional disability.

Cho and colleagues (1999) examined the association between chronic illness and functional ability change over a 3-year period in 202 community-dwelling older adults. The target chronic conditions in the study included hypertension, osteoarthritis, coronary artery disease, obesity, undernutrition, urinary incontinence, sleep disorders, falls, gait/balance disorders, hearing and vision deficits, and

depression. Functional ability was assessed by the instrumental activities of daily living (IADLs) and the basic activities of daily living (BADLs). The investigators found that although the functional ability of the sample was similar at the baseline, the presence of chronic conditions was significantly related to functional decline in IADLs and BADLs during the 3-year period. Chronic conditions associated with decline in IADLs were gait/balance disorders, depression, and coronary artery disease. Chronic health conditions associated with declines in BADLs were gait/balance disorders, depression, hypertension, and urinary incontinence.

Orfila et al.'s (2000) findings supported a relationship between chronic health problems and functional ability. These researchers found that in a sample of 1,315 older adults, the significant contribution of age to functional decline was weakened when chronic health conditions were entered in the analyses. This suggests that chronic health conditions, rather than chronological age, affect functional ability. Therefore, it is logical to note that age should not simply be equated with health decline if other variables, such as comorbidity, are not considered. Like the variable of education, age may be a proxy for other characteristics that are not included in the study model.

An association between medical problems and lower-extremity functioning in a sample of 2,873 Mexican Americans aged 65 and older has been found (Perkowski et al., 1998). Lower-extremity physical functioning was assessed by measures of standing balance, repeated chair stands, walking, and an overall summary measure.

Regression analyses showed that the presence of chronic conditions (arthritis, diabetes, visual impairment, obesity, or being underweight) was negatively related to lower-extremity functioning. Also, the number of medical problems was negatively associated with lower extremity performance. The inability to complete tests of lower-extremity functioning was greatest for those who experienced arthritis or diabetes and those who had three or more medical problems.

Woo and colleagues (1998) examined the relationships of medical conditions to functional limitation among a random sample of 2,032 Chinese older adults, aged 70 and older. Both cross-sectional and longitudinal designs were used. Functional ability was assessed by 10 basic activities of daily living, using the Modified Barthel ADL Index. In the cross-sectional study, the authors found that after adjusting for demographic variables (age and gender), medical conditions of dementia, stroke, Parkinson's disease, and fractures were associated with severe functional limitation. These conditions, in addition to asthma and diabetes mellitus, were also associated with mild-to-moderate functional limitation. Stroke, dementia, and fractures contributed most to severe functional limitation. The longitudinal study consisted of 1,334 older adults with no limitations at the baseline. Stroke and arthritis were identified as chronic health problems influencing mild-to-moderate functional limitation over the 18-month period among older people who were initially independent.

In a longitudinal study, Boult, Kane, Louis, Boult, and McCaffrey (1994) found that arthritis, cerebrovascular disease, and coronary artery disease significantly increased the probability that an independent older person would become severely functionally limited within four years. Similarly, Liang (1986) examined the relationships among five self-reported measures of physical health of older adults using a structural equation model across four randomly divided subsamples (729, 726, 725, and 764, respectively), obtained from the 1968 National Senior Citizen Survey. Liang found that the presence of a chronic illness had a moderate negative effect on instrumental activities of daily living, representing functional ability, across four groups ($\beta$ = -.22 to -.26, $p$ = .05).

A study by Guranik and Kaplan (1989) supports the idea that there is a relationship between health conditions and physical functioning. In a sample of 841 older adults, the investigators found that older adults without hypertension at baseline were 6.7 times more likely to be in the high functional group (OR = 6.7, 95% CI = 1.9–23.8) and were 4.1 times more likely to be in the high functional group at a follow-up, compared to the low/moderate functional group (OR = 4.1, 95% CI = 1.2–14.1). Correspondingly, persons without arthritis at baseline were 2.4 times more likely to be in the high functional group (OR = 2.4, 95% CI = 1.1–5.3) and were 3.0 times more likely to be in the high functional group at the follow-up, compared to the low/moderate functional group (OR = 3.0, 95% CI = 1.4–6.5). These findings showed that chronic health conditions influence functional ability. In conclusion, across

studies, the presence and the number of certain chronic health problems have been found to be negatively associated with functional ability.

Chronic health problems and perceived health status. The relationship between chronic health problems and perceived health status has been found in previous studies (Cott, Gignac, & Badley, 1999; Damian et al., 1999; Johnson & Wolinsky, 1993). From the 1994/95 Canadian National Population Health Survey interview data, Cott et al. (1999) examined factors associated with self-rated health in people with and without chronic health conditions. Cott et al. found that illness-related factors such as chronic disease, disability, and pain were associated with perception of poor health among 13,995 respondents aged 20 and older.

Damian and colleauges (1999) studied the major determinants of self-assessed health among community-dwelling older people. Using logistic regression, the authors categorized self-rated health into two groups: good and poor. These researchers found that the number of chronic conditions was one of the main determinants of perceived health status. Persons with at least three chronic conditions had a 3.48 probability of reporting poor health (N = 677, 95% CI = 2.49–4.85).

Similarly, VanderZee and Buunk (1995) examined the role of social comparison as a mediator between objective health status and subjective health evaluation in a random sample of 361 adults aged 18 to 81 (mean age 42.7). Chronic health problems were measured by a revised version of the List of Chronic Diseases. General subjective health evaluation was measured by a general health perception

scale from the Medical Outcomes Study (MOS). Using structural equation modeling, the investigators found that chronic health problems had a large, negative, and direct effect on general health evaluation ($\beta$ = -51, $p < .01$) and an indirect effect on general health evaluation through psychological distress.

Johnson and Wolinsky (1993) used structural equation modeling to test the structure of health status, including disease, disability, functional limitation, and perceived health in 5,151 older adults. In the model, perceived health was the dependent variable. Disease was operationalized as the presence or absence of common diseases, such as atherosclerosis, hypertension, stroke, rheumatic fever, coronary heart disease, hip fracture, cancer and Alzheimer's disease. Results revealed that the presence of diseases, particularly atherosclerosis and hypertension, had weak and negative direct effects on the perception of poorer health ($\beta$ = -.05, $p < .001$ and -.04, $p < .01$, respectively), regardless of disability and functional limitation. Because the sample size was large, the weak coefficients were statistically significant (Munro, 1997). Overall, chronic health problems have been found to be negatively associated with perceived health status.

Summary

The literature consistently shows that chronic health problems have been negatively associated with functional ability in both cross-sectional and longitudinal studies. The relationship between chronic health problems and perceived health status was also found to be negative. The strength of the relationship between chronic health

problems and perceived health status varied from weak to strong; however, some studies used a large sample; thus, a weak relationship, which might have been non-significant in a smaller sample was found to be significant.

Functional Ability

Functional ability refers to a person's capacity to perform activities essential to their well-being (Becker & Cohen, 1984; Brown, 1988). These abilities depend on the integration of biological, psychological, and social functioning (Becker & Cohen, 1984; Knight, 2000). Any changes of one aspect will affect the functioning of other aspects within the system. Specific age-related changes can be seen at different levels in all three main components of the bio-psycho-social system (Becker & Cohen, 1984).

Spirduso (1995) stated that physical health and function are so important that many gerontologists have recommended a baseline of physical capacity for all older adults. Panicucci (1983) proposed that the functional assessment approaches allow nurses to emphasize the potential and goals of the client, such as independence. In addition, functional ability allows older people to maintain their preferred lifestyles and assures their well-being (Becker & Cohen, 1984). Functional assessment is also important because it focuses on the activity that older people perform, rather than on a negative outcome, such as mortality and morbidity.

Functional ability and perceived health status. A consistent positive relationship between functional ability and perceived health status has been found

across studies (Barsky, Cleary, & Klerman, 1992; Ferraro, 1980, 1985; Gama et al., 2000; Johnson and Wolinsky, 1993; Mossey, 1995; Piano, 1997; Wan, 1976; Whittle & Goldenberg, 1996). Gama and colleagues (2000) explored the relationship of 18 activities of daily living to self-rated health in a sample of 781 people aged 65 and older. Functional ability was measured by the Barthel ADL index and by Lawton and Brody's index for basic and instrumental activities of daily living. Participants were classified as belonging to one of three groups: good functional ability (score 100), fair functional ability (score 91-99), and poor functional ability (score 0-90). With respect to the dependent variable, self-rated health, participants fell into two groups, according to how they rated their health: good (good and very good) and poor (very poor, poor, and fair). Through logistic regression, use of stairs (OR = 4.28, 95% CI = 2.82–6.52), ambulation (OR = 3.67, 95% CI = 2.39–5.64), and chair/bed transfer (OR = 3.00, 95% CI = 1.68–5.36) were associated with higher self-rated health. Ability to handle finances (OR = 2.20, 95% CI = 1.38–3.50), laundry (OR = 2.15, 95% CI = 1.42–3.23), and transportation (OR = 2.12, 95% CI = 1.46–3.07) was associated with self-rated health. Results indicated that a higher level of functional ability was associated with higher self-rated health.

Piano (1997) found a positive relationship between functional ability and perceived health status in a random sample of 179 community-dwelling older adults (r = .37). Also, Whittle and Goldenberg (1996) found an association between functional ability and perceived health status in a sample of 47 persons who were 70

years of age and older. The higher level of dependency in instrumental activities of daily living (IADLs) was associated with poorer subjective health ($r$ = -.69). In other words, the higher level of performance of IADLs was positively associated with a better perception of health. Although the small sample size limits the generalizability of this study, the results are consistent with other studies of functional ability and perceived health status.

Johnson and Wolinsky (1993), studying 5,151 older adults from the Longitudinal Study of Aging (LSOA), found that limitations in household ADLs had a direct effect on perception of poorer health in both white and black females ($b$ = .63, .77, respectively, $p$ < .001). Limitations in advanced ADLs had a direct effect on the perception of poorer health in white males ($b$ = .19, $p$ < .01).

Factors contributing to overall self-rated health in a random sample of 100 medical patients were examined by Barsky and colleagues (1992). These authors found a moderate association between global health status and functional ability for intermediate activities of daily living ($r$ = .62, $p$ < .001). Using multiple regression, the most powerful predictors of perceived health status were hypochondriasis, somatization, and functional disability, which together accounted for 76% of the variance in perceived global health. This high percentage of variance in perceived global health indicates that perceived health status may reflect psychological and functional health. Interestingly, medical morbidity, rated by the physician, did not explain any additional variance in perceived health status. The authors stated that

these findings support previous work indicating that functional ability is a key factor that patients consider when rating their health status.

Wan (1976) examined factors affecting self-rated health status among a sample of 11,153 non-institutionalized adults, aged 58–63. Using discriminant function analysis, Wan found that sociomedical health, operationalized by severity and duration of disability and selected items of instrumental ADLs, was a better explanatory variable of self-rated health than was either socioeconomic status or psychological well-being. In other words, functional ability was a significant predictor of perceived health status. In short, previous studies consistently support the positive association between functional ability and perceived health status.

Functional ability and perceived abilities for health-promoting self-care. Evidence for the association between functional ability and self-efficacy or self-care ability has been found in the literature (Grembowski et al., 1993; Horn et al., 1998; Thompson, 1992). Some studies show the relationship of functional ability to self-care management in response to illness (Dodd & Dibble, 1993; Pavlides, 1993).

Grembowski and co-investigators (1993) found that better functional health was associated with high efficacy expectations for engaging in three preventive behaviors: diet, exercise, and weight control among older adults ($N = 2,524$, $r = .14$, $p = .05$). Efficacy expectations were defined as "a participant's perceived ability and likelihood to control a specific health behavior" (p. 94). Functional ability was

measured by the Quality of Well-Being (QWB) Scale, providing an integrative assessment of physical activity, mobility, social activity, self-care, and symptoms.

Thompson (1992) found a significant relationship between functional ability and ability for self-care among 350 patients being discharged from the hospital to a home setting. This study focused on self-care ability in performing seven behaviors: activities of daily living, diet, medications, treatments/therapeutic regimens, physician/health care contacts, therapeutic exercise, and overall self-efficacy. Similarly, Horn and colleagues (1998) studied factors influencing self-efficacy of persons with spinal cord injury after being discharged at 12 months from the acute care setting. Self-efficacy in performing activities of daily living was dichotomized into two categories: low and high. Through chi-square statistics, these investigators found that less-severe neurological impairment was associated with high self-efficacy. Using logistic regression, results showed that persons with less severe neurological impairment had a .26 probability of having a higher self-efficacy than those with more severe impairment ($N = 105$, $p < .01$). Although modest, the odds ratio indicates that health status may influence self-efficacy in self-care.

Pavlides (1993) examined the relationships among functional ability, complexity of medication, and adherence to a medication regimen in 94 homebound older people, based on Orem's theory of self-care. The findings revealed a positive relationship between functional ability and adherence to a prescribed medication regimen, an aspect of self-care behavior in response to illness.

Dodd and Dibble (1993) used Orem's self-care model to determine the predictors of self-care behaviors in a sample of 127 adults with cancer. The selected predictors included demographic variables, performance status, affective state, social support, ability to manage a situation, self-care ability, and prior health-promoting activities. Through multiple regression analyses, four significant predictors of self-care (health status, social support, educational level, and anxiety) accounted for 47% of the self-care variance. Persons with better functional ability performed more self-care behaviors.

In a sample of 120 Thai older adults, Vithayachockitikhun (1991) found that health status, measured by the Denyes Health Status Instrument, was moderately and positively associated with self-care agency, measured by the Appraisal of Self-Care Agency Scale ($r = .52$, $p < .001$). However, the sample in this study was recruited from elderly clinics; therefore, the selection bias cannot be ignored and the subjects may not be representative of older adults in the community.

In contrast, Smits & Kee (1992) did not find a significant relationship between health status and self-care agency in the sample of 48 older adults. Self-care agency was measured by the Exercise of Self-Care Agency (ESCA) Scale developed by Kearney & Fleischer (1979). Functional ability was measured by Roscow and Breslau's Guttman Health Scale for the Aged. The lack of relationship between health status and self-care agency might be because of two factors: (1) the sample size in this study was very small; thus, the power to find a significant relationship was

decreased; and (2) the functional ability of the sample in this study was mostly independent and might be too homogeneous to show a significant relationship. Additionally, not only was small the sample size, but probability sampling was not employed; thus, generalizability of these results is limited.

Summary

In the literature review, functional ability consistently showed a positive relationship with perceived health status. Although a positive relationship between functional ability and self-care ability or self-care agency was found in a number of studies, a few studies found non-significant relationships. However, methodological problems (e.g., a small sample size) appear to be a plausible explanation for the findings.

Perceived Health Status

Perceived health status is a subjective aspect that relates to feeling well, conveying the notion that individuals take control over their own health (Simons-Morton et al., 1995). Perceived health status is a unifying concept that reflects an evaluation by individuals of their general health (Speake, Cowart, & Pellet, 1989). More specifically, Shadbolt (1997) stated that self-rated health reflects "a complex process of internalized calculations that encompass both lived experience and knowledge of disease causes and consequences" (p. 951). It is often used as a proxy for other physical and psychological status measures (Johnson & Wolinsky, 1993).

Although perceived health status is subjective (and therefore of questionable validity), it is important because of its relationship to such health outcomes as mortality (Mossey & Shapiro, 1982; Kaplan & Camacho, 1983; Yu et al., 1999), changes in morbidity, recovery from illness, institutionalization (Mossey, 1995; Spirduso, 1995) self-care ability (Söderhamn et al., 2000) and health-promoting behavior (Frank-Stromborg, Pender, Walker, & Sechrist, 1990; Palank, 1991; Pender, Walker, Sechrist, & Frank-Stromborg, 1990; Ratanaamornchai, 1992).

Perceived health status and perceived abilities for health-promoting self-care. Perceived health status has been found to be associated with self-care ability (Söderhamn et al., 2000), self-efficacy (Clark et al., 1995; Grembowski et al., 1993), and health-promoting behaviors (Frank-Stromborg et al., 1990; Hawkins, Duncan, & McDermott, 1988; Pender et al., 1990; Ratanaamornchai, 1992; Weitzel & Waller, 1990). Perceived health status is found to be consistent in predicting self-care ability and health-promoting lifestyles.

Söderhamn and colleagues (2000) found that the perception of good health status was a strong predictor of self-care ability in a sample of 125 community-dwelling older adults, 65 years and older ($\beta = .52$, $p < .0001$). Similarly, Grembowski et al. (1993) found that older adults who rated their health as better were more likely to have high efficacy expectations for engaging in five preventive behaviors, involving diet, exercise, weight control ($N = 2{,}524$, $r = .20$, $p = .05$), smoking, and alcohol consumption ($r = .06$, $p = .05$). These correlation coefficients were weak;

however, they were significant because a large sample size was used. When examined, only 12% of older adults in the top one-third of the efficacy distribution rated their health as poor or fair, whereas about 24% of older adults in the bottom one-third of the efficacy distribution did so. These results support the association between self-efficacy and perceived health status.

Clark et al. (1995) studied a sample of Health Maintenance Organization (HMO) enrollees aged 65 and older, finding that health status was associated with exercise self-efficacy. Health status measures (satisfaction with health, stress from life events, depression, and the presence of cancer) were associated with self-efficacy. When the outcome expectation of exercise measure was entered in the model, a 1-unit increment in the belief that "not exercising is harmful" was associated with a .5-unit increment in exercise self-efficacy. However, the association among health measures mentioned above, excepting stress from life events, remained significant.

Hawkins et al. (1988) used canonical correlation to determine the relationships between self-reported health status and health behaviors among 126 older Americans drawn from a population of senior center participants. Findings showed that people who had better health status were more likely to engage in the self-care behaviors of regular exercise and sleeping seven or eight hours a day. Similarly, Speake, Cowart, and Stephens (1991) found that perceived health status was a weak-to-moderate predictor of health practices in older adults in exercise, self-

actualization, and interpersonal support ($\beta$ = .19, $p$ = .05; $\beta$ = .22, and .23, $p$ = .01, respectively).

Perceived health status was found to be predictive of health-promoting lifestyles in employees who attended health-promotion programs in the workplace ($\beta$ = .19, $p$ < .001) (Pender et al., 1990), in ambulatory cancer patients ($\beta$ = .19, $p$ < .001) (Frank-Stromborg et al., 1990), and in the white ethnic group of blue-collar workers ($\beta$ = 40, $p$ < .001) (Weitzel & Waller, 1990). Also, Ratanaamornchai (1992) found that perceived health status, education, income, and health locus of control jointly accounted for 38% of the variance in health-promoting lifestyles in a sample of 400 older adults in Thailand.

In an integrative review and meta-analysis study of self-care in Thailand, Hanucharurnkul and colleagues (2000) found that health status had a large effect size on self-care agency among various populations. Although much of the research in the meta-analysis focused on the health status of people with illnesses, this finding lends support to the association of health status with self-care agency.

Bandura (1997) states that self-efficacy in older people is based on their appraisals of their abilities. Older people may maintain a high sense of self-efficacy by appraising their capabilities through selective social comparison with their peers, rather than with younger people. Older adults might perceive their health differently although they have similar objective measures of health. Because health status is a

source of functional potential and endurance, older adults' appraisals of their health should affect self-efficacy beliefs to perform health-promoting self-care.

In conclusion, perceived health status was found to be consistently, positively related to self-care behaviors, self-care ability, and self-efficacy. However, the strength of association varies from small to large. These results might be related to various domains of self-care measure and to methodological issues.

## Summary

Although research on self-care is growing, the literature review indicates that there is a gap in the area of self-care in health-promotion, particularly among older adults. Self-care research in the nursing literature has been conducted mostly with people who have specific diseases. In these studies, self-care has been operationalized in different ways, and inconsistent results have been found. Self-care ability, as well as self-efficacy, has been used as a predictor, rather than as a dependent variable. Regarding research designs, most studies used a cross-sectional, correlational approach to predict the outcome variable. Some experimental studies applied knowledge in self-efficacy theory to design interventions to improve health outcomes.

In this study, path analysis was used to answer the research questions. Path analysis is part of the correlational design that has the ability to explain how variables of interest are interrelated, but has limitations in its ability to infer cause and effect. This chapter has presented research on the relationships among variables in the

proposed model: the relationships of exogenous variables to endogenous variables and those among endogenous variables.

# CHAPTER 3

# METHODOLOGY

This chapter describes the research designs and methods that were used to conduct the present study. The chapter includes descriptions of the research design, population and sampling, procedures for data collection, pilot study, instrumentation, procedures for data analysis, translation process, and protection of human subjects.

## Research Design

A descriptive correlational, cross-sectional research design was used to explore relationships among variables and to test a proposed model of factors contributing to perceived abilities for health-promoting self-care in community-dwelling Thai older adults. According to Polit and Hungler (1995), the correlational, cross-sectional design has the following advantages. First, a correlational design is appropriate when an experimental design is not feasible (e.g., is too expensive or too time-consuming). Second, a correlational design allows the researcher to explore relationships among variables as they naturally occur without any artificial manipulation. Finally, a cross-sectional design allows the researcher to collect a large amount of data in an economical way.

However, the weakness of the correlational, cross-sectional design is that it is limited in its ability to explain causal relationships between variables due to lack of manipulation or control of the independent variables (Polit & Hungler, 1995). Several independent variables in this study are not amenable to manipulation (i.e., age,

education, chronic health problems, and functional ability); thus, a descriptive, correlational design is appropriate. Although weaker than a longitudinal design, a cross-sectional design can be used to infer temporal sequencing under two conditions: (1) when logical reasoning assures that one variable preceded the other; and (2) when a theoretical framework guides the analysis (Polit & Hungler, 1995). In this study, the relationships among variables were established by related theories and time-ordering (e.g., education precedes perceived abilities for health-promoting self-care).

## Population and Sample

### Research Setting

The target sample for this study was community-dwelling Thai older adults, aged 60 or older, in Suphanburi Province. Three out of ten districts (Sriprachan, Samchuk, and Dermbangnangbuad) were selected as research settings for the recruitment of Thai older adults. These three districts were selected because (1) Thai older people in these locations remain in the agricultural lifestyle, the predominant lifestyle of people in Thailand; (2) there were key people available to facilitate data collection; and (3) these areas were accessible to the researcher.

Suphanburi is a province in the central region of Thailand, located approximately 120 kilometers from the capitol, Bangkok. The total number of adults aged 60 and older in Suphanburi Province was 92,929 in 2000 (41,118 males and 51,811 females). On average, the number of adults aged 60 years and older living in each village ranged from 80 to 133 in the selected districts (Department of Local

Administration, Ministry of Interior, 2000). Two to three villages were selected from each of the three subdistricts.

Criteria for inclusion in the study were:

1. 60 years old or older;
2. female or male;
3. able to communicate in the Thai language; and
4. willing to participate in the study.

Criteria for exclusion from the study included:

1. presence of an acute or current medical or psychiatric problem that might interfere with memory or judgment;
2. participant's decision not to continue; and
3. being a significant other of the selected participant (e.g., wife or husband).

Sample Size

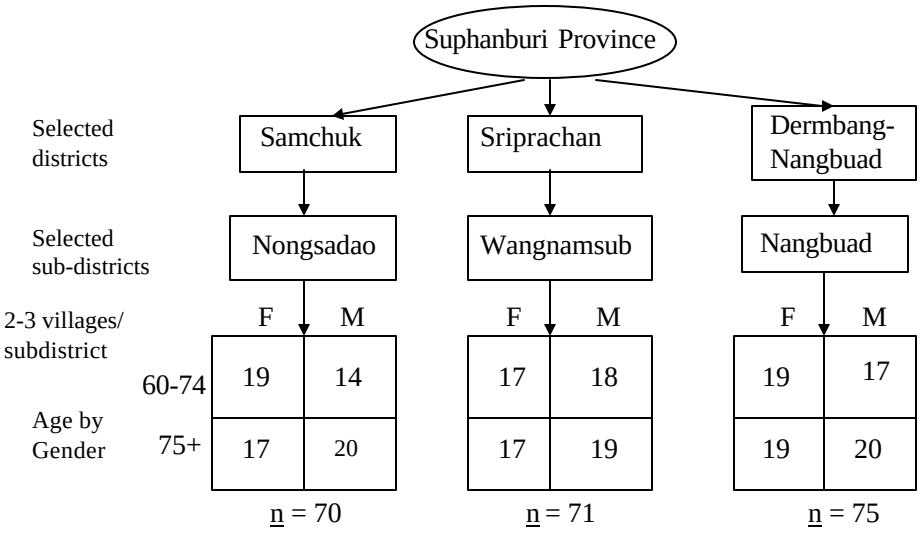
For path analysis, no exact formula was found to calculate sample size. Instead of calculating the number of subjects per measured variable, the authors (Bentler, 1995; Pedhazur & Schmelkin, 1991; Tabachnick & Fidell, 1996) suggested that the number of subjects per estimated parameter be used. "Parameter" refers to the relation between two variables (Hoyle, 1995, p. 3). A free parameter is a parameter with an unknown value, which is to be estimated from the data and assumed to be non-zero, while a fixed parameter is not estimated from the data and has a value fixed at zero (Hoyle, 1995; MacCallum, 1995).

According to Bentler (1995), the ratio of sample size to the number of free parameters in a structural model is at least 5:1 under the normal or elliptical theory; this ratio should be larger for arbitrary distributions. In this study, the hypothesized model contained 31 free parameters (22 structural paths, 1 covariate, 2 variances associated with exogenous variables, and 6 error terms associated with endogenous variables); therefore, a sample of 155 was a minimum requirement. Oversampling of approximately 40% was performed to assure an adequate sample size. A sample of 216 Thai older adults was recruited for this study.

Sampling

Due to the extensive geographical spread, the time factor, and budget limitations in this study, the three aforementioned subdistricts were selected based on their accessibility. Potential participants, community-dwelling Thai older adults, were recruited by stratified random sampling from the selected research setting. The stratification was based primarily on gender and age ranges (60 to 75, and 75 and older) because gender (Arber & Cooper, 1999; Musil, 1998) and age range may affect health status (Dunkle et al., 1994; Swaddiwudhipong et al., 1996). Additionally, only one older adult per family (e.g., one of a couple) was recruited, in order to avoid the homogeneity issue between wife and husband because a violation of the independence assumption is a serious problem for multivariate analysis procedures (Stevens, 1996).

Figure 3.1. Sampling procedure




Note. Total recruited sample (N) = 216: 108 Females and 108 Males
Age 60-74 years = 104, 75 years and older = 112

Potential participants were selected at random from name lists obtained from key persons in the villages (the Village Health Communicators, VHC) and from local health centers, in which all Thai older adults registered for accessing the free health care services provided by the Thai government since 1991. The Village Health Communicators were volunteers living in the villages, trained to educate their neighbors and help health personnel with health promotion and disease prevention services (Swaddiwudhipong et al., 1996). Between 70 and 75 participants in each of the three subdistricts obtained the sample (see Figure 3.1).

## Protection of Rights of Human Subjects

Prior to data collection, approval was obtained from the Departmental Review Committee (DRC) of The University of Texas at Austin School of Nursing. The researcher first contacted the director of the Suphanburi Provincial Health Office, the research site, to obtain written permission for data collection in the three districts. Then, the researcher contacted the key persons from each village and the directors of local health centers to obtain the lists of names of the Thai older adults. A table of random numbers was used to select potential subjects. Once the potential participants were identified, the researcher went to their home along with the key person of the village to explain the study's purpose and to obtain verbal consent. When subjects agreed to participate, a one-time interview was conducted by the researcher in their homes and at the participants' convenience.

The participants were informed that no known major risks were anticipated for participation in this study, except for possible inconvenience and fatigue. Participants were assured that they might discontinue participation in the study at any time, simply by stopping the interview or by omitting to answer questions uncomfortable for them. They also were assured that their decision to discontinue participation would not affect their relationship with any organization or group. No invasive procedure was employed in the study.

The participants were assured of the confidentiality of their answers by using code numbers on the questionnaires instead of names. All data were reported in the

aggregate form. No individual was able to be identified from any data report. All data were kept in a locked file cabinet accessible only to the researcher when not in use. The list linking the data with names of the participants was destroyed upon completion of the study. There was no cost for participation in this study.

## Procedures for Data Collection

Data collection interviews were conducted in the participants' homes by the researcher, using structured instruments. Polit and Hungler (1995) describe the advantages of face-to-face interviews in terms of response rates, audience, clarity, depth of questioning, missing information, order of questions, sample control, and supplementary data. The face-to-face interview was used in this study because this method (1) is appropriate for Thai older adults who are illiterate and/or visually impaired; (2) may reduce ambiguity and confusion; (3) has high response rates; and (4) potentially allows the researcher to obtain additional useful data.

The structured interview included the Personal Information Sheet, the Family APGAR Questionnaire, the Friend APGAR Questionnaire, the Chronic Health Problems Checklist, the Modified Barthel ADL Index, the Chula ADL Index, the Self-Rated Health, and the Self-Rated Abilities for Health Practices. The interview took between 30 and 50 minutes to complete. When a potential participant agreed to take part, the researcher assessed the participants' condition regarding the presence of acute or current health problems that could interfere with memory or judgment.

During the interviews, no participant was found to have such cognitive impairment as memory loss, impairment of language, or impairment of object recognition.

To avoid difficulties with the Likert scale ratings, the researcher used toy blocks of different numbers and colors to represent the numerical points on the instrument scale. Bernal, Wooley, and Schensul (1997) suggested this type of visual aid for use in questionnaire administration.

## Instrumentation

Eight instruments that were used to accomplish the research purpose included the Personal Information Sheet, the Family APGAR Questionnaire, the Friend APGAR Questionnaire, the Chronic Health Problems Checklist, the Modified Barthel ADL Index, the Chula ADL Index, the Self-Rated Health, and the Self-Rated Abilities for Health Practices (Appendices D-J). The developers of the instruments granted permission for use of their instruments in this study. The variables and their indicators are presented in Table 3.1.

### The Personal Information Sheet

The purpose of the Personal Information Sheet was to collect information regarding personal and social background (age, gender, marital status, education, occupation, income, and living arrangements). Perceived health status was also included in this form.

Table 3.1

Operational Factors Used in the Study Model

| Variable name | Indicators |
|---|---|
| • Age | • Number of years from birth |
| • Education | • Number of years of formal education |
| • Perceived Family Support | • Family APGAR Questionnaire |
| • Perceived Friend Support | • Friend APGAR Questionnaire |
| • Chronic Health Problems | • Number of chronic symptoms, diseases, or impairment that the participant identified, assessed by the Chronic Health Problem Checklist |
| • Functional Ability | • Composite score of the Modified Barthel ADL Index and the Chula ADL Index |
| • Perceived Health Status | • Self-Rated Health Scale |
| • Perceived Abilities for Health-Promoting Self-Care | • Self-Rated Abilities for Health Practices Scale |

## The Family APGAR Questionnaire

The Family APGAR is a brief questionnaire developed by Smilkstein (1978) to test five areas of family functioning: Adaptability, Partnership, Growth, Affection, and Resolve.

> Adaptation is the utilization of intra and extrafamilial resources for problem solving when family equilibrium is stressed during a crisis. Partnership is the sharing of decision making and nurturing responsibilities by family members. Growth is the physical and emotional maturation and self-fulfillment that is achieved by family members through mutual support and guidance. Affection is the caring or loving relationship that exists among family members. Resolve is the commitment to devote time to other members of the family for physical and emotional nurturing. It also usually involves a decision to share wealth and space. (Smilkstein, 1978, p. 1232)

Smilkstein and colleagues (1982) stated, "Family is the first and frequently the foremost of social support systems…" (p. 311). Family function refers to "the way in which the family is viewed by an individual as a nurturing and supportive unit" (Swain & Harrigan, 1994, p. 44). The Family APGAR allows an individual to identify the value of the family as a support unit or possible stressor. A higher score indicates greater family support (Swain & Harrigan, 1994). The strengths of this instrument are that it is brief, easy to administer, and the questions are asked using minimally different wording: perception of satisfaction (Swain & Harrigan, 1994).

The Family APGAR Questionnaire consists of five items. Examples of the questions are “I am satisfied with the help that I receive from my family when something is troubling me” and “I am satisfied with the way my family expresses affection and responds to my feelings such as anger, sorrow, and love” (Smilkstein, 1978). The score for each item ranges from 0 to 2, “hardly ever,” “some of the time,” and “almost always,” respectively. Total scores range from 0 to 10. A score of 7 to 10 indicates a highly functional family, a score of 4 to 6 indicates a moderately dysfunctional family, and a score of 0 to 3 indicates a severely dysfunctional family. According to Smilkstein (1993) and colleagues (1982), the 3-option scale is generally appropriate for screening for family function. However, for research purposes, the authors suggested that a 5-point scale be used to obtain greater discriminant power: 0 = never, 1 = hardly, 2 = some of the time, 3 = almost always, and 4 = always. Therefore, in this study, total score on the 5-point scale of the Family APGAR Questionnaire ranges from 0 to 20. A higher score indicates greater perceived family support.

Psychometric Properties of the Family APGAR Questionnaire

Validity was established using Pless and Satterwhite’s (1973) Family Function Index and evaluated by social workers and psychologists. Regarding reliability, it was found in Taiwan that the 5-point response scale obtained a higher Cronbach’s alpha (.86) among 1,377 students aged 10–13 years than did the 3-point response scale (.80) among 1,164 students of the same age (Smilkstein et al., 1982).

However, using the 3-point response, Fink (1995) found that the alpha coefficients of the Family APGAR Questionnaire were good: .90 for 65 older persons and .84 for 65 caregiving partners. In addition, Huang (1998) reported a high test-retest reliability coefficient (.94) and a high alpha coefficient (.97) for the 3-point response of this instrument in a sample of Taiwanese older adults. In this study, Cronbach's alpha for the 5-point Family APGAR Questionnaire was .91.

### The Friend APGAR Questionnaire

Similar to the Family APGAR Questionnaire, the Friend APGAR Questionnaire is a brief questionnaire developed by Smilkstein et al. (1982) to assess five areas of friend support: Adaptability, Partnership, Growth, Affection, and Resolve. Smilkstein et al. said that, although the family is the first and primary source of social support, friends are also relevant to an individual. For example, older people who are geographically isolated from family or have no surviving family may relate most strongly to a social network of friends. The Friend APGAR Questionnaire consists of five items. The item contents and the choice format are analogous to those in the Family APGAR Questionnaire, but the source of support is friends, instead of the family. The 5-point scale was used in this study; therefore, the total score on the Friend APGAR Questionnaire ranged from 0 to 20. A higher score indicates greater perceived friend support.

Psychometric Properties of the Friend APGAR Questionnaire

The validity was tested among 297 college students. Smilkstein et al. (1982) found that the average score of the sample of college students on the Family APGAR Questionnaire and on the Friend APGAR Questionnaire was significantly different (correlated $t(296) = 3.15$, $p = < .01$), supporting the construct validity of the Friend APGAR. A report of reliability for the Friend APGAR was not found in the literature. In this study, Cronbach's alpha for the five-point response of the Friend APGAR Questionnaire was .94.

The Chronic Health Problem Checklist

The Chronic Health Problem Checklist was developed by Erickson et al. (1991) and adjusted by the researcher for this study. Chronic health problems included in the checklist are those commonly found in the literature. An open-ended option is provided so participants can identify problems not included on the list. Examples of problems on the list include hypertension, diabetes, and chronic lung diseases. The item "serious accident" was counted only in the event of existing sequelae. Any acute health problems that could be resolved in a short time period (e.g., acute diarrhea, cold) were not counted in the number of chronic diseases. The number of chronic health problems was obtained by summing the number of problems that the participants identified.

## The Modified Barthel ADL Index and The Chula ADL Index

The Modified Barthel Activities of Daily Living Index (MBAI) and the Chula ADL Index (CAI) were tested in Thai older adults in one study by Jitapunkul et al. (1994). Historically, the Barthel Activities of Daily Living Index was developed for health personnel to evaluate patients' activities of daily living (ADLs; e.g., feeding, moving, personal toilet, bathing, walking, dressing, continence of bowels and bladder) before admission to, and after discharge from, a hospital in Maryland (Mahoney & Barthel, 1965). It has been widely used to measure basic activities of daily living in older people and is based on the amount of physical assistance required from others.

In Thailand, the MBAI was tested in 703 Thai older adults (Jitapunkul et al., 1994). The MBAI (Thai version) includes feeding, grooming, transferring, toilet use, mobility, dressing, climbing stairs, bathing, bowel continence, and bladder continence. The possible scores on the MBAI range from 0 to 20. A higher score indicates greater functional ability. Jitapunkul and colleagues findings revealed that the mean of the MBAI slightly declined with advancing age. However, the MBAI alone might be inadequate to assess the functional ability of Thai older adults because the scale consists of only basic ADLs and might be too simple for comparatively healthy older adults. Therefore, a tool for evaluating the ability to perform more complex tasks necessary for independent living (extended ADLs or instrumental ADLs) was needed to increase discriminant power.

Jitapunkul and colleagues (1994) also developed the Chula ADL Index to measure extended ADLs in the Thai context. Initially, the researchers used the Office of Population Censuses and Surveys (OPCS) disability scale from England to test functional ability among Thai people. They found that this tool was inappropriate to assess extended ADLs in Thai older adults because it rated 99% of the people in the study as disabled although the mean of their scores on the Barthel ADL Index was high (19.5 of 20). Thus, the Chula ADL Index was developed and is more appropriate for Thai older adults. In this study, the self-report method on the MBAI and the CAI was used to evaluate the participant's ability in performing basic activities of daily living and instrumental activities of daily living, respectively.

Psychometric Properties of the MBAI and the CAI

The construct validity of the MBAI and the CAI was tested in Thai older adults (Jitapunkul et al., 1994). Factor analysis with varimax rotation revealed four factors with factor loadings of .50 and over: (1) basic ADLs; (2) extended (or instrumental) ADLs; (3) intermediate ADLs; and (4) bladder/bowel control. Five of the extended ADL items, named the Chula ADL Index (CAI), included walking outdoors, using public transportation, cooking, handling money, and doing heavy housework. The variables of doing light housework, climbing stairs, and shopping did not significantly contribute to the regression model; thus, they were excluded.

The response scales for each item of the instruments are not identical. For example, for cooking, a 3-point response was used: 0 = unable, 1 = needs help but can

do something alone, and 3 = independent, while for doing heavy housework a 2-point response was used: 0 = unable and 1 = independent. Possible scores on the CAI range from 0 to 9. A higher score indicates greater functional ability.

The five items on the CAI are ranked by difficulty and Guttman scaling. The coefficient of reproducibility and scalability were .96 and .67, respectively, which are acceptable for a hierarchical scale (Nie, Hull, Jenkins, Steinbrenner, & Bent as cited in Jitapunkul et al., 1994). The Spearman-Brown coefficient of the MBAI was .67. In the present study, Cronbach's alpha for internal consistency was .75 for the Chula ADL Index and was .86 for the MBAI.

### The Self-Rated Health Scale

Self-rated health did not draw attention from health researchers until 1976, when this question was added to the National Center for Health Statistics annual survey of the United States (Simmons-Morton et al., 1995). Simmons-Morton and colleagues raised a question concerning measures of health: "If one wants to know how healthy people are, why not ask them?" (p. 17). Simons-Morton et al. reported that this simple question found to be the best indicator of general health. To date, self-rated health has been included in several studies in the older population (Cott, Gignac, & Badley, 1999; Dunn & Dyck, 2000; Gama et al., 2000; Leinonen, Heikkinen, & Jylha, 1998; National Statistics Office, Thailand, 1994).

In a report of the Survey of Elderly in Thailand (National Statistics Office, Thailand, 1994), self-rated health was also used to assess perceived health status or

subjective health among 4,011,854 Thai older adults. On a 5-point scale—very poor, poor, fair, good, very good—6.9% of older adults rated their health as very good, 31.4% as good, 35.8% as fair, 23% as poor, and 2.9% as very poor. This distribution was quite normal, similar to Lorig and colleagues' (1996) study, which found that the distribution of self-rated health (a 5-point scale) among 1,130 individuals aged 39 to 90 years was normal.

Psychometric Properties of the Self-Rated Health Scale

Subjective health is a unique phenomenon, and it contributes to the current and future health of an individual (Mossey, 1995). Although self-rated health is a subjective measure and thus has questionable validity, it has been reported in a number of studies that perceived health status in advancing age is a significant predictor of mortality (Mossey, 1995; Greiner, Snowdon, & Greiner, 1999; Spirduso, 1995; Yu et al., 1999).

The stability of the Self-Rated Health Scale is inconclusive. Mossey and Shapiro (1982) found that self-rated health was a quite stable measure, as many as four years after the previous assessment. Likewise, Leinonen, Heikkinen, and Jylha (1998) reported that self-rated health in a sample of adults aged 75 to 80 did not significantly change over the 5-year period after the baseline, although almost half of the follow-up group reported that their health became worse, and some of them rated it as better. This finding indicates that self-rated health may be age-adjusted.

In a study of 51 persons, the 10-day test-retest reliability of self-rated health was .92, suggesting that the stability is rather high (Lorig et al., 1996). A test-retest reliability above .70 is satisfactory (Polit & Hungler, 1999). Although the stability has been reported in previous studies, it was noted that self-rated health may be sensitive to acute changes in health status (Mossey, 1995). Therefore, perceived health status for this study was evaluated by a single question: "In general, how would you rate your health over the past month?" The answer was rated from 1 to 5: poor to excellent. A higher score indicates greater perceived health status.

## The Self-Rated Abilities for Health Practices Scale

The Self-Rated Abilities for Health Practices Scale, SRAHP (Becker et al., 1993) was used to measure perceived abilities for health-promoting self-care of Thai older adults. The SRAHP consisted of 28 items to assess four areas of health-promoting abilities, including nutrition, psychological well-being, exercise, and health responsibilities. Each item was scored on a 5-point Likert-type scale, ranging from 0, "not able to do at all," to 4, representing "full capability" for that particular item. Total scores ranged from 0 to 112. A higher score indicates greater perceived abilities for health-promoting self-care.

### Psychometric Properties of the SRAHP Scale

The reliability and validity of this scale was evaluated by the developers in three groups of people: those who participated in a health fair organized by a county medical association, undergraduate students, and adults with disabilities. Among

participants of the health fair, Cronbach's alpha for total scale was .94; the alphas for Nutrition, Psychological Well-Being, Exercise, and Responsible Health Practices were .81, .90, 92, and .86 respectively. Among undergraduate students, Cronbach's alphas for the total scale, Nutrition, Psychological Well-Being, Exercise, and Responsible Health Practices subscales were .94, .81, .86, .89, and .88, respectively. In adults with disabilities, Cronbach's alphas were .91, .76, .86, .90, and .77 for the total scale, Nutrition, Psychological Well-Being, Exercise, and Responsible Health Practices subscales, respectively. In this study, Cronbach's alphas were .94, .71, .90, .90, and .82 for the total scale, Nutrition, Psychological Well-Being, Exercise, and Responsible Health Practices subscales, respectively.

The test-retest reliability was reported by administering the questionnaire twice among undergraduate students, two weeks apart. The Pearson correlation coefficients were .70, .63, .63, .69, and .73 for total scores, Nutrition, Psychological Well-Being, Exercise, and Responsible Health Practices, respectively. The validity of this instrument was evaluated by comparing it with Sherer et al.'s (1982) General Self-Efficacy. The scores on the Self-Rated Abilities for Health Practices Scales were moderately correlated with the General Self-Efficacy Scale with $\underline{r} = .43$, while the Responsible Health Practices, Psychological Well-Being, Exercise, and Nutrition Subscales were correlated with the General Self-Efficacy Scale with $\underline{r} = .44, .43, .28,$ and .26, respectively. All these correlations were significant at $\underline{p} < .01$ for one-tailed significance tests.

## Pilot Study

A pilot study was conducted in two phases. In Phase I, data were collected in a sample of 58 Thai adults in Houston, Texas, in March, 2000. In Phase II, data were collected in a sample of 12 older adults in Thailand during April 2000. The purposes of the pilot study were to test for cultural implications of using the research instruments proposed—i.e., to evaluate their clarity, readability, language, and administration—as well as to test at the outset for internal consistency of these instruments. The instruments for the pilot study included: (1) Personal Information Sheet (PIF); (2) the Self-Rated Health Scale; (3) the Modified Barthel ADL Index (MBAI); (4) the Chula ADL Index (CAI); (5) the Family APGAR Questionnaire; and (6) the Self-Rated Abilities for Health Practices Scale.

According to Polit and Hungler (1999), a pilot study is useful for assessing the adequacy of the plan for data collection and the appropriateness of the research instruments and instructions. Polit and Hungler suggested that characteristics of participants be the same in the pilot study as those in the major study. In Phase I of the pilot study, all participants recruited were first-generation Thai adults who spoke Thai at home; therefore, testing comprehensibility of the research questionnaires among these participants was useful in guiding the modification of the instrument items. In addition, the pilot study was expected to be useful in detecting possible problems that might occur during the data collection process. However, it was found that the educational levels among Thai older adults recruited in Houston were higher

than among those in Thailand. Because this difference might have affected the comprehensibility of the language used, the research instruments were re-tested among 12 older adults in Thailand in Phase II.

## Pilot Sample

Convenience sampling was used to recruit a sample of 58 Thai adults in a Thai community in Houston, Texas. Most of the sample was recruited at the Thai temple at Houston (Wat Buddhavas), where Thai people congregate and engage in ritual and cultural activities. Snowball sampling was used. Because Thai people are a minority group in Houston and the number of older adults was relatively small compared to the total Thai population there, the number of accessible older adults was not adequate to test reliability. Therefore, both younger and older Thai adults were included in this pilot study.

Among the 58 participants, five Thai people, aged 60 and older, were recruited in Phase I of the pilot study. The mean age of the sample was 42.29 years (SD = 11.60), with age ranging from 22 to 62. Of the participants, thirty-five (60.3%) were female and 23 (39.7%) were male. Approximately 52% of the sample were married. Educational level ranged from elementary to graduate, but 70% of the sample had a college education. In addition, this sample represented Thai persons with independent functional ability. In Phase II, two male and ten female participants in Thailand, aged 60 and older, were recruited. The mean age of the sample was 67.50 years (SD = 8.19), ranging from 60 to 88. Educational level ranged from no

formal education to technical school (post high school). Two-thirds of the sample were married. Some participants had partial mobility limitations.

## Pilot Procedures

After approval was given by the Department Review Committee (DRC) at the University of Texas at Austin School of Nursing and verbal consent was obtained from potential participants, the pilot data were collected. The participants were informed of the protection of human subjects. In Phase I, the research settings were the Thai temple at Houston and the participants' homes. A structured interview was conducted by the researcher and the time spent to complete the questionnaires varied from 45 to 90 minutes. Younger and literate adults preferred the self-administered questionnaire, which took 20 to 30 minutes to complete. Few participants took the questionnaires home and sent them back in prepaid envelopes by mail.

In Phase II, convenience sampling was used to recruit the pilot participants: older adults in Thailand. The pilot sample was recruited from neighbors and acquaintances of the researcher. A structured interview to administer the instruments was conducted by the researcher and a research assistant among nine Thai older adults. Three participants completed the instruments by themselves. Three of the total (12) had no formal education. Seven participants had an elementary education. The other two participants graduated high school and technical school, respectively.

## Instruments

### Translation Process

The process of translation and back-translation of the research instruments (the Family APGAR Questionnaire and the Self-Rated Abilities for Health Practices Scale) was guided by Brislin, Lonner, and Thorndike's (1973) specifications. The symmetrical approach to translation was used to obtain construct equivalence, rather than verbatim equivalence, between the original and target languages (Jones, 1987; Jones & Kay, 1992). In other words, the purpose was to achieve equivalent familiarity and naturalness in both the original and target languages. Because the MBAI and CAI were already available in Thai, translation was not necessary for these measures.

The Family APGAR Questionnaire, the Self-Rated Health Scale, and the Self-Rated Abilities for Health Practices Scale were translated from English into Thai by a bilingual Thai person. The Thai version was blindly back-translated by a doctoral candidate in physical therapy who had lived in the United States for four years at the time of the study. The researcher examined the Thai and back-translated English versions. A minor error was found in the translated version (Thai): the phrase "I am satisfied with" in item 5 of the Family APGAR Questionnaire was missing. This item was subsequently provided by the researcher. The corrected statement of the Thai version was again blindly back-translated by the same bilingual person. Furthermore, three Thai people gave opinions regarding the use of formal Thai wording; subsequently, additional adjustments were made. The details of adjustment are

discussed in the result section of the pilot study. Finally, two American nursing professors who were experts in nursing research examined the equivalence of the original English version and the translated English version. For the SRAHP, one of the tool developers approved the equivalence of the original English version and the back-translated English version.

## Results of the Pilot Study

Data were analyzed by SPSS for Windows, Version 9 (1998). Internal consistency was examined for the Family APGAR Questionnaire and the Self-Rated Abilities for Health Practices Scale. The wording of some items was adjusted based on participants' responses.

### The Family APGAR Questionnaire

The Family APGAR Questionnaire was used to measure perceived family support in the pilot sample. The alpha coefficients for the total scale of the Family APGAR were .75 for the Houston sample and .83 for the Thailand sample. Both of these alpha coefficients were acceptable for internal consistency (Munro, 1997). The mean score of the Family APGAR Questionnaire for the Houston sample was 8.32 (SD = 1.82, ranging from 3 to 10), whereas that for the Thailand sample was 8.42 (SD = 2.11, ranging from 4 to 10).

The participants in Houston were able to respond to the items easily although several words in the first translation in Thai were rather formal in the Thai writing style. However, the participants in Thailand had difficulty responding to the formal

word. For example, in the item, “I found that my family accepts my wishes to take on new activities or make changes in my life-styles,” an 88-year-old participant did not understand the terms “activities” and “life-styles” in Thai language because they seemed too abstract. Therefore, this statement was changed to “I found that my family accepts my ideas when I want to do a new thing or change my living patterns.” In addition, examples were added to facilitate comprehension: “such as, my wishes to exercise or do things I like.” After this item was changed, other Thai older adults responded to it more easily.

In addition, the original statement, “I am satisfied with the way my family expresses affection and responds to my feelings,” was adjusted to “I am satisfied with the way my family shows me their love, cares about, and responds to my feelings.” In the Thai version and back-translation, the term “cares about” was added to make the item less abstract and more appropriate for participants who were not well-educated. Basically, the phrase “respond to my feelings” is not used in everyday Thai, but rather in academic speech; thus it was difficult for Thai older adults who were illiterate to understand its meaning. Although some Thai words were exactly appropriate translations of the English version, they had to be changed to the less formal words used in daily Thai life.

Regarding the format, the original Family APGAR, published in 1978 using the 3-point scale format, was used in the pilot study. Subsequently, as aforementioned, Smilkstein et al. (1982) and Smilkstein (1993) recommended that a

5-point scale be used for research purposes to obtain greater discriminant power. This suggestion was employed in this dissertation because it was found that the 5-point format was not too difficult for Thai older adults to rate.

The Self-Rated Health Scale

The question, "In general, how would you rate your health at present?" was used in the pilot study. The 4-point ratings were: 1 = poor, 2 = fair, 3 = good, and 4 = excellent. The respondents, both in Houston and Thailand, could answer this question without difficulty. Most of the respondents (44.3%) rated their health as fair. Thirty respondents (42.9%) rated their health as good. Seven respondents (10%) rated their health as excellent, and only two respondents (2.9%) rated their health as poor. Because the respondents in the pilot study had no difficulty rating their health, the 4-point scale was changed to a 5-point scale (1= very poor, 2 = poor, 3 = fair, 4 = good, or 5 = excellent) to obtain more discriminant ability.

The Modified Barthel ADL Index (MBAI) and the Chula ADL Index (CAI)

The MBAI and the CAI, available in Thai, were tested in the pilot study. No language problems were found; however, the appropriateness of the MBAI for use with community-dwelling Thai older adults was of concern. Because most of the respondents both in Houston ($\underline{n}$ = 58) and in Thailand ($\underline{n}$ = 12) were functionally independent, the distribution of the scores on the MBAI was highly and negatively skewed, suggesting that the MBAI was too easy to measure their functional ability. Eight of ten items of the MBAI had zero variance when calculating reliability,

reflecting no discriminant power. The two remaining items (Transfer and Bladder continence) produced very low alpha coefficients: -.02 for the Houston sample and -.11 for the Thailand sample, meaning that these items had low internal consistency. However, most of the pilot samples consisted of young adults, and the sample size was very small. These results suggested that the MBAI be performed in a larger sample of older adults.

In contrast, the CAI had acceptable alpha coefficients: .78 for the Houston sample (n = 58) and .77 for the Thailand sample (n = 12). These coefficients reflect adequate internal consistency. The CAI aims to measure more difficult functional activities than the MBAI, meaning that the CAI has more discriminant power than the MBAI. These results suggested that the CAI is appropriate for evaluating functional ability in Thai older adults.

The Self-Rated Abilities for Health Practices Scale

The Self-Rated Abilities for Health Practices Scale was used to measure perceived abilities for health-promoting self-care in the pilot samples. The reliability coefficients (Cronbach's alphas) among 58 Thai adults in Houston for the total scale, Nutrition, Psychological Well-Being, Exercise, and Responsible Health Practices were .93, .74, .87, .91, and .88, respectively. Among 12 older adults in Thailand, Cronbach's alphas for the total scale, Nutrition, Psychological Well-Being, Exercise, and Responsible Health Practices subscales were .88, .80, .85, 93, and .60, respectively. These results indicate that the scale in total and most of the subscales are

highly reliable, except for the Responsible Health Practices among the pilot sample in Thailand. It should be noted that the sample size in the Thailand group was very small and it might not be appropriate to test reliability in such a small sample. However, the main purpose of the pilot study in Thailand was to test the comprehensibility of the instrument, rather than to test the reliability.

When the Responsible Health Practices subscale was examined, item 25 ("Use medication correctly") was not strongly related to the other items. This might be because one participant rated this item as 0, while she rated other items in this subscale as 4. The reason of rating item 25 as very low might be that she had been diagnosed as having had diabetes only for a few months, so, perhaps she did not yet perceive herself as able to use her medications properly. The language of this item is very straightforward in Thai; therefore, the low reliability for this subscale cannot be explained by errors in translation. Rather, it was most likely due to one participant's low response, which affected the reliability in this small sample. In the Houston sample, on the other hand, the reliability of the Responsible for Health Practices subscale was good (.88). When explored, it was found that the alpha of this subscale would be reduced from .88 to .85 if item 25 were deleted. This suggests that item 25 should remain and be re-explored in the larger sample.

Regarding translation into Thai, the first translated version was rather formal. Most of the Houston participants understood the scale, but some of them commented on the formal Thai language. Therefore, some items were adjusted into less formal

Thai language when this was possible. For example, an older adult with no formal education in Thailand did not understand what “fiber content” (item 5) meant. The researcher asked four Thai people both in Thailand and Houston to validate this Thai word and found an understandable term that has the same meaning as “fiber content” (‘Kag’ or ‘Sen-yai’). The revised item was tested on two older adults in Thailand with no formal education, and these subjects were able to respond easily to the question.

In addition, four statements were adapted to fit the Thailand context. For example, item 6, “Figure out from the labels what foods are good for me” had little meaning in Thai because most Thai older adults do not read labels, but they may be able to figure out what kind of food is good for them using their experience or other sources. Furthermore, Thai elders tend to buy fresh food from markets and the fresh products do not carry labels. Therefore, the statement was adjusted to “Find out what kind of food is good for me by various ways (e.g., ask persons who know, read from the label).”

Item 8 was adjusted to “Find out a way to rest and engage in recreation.” The first back-translation from Thai to English was "Know how to relax," but an older adult in Thailand questioned the word “relax” and thought about it in terms of relaxation from stress. This perception may make item 8 redundant with item 14, “Change things in my life to reduce my stress” in the Thai sense. However, when the pilot data ($\underline{N}$ = 70) were examined, items 8 and 14 were correlated, but were not identical ($\underline{r}$ = .42). Therefore, the adjusted Thai statement might enable participants to

better understand the meaning, which was close to the original statement. Addition minor adjustments were made; for example, changing “pressure sore” in item 23 to “wound” and giving an example of the protection of one’s rights in item 27, “Do not let others take unfair advantage of me.” It was noted that the participants in both pilot settings responded without difficulty to item 27 with the example.

After one of the developers of this instrument examined the equivalence of the instrument (the original and back-translated English versions), the adjustments described above were judged to be reasonable. However, it was suggested that two statements, items10 and 13, be adjusted in Thai to make the meanings match the original ones as closely as possible. For item 10, “Do things that make me feel good about myself” should emphasize “myself.” It was found that the phrase “about myself” was missing from the back-translation of this item, although this phrase was present in the Thai statement. Interestingly, it was pointed out that the phrase in item 10 (“Do things that make me feel good about myself”) is not common in the Thai language. In Phase II of the pilot study, a 75-year-old respondent did not understand what it meant and tried to give an example related to self-esteem. Similarly, three Thai faculty members working in gerontological nursing suggested that the phrase be changed and directed toward the feeling of self-esteem, which was easier for older adults to understand. Thus, item 10 was changed to “Do things that promote my self-esteem,” under the approval of one of the developers.

For item 13, “Figure out how I respond to stress,” the first back-translation used “Find a way to manage my stress.” However, one of the developers suggested that this statement should reflect “self-awareness,” not management. As mentioned earlier, it was difficult to find a phrase identical to “respond to stress” in the Thai sense because this phrase is not spoken style, but written style. Therefore, this item was adjusted to “Find ways to deal with my stress.” Although this statement somewhat changes the item intent, one of the developers agreed that it was the best alternative because it taps into the same construct as other items.

Finally, concerning the instruction stating “…use the following scale to indicate ‘how well’ you are able to do…, not ‘how often’ you actually do it,” the researcher asked two respondents after they returned their completed questionnaires whether they rated them based on “how well” or “how often.” One of the respondents explained that she rated the questionnaire based on both “how well and how often” while the other revealed that she rated the statements based on “how well” and she could not rate them based on “how often” even after trying again. She added that she felt the instructions were clear.

## Procedures for Data Analysis

Data analysis included the application of both descriptive and inferential statistics. Descriptive statistics (i.e., frequency, percentage, range, mean, and standard deviation) were used to delineate characteristics of the sample and examine the distribution of demographic variables and the variables of interest in this study.

Inferential statistics were used to determine reliability of the research instruments and subscales and to answer research questions 1, 2, and 3. The overall level of significance was set at the alpha of .05. SPSS Version 9 (1998) was used for data analysis of descriptive statistics and research question 1. EQS 6 (Bentler, 2001), a structural equation modeling program, was used for path analysis to answer research question 2 and 3.

Mueller (1996) noted that path analysis is "a multivariate method based on linear regression that allows the researcher to estimate the strengths of the direct structural effect from one variable to another and the indirect effects through mediating variables within the context of an a priori specified path model" (p. 2). Path analysis is a structural equation modeling approach, but its distinguishing characteristic is that it does not have latent variables (Raykov & Marcoulides, 2000).

In the proposed model, there are two exogenous variables (age and education) and six endogenous variables (perceived family support, perceived friend support, chronic health problems, functional ability, perceived health status, and perceived abilities for health-promoting self-care). Perceived abilities for health-promoting self-care was the outcome variable. Six structural equations were tested for significance of the variance contributed by their respective independent variables. The six structural equations were as follows:

Equation 1: Chronic Health Problems = Age + Error Term

Equation 2: Perceived Family Support = Age + Education + Error Term

Equation 3: Perceived Friend Support = Age + Education + Error Term

Equation 4: Functional Ability = Age + Education + Chronic Health Problems + Perceived Family Support + Perceived Friend Support + Error Term

Equation 5: Perceived Health Status = Age + Education + Chronic Health Problems + Perceived Family Support + Perceived Friend Support + Functional Ability + Error Term

Equation 6: Perceived Abilities for Health-Promoting Self-Care = Age + Education + Perceived Family Support + Perceived Friend Support + Functional Ability + Perceived Health Status + Error Term

The EQS 6 software program (Bentler, 2001) was used to test the hypothesized model and determine whether the model fit the data. The EQS is a structural equation modeling program, which provides some statistics based on normal theory that can be robust to violation of the normality assumption (Bentler, 1995).

Three research questions proposed for this study are as follows.

Research Question 1

What are the relationships among basic conditioning factors (age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status) and self-care agency (perceived abilities for health-promoting self-care) among community-dwelling Thai older adults?

For this question, Pearson's r (Pearson product-moment correlation) procedure was used to analyze the bivariate relationships among age, education, perceived family support, perceived friend support, chronic health problems, functional ability, perceived health status, and perceived abilities for health-promoting self-care in Thai older adults.

Research Question 2

What are the coefficients of the paths in the operational model of factors contributing to perceived abilities for health-promoting self-care of community-dwelling Thai older adults?

Research Question 3

Does the hypothesized model of factors contributing to perceived abilities for health-promoting self-care of community-dwelling Thai older adults adequately fit the data?

Research questions 2 and 3 are discussed together because the answers to these questions are interdependent and need to be considered concurrently. Path analysis, using the EQS 6 software program, was computed to estimate the parameters of the hypothesized model. The model was tested by the maximum likelihood (robust) procedures in EQS 6. The robust statistics refer to (1) the Satorra-Bentler scaled test statistic, and (2) robust standard errors. The Satorra-Bentler scaled test statistic (S-B $\chi^2$) is "designed to have a distribution that is more closely approximated by $\chi^2$ than the usual test statistic" (Bentler, 1995, p. 47). That is, it was

corrected for nonnormality in large samples (Byrne, 1994). Where the normal distribution assumption is violated, the robust statistics perform better than uncorrected statistics (Bentler, 1995; Chou & Bentler, 1995).

The path coefficients and squared multiple correlations ($\underline{R}^2$) were estimated through the analysis. The standardized coefficient was used as an estimate of a structural effect. Bollen (1989) noted that there are no restrictions against using a standardized coefficient in path analysis; however, the standardized coefficient enables the researcher to compare the effects of independent variables on dependent variables by the same unit in the same model, not for the same variable across different groups. Beta ($\beta$) was used as a structural effect of an endogenous variable on another endogenous variable. Gamma ($\gamma$) represents a structural effect of an exogenous variable on another endogenous variable; Phi ($\phi$) represents a variance/covariance matrix of exogenous variables (Mueller, 1996). In path analysis, there are three types of structural effects: direct, indirect, and total effects: Total effects = Direct effect + Indirect effects (Bollen, 1989).

The goodness-of-fit indices that should be considered are the $\chi^2$ statistic, normed fit index (NFI), nonnormed fit index (NNFI), and comparative fit index (CFI). For the $\chi^2$ statistic, the larger probability (exceeding .05 or .01) indicates a better-fit model (Bentler, 1995). However, the $\chi^2$ test is not sufficient to evaluate the adequacy of the model because of the sample size issue. When the sample size is very large, the specified model is more likely to be rejected although the difference

between the sample covariance matrix and the fitted model is small (Hu & Bentler, 1995; Mueller, 1996; Munro, 1997).

The CFI and NFI can range from 0 to 1, while the NNFI can be outside this range (Bentler, 1995). The CFI and NFI close to 1 indicate that the observed data better fit the model. Practically speaking, the model having a CFI greater than .90 indicates an acceptable fit to the data (Bentler, 1995; Byrne, 1995; Stevens, 1996), although this cutoff may be somewhat subjective (Mueller, 1996; Norris, 1997a). Interpretation of the fit index should be made with caution when the multivariate normality assumption is not met (Mueller, 1996). Bentler (1995) recommended that the CFI be the index of choice because it has advantages in avoiding the underestimation of fit found in the model with NFI and in reflecting a better fit at all sample sizes, compared to the NNFI. Therefore, a comparative fit index (CFI) or robust CFI was mainly used to determine whether the data fit the proposed model. However, other fit indices (e.g., the root mean square error of approximation, RMSEA) were considered in this study as well. The RMSEA is not sample-dependent. Its value of less than .05 is an indicator of a good fit model (Raykov & Marcoulides, 2000).

## Summary

A correlational, cross-sectional research design was used to examine the relationship of selected basic conditioning factors (age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and

perceived health status) to self-care agency (perceived abilities for health-promoting self-care) among community-dwelling Thai older adults. In addition, a model of factors contributing to perceived abilities for health-promoting self-care was tested by path analysis through EQS 6 to examine the direct and indirect effects of selected basic conditioning factors (age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status) on perceived abilities for health-promoting self-care of Thai older adults. Two hundred and sixteen participants were recruited by stratified random sampling of Thai older adults living in three districts in Suphanburi Province.

A pilot study was conducted to examine the research instruments for clarity, readability, language, and administration and as a preliminary test of the internal consistency of these instruments. The results of the pilot study were discussed. Overall, this chapter presented the population and sample, the procedures for data collection, the instrumentation, the processes and results of the pilot study, the data analysis procedures used, and the procedures taken for protection of human subjects.

# CHAPTER 4

# PRESENTATION OF THE FINDINGS

This chapter presents the results of data analyses guided by a conceptual model of factors contributing to health-promoting self-care of community-dwelling Thai older adults. This chapter includes four sections. The first section presents the characteristics of the sample. The second section presents descriptive statistics (e.g., mean, standard deviation, range, skewness, and kurtosis) for the major study variables and the reliability coefficients for the study instruments. The third section includes findings relevant to the research questions and the hypotheses. In this section, a correlation matrix was generated to examine the correlation among the study variables. In addition, the originally hypothesized model was tested and then, modified to obtain a good-fit model. Direct, indirect, and total effects of the predictors on each endogenous variable are presented. The last section presents the results of additional analyses of testing the final modified model for equality across genders.

## Characteristics of the Sample

A sample of 216 Thai older adults who lived in rural areas of Suphanburi Province, Thailand, was recruited for the study. Through the EQS 6 program using the cases with largest contribution to normalized multivariate kurtosis, five multivariate outliers were detected and deleted; thus, the sample used in the analysis consisted of 211 participants: 106 males (50.2%) and 105 females (49.8%). The five

multivariate outliers included two males who completed 14 and 16 years of education respectively, and three females who had a very low score on a composite of the MBAI and the CAI (13, 5, and 4 out of 29) and who also had a low score on the SRAHP (30, 40, and 48 out of 112, respectively).

The characteristics of the sample are shown in Table 4.1. The age range of the participants was 60 to 93 years old with a mean of 73.21 (SD = 7.53). The participants had completed 0 to 13 years of school with a mean of 3.50 years (SD = 2.21). Approximately, 76% of the participants completed 1 to 6 years of school, while 21.8% had no formal education. Few participants completed more than 6 years of school.

Almost 50% of the participants were widowed and 48.3% were married. Only a few participants were divorced or never married. Most participants (43.6%) lived with their spouse, and/or children/grandchildren, while 11.8% lived alone. The number of chronic health problems reported by the participants ranged from 0 to 7 with a mean of 2.7 (SD = 1.53). Twelve participants (5.7%) reported no chronic health problems. The most common chronic health problems among Thai older adults were visual impairment (64%), arthritis (39.3%), hypertension (30.3%), muscle/back pain (19.4%), constipation (18.5%), and gastritis (16.1%) (see Table 4.2).

Table 4.1

Demographic Characteristics of Community-Dwelling Thai Older Adults (N = 211)

| Items | n | % |
|---|---|---|
| Gender | | |
| Male | 106 | 50.2 |
| Female | 105 | 49.8 |
| Age (years) | | |
| 60–64 | 38 | 18.0 |
| 65–69 | 33 | 15.6 |
| 70–74 | 33 | 15.6 |
| 75–79 | 64 | 30.3 |
| ≥80 | 43 | 20.4 |
| Education (years) | | |
| 0 | 46 | 21.8 |
| 1–6 | 161 | 76.3 |
| 7–12 | 3 | 1.4 |
| ≥13 | 1 | 0.5 |

Table 4.1 (Continued)

Demographic Characteristics of Community-Dwelling Thai Older Adults (N = 211)

| Items | n | % |
|---|---|---|
| Marital status | | |
| Married | 102 | 48.3 |
| Widowed | 104 | 49.3 |
| Divorced | 1 | 0.5 |
| Never married | 4 | 1.9 |
| Living situation | | |
| Living alone | 25 | 11.8 |
| Living only with spouse | 22 | 10.4 |
| Living with spouse/children/grandchildren | 70 | 33.2 |
| Living with children/grandchildren | 94 | 44.5 |

Table 4.2

Chronic Health Problems of Community-Dwelling Thai Older Adults (N = 211)

| Type of Chronic Health Problems | n | % |
|---|---|---|
| Visual impairment | 135 | 64.0 |
| Arthritis | 83 | 39.3 |
| Hypertension | 64 | 30.3 |
| Muscle and back pain | 41 | 19.4 |
| Constipation | 39 | 18.5 |
| Gastritis | 34 | 16.1 |
| Bladder incontinence | 31 | 14.7 |
| Mental trouble | 25 | 11.8 |
| Dizziness | 25 | 11.8 |
| Hemorrhoid | 19 | 9.0 |
| Diabetes | 17 | 8.1 |
| Serious accident with sequelae | 15 | 7.1 |
| Allergy, Asthma, Bronchitis | 14 | 6.6 |
| Paresis | 13 | 6.2 |
| Heart disease | 13 | 6.2 |
| Hypercholesterolemia | 11 | 5.2 |
| Chronic urinary tract infection | 9 | 4.3 |
| Numbness and non-specific symptoms | 6 | 2.8 |
| Skin disease | 5 | 2.4 |
| Others (colitis, anemia, convulsion, inguinal hernia, cancer, liver disease) | 18 | 8.5 |

Note. A participant might have more than one health problem.

## Descriptive Statistics for Major Variables

Major variables in this study included age, education, perceived family support, perceived friend support, functional ability, perceived health status, and perceived abilities for health-promoting self-care. Descriptive statistics are presented in this section. Mean, standard deviation, range, skewness, and kurtosis are shown in Table 4.3 to describe the distribution of the study variables.

The age range of the participants was 60 to 93 years old with a mean of 73.21 (SD = 7.53). The skewness coefficient of age appeared to be close to zero, indicating that the distribution of age was fairly symmetric. Regarding kurtosis, Jacobsen (1997) noted that if the value, produced by dividing the kurtosis statistics by the standard error, is not beyond ± 1.96, the distribution has a normal curve. In this study, the kurtosis value of age was significant and slightly platykurtic (-.73/.33 = -2.21).

The educational level ranged from 0 to 13 years of school with a mean of 3.50 years (SD = 2.21). The skewness coefficient of education (-.30) was severely negative, indicating that the mean of years of education was less than the median. According to Jacobson (1997), "skewness values above 0.2 or below -0.2 indicate severe skewness" (p. 42). However, the kurtosis value of education was insignificant (.43/.33 = 1.30), indicating that its peakedness was close to a normal curve.

The scores on both perceived family support and perceived friend support ranged from 0 to 20 with a mean of 15.98 (SD = 4.53) and 15.56 (SD = 5.09), respectively (see Table 4.3). The skewness coefficients of both perceived family

support (-1.29) and perceived friend support (-1.36) were greatly negative, indicating that most Thai older adults were satisfied with support obtained from the family and friends. The kurtosis values of these two variables were large positive numbers, indicating a leptokurtic shape.

The number of chronic health problems ranged from 0 to 7 with a mean of 2.61 (SD = 1.53). The skewness value was positive (.47), indicating that most participants had few chronic health problems. The kurtosis value was not significant (-.11/.33 = -.33), indicating that its peakedness was close to that of a normal distribution.

The scores on functional ability, the composite scores on the Modified Barthel ADL Index and those on the Chula ADL Index, ranged from 14 to 29 with a mean of 27.30 (SD = 2.55). The distribution was negatively skewed (-2.36), indicating that functional ability of the participants in performing basic activities of daily living and instrumental activities of daily living were very high, indicating that most of the participants were independent in performing activities of daily living. Moreover, the kurtosis value of functional ability was highly leptokurtic (6.96).

On the other hand, the skewness coefficient (0.21) and the kurtosis value of perceived health status (-0.45) were close to zero, indicating that the distribution of perceived health status was nearly normal. The scores on perceived health status ranged from 1 to 5 with a mean of 2.76 (SD = 0.94).

Table 4.3

Mean, Standard Deviation, and Ranges of Major Variables (N = 211)

| Variable | Mean | SD | Actual Range | Possible Range | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| Age | 73.21 | 7.53 | 60–93 | 60 to highest possible | .09 | -.73 |
| Edu | 3.50 | 2.21 | 0–13 | 0 to highest possible | -.30 | .43 |
| PFaS | 15.98 | 4.53 | 0–20 | 0–20 | -1.29 | 1.08 |
| PFrS | 15.56 | 5.09 | 0–20 | 0–20 | -1.36 | 1.16 |
| CHP | 2.69 | 1.53 | 0–7 | 0 to highest possible | .47 | -.109 |
| FA | 27.30 | 2.55 | 14–29 | 0–29 | -2.36 | 6.96 |
| PHS | 2.76 | 0.94 | 1–5 | 1–5 | 0.21 | -0.45 |
| PAHPSC | 79.91 | 19.96 | 11–112 | 0–112 | -0.81 | 0.44 |

Note. Edu = educational level, PFaS = perceived family support, PFrS = perceived friend support, CHP = chronic health problems, FA = functional ability, PHS = perceived health status, PAHPSC = perceived abilities for health-promoting self-care.

Lastly, the scores on perceived abilities for health-promoting self-care ranged from 11 to 112 with a mean of 79.91. The distribution of perceived abilities for health-promoting self-care was negatively skewed (-0.81), indicating that most of the participants tended to report their abilities for health-promoting self-care as high. The

kurtosis statistics of this variable, which was nearly zero (0.28), indicated that the distribution kurtosis was close to that for a normal curve.

An assessment of the skewness and kurtosis values are important for further analyses because when the measured variables are "highly nonnormal" (e.g., skewness = 3; kurtosis = 21), the standard errors of parameter estimates are underestimated, resulting in the untrustworthy output (West, Finch, & Curran, 1995). Overall, the skewness and kurtosis values in Table 4.3 were not "highly nonnormal."

Table 4.4

Reliability Coefficients of the Instruments Used in the Study (N = 216)

| Scales | Number of Items | Alpha Coefficient |
|---|---|---|
| Family APGAR Questionnaire | 5 | .91 |
| Friend APGAR Questionnaire | 5 | .94 |
| Modified Barthel ADL Index | 10 | .86 |
| Chula ADL Index | 5 | .75 |
| Self-Rated Abilities for Health Practices (Total scale) | 28 | .94 |
| Subscales: | | |
| Nutrition | 7 | .71 |
| Well-being | 7 | .90 |
| Exercise | 7 | .90 |
| Health Practices | 7 | .82 |

Table 4.4 shows the reliability coefficients (Cronbach's alpha) of the scales used in this study. Polit and Hungler (1995) noted that reliability coefficients in the proximity of .70 may be sufficient although there is no absolute standard to determine what an acceptable reliability coefficient should be. The reliability coefficients of the scales used in this study ranged from acceptable to high. The Family APGAR Questionnaire, the Friend APGAR Questionnaire, the Modified Barthel ADL Index, and the Self-Rated Abilities for Health Practices had high reliability coefficients: .91, .94, .86, and .94, respectively. The Chula ADL Index had an acceptable reliability coefficient (.75). The reliability coefficients of the Self-Rated Abilities for Health Practices subsclaes ranged from acceptable to high reliability coefficients (.71 to .90).

## Analyses of Research Questions

This section presents data analysis procedures and findings for each research question and hypothesis. The significance level was initially set at the alpha of .05. Pearson's r (Pearson's product-moment correlation coefficient) was used to answer research question 1. However, to answer research question 1, multiple testing within the correlation matrix was performed, resulting in inflated Type I error rate. Thus, a Bonferroni type adjustment was made for inflated Type I error. Based on a Bonferroni correction, a new significant level comes from dividing the overall alpha level by the number of comparisons (Pedhazur & Schmelkin, 1991); thus, the probability level for the test of each correlation coefficient had to be less than .007 (.05/7) to be considered significant. Standardized structural coefficients ($\beta$) generated

by EQS 6 were used to answer research question 2. The goodness-of-fit indices (e.g., the Satorra-Bentler scaled statistics—S-B $\chi^2$, comparative fit index) were used to answer research question 3 to determine whether the hypothesized model adequately fits the data.

Research question 1: What are the relationships among basic conditioning factors (age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status) and self-care agency (perceived abilities for health promoting self-care) among community-dwelling Thai older adults?

The bivariate relationships among the study variables were examined using Pearson's correlation coefficients (see Table 4.5). Age was significantly negatively associated with education ($\underline{r}$ = -.41, $\underline{p}$ < .001), perceived family support ($\underline{r}$ = -.19, $\underline{p}$ = .006), perceived friend support ($\underline{r}$ = -.21, $\underline{p}$ = .002), functional ability ($\underline{r}$ = -.42, $\underline{p}$ < .001), and perceived abilities for health-promoting self-care ($\underline{r}$ = -.45, $\underline{p}$ < .001). That is, persons with advancing age tended to report lower educational level and lower scores on family support, friend support, functional ability, and abilities for health-promoting self-care. The hypothesized relationships between age and perceived family support, perceived friend support, functional ability, and perceived abilities for health-promoting self-care were supported, with the exception of the relationship of age to chronic health problems ($\underline{r}$ = .07, $\underline{p}$ > .05) and to perceived health status ($\underline{r}$ = -.13, $\underline{p}$ > .05).

Educational level was significantly positively associated with perceived family support ($r$ = .22, $p$ = .001), functional ability ($r$ = .22, $p$ = .001), and perceived abilities for health-promoting self-care ($r$ = .39, $p$ < .001). However, the positive relationships of education to perceived friend support ($r$ = .16, $p$ = .018) and to perceived health status ($r$ = .15, $p$ = .032) became non-significant after Bonferroni correction.

Perceived family support was significantly positively associated with perceived friend support ($r$ = .55, $p$ < .001), functional ability ($r$ = .29, $p$ < .001), perceived health status ($r$ = .27, $p$ <.001), and perceived abilities for health-promoting self-care ($r$ = .61, $p$ < .001), but negatively associated with chronic health problems ($r$ = -.30, $p$ < .001).

Similarly, perceived friend support was significantly positively associated with functional ability ($r$ = .29, $p$ < .001), perceived health status ($r$ = .21, $p$ = .002), and perceived abilities for health-promoting self-care ($r$ = .50, $p$ < .001), but negatively associated with chronic health problems ($r$ = -.29, $p$ < .001). The hypothesized relationships of perceived family support, as well as perceived friend support, to functional ability, perceived health status, and perceived abilities for health-promoting self-care were supported. However, the significant relationships of three dyads (perceived family support and perceived friend support; perceived family support and chronic health problems; perceived friend support and chronic health problems) were not hypothesized initially.

Table 4.5

Correlation Matrix of Study Variables (N = 211)

| Variable | Age | Edu | PFaS | PFrS | CHP | FA | PHS | PAHPSC |
|---|---|---|---|---|---|---|---|---|
| Age | 1.00 | | | | | | | |
| Edu | -.41** | 1.00 | | | | | | |
| PFaS | -.19** | .22** | 1.00 | | | | | |
| PFrS | -.21** | .16* | .55** | 1.00 | | | | |
| CHP | .07 | -.06 | -.30** | -.29** | 1.00 | | | |
| FA | -.42** | .22** | .29** | .29** | -.35** | 1.00 | | |
| PHS | -.13 | .15* | .28** | .21** | -.41** | .30** | 1.00 | |
| PAHPSC | -.45** | .39** | .61** | .50** | -.25** | .54** | .44** | 1.00 |

Note. Edu = educational level, PFaS = perceived family support, PFrS = perceived friend support, CHP = chronic health problems, FA = functional ability, PHS = perceived health status, PAHPSC = perceived abilities for health-promoting self-care. *$p < .05$, two-tailed. **$p < .007$ (Bonferroni correction), two-tailed.

Chronic health problems were significantly negatively with functional ability ($r$ = -.35, $p$ < .001), perceived health status ($r$ = -.41, $p$ < .001), and perceived abilities for health-promoting self-care ($r$ = -.25, $p$ < .001). The first two hypothesized relationships among these variables were supported, but the last significant relationship was not hypothesized initially. Functional ability was significantly positively associated with perceived health status ($r$ = .30, $p$ < .001) and perceived abilities for health-promoting self-care ($r$ = .54, $p$ < .001), as hypothesized. Finally, the significant positive relationship ($r$ = .44, $p$ < .001) of perceived health status to perceived abilities for health-promoting self-care was supported.

Research question 2 (What are the coefficients of the paths in the operational model of factors contributing to perceived abilities for health-promoting self-care of community-dwelling Thai older adults?) and research question 3 (Does the hypothesized model adequately fit the data?) are discussed in the same section because the analysis procedures are interrelated.

The analysis procedures to answer research question 2 and 3 were performed simultaneously using path analysis through EQS 6, a structural equation modeling program. Basically, the EQS program has the ability to generate both parameter estimates and goodness-of-fit indices that determine the extent to which the hypothesized model is consistent with the data (Byrne, 1994). The goodness-of-fit indices (e.g., the Satorra-Bentler scaled statistics, comparative fit index) were used to determine whether the model adequately fits the data. Because path analysis is an

extension of regression analysis (Norris, 1997b), an assessment of multicollinearity among predictors was performed first.

**Assessment of Multicollinearity among Predictor Variables**

In regression analysis, high correlations among the predictor variables, multicollinearity, may produce problems: (1) the size of multiple correlation R is limited; (2) making it difficult to determine the importance of a given predictor; and (3) estimates of regression coefficients will be unstable (Stevens, 1996). The three measures used for detecting multicollinearity were the simple correlations among the predictors, the tolerance value, and the variance inflation factor (VIF). According to Munro (1997), the tolerance value is "the proportion of the variance in a variable that is not accounted for by the other independent variables" ($1 - R^2$) (p. 268) and its value ranges from 0 to 1. If the tolerance value is too low, it will have a problem in the analysis (Tabachnick & Fidell, 1996). Inversely, the variance inflation factor is equal to $1/(1 - R^2)$ (Steven, 1996). Variables with high tolerances have small variance inflation factors (Munro, 1997).

Mueller (1996) stated that multicollinearity might be present if the absolute value of the zero-order correlation coefficients are .70 or larger. However, the zero-order correlation coefficients among predictors in this study were not large, ranging from .15 to .55 (see Table 4.5).

From Table 4.6, the tolerance values ($1-R^2$) were quite large, ranging from a low of .661 (perceived family support) to a high of .888 (chronic health problems),

thus, multicollinearity was not problematic. The tolerance of .888 for chronic health problems indicates that only 11.2% (1 - .888 = .112) of the variance was shared with the other predictors. In addition, Stevens (1996) suggested that if the VIF exceeds 10, it should be a concern. In this analysis, the VIF ranged from 1.126 to 1.513 (see Table 4.6); therefore, multicollinearity among the predictors is not a concern in the proposed analyses.

Table 4.6

Assessment for Multicollinearity among Predictor Variables

| Predictor Variable | Tolerance | VIF[a] |
|---|---|---|
| 1. For the first equation (DV = Chronic health problems) | 1.00 | 1.00 |
| Age | | |
| 2. For the second equation (DV = Perceived family support) | | |
| Age | 0.871 | 1.149 |
| Education | 0.871 | 1.149 |
| 3. For the third equation (DV = Perceived friend support) | | |
| Age | 0.871 | 1.149 |
| Education | 0.871 | 1.149 |
| 4. For the fourth equation (DV = Functional ability) | | |
| Age | .845 | 1.184 |
| Education | .848 | 1.179 |
| Perceived family support | .677 | 1.476 |
| Perceived friend support | .676 | 1.479 |
| Chronic health problems | .888 | 1.126 |

Table 4.6 (Continued)

Assessment for Multicollinearity among Predictor Variables

| Predictor Variable | Tolerance | VIF[a] |
|---|---|---|
| 5. For the fifth equation (DV = Perceived health status) | | |
| Age | .797 | 1.254 |
| Education | .844 | 1.185 |
| Perceived family support | .661 | 1.513 |
| Perceived friend support | .673 | 1.485 |
| Chronic health problems | .839 | 1.192 |
| Functional ability | .814 | 1.229 |
| 6. For the sixth equation (DV = Perceived abilities for health-promoting self-care) | | |
| Age | .797 | 1.255 |
| Education | .837 | 1.195 |
| Perceived family support | .661 | 1.513 |
| Perceived friend support | .663 | 1.503 |
| Chronic health problems | .752 | 1.330 |
| Functional ability | .803 | 1.245 |
| Perceived health status | .788 | 1.269 |

Note. [a]VIF = variance inflation factor, DV = dependent variable.

## Model Testing and Modification

Step One: Initial Model

First of all, the assumption of multivariate normality was assessed through the EQS 6 program. Using the cases with largest contribution to normalized multivariate kurtosis identified by EQS6, five multivariate outliers were deleted. Consequently, the normalized estimate was lowered from 17.60 to 7.25. The path analysis was performed on 211 participants. There were no missing data. After deletion of five outliers, four variables (perceived family support, perceived friend support, functional ability, and perceived abilities for health-promoting self-care) were still significantly skewed. Therefore, maximum likelihood estimation with robust statistics, including a robust test of the hypothesized model and robust standard errors, were employed. Specifically, the robust tests and standard errors were adjusted for the extent of the non-normality (Bentler, 1995).

Based on the initial proposed model, six structural equations were entered into the path analysis.

Equation 1: Chronic Health Problems = Age + Error

Equation 2: Perceived Family Support = Age + Education + Error

Equation 3: Perceived Friend Support = Age + Education + Error

Equation 4: Functional Ability = Age + Education + Perceived Family Support + Perceived Friend Support + Chronic Health Problems + Error

Equation 5: Perceived Health Status = Age + Education + Perceived Family Support + Perceived Friend Support + Chronic Health Problems + Functional Ability + Error

Equation 6: Perceived Abilities for Health-Promoting Self-Care = Age + Education + Perceived Family Support + Perceived Friend Support + Functional Ability + Perceived Health Status + Error

In the first equation, chronic health problems were predicted by age. In the second equation, perceived family support was predicted by age and education. In the third equation, perceived friend support was predicted by age and education. In the fourth equation, functional ability was predicted by age, education, perceived family support, perceived friend support, and chronic health problems. In the fifth equation, perceived health status was predicted by age, education, perceived family support, perceived friend support, chronic health problems, and functional ability. Finally, perceived abilities for health-promoting self-care were predicted by age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status.

In the analysis, the raw data were used and transformed by the EQS program into a covariance matrix (Table 4.7). Maximum Likelihood Method (Robust) was used to estimate the parameters. A non-significant chi-square is desired because it indicates that it is consistent with the pattern of covariation among the variables (Stevens, 1996). In step 1 of the path analysis, the results showed that the S-B $\chi^2$ was

huge (3926.06) with 5 degrees of freedom (see Table 4.8). The p-value was .000 and the robust CFI was .00, indicating that the initial model was wrongly specified and definitely did not fit the data. In this step, the iterative process has not converged after the default maximum number of iterations (30) was reached, resulting in unstable and invalid estimates in the output (Byrne, 1994). Additionally, the multivariate Wald Test, an index used to evaluate whether some the free parameters could be dropped (Bentler, 1995), suggested dropping the path between chronic health problems and age. It was not surprising because the zero-order correlation between age and chronic health problems was not significant ($r = .07$, $p > .05$).

Table 4.7

Covariance Matrix of Study Variables (N= 211)

| | Age | Edu | PFaS | PFrS | CHP | FA | PHS | PAHPSC |
|---|---|---|---|---|---|---|---|---|
| Age | 56.72 | | | | | | | |
| Edu | -6.84 | 4.87 | | | | | | |
| PFaS | -6.44 | 2.21 | 20.50 | | | | | |
| PFrS | -8.22 | 1.82 | 12.66 | 25.94 | | | | |
| CHP | .77 | -.19 | -2.10 | -2.25 | 2.34 | | | |
| FA | -8.13 | 1.23 | 3.32 | 3.82 | -1.37 | 6.52 | | |
| PHS | -.94 | .31 | 1.17 | .96 | -.59 | .72 | .88 | |
| PAHPSC | -67.18 | 16.96 | 54.75 | 50.35 | -7.54 | 27.75 | 8.27 | 398.47 |

Note. Edu = educational level, PFaS = perceived family support, PFrS = perceived friend support, CHP = chronic health problems, FA = functional ability, PHS = perceived health status, PAHPSC = perceived abilities for health-promoting self-care.

Table 4.8

Process and Results for Model Modification

| Model | Scaled $\chi^2$ | df | p Value | Robust CFI | RMSEA |
|---|---|---|---|---|---|
| Model 1: Hypothesized Model | 3926.06 | 5 | .000 | .00[a] | 1.932 |
| (A) CHP = Age + Error | | | | | |
| (B) PFaS = Age + Edu + Error | | | | | |
| (C) PFrS = Age + Edu + Error | | | | | |
| (D) FA= Age + Edu + PFaS + PFrS + CHP + Error | | | | | |
| (E) PHS = Age + Edu + PFaS + PFrS + CHP + FA + Error | | | | | |
| (F) PAHPSC = Age + Edu + PFaS + PFrS + CHP + FA + PHS + Error | | | | | |

Note. [a]The iterative process has not converged after the default maximum number of iterations (30) was reached.

Edu = educational level, PFaS = perceived family support, PFrS = perceived friend support, CHP = chronic health problems, FA = functional ability, PHS = perceived health status, PAHPSC = perceived abilities for health-promoting self-care. RMSEA = root mean-square error of approximation.

Table 4.8 (Continued)

Process and Results for Model Modification

| Model | Scaled $\chi^2$ | df | p Value | Robust CFI | RMSEA |
|---|---|---|---|---|---|
| Model 2: Path dropped: CHP predicted by Age | 78.39 | 6 | .000 | .772 | .240 |
| Model 3: Paths with non significance were dropped: PHS predicted by Age; PHS predicted by PFrS; PHS predicted by Edu; FA predicted by Edu; FA predicted by PFaS; FA predicted by PFrS; PFrS predicted by Edu | 86.59 | 14 | .000 | .772 | .157 |
| Model 4: Paths added: PAHPSC predicted by CHP; PFaS predicted by CHP; PFrS predicted by CHP | 55.49 | 11 | .000 | .860 | .139 |

Note. Edu = educational level, PFaS = perceived family support, PFrS = perceived friend support, CHP = chronic health problems, FA = functional ability, PHS = perceived health status, PAHPSC = perceived abilities for health-promoting self-care. RMSEA = root mean-square error of approximation.

Table 4.8 (Continued)

Process and Results for Model Modification

| Model | Scaled $\chi^2$ | df | p Value | Robust CFI | RMSEA |
|---|---|---|---|---|---|
| Model 5: Final model (Standardized solution)<br>-Moving 3 intervening variables (CHP, PFrS, and PFaS) as exogenous variables<br>-Adding a correlation path between PFrS and PFaS<br>(D) FA= -.405*Age - .327*CHP + Error<br>(E) PHS = -.318*CHP + .151*FA + .136*PFaS + Error<br>(F) PAHPSC = .367*PFaS + .279*FA + .245*PHS - .160*Age + .152*PFrS + .134*Edu + .119*CHP + Error | 7.09 | 8 | .526 | 1.00 | .000 |

Note. Edu = educational level, PFaS = perceived family support, PFrS = perceived friend support, CHP = chronic health problems, FA = functional ability, PHS = perceived health status, PAHPSC = perceived abilities for health-promoting self-care. RMSEA = root mean-square error of approximation.

Step Two: Model Modification by Dropping a Path from CHP to Age

In the second step, according to the multivariate Wald Test in the first step, the path from age to chronic health problems was dropped, resulting in a considerable decrease of the scaled chi-square from 3926.06 to 78.39 with 6 degrees of freedom. However, the p value was still significant (.000) and the robust CFI (.772) indicated that the model did not fit the data and needed modification. The multivariate Wald Test suggested dropping 7 paths: (1) the relationships of age to perceived health status; (2) education to perceived friend support; (3) education to functional ability; (4) education to perceived health status; (5) perceived family support to functional ability; (6) perceived friend support to functional ability; and (7) perceived friend support to perceived health status.

Step Three: Model Modification by Dropping All Non-Significant Paths

After dropping the 7 structural paths that were not significant suggested by the multivariate Wald Test in step two, the scaled chi-square slightly increased, from 78.39 to 86.59 with 14 degrees of freedom. The p value was significant (.000) and the robust CFI was .772, meaning that the model still did not fit the data.

In this step, the multivariate Wald Test suggested that none of the free parameters be dropped, but the multivariate Lagrange Multiplier Test (LM Test)—an index used to evaluate whether some of the fixed parameters in the model could be freed (Bentler, 1995)—suggested adding four paths: those from chronic health problems to perceived abilities for health-promoting self-care, perceived family

support, and perceived friend support; and a path between perceived family support and perceived friend support. However, the latter path was questionable in terms of lack of rationale because no literature was found to support the causal relationship between perceived family support and perceived friend support; therefore, this path was considered as a covariate.

Step Four: Model Modification by Adding Paths

According to the LM Test in the third step, three paths were added: the relationship of chronic health problems to perceived family support, perceived friend support, and perceived abilities for health-promoting self-care. The result showed that the scaled chi-square was decreased from 86.59 to 55.49 with 11 degrees of freedom. The p-value (.000) was significant although the robust CFI increased from .772 to .860. Because the model with the CFI greater than .90 is required to obtain an acceptable fit to the data (Bentler, 1995; Byrne, 1994; Stevens, 1996), further modification was performed. In this step, no path was suggested by the Wald Test for dropping, but the LM Test still suggested the relationship between perceived family support and perceived friend support.

Step Five: Final Modified Model

The relationship between perceived family support and perceived friend support, not hypothesized initially, was employed as a correlation between exogenous variables, denoted by a curved line with an arrow at each end. Furthermore, chronic health problems were considered as an exogenous variable because the relationship of

age to chronic health problems was not significant. Therefore, there were five exogenous variables in the final model: age, education, perceived family support, perceived friend support, and chronic health problems.

The eight correlations among exogenous variables in this model included those between (1) age and education; (2) age and perceived friend support, (3) age and perceived family support; (4) education and perceived family support; (5) education and perceived friend support; (6) chronic health problems and perceived family support; (7) chronic health problems and perceived friend support; and (8) perceived family support and perceived friend support. Overall, eight structural paths were dropped; one structural path was added; and three correlations among predictors were added.

The results of goodness-of-fit indices demonstrated a substantial improvement (Table 4.9). The scaled chi-square decreased from 55.49 to 7.09 with 8 degrees of freedom. The p-value (.526) was non-significant and the robust CFI was 1, indicating that the modified model fit the data very well. In addition, the other fit indices, such as Bentler-Bonett's normed fit index (NFI) and Bentler-Bonett's non-normed fit index (NNFI) showed that the model adequately fit the data. The NFI in this analysis was .979 and the NNFI was 1.010. The values of NFI and NNFI greater than .9 are desired. The possible range of NFI is 0 to 1, but that of NNFI can be outside the range of 0 to 1 (Bentler, 1995). Basically, the NFI tends to underestimate fit in small sample sizes although the model is correct (Bentler, 1995; Mueller, 1996). Therefore, the CFI

is the index of choice because it is a revision of the NFI by considering the sample size (Byrne, 1994). Also, the CFI greater than .9 is desired. The root mean square error of approximation (RMSEA) has become another popular index of model fit because of its known distribution and theoretical range (0-1). An RMSEA value of less than .05 is an indicator that the model fits the data (Raykov & Marcoulides, 2000). In this final model, the RMSEA was .00.

Table 4.9

The Goodness-of-Fit Indices Used in the Study

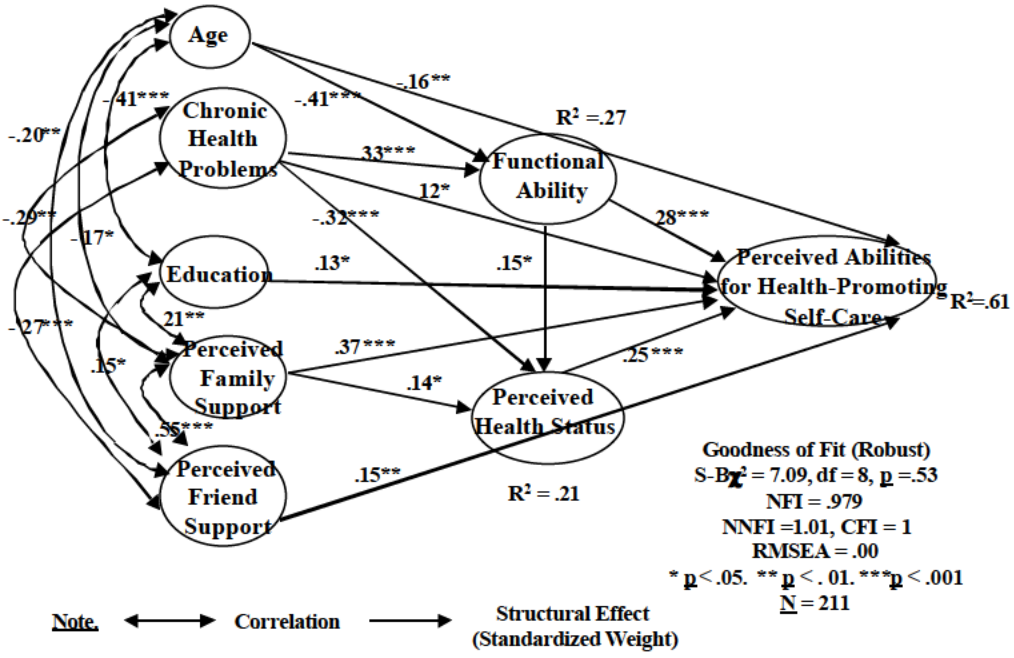
| Fit Index | Possible Range | Indicator of Acceptable Fit | Result |
|---|---|---|---|
| Probability of $S\text{-}B\chi^2$ | 0–1 | > .05 (or > .01)[a] | .53 |
| NFI | 0–1 | > .9 | .98 |
| NNFI | can be outside 0–1 | > .9 | 1.01 |
| CFI | 0–1 | > .9 | 1 |
| RMSEA | 0–1 | < .05 | .00 |

Note. $S\text{-}B\chi^2$ = Satorra-Bentler scaled chi-square, NFI = normed fit index, NNFI = nonnormed fit index, CFI = comparative fit index, RMSEA = root mean square error of approximation.

[a]The traditional significance p-value is .05, but one may set the p-value at .01.

To determine the statistical significance of parameter estimates, the robust test statistics were used. The test statistic represents "the estimated parameter divided by its standard error; as such it operates as a z statistic in testing that the estimate is statistically different from zero" (Byrne, 1994, p. 60). The test statistic needs to be greater than $\pm$ 1.96 to be significant at the alpha level of .05 before the hypothesis, which states that the estimate is equal to zero, can be rejected (Byrne, 1994). In this analysis, the output showed that all paths that remained in this model were significant. The structural equations with standardized estimates are presented in Table 4.8 (Model 5).

**Figure 4.1. A final modified model of factors contributing to perceived abilities for health-promoting self-care of community-dwelling Thai older adults.**



In the final model after modifications and testing (see Figure 4.1), 27% of the total variance in functional ability was accounted for by age and chronic health problems. Twenty-one percent of the total variance in perceived health status was accounted for by age, perceived family support, chronic health problems, and functional ability. Sixty-one percent of the total variance in perceived abilities for health-promoting self-care was accounted for by all study predictors: age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status.

Table 4.10

Effects of Age, Edu, PFaS, PFrS, CHP, FA, and PHS on PAHPSC

| Variable | Correlation (r) | Effects on PAHPSC | | | |
|---|---|---|---|---|---|
| | | Structural | | | Noncausal[b] |
| | | Direct | Indirect | Total[a] | |
| Age | -.447*** | -.160** | -.128 | -.288 | -.159 |
| Edu | .385*** | .134* | 0 | .134 | .251 |
| PFaS | .606*** | .367*** | .033 | .400 | .206 |
| PFrS | .495*** | .152** | 0 | .152 | .343 |
| CHP | -.247*** | .119* | -.181 | -.062 | -.185 |
| FA | .544*** | .279*** | .037 | .316 | .228 |
| PHS | .442*** | .245*** | 0 | .245 | .197 |

Note. [a] Total structural effect = direct effect + indirect effects; Statistical significance for total and indirect effects for standardized values are not provided by EQS 6.

[b] Noncausal relationship = r - total structural effect

*p < .05. **p < .01. ***p < .001

## Effects of Predictors on Endogenous Variables

### Effects of Predictors on Perceived Abilities for Health-Promoting Self-Care

Table 4.10 presents the effects of age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status on perceived abilities for health-promoting self-care. Theoretically, total association or correlation is the sum of "causal" effects (referred to as structural effects) and noncausal relationships (Maruyama, 1998; Norris, 1997b). Total structural effects are defined as the sum of the direct effect (DE) and the indirect effect (IE) of an independent on a dependent variable (i.e., TE = DE + IE) (Bryne, 1994; Mueller, 1996; Pedhazur, 1982). Noncausal relationships consist of associations due to shared antecedents and unanalyzed prior association; noncausal = shared antecedents + unanalyzed prior association. Also, noncausal relationships are total correlation minus total structural effects (Davis, 1985; Maruyama, 1998) or noncausal = r – total structural effects. Total indirect effects between two variables are "the sum of all particular indirect effects through possible intervening variables" (Mueller, 1996, p. 36).

In this analysis, the standardized values were presented thoroughout. Gamma ($\gamma$) represents a "structural coefficient associated with an effect from an exogenous to an endogenous variable"; beta ($\beta$) represents a "structural effect from an endogenous to another endogenous variable" (Mueller, 1996, p. xxi); Phi ($\phi$) denotes "variance/covariance matrix of exogenous variables" (p. xxii).

The output showed that age had both a negative direct effect on perceived abilities for health-promoting self-care ($\gamma$ = -.160, $p$ < .01) and a negative indirect effect ($\gamma$ = -.128) on perceived abilities for health-promoting self-care through functional ability (see Figure 4.1). Therefore, total structural effects of age on perceived abilities for health-promoting self-care = [-.160 + (-.405)(.279) + (-.405)(.151)(.245)] = -.288 (see Table 4.10 & Figure 4.1). In addition to structural effects, noncausal relationships were presented.

Education had a positive direct effect on perceived abilities for health-promoting self-care ($\gamma$ = -.134, $p$ < .05). Perceived family support had both a positive direct effect on perceived abilities for health-promoting self-care ($\gamma$ = .367, $p$ < .001) and a positive indirect effect on perceived abilities for health-promoting self-care ($\gamma$ = .033) through perceived health status. Perceived friend support had a positive direct effect on perceived abilities for health-promoting self-care ($\gamma$ = .152, $p$ < .01). Chronic health problems had a positive direct effect on perceived abilities for health-promoting self-care ($\gamma$ = .119, $p$ < .05), but had a negative indirect effect on perceived abilities for health-promoting self-care ($\gamma$ = -.181) through functional ability and perceived health status.

Functional ability has both a positive direct effect on perceived abilities for health-promoting self-care ($\beta$ = .279, $p$ < .001) and a positive indirect effect on perceived abilities for health-promoting self-care ($\beta$ = .037) through perceived health

status. Finally, perceived health status had a positive direct effect on perceived abilities for health-promoting self-care ($\beta = .245$, $\underline{p} < .001$).

In sum, all of the seven predictors in the proposed model had direct effects on perceived abilities for health-promoting self-care. Four predictors (age, perceived family support, chronic health problems, and functional ability) also had indirect effects on perceived abilities for health-promoting self-care. Two predictors (age and chronic health problems) had negative total effects on perceived abilities for health-promoting self-care, but the rest (education, perceived family support, perceived friend support, functional ability, and perceived health status) had positive total effects on perceived abilities for health-promoting self-care.

Table 4.11

Effects of PFaS, CHP, and FA on PHS

| Variable | Correlation (r) | Effects on Perceived Health Status | | | |
|---|---|---|---|---|---|
| | | Structural | | | Noncausal[b] |
| | | Direct | Indirect | Total[a] | |
| Age | -.133[ns] | 0 | -.061 | -.061 | -.072 |
| PFaS | .275*** | .136* | 0 | .136 | .139 |
| CHP | -.410*** | -.318*** | -.049 | -.367 | -.043 |
| FA | .301*** | .151* | 0 | .151 | .150 |

Note. [a] Total structural effect = direct effect + total indirect effects; Statistical significance for total and indirect effects for standardized values are not provided by EQS 6.

[b]Noncausal relationship = r – total structural effect.

*p < .05. **p < .01. ***p < .001. NS = non-significant.

## Effects of Predictors on Perceived Health Status

Table 4.11 presents the effects of perceived family support, chronic health problems, and functional ability on perceived health status. Age did not have a significant direct effect on perceived health status, but had a modest indirect effect ($\gamma$ = -.061) on perceived health status through functional ability; thereby, total effect of age was -.061. Perceived family support had a direct effect on perceived health status ($\gamma$ = .136, p <. 05). Chronic health problems had a negative direct effect on perceived

health status ($\gamma$ = -.318, $p$ <. 001) and had a negative indirect effect on perceived health status ($\gamma$ = -.049) through functional ability. Functional ability had a positive direct effect on perceived health status ($\beta$ = .151, $p$ <. 05).

In short, age and chronic health problems had negative total effects on perceived health status, but perceived family support and functional ability had positive total effects on perceived health status, as hypothesized.

Effects of Predictors on Functional Ability

The effects of age and chronic health problems on functional ability are presented (see Table 4.12). Age had a negative direct effect on functional ability ($\gamma$ = -.405, $p$ < .001). Chronic health problems also had a negative direct effect on functional ability ($\gamma$ = -.327, $p$ < .001). As hypothesized, age and chronic health problems had a negative direct effect on functional ability. However, education, perceived family support, and perceived friend support did not influence functional ability in this study; thereby, these findings did not support the initial hypotheses.

Table 4.12

Effects of Age and CHP on FA

| Variable | Correlation (r) | Effects on Functional Ability | | | |
|---|---|---|---|---|---|
| | | Structural | | | Noncausal[b] |
| | | Direct | Indirect | Total[a] | |
| Age | -.423*** | -.405*** | 0 | -.405 | -.018 |
| CHP | -.350*** | -.327*** | 0 | -.327 | -.023 |

Note. [a] Total structural effect = direct effect + total indirect effects; Statistical significance for total and indirect effects for standardized values are not provided by EQS 6.

[b] Noncausal relationship = r – total structural effect.

*p < .05. **p < .01. ***p < .001.

Summary

Age had a direct effect on functional ability and had indirect effects on perceived health status through functional ability and on perceived abilities for health-promoting self-care through functional ability and perceived health status. Education had a direct effect on perceived abilities for health-promoting self-care. Chronic health problems had direct effects on functional ability, perceived health status, and perceived abilities for health-promoting self-care and had indirect effects on perceived health status through functional ability and on perceived abilities for health-promoting self-care through functional ability and perceived health status.

Perceived family support had a direct effect on perceived health status and perceived abilities for health-promoting self-care and had an indirect effect on perceived abilities for health-promoting self-care through perceived health status. Perceived friend support had a direct effect on perceived abilities for health-promoting self-care. Functional ability had direct effects on perceived health status and perceived abilities for health-promoting self-care and had an indirect effect on perceived abilities for health-promoting self-care through perceived health status. Lastly, perceived health status had a direct effect on perceived abilities for health-promoting self-care.

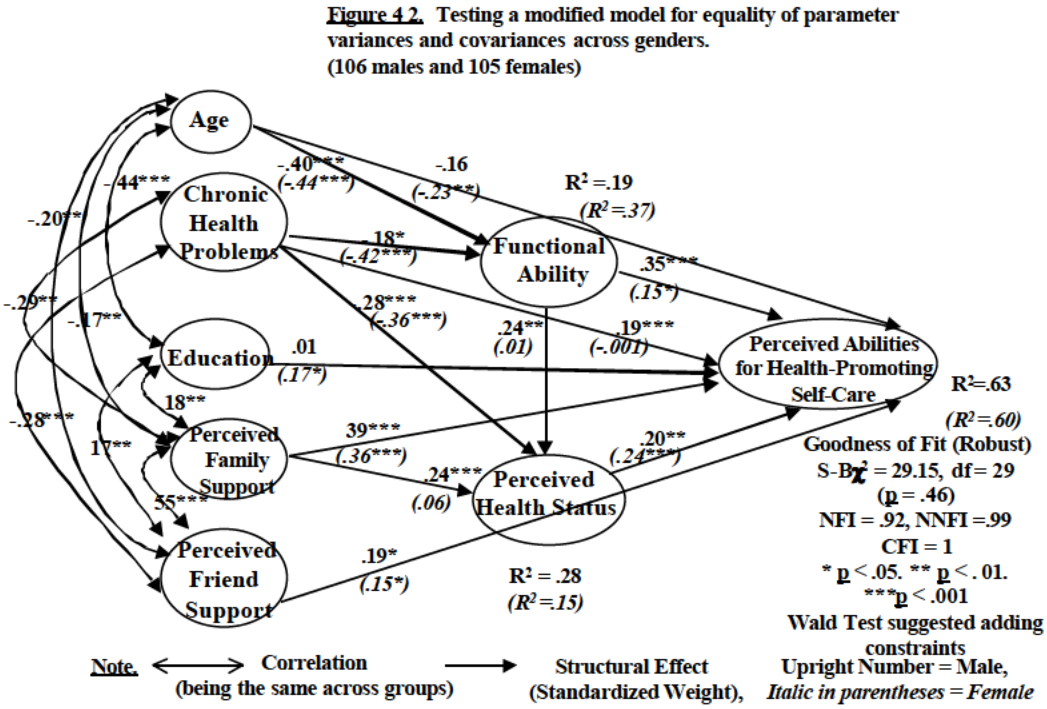
## Additional Data Analyses

Data used in the analysis for this study consisted of 106 males and 105 females; therefore, testing the study model for its equivalence (invariance) across genders was of interest and then, was explored. An additional research question asked whether the parameters, which refer to $\beta$, $\gamma$, and $\phi$, in the modified model obtained from the total sample (Figure 4.1) were the same for males and females. Multisample analysis was used to answer the research question because of its ability to test a theoretical model for its applicability across groups simultaneously (Scott-Lennox & Lennox, 1995). Comparability of structural processes is allowed by this technique (Maruyama, 1998). In this study, male and female elderly Thais were different samples from the same population. Multisample analysis allows researchers to "analyze data from all samples simultaneously and…ought to verify that a model, identical in all groups, reproduces the sample data from each group to within sampling accuracy" (Bentler, 1995, p. 149). The goodness-of-fit $\chi^2$ test can be used to describe the adequacy of the model (Bentler, 1995).

In the tested model in this study, 28 parameters were estimated for each group simultaneously (12 structural paths, 8 covariances, 5 variances associated with exogenous variables, and 3 error terms associated with endogenous variables). Byrne (1994) recommended that "in testing for invariance across groups, sets of parameters are put to the test in a logically order and increasingly restrictive fashion" (p. 161). The equality of error variance and covariances is presumably the least important

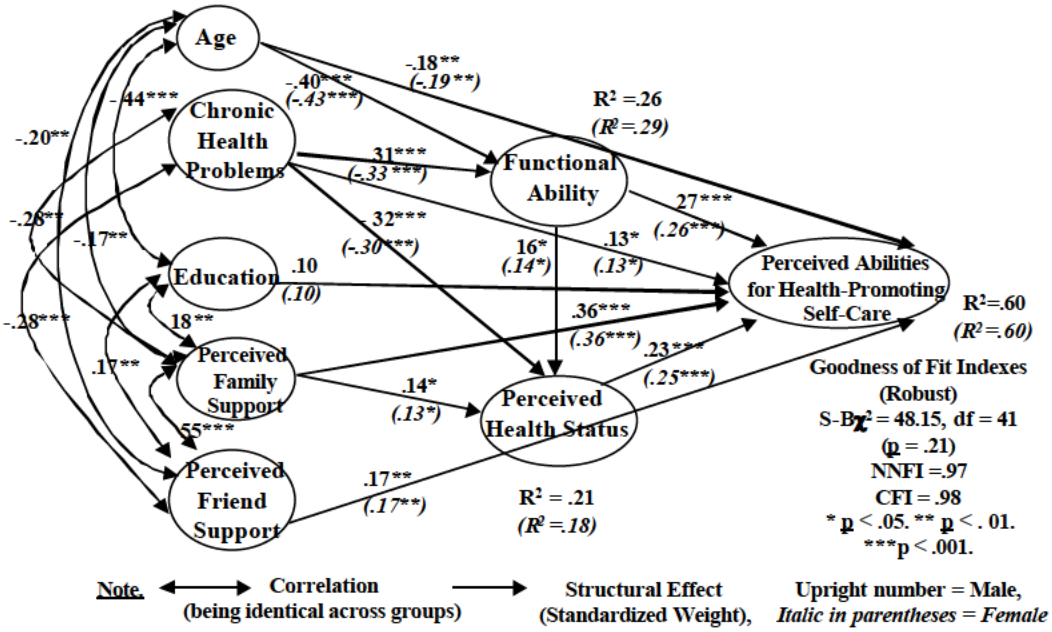
hypothesis to test (Bentler, 1995) because the procedure is an overly restrictive test of the data (Byrne, 1994).

In this analysis, the model with unconstrained free parameters was tested first, meaning that only parameter variances and covariances were constrained. The result showed that the model fit the data across groups ($S\text{-}B\chi^2 = 29.15$, $\underline{df} = 29$, $\underline{p} = .46$, NNFI = .99, CFI = 1). This analysis yielded different parameter estimates between males and females: for example, the paths between (1) age and perceived ability for health-promoting self-care; (2) education and perceived ability for health-promoting self-care; (3) chronic health problem and perceived ability for health-promoting self-care; (4) perceived family support and perceived health status; and (5) functional ability and perceived health status (Figure 4.2). The Box test for testing homogeneity of covariance matrices was also explored and the finding showed that it was not significant ($\underline{N} = 211$, $\underline{p} = .14$), indicating that the covariance matrices between females and males were not significantly different. However, for this multisample analysis, the Wald Test suggested that additional five parameters be dropped. In other words, constraints should be increased in further analyses; therefore, testing for equality of parameter loadings were added in the next step.




Secondly, when the model was constrained to have equal parameter loadings, variances, and covariances for both groups, the fit indices were also adequate ($S\text{-}B\chi^2$ = 48.15, df = 41, p = .21, NNFI = .97, CFI = .98). No additional path was suggested by the LM Test, but the Wald Test indicated that one parameter (the path between education and perceived abilities for health-promoting self-care) in the model might be dropped. In this analysis, all parameter estimates were almost identical between males and females (Figure 4.3).

**Figure 4.3.** Testing a modified model for equality of parameter loadings, variances, and covariances across genders. (106 males and 105 females)




Lastly, the fully constrained model (the most restrictive hypothesis) was tested, meaning that all parameters (all parameter loadings, variances, covariances, and error variances) were constrained to be equal across groups. It was found that this hypothesis was rejected ($S\text{-}B\chi^2 = 1240.46$, $df = 44$, $p < .001$, CFI = .000). In other words, the fully constrained model did not fit the data across genders.

In conclusion, these findings indicate that the modified model fit the data with similar parameter estimates between males and females only when the parameter loadings, variances, and covariances were constrained. Error variances for males and females might differ in some attributes that are not explained by the study variables in the model. The second model with constrained parameter loadings, variances, and

covariances, was retained because of the good fit indices and the modification index. The results showed that the parameter estimates across genders were almost identical. In addition, the proportion of variances in each endogenous variable explained by its predictors was similar across groups.

Table 4.13 showed that all parameter estimates in the model (generated by that with constrained parameter loadings, variances, and covariances) between male and female were similar and the correlations among predictors were identical across genders. All parameter estimates, except the parameter estimate between education and perceived abilities for health-promoting self-care, were significantly different from zero across groups.

Table 4.13

Standardized Coefficients for Multisample Analysis across Genders

| Parameters | Thai Elderly Males (n = 106) | Thai Elderly Females (n = 105) |
|---|---|---|
| Age–FA | -.40*** | -.43*** |
| Age–PAHPSC | -.18** | -.19** |
| Edu–PAHPSC | .10 | .10 |
| PFaS–PHS | .14* | .13* |
| PFaS–PAHPSC | .36*** | .36*** |
| PFrS–PAHPSC | .17** | .17** |
| CHP–FA | -.31*** | -.33*** |
| CHP–PHS | -.32*** | -.30*** |
| CHP–PAHPSC | .13* | .13* |
| FA–PHS | .16* | .14* |
| FA–PAHPSC | .27*** | .26*** |
| PHS–PAHPSC | .23*** | .25*** |

Note. Satorra-Bentler scaled chi-square (S-B$\chi^2$) = 48.15; df = 41; p values for S-B$\chi^2$ = .21; NNFI, non-normed fit index = .97; Robust CFI, comparative fit index = .98

*p < .05. **p < .01. ***p < .001.

## Summary

This chapter presents the sample characteristics, including gender, age, educational level, marital status, living patterns, and chronic health problems. The sample for the analysis consisted of 211 Thai older adults, living in the rural areas of Thailand. Pearson's correlation coefficient was used to test the bivariate relationships among variables. The EQS 6 software program was used to test the hypothesized model of factors contributing to perceived abilities for health-promoting self-care of community-dwelling Thai older adults. The robust statistics (Satorra-Bentler scaled chi-square and robust standard errors), the goodness of fit indices (CFI, NFI, NFI, RMSEA) and modification indices (the Wald Test and Lagrange Multiplier, LM, Test) were employed to modify the hypothesized model. Three variables, proposed as endogenous variables initially, were reconceptualized to be exogenous variables because (1) the relationship between age and chronic health problems was insignificant; and (2) the relationship between perceived family and perceived friend support, suggested by the LM Test, was conceptualized as correlational rather than causal. Multiple fit indices indicate that the modified model fit the data well. The decomposition of effects with standardized values was presented. The proportion of total variance in each endogenous variables (functional ability, perceived health status, and perceived abilities for health-promoting self-care) were reported. Finally, multisample analyses to test for equality of the model across genders were performed. Gender differences were not significant when parameter loadings, variances, and

covariances were constrained and the goodness-of-fit indices were adequate, indicating that the modified model fit the data across genders. However, the fully constrained model showed that the model did not fit the data across groups, indicating that error variances for both genders differ in some characteristics that were not included in the study model.

# CHAPTER 5

# SUMMARY, DISCUSSION, AND RECOMMENDATIONS

This chapter includes three sections. The first section presents a summary of the study, including the purpose of the study, research questions, methodology, data analysis procedures, and findings. The second section presents discussion of both the theoretical and methodological aspects of the study, as well as an interpretation and generalization of the findings. The last section presents recommendations for future research and implications for nursing theory, education, and practice.

## Summary of the Study

The purpose of this descriptive correlational study was to examine factors contributing to perceived abilities for health-promoting self-care among community-dwelling Thai older adults. Selected concepts from Orem's (1995) self-care theory and Bandura's (1997) self-efficacy theory were integrated in a conceptual model for this study. The study variables include age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status, as well as perceived abilities for health-promoting self-care. Three research questions and 22 hypotheses were explored.

Stratified random sampling was employed to recruit the sample, based on age and gender. The study sample initially consisted of 216 Thai older adults living in the rural areas of Suphanburi Province, Thailand. However, five multivariate outliers were deleted, so the final sample consisted of 211 older adults (106 males and 105

females), with a mean age of 73.21 years. The majority of participants had from 1 to 6 years of formal education and lived with their family members (spouse, children, and/or grandchildren).

Perceived family support, perceived friend support, chronic health problems, functional ability, perceived health status, and perceived abilities for health-promoting self-care were measured by the Family APGAR Questionnaire, the Friend APGAR Questionnaire, the Chronic Health Problem Checklist, the Modified Barthel ADL Index combined with the Chula ADL index, the Self-Rated Health Scale, and the Self-Rated Abilities for Health Practices Scale, respectively. The reliability coefficients of the scales used were acceptable to good, ranging from .75 to .94.

Descriptive statistics (percentage, range, mean, standard deviation, skewness, and kurtosis) were used to describe characteristics of the sample and to explain the distribution of the data. Pearson's correlation coefficient was used to examine the relationships among the study variables. All hypotheses were supported except that no relationship was found between age and chronic health problems, nor between age and perceived health status. Perceived abilities for health-promoting self-care were negatively associated with age and chronic health problems, but positively associated with educational level, perceived family support, perceived friend support, functional ability, and perceived health status.

Using the EQS 6 program, the hypothesized model was tested. The initial model did not fit the data, and was modified by the Wald Test for dropping

insignificant paths and by the Lagrange Multiplier (LM) test for adding paths until the goodness-of-fit indices were adequate (>.90). During the modification process, eight paths were dropped (the paths between age-chronic heath problems; age-perceived health status; education-perceived friend support, education-functional ability, education-perceived health status; perceived family support-functional ability; perceived friend support-functional ability; and perceived friend support-perceived health status).

The LM Test suggested that four paths be added, between (1) chronic health problems and perceived family support; (2) chronic health problems and perceived friend support; (3) chronic health problems and perceived abilities for health-promoting self-care; and (4) perceived family support and perceived friend support. However, a structural relationship between perceived family support and perceived friend support was not corroborated by the existing literature or theory. Therefore, three endogenous variables (perceived family support, perceived friend support, and chronic health problems) were reconceptualized to be exogenous variables. Chronic health problems was made an exogenous variable since there was no significant relationship between age and chronic health problems. The added relationships suggested by the LM Test were treated as covariates, except for the relationship between chronic health problems and perceived abilities for health-promoting self-care, which was drawn as a structural path. In the final step, multiple-fit indices suggest that the modified model did fit the data well.

Age had a direct effect on functional ability and on perceived abilities for health-promoting self-care and had an indirect effect on perceived health status (through functional ability) and on perceived abilities for health-promoting self-care (through functional ability and perceived health status) (see Figure 4.1). Education directly influenced perceived abilities for health-promoting self-care. Chronic health problems had a direct effect on functional ability, perceived health status, and perceived abilities for health-promoting self-care and furthermore had an indirect effect on perceived health status (through functional ability) and on perceived abilities for health-promoting self-care (through functional ability as well as perceived health status).

Perceived family support had a direct effect on perceived health status and perceived abilities for health-promoting self-care, and had an indirect effect on perceived abilities for health-promoting self-care (through perceived health status). Perceived friend support had a direct effect on perceived abilities for health-promoting self-care. Functional ability had a direct effect on perceived health status and on perceived abilities for health-promoting self-care and had an indirect effect on perceived abilities for health-promoting self-care (through perceived health status). Lastly, perceived health status had a direct effect on perceived abilities for health-promoting self-care.

Twenty-seven percent of the total variance in functional ability was accounted for by age and chronic health problems. Twenty-one percent of the total variance in

perceived health status was accounted for by age, perceived family support, chronic health problems, and functional ability. Sixty-one percent of the total variance in perceived abilities for health-promoting self-care was accounted for by all study predictors: age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status.

In addition, multisample analyses were performed to test for the equality of sets of parameters of the modified model across genders. When only variance and covariance were constrained, gender differences were not significant. However, the Wald Test suggested that the number of constraints be increased in further analyses. In the second analysis, when parameter loadings, variances, and covariances were constrained, gender differences were not significant. The goodness-of-fit indices were adequate, indicating that the modified model fit the data well across genders. Subsequently, when error variances and covariances were constrained along with parameter loadings, variances, and covariances, the modified model did not fit the data across genders, indicating that error variances and covariances for males and females were not equal. Therefore, the model with the constraints of parameter loadings, variances, and covariances (the second analysis) was retained.

## Discussion of the Findings

### Sample Characteristics and Correlations among Exogenous Variables

Because the sample was straitified by age and gender, the number of males and females was almost equal, as well as the number of participants in each age range

(60-74 and 75 and older). Age was moderately and negatively associated with education. Participants 75 years and older were more likely to have no formal education than were those who were 60 to 74. This is similar to what was found in Chayovan and Knodel's (1996) study. An explanation is that compulsory formal education did not apply to Thai adults above the age of 75 because the first Compulsory Primary Education Act in Thailand was put into effect in 1921 (Educational Management Information System Centre, Ministry of Education, Thailand, 1998). Two participants who completed 14 and 16 years of education, respectively, were subsequently considered outliers and excluded from the analysis.

A higher percentage of women than men in this study had been widowed. This finding is consistent with previous research among Thai older adults (Chayovan & Knodel, 1996; Jitapunkul & Bunnag, 1998;). Women outliving men is a trend shown in various samples across countries, but the explanations for this phenomenon remain inconclusive (Spirduso, 1995).

In this study, almost all married participants lived with the spouse. A few couples lived separately for family reasons. For example, one spouse needed to stay with children or grandchildren in a distant area. Only one participant was divorced in this sample. One possible explanation of this finding is that Thai people consider divorce to be an extreme solution to problems, and they tend to avoid it if they can reach a compromise; however, this phenomenon may vary according to cohorts and locations (urban or rural). In general, the extended family of Thai older adults in rural

areas is intact. In this study, 78% of participants lived with their spouse, children, or grandchildren in the same house. The Thai older adults in this study who lived alone tended to have their children or grandchildren living in close proximity (e.g., in another house, but in the same area).

Although living as a family does not ensure an elder's satisfaction with family support, the scores on the Family APGAR were highly negatively skewed, indicating that most participants perceived support from their family as high. A possible explanation for this finding is that the Thai culture of filial responsibility and filial piety, rooted in Buddhism, has influenced Thai people to respect, care for, and support their parents (Payutto, 1999). However, age was weakly and negatively associated with perceived family support in this study. When the relationships between age and each of the items on the Family APGAR Questionnaire were explored, it was found that item 3 ("I found that my family accepts my wish to take on new activities or make changes in my life-style") and item 4 ("I am satisfied with the way my family expresses affection and responds to my feelings") were significantly negatively associated with age. Ninlert (1996) found that an expression for respect of family members was the first priority contributing to the quality of life among rural elderly Thais.

In this study, Thai older adults tended to identify their neighbors as their friends. Study participants tended to accept that, as they aged, they would have less contact with their old friends. Thai older adults seldom expect support from their

friends. However, it is common for them to receive support from their family members (Oopayokin, Karnjanawong, Sirisuk, & Muttiko, 1998). In general and in this study, transportation was indicated as a problem for Thai older adults; the participants in this study cited this is a reason why they had little contact with their friends. The majority of the study participants were not likely to drive and only a few of them rode bicycles or motorcycles. Most of the latter tended to be males. These trends may be the reason that age was negatively associated with perceived friend support.

Perceived family support was strongly and positively associated with perceived friend support. This relationship was identified and added during path analysis. During the interview, the researcher noticed that participants who were satisfied with support from the family were less likely to expect support from others (friends). They tended to appreciate existing support from friends, although they had fewer friend contacts as they were older. A causal relationship between perceived family support and perceived friend support was not found in the literature; therefore, the association of these variables found during the analysis is correlational.

Age was not significantly associated with chronic health problems. This finding did not support the study hypothesis nor those of previous studies (Chayovan & Knodel, 1996; Swaddiwudhipong et al., 1996). A possible reason for this finding is that the sample was relatively healthy. Most of the participants reported that they participated in physical activities that kept them healthy (e.g., gardening, bicycling, or

doing housework). For example, the two oldest adults in this sample, both aged 93, reported only one health problem: visual impairment for one and bladder incontinence for the other. One of them could thread a needle without using eyeglasses. Another possible explanation is that chronic health problems were identified by self-report. Thai older adults are less likely to see a physician as long as they feel well and can work (Chayovan & Knodel, 1996; Jitapunkul & Bunnag, 1998); thus, existing health problems might be undiagnosed.

The absence of a relationship between age and chronic health problems is preliminary evidence that age should not always be equated with chronic health problems. Oudt (1988) found that a sample of 59 women aged 85 to 97 years old living at home were in relatively good health and were intellectually intact. Health behaviors are mainly self-initiated rather than professionally directed. Konrad (1998) noted that disabilities in old age are not necessarily generalized, nor are they indicated only by biological processes independently of social and psychological processes. Perhaps the relationship between age and chronic health problems found in the literature is contingent upon the nature of the population (e.g., community-dwelling, hospitalized, or institutionalized older adults).

Age was not significantly associated with perceived health status either. In the literature review, this relationship was controversial. Some studies (Ferraro, 1984; Idler, 1993; Mossey, 1995) stated that older adults tended to be more optimistic in rating their health, while others (Chayovan & Knodel, 1996; Dunn & Dyck, 2000;

Johnson & Wolinsky, 1993) reported that older adults tended to rate their health as poorer than did younger adults. G. Roberts (1999) and Orfila et al. (2000) commented that different questions for rating health (a global item versus age-comparative items) yielded different results. The global question tended to show that age was negatively associated with perceived health status. In this study, a global item was used to assess perceived health status, and it was found to have a negative relationship with age, but the relationship was not significant.

The relationship of chronic health status to perceived family support and to perceived friend support—relationships not proposed initially—were found during path analysis. Chronic health problems were weakly and negatively associated with perceived family support and perceived friend support. A plausible explanation is that when older adults have more health problems and serious symptoms, they might have more need for support than those who have fewer health problems, particularly those with low income (Yodpeth et al., 1998). If the quality and quantity of support are lower than expected, participants might rate low satisfaction with family and friend support.

Education was weakly and positively associated with perceived family support and perceived friend support. A possible rationale for this result is that people with higher education develop larger social networks and have access to more resources. However, the variability of education in this sample was small; thus, the strength of its relationships to other variables is also modest.

Overall, the bivariate relationships among variables as hypothesized were supported, except for the relationship between age and chronic health problems and between age and perceived health status; those relationships were not established.

Effects of Exogenous Variables on Endogenous Variables

This section presents the relationships between exogenous variables and mediating variables and their contribution to perceived abilities for health-promoting self-care. The order of presentation will follow the model, which shows variables moving left to right, from exogenous to endogenous variables. From path analysis, all predicting variables (age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status) contributed directly to perceived abilities for health-promoting self-care. Additionally, some predictors (age, chronic health problems, perceived family support, and functional ability) contributed indirectly to perceived abilities for health-promoting self-care. The study further found: (1) a correlation between chronic health problems and perceived family support; (2) a correlation between chronic health problems and perceived friend support; (3) a correlation between perceived family support and perceived friend support; and (4) a structural path between chronic health problems and perceived abilities for health-promoting self-care. The total effect of perceived family support on perceived abilities for health-promoting self-care was the largest among the study variables, indicating that family support is very important in perceived abilities for health-promoting self-care among Thai older adults.

There is no exact standard for determining the strength of path coefficients (Kline, 1998). However, rough guidelines have been reported by Kline: “standardized path coefficients with absolute values less than .10 may indicate a ‘small’ effect; values around .30 a ‘medium’ one; and ‘large’ effects may be suggested by coefficients with absolute values of .50 or more” (p. 149). However, Kline warned that an interpretation of these guidelines should not be rigid. Using these guidelines, perceived family support, functional ability, age, and perceived health status had medium effects on perceived abilities for health-promoting self-care, whereas perceived friend support, education, and chronic health problems had small effects on perceived abilities for health-promoting self-care.

Age had a weak and negative direct effect on perceived abilities for health-promoting self-care and had a negative indirect effect on perceived abilities for health-promoting self-care through functional ability and through perceived health status. Age had a moderate effect on perceived abilities for health-promoting self-care. Existing studies revealed an inconsistent relationship between age and self-care ability. Some studies showed that age was negatively associated with perceived abilities for health-promoting self-care (Söderhamn et al., 2000) and negatively associated with self-efficacy (Clark et al., 1995; Conn, 1998; Wilcox & Storandt, 1996); others found a nonsignificant relationship between age and perceived abilities for health-promoting self-care (Jirovec & Kasno, 1993; McDermott, 1993).

Because age subsumes many attributes and may serve as a proxy for other variables, researchers might better understand how age affects the phenomena under study if age-related variables are included in the model. In this study, functional ability and perceived health status were important age-related variables and served as mediating variables between age and perceived abilities for health-promoting self-care. Age also had a direct effect on perceived abilities for health-promoting self-care. However, it cannot be determined whether this effect was due to age alone or to other attributes related to and subsumed by age, but not included in the model. Dean (1992) stated, "Independent effects of age are small. Rather, age is statistically related to social and psychosocial variables that directly influence behavior and health and thus should perhaps be considered in more technical terms as a summary collector of causal influences" (p. 50).

Education had a weak and positive direct effect on perceived abilities for health-promoting self-care. In previous studies, education was found to have a positive relationship to self-efficacy in self-care (Horn et al., 1998); to self-efficacy in healthy lifestyles (Johnson et al., 1993), to self-efficacy in general (Homnan, 1996), to self-efficacy in exercise (Clark et al., 1995), and to self-care agency (Panawattanakul, 1991). In this study, although the variability of the educational levels among the sample was small, a significant effect was still found. The strength of the significance might have been higher if a larger sample size had been used because then the variation in level of education have been greater.

Perceived family support had a moderate and positive direct effect on perceived abilities for health-promoting self-care. The family may encourage older adults to engage in general health practices, such as good nutrition, and exercise, which, in turn enhance self-efficacy in health-promoting self-care. Prohaska (1998) noted that the family serves as a source of communication and advice for older adults who are developing self-care. Family members may support one another emotionally, materially, and with information (Sallis & Nader, 1988). Also, a possible explanation for the direct effect of perceived family support on perceived abilities for health-promoting self-care is that the family might facilitate older adults' confidence in managing stress and their emotions, which in turn increases psychological well-being. It was found that perceived family support had a moderate and positive relationship with the psychological well-being subscale, which was the largest correlation coefficient among the four subscales of the Self-Rated Abilities for Health Practices Scale.

Perceived family support had an indirect effect on perceived abilities for health-promoting self-care (through perceived health status). This may indicate that the family uses verbal persuasion to strengthen older adults' self-efficacy beliefs about their health status (Bandura, 1997). The positive relationship of perceived family support to perceived abilities for health-promoting self-care also corroborates findings in previous studies (Brugge, 1982; Schott-Baer, 1989), although these studies were conducted in the context of illness among adults.

Perceived friend support had a weak and positive direct effect on perceived abilities for health-promoting self-care. Few researchers have explored perceived friend support as a variable for predicting self-care ability or self-efficacy in self-care. Some studies reported a positive relationship between friend support, self-care behavior, and physical activity (Eyler et al., 1999; Hovell, Sallis, Hofstetter, Spry, Faucher, & Caspersen, 1989; Wang & Fenske, 1996). Reinhardt (1996) reported that, among older adults who experienced age-related vision loss, the magnitude of family support was greater than friend support in predicting psychological well-being and in adaptation to visual loss. In addition, family support was more highly correlated with physical activity than was friend support (Sallis, Grossman, Pinski, Patterson, & Nader, 1987).

In this study, the degree of perceived family support was greater than perceived friend support in predicting perceived abilities for health-promoting self-care. This finding is not surprising because the family is the main source of support in Thailand (Yodpeth et al., 1998). In conversation, many Thai older adults in this study said that they seldom saw or visited their friends because it was physically difficult for them to visit their friends and they also stated that they had transportation problems. These reasons might explain why perceived friend support was not as good as a predictor as perceived family support of perceived abilities for health-promoting self-care.

Chronic health problems had moderate and negative direct effects on both functional ability and perceived health status. This finding is consistent with previous work (Cho et al., 1999; Guranik & Kaplan, 1989; Johnson & Wolinsky, 1993; Liang, 1986; Orfila et al., 2000). In addition, chronic health problems had an indirect effect on perceived health status through functional ability. This finding supports Johnson and Wolinsky's (1994) findings that the major impact of disease on perceived health status was mediated by disability and functional limitation among adults aged 70 and older. Liang (1986) also found that chronic illnesses had a direct effect on subjective health and had an indirect effect on subjective health, through functional ability, the number of sick days, and the degree of self maintenance among non-institutionalized adults aged 65 and over.

Chronic health problems had a weak and positive direct effect on perceived abilities for health-promoting self-care; however, when the total effect was taken into account, this relationship became negative, though it was still weak. Pedhazur (1982) cautioned that when an interpretation is made, the total effect (or the effect coefficient) of a variable affecting a given endogenous variable should be used; using only the direct effect for interpretation may be misleading.

The direct effect of chronic health problems on perceived abilities for health-promoting self-care was added to the model, according to the LM Test. In the literature review, this relationship was absent. A number of studies focused on the relationship of self-efficacy to the management of chronic illness across samples; for

example among older women with heart disease (Clark & Dodge, 1999) and among patients with cancer pain (Lin, 1998). Overall, the magnitude of the indirect effect of chronic health problems on perceived abilities for health-promoting self-care (through functional ability and perceived health status) exceeded the direct effect. One plausible explanation is that chronic health problems may be a proxy for functional ability and perceived health status (Johnson & Wolinsky, 1993). Thus, the direct effect of chronic health problems on perceived abilities for health-promoting self-care might be suppressed when functional ability and perceived health status are included in the model.

In conclusion, five exogenous variables in the final modified model (age, education, chronic health problems, perceived family support, and perceived friend support) contributed to perceived abilities for health-promoting self-care, directly and/or indirectly through two mediating variables (functional ability and perceived health status). Mediating variables in the model also contributed to perceived abilities for health-promoting self-care. Most findings of this study support the original hypotheses and also support previous studies, with the exception of the relationship of age to chronic health problems and to perceived health status, which also are inconsistent in existing research.

### Effects of Mediating Variables on Endogenous Variables

The contribution of functional ability to perceived health status in this study is consistent with previous studies, aforementioned (Johnson & Wolinsky, 1994; Liang,

1986). Functional ability was the second-largest coefficient of the total effect on perceived abilities for health-promoting self-care. Because functional ability refers to the abilities to perform both the basic and extended ADLs necessary for living independently, it is an important component of perceived self-efficacy in self-care. When older adults have the capability to care for themselves independently, they should have increased self-confidence. On the other hand, persons who are dependent upon others for assistance with ADLs may have difficulty developing self-efficacy in self-care.

Functional ability also mediated the effect of age and chronic health problems on perceived health status and perceived abilities for health-promoting self-care. This result is congruent with previous work (Dean, 1992; Ory et al., 1998). Ory and colleagues stated that age may not directly affect self-care. Rather, self-care is mediated by the presence of physical impairments and dysfunction in older adults. Perhaps age and chronic health problems encompass functional impairment commonly seen in older adults.

Perceived health status had a moderate and positive direct effect on perceived abilities for health-promoting self-care. The finding supports previous work, which reported the positive relationships between perceived health status and self-care ability (Söderhamn et al., 2000), self-efficacy (Clark et al., 1995), and self-care agency (Hanucharurnkul et al., 2000). Perceived health status is often referred to as a function of physical illness and functional disability (Han, Small, & Haley, 1999).

This finding also supports Bandura's (1997) notion that older adults may maintain a sense of self-efficacy by focusing on appraisals and re-appraisals of their abilities, which can mediate their biological functions.

## Testing for Equality across Genders

The test of the modified model across genders did not show significant gender differences in this study. Therefore, this model may be applicable to both male and female Thai older adults if cross-validation yields the same results. Since self-efficacy for health-promoting self-care represents a gap in the literature, few studies tesing gender differences in self-efficacy for health-promoting self-care were found. Previous researchers (Gritz et al., 1998; Milligan et al., 1997) found that gender was not a significant predictor of smoking cessation. However, gender differences in self-efficacy, functional ability, and perceived health status have been found, but were inconsistent and task-dependent. For example, males had higher self-efficacy in physical activity than did females (Godin & Shephard, 1985; Jenkins & Gortner, 1998; Milligan et al., 1997; Schuster & Waldron, 1991), while females' self-efficacy for eating a healthy diet was higher than among males (Forster & Jeffery, 1986; Milligan et al., 1997). Sonn, Grimby, and Svanborg (1996) found that, at age 76, females had higher functional performance in cooking, bathing, and dressing than did their male counterparts. In this study, the fact that the Self-Rated Abilities for Health Practices are combined with perceptions regarding various health promotion actions may have obscured gender differences.

Gender differences in perceived health status are also inconsistent. A number of studies (Jylha, Guranik, Ferrucci, Jokela, & Heikkinen, 1998; Leinonen et al., 1998; Musil, 1998) found no gender difference in health ratings. On the other hand, some studies found gender differences in perceived health (Arber & Cooper, 1999; Fuller, Edwards, Sermsri, & Vorakitphokatorn, 1993; Waldron, 1983). It is important to note that differences in methodological procedures and sample sizes may yield different results.

## Theoretical Aspects

Orem's (1995) self-care theory was useful in providing guidelines for this study. In addition, Bandura's (1997) self-efficacy theory was useful in clarifying Orem's construct of self-care agency. In this study, age, education, perceived family support, perceived friend support, chronic health problems, functional ability, and perceived health status were conceptualized as basic conditioning factors. Perceived abilities for health-promoting self-care were conceptualized as part of self-care agency in terms of a human disposition affecting one's goals.

Findings support the premise that basic conditioning factors contribute to self-care agency (Orem, 1995). Orem's self-care theory was useful in explaining self-care directed toward health and well-being. Results of this study showed that all variables under the construct of basic conditioning factors directly and/or indirectly contribute to perceived abilities for health-promoting self-care.

An extension of Orem's self-care theory by including self-care directed toward health promotion is relevant to the development of this theory. Previous work (Davidson, 1988; Edwards, 1997; Hartweg, 1990; Pender, 1996; Wang, 1998) demonstrated the congruence between self-care and health promotion. Self-care is an important strategy for maintaining and promoting health (Pender, 1996). Orem, as well, (1995, 2001) included the concept of health promotion in her work and stated that health promotion is based on the human potential for improvement.

In conclusion, the study model supported the proposition of Orem's (1995) self-care theory regarding the relationship between basic conditioning factors and self-care agency. An extension of the self-care concept to include health promotion may provide a direction to maximize health for older adults. Although the initial hypothesized model was rejected, the modified one still supports the essence of both theories.

## Methodological Aspects

This section discusses the methodological issues related to translated instruments, data collection procedures, data analysis techniques, and generalizability of the study findings.

### Translated Instruments

Three instruments in this study (the Family APGAR Questionnaire, the Friend APGAR Questionnaire, and the Self-Rated Abilities for Health Practices) were translated into Thai. The translation process focused on the symmetrical approach to

obtain construct equivalence (equivalent meaning, familiarity, and naturalness), rather than verbatim equivalence (Jones, 1987; Jones & Kay, 1992). However, because these instruments were developed in the Western culture and context, it was quite difficult to translate identical meanings from the original version into the Thai context, particularly for older adults who were not well educated.

The translated version of each instrument was adjusted to be as informal as possible while preserving the same general meaning. For example, the term "lifestyles" in the Family APGAR Questionnaire was adjusted to "living patterns" (Kwam-pen-yu, which is less formal Thai). The pilot study turned out to be very useful because it targeted a number of phrases that had to be adjusted in Thai before they were used in the larger study. However, although the nutrition subscale of the SRAHP was reliable (Cronbach's alpha = .71), it may need further adjustment.

Although the reliability coefficients for the Family APGAR Questionnaire (Cronbach's alpha = .91), the Friend APGAR Questionnaire (Cronbach's alpha = .94), and the Self-Rated Abilities for Health Practices in total (Cronbach's alpha = .94) were satisfactory in the study sample, they should be re-tested for future use because the alpha coefficient is affected by several factors, such as total test variance and the distribution of data (Waltz, Strickland, & Lenz, 1991). The alpha coefficient will be low when the distribution of data is skewed or when the sample is homogeneous (the test variance is low) (Waltz, Strickland, & Lenz, 1991).

The notion of sample homogeneity may explain why the Modified Barthel ADL Index (MBAI) had a very low coefficient in the pilot sample (-.02). Most of the pilot sample comprised Thai adults younger than 60 years of age, whose functional abilities were highly independent. The variance was almost zero. In addition, the size of the pilot sample was small (N = 70); therefore, it was difficult to obtain normal distributed data on the MBAI. The distribution of scores on the BMAI in the pilot sample was highly negatively skewed. However, when the MBAI was employed in a larger sample of Thai older adults, the alpha coefficient for the MBAI was substantially increased (.86).

Data Collection Procedures

The participants were recruited through stratified random sampling based on age range and gender of Thai older adults living in rural areas in Suphanburi Province, Thailand. Although this procedure might minimize selection bias and be more likely to obtain representative samples than convenience sampling, generalization of the study results should be made cautiously. The stratifying variables used in this study (age and gender) cannot reflect other existing attributes of the target population (e.g., socioeconomic status, health status). In addition, the locations of the research setting (three districts and three sub-districts) were not randomly selected, but were chosen for their accessibility. Therefore, the sample in this study may not be representative of Thai older adults in Suphanburi Province or in Thailand.

Although the sample size recruited in the study may be regarded as medium to large, according to Kline (1998), it is relatively small compared to the population of Thai older adults. Because time and budget were limited, the sample size in this study was based on a minimum requirement for testing a model (the ratio of 5:1 for the number of subjects per free parameter under normal theory) suggested by Bentler (1995).

Regarding the administration process, approximately 90% of the participants could understand and rate the Likert scale without difficulty. However, a few participants had difficulty distinguishing the degree of difference on the scales; therefore, a visual aid (toy blocks of different colors and numbers) was used in combination with verbal communication. Although this method took longer than the verbal communication method alone, it was useful in minimizing errors and helped ensure more accurate data. A similar technique using a visual aid as a symbol of the numerical points on the scale was found to be useful for test administration (Bernal et al., 1997).

During the interview, the participant's family members tended to observe or be with the participant because they were afraid that the older adult could not answer the questions appropriately even though the researcher informed the participants and their relatives that there were no right or wrong answers on the questionnaire. In some cases (roughly 10%), this situation could not be avoided. Thus, the researcher was concerned that participants' answers on the Family APGAR would be different with

family members present. A solution to this dilemma was that the researcher administered the Family APGAR scale last. This strategy worked well in most cases because the relatives tended to leave before the interview ended. Still, the family environment may have influenced some participants' ratings on the Family APGAR. Future research should systematically assess how many family members were present.

Data Analysis Procedures

Path analysis in this study was based on structural equation modeling (SEM) techniques. Although SEM has the capacity to estimate and to test relationships among variables with a more comprehensive and flexible approach than do the standard approaches (correlation, multiple regression, and ANOVA), Stevens (1995) cautioned that the sophistication of the SEM techniques "should not blind researchers to some basic research principles" (p. 415).

According to Hoyle (1995), SEM is similar to standard approaches in four basic ways: (1) both are "based on linear statistical models; (2) statistical tests associated with SEM and standard statistical approaches are valid only if certain assumptions about the observed data are met; (3) neither SEM nor standard approaches offer statistical tests of causality; and (4) post-hoc adjustments to statistical hypotheses tested by any statistical model necessitate cross-validation" (p. 13-14).

Regarding causality, causal relationships among study variables cannot be inferred from the results of this study because an experimental design was not used. Mueller (1996) noted that the relationships among variables in the structural model are something more than correlational in nature, but cannot be explicitly referred to as causal. At best, SEM may answer the question of whether the hypothesized model is consistent with the data (Bollen, 1989). In addition, this study was cross-sectional; therefore, it has limited ability to infer causality. When determining causation is the goal, a longitudinal design is required because the time sequence provides more validity for the questions regarding changes, developmental processes, and causation (Pedhazur & Schmelkin, 1991).

The study model is recursive, with unidirectional flow and no reciprocal causation between endogenous variables (Pedhazur, 1991); thus, its explanatory power is limited because variables in social and behavioral sciences often interact with one another (Thanawiboonchai, 1994). However, because this study was cross-sectional, a nonrecursive path model was not permitted (Munro, 1997).

It is important to note that more than one model could fit the data (Bollen, 1989; Stevens, 1996). An alternative model representing competing hypotheses should be explored even if the original hypothesized model is supported. Theoretical guidance is considered when selecting one model over another (Stevens, 1996). In this study, the fit indices of the final modified model indicated that the model fit the data well; however, it does not mean that it is the only model that fits the data.

Post-hoc model modifications—"the generation of multiple competing models and the capitalization on chance by fitting a model to sample data" (Mueller,1996, p. 95)—should be performed with clear theoretical justification if the sample size is large enough. Stevens (1996) noted that a sample of 400 might be adequate for post-hoc model modifications if the specification errors are minor. Then, the model should be cross-validated over a new and independent sample from the same population (Byrne, 1994; Mueller, 1996; Stevens, 1996). In brief, testing a model is a continuing task that requires taking both theoretical and empirical considerations into account.

In this study, multisample analysis in testing for invariance across genders is appropriate because they might have different parameter loadings, variances, covariances, or error variances that need to be tested. However, when the samples are definitely different, multisample analysis is unnecessary; rather, a test of a model over each sample separately is more appropriate (Bentler, 1995).

Generalizability

Generalization of this study should be made cautiously due to the following factors. Firstly, the research design is correlational. Although a correlational design had the advantage of allowing the researcher to conduct the study in a natural setting (Polit & Hungler, 1995), an experimental design was not used; thus, causal relationships cannot be inferred (Pedhazur & Schmelkin, 1991). Secondly, although stratified random sampling was used in this study to reduce selection bias, sampling was not strictly random because the research settings were deliberately selected.

Next, the sample size was relatively small although the minimum requirement of sample calculation based on Bentler's (1995) criterion was met. Lastly, the modified model is not yet cross-validated over independent samples.

## Recommendations and Implications

This section includes recommendations for future research and implications for nursing theory, education, and practice.

### Recommendations for Future Research

Although findings showed that the final modified model fit the data well, the model is tentative. Cross-validation is recommended with larger randomly chosen samples from the same target population (Byrne, 1994). If the model specifications for the second sample are identical to those of the first, the trustworthiness of the model will be increased.

Multisample structural equation modeling (MSEM) may explain how different or similar factors can contribute to perceived abilities for health-promoting self-care of Thai older adults across groups. The present study is more likely to reflect Thai older adults in rural areas, but not those in urban areas or in institutions. Future research should include samples from different settings and compare them simultaneously using the MSEM approach. As the Thai society changes from agricultural to industrial, the pattern of social support among the family and friends or of lifestyles influencing health may also be modified.

Future research should test the model in a larger sample with at least 10 subjects per free parameter, to obtain a more stable model (Bentler, 1995). Data from a larger sample may have a better chance to meet the assumption of normality, and thus increase generalizability. For example, the distribution of functional ability for this sample was highly negatively skewed because few participants had limitations in performing the activities of daily living. In a larger sample, there is a greater possibility of recruiting those with functional limitations. In addition, a longitudinal study is recommended because it has more power than a cross-sectional design to reveal changes (e.g. increase or decrease), developmental processes, and causal explanations (Pedhazur & Schmelkin, 1991).

An instrument with increased functional ability variability should be considered. The sample in this study was mostly independent in performing basic ADLs and extended ADLs. Although the Chula ADL Index produced an acceptable reliability coefficient (.75), it may have had a higher reliability coefficient if the variability was increased; thus, its ability to make finer functional ability discriminations would be increased. Future researchers might also want to consider using functional ability as a stratifying variable.

Perceived abilities for health-promoting self-care is a global concept, including several domains. Future research may examine what factors contribute to the specific domains of perceived abilities for health-promoting self-care, such as nutrition, exercise, and health practices, in order to better understand the phenomenon

and plan interventions appropriate to certain domains. The theory of self-efficacy could guide in development of interventions. In addition, for manipulable variables (such as interventions promoting family support or friend support), an experimental design or quasi-experimental design may be used to explain causality.

Path analysis in this study is useful to demonstrate how selected basic conditioning factors were related and contributive to perceived abilities for health-promoting self-care. Orem (2001) noted that nurses should understand interactions among basic conditioning factors; this knowledge is an important part of nursing practice and education. Future researchers may consider studying such interactions.

The interview method was found to be useful to obtain a high response rate in this study. In addition, the key person in the villages was extremely helpful in introducing the researcher to the participants. These factors increased participation. Future researchers may want to consider having a key person assist in the data collection process.

Finally, researchers may also consider doing interviews with Thai older adults. Qualitative data may provide insight into what factors contribute to Thai older adults' perception regarding their capability to engage in health-promoting self-care. A small number of older adults may be selected based on the representativeness of the sample toward the concept of interest, such as perceived self-care abilities (Polit & Hungler, 1999). For example, the process of how family support contributes to

perceived abilities for health-promoting self-care is not well understood. An in-depth interview could provide increased understanding of this phenomenon.

## Implications for Nursing Theory

Social cognitive theory was integrated with nursing theory to enhance the explanatory power of the study model. Results of this study suggest that both theories can be used with Thai older adults. Testing theories that were developed from one culture to another may increase external validity (Wang, 1998). According to Walker and Avant (1988), "A theory that has strong empirical evidence to support it is a stronger theory than one that does not" (p. 148).

Another important concept in the model is "health." The concept of health is abstract and multidimensional. In this study, three health-related variables (chronic health problems, functional ability, and perceived health status) demonstrated different dimensions of health; however, they may not be able to capture all dimensions of health. Further study should include other variables related to the psychological aspect (e.g., well-being, depression) to generate a more extensive explanation.

Findings about family support in this study corroborate previous work (Cohen & Wills, 1985; Norbeck, 1988) in showing that social support has a positive effect on health. Regarding the cultural aspect, the findings of this study confirm that family support is extremely important to Thai older adults. Although friend support appeared not to contribute to perceived health status or functional ability in this study, it may

be premature to accept this finding. More studies regarding friend support and perceived abilities for self-care need to be conducted.

In sum, testing a synthesized model is a necessary part of theory development to affirm the theory's empirical validity (Walker & Avant, 1995). Although this study supports Orem's (1995) self-care theory and Bandura's (1997) self-efficacy theory, re-testing and cross-validating are still needed.

## Implications for Nursing Education

In Thailand, while the aging population is increasing, there is a huge knowledge gap about health-promoting self-care among older adults. Although the findings of this study may contribute only a small amount to the knowledge regarding health promotion in elders, they may aid nurse educators in developing a nursing curriculum in gerontology. To date, several nursing curricula in Thailand are based on Western textbooks and materials. Basic knowledge about Thai older adults needs to be better understood among nursing students and educators in Thailand so that these concepts can be integrated into Thai nursing education.

Recently, although a number of studies among Thai older adults have been conducted by researchers in the fields of gerontology, geriatrics, and social work, they are insufficient to generate the knowledge essential to meet continuously growing health care demands. Nursing students at all levels (undergraduate and graduate) need to learn more about how to promote health and prevent diseases in Thai older adults. This study may add some basic knowledge related to perceived

abilities of older adults for performing health-promoting self-care. In the past, the Thai nursing curriculum has focused more on illness than on wellness. Nursing students might see older people as "frail" because they see ill older people in hospitals more often than they see healthy ones in the community. This study demonstrates that age and the number of chronic health problems are not necessarily a given. The focus of nursing education in gerontology should be on health promotion, functional independence, and quality of life (Futrell, 1996).

## Implications for Nursing Practice

Some variables in this study may be manipulable, such as perceived family support, perceived friend support, and perceived health status. Thus, interventions that enhance these variables should increase perceived abilities for health-promoting self-care.

This study indicates that family support is extremely important in perceived abilities for health-promoting self-care among Thai older adults. Family members can encourage their older members to perform health practices (Miller, 1982), which in turn, promote perceived abilities for self-care of older adults. In Thailand, Hanucharurnkul (1989) found that family members tended to advise patients with head/neck cancer to seek assistance regarding their health status. Seeking help is a skill required for self-care (Orem, 1995).

In addition, the safe environment is an important factor to promote older adults' confidence in performing self-care activities. Family members can strengthen

perceived abilities for self-care of older adults by creating the safe home environment, and this process can promote independence of older adults. Interventions to promote and maintain family support in the Thai culture should be considered. It should be noted that older persons' perceptions of family support may be different from family members' perceptions and from actual support. However, actual support may be difficult to operationalize. Interventions that maximize older adults' perception of family support and stimulate family members to provide support for older adults should be considered.

Because friend support also contributes to perceived abilities for health-promoting self-care, strategies that facilitate older adults to maintain friend contacts may strengthen perceived friend support. In addition to neighbors or religious groups, senior citizen clubs may be good resources for older adults to increase their network of friends. Community participation may be important because interactions among older adults in the community might promote health, at least in psychosocial aspects.

Any resource that helps older adults be independent in performing the activities of daily living should be considered. For example, environmental safety and adequate transportation might facilitate independence among older adults. Implications for nursing practice may not be limited to the above discussion. For each practice setting, nursing strategies that enhance perceived abilities for health-promotion of older adults may be developed based on the particular context of the setting.

During the study, the researcher noticed that nurses in the community played a significant role in promoting health, and they worked closely with key people in the villages. In a leadership role, nurses can emphasize the need for health promotion among individuals and the community in various ways, such as by appeals in the mass media and participation in developing a national health promotion policy. Using leadership, creativeness, and sound theoretical models, nurses may help older people maximize a healthy life.

## Summary

This chapter presented the summary, discussion of the findings' both theoretical and methodological aspects, recommendations for future research, and implications for nursing theory, education, and practice. An integration of Orem's (1995) self-care theory and Bandura's (1997) theory guided the development of the study model. Findings of this study supported the premises of Orem's self-care theory and self-efficacy was useful as theoretical support for perceived abilities for health-promoting self-care. However, cultural and methodological issues need to be considered, and generalizations should be made cautiously. Recommendations for future research were discussed. Cross-validation over independent samples and a longitudinal study would increase the validity of the study model. Implications for nursing theory, education, and practice were discussed.

# Appendix A

## Human Subjects Approval Document

THE UNIVERSITY OF TEXAS AT AUSTIN

Application for the Review of a Project Involving Human Subjects

**APPLICATION FOR DRC REVIEW ONLY (EXEMPT FROM IRB REVIEW)**

Project Title: A Model of Factors Contributing to Perceived Abilities for Health-Promoting Self-Care of Community-Dwelling Thai Older Adults

Principal Investigator(s): (Give address for correspondence about approval. Student PIs may prefer to list a home address rather than a departmental address.)

Porntip Malathum _____ malathum@hotmail.com
(Name - type or print) (Department **and** Campus Mail Code) (E-mail Address)

Faculty Supervisor (if PI is a student):
Gayle Acton, Ph.D., R.N. School of Nursing gayle.acton@mail.utexas.edu
(Name - type or print) (Department **and** Campus Mail Code) (E-mail Address)

If the project is a student project, attach the Faculty Supervisor Approval Form.

If funded or submitted for funding: Agency or source of funding_____

Title of grant: _____

Grant contract number (if known): _____

Exemption Category: 45 CFR 46.101 (b) 2 . (See Criteria for Exemption from IRB Review and Exemption Categories.)

In making this application, I certify that I understand the policies and procedures governing research with human subjects developed by The University of Texas at Austin and that I fully intend to comply with the letter and spirit of The University's Multiple Project Assurance (MPA). I further acknowledge my responsibility to report any changes in the protocol and to obtain written approval for these changes prior to making them. Copies of the Policies and Procedures Manual, the MPA, and 45 CFR 46 have been distributed to DRCs and are also available in OSP. **Continuing Review Requirements:** Annual DRC review and continuing DRC and IRB surveillance must be maintained for compliance with DHHS policies and The University's MPA.

_____ _____ December 14, 00
Signature(s): Principal Investigator(s) and Faculty Supervisor (if student project) Date
Reviewed and Approved by Departmental Review Committee:

_____ 12/20/00
Signature of DRC Chair Date

Exempt Application
Page 1

## Appendix B

## Permission Letter from Research Setting

No. S.P. 0033.003/1/ 6901

Suphanburi Provincial Health Office
78 Moo 4, Tab-Tee-Lek -Subdistrict,
Muang district, Suphanburi 72000

November 6, 2000

Ms. Pornthip Malathum
53/1360 Krisadanakorn Village, Soi 16
Jeangwattana Road
Pakkred, Nonthaburi 11120
THAILAND
Tel: 503-1093, Fax: 982-9989

Dear Ms. Pornthip Malathum:

I have received your letter dated October 12, 2000, regarding permission to conduct dissertation research titled, '" Factors Contributing Perceived Abilities for Health-Promoting Self-care of Community-Dwelling Thai Older Adults" in the three districts in Suphanburi Province (Sriprachan, Samchuk, and Dermbangnangbuad).

I am pleased to inform you that permission is hereby granted for you to conduct the dissertation study in the three districts mention above. If you have any information , please direct contact Dr. Chawthip Boromtanarat at Tel: 035-525869-76, 01-8573682.

Sincerely yours,

(Surin Prasithirun, M.D.)
Director, Suphanburi Provincial Health office

## Appendix C

## Cover Letter

## Cover Letter

Title of Study: Factors Influencing Self-Care Abilities for Health-Promotion of Community-Dwelling Thai Older Adults

You are invited to participate in a study about what factors influence abilities of Thai older adults for taking care of their health. My name is Porntip Malathum. I am a doctoral student at The University of Texas at Austin, School of Nursing, USA. This study is part of my dissertation research project. I hope to learn more about what is related to Thai older adults taking care of their health. You are being asked to participate in this study because you are a Thai person who is at least 60 years of age and lives in the community. Your name is randomly selected from the name lists obtained from the head of the villages and local health centers. If you participate, you will be one of approximately 144 people in the study.

If you decide to participate, I will interview you at a place convenient to you, such as your home. The one-time interview will take about 30–45 minutes and will ask questions about what you think about your general physical health, your ability and confidence to take care of your health, and how supportive your family and friends are. Also, the interview will ask you questions about your personal information, such as age, education, income, and occupation etc. You do not have to answer every question.

There are no known risks to you or discomforts expected other than the possible inconvenience of taking approximately 30-45 minutes of your time to complete the one-time interview. However, if you become uncomfortable in answering any of the survey or interview questions, you can choose to not answer them. There are no direct benefits to you for being in this study. However, a possible benefit of being in the study is that the findings may help health care professionals better understand what factors influence abilities of Thai older adults for taking care of their health. Your participation in this study is voluntary. There is no cost and you will receive no payment for your participation in this study.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. Your response will not be linked to your name in any written or verbal report of this research project. The information gathered about you will be coded with a number so that the information cannot be identified with you. Your name will not be used.

Your decision to participate or to decide not to participate will not affect your present or future relationship with The University of Texas at Austin and any other organizations, such as the local hospitals or health centers in your community. If you decide to take part in the study, you are free to discontinue participation at any time by simply telling me.

If you have any questions about the study, please ask me. If you have any question later, please contact me, Porntip Malathum, at 53/1360 Krisadanakorn Village, Jeangwattana Street, Pakkred, Nonthaburi, 11120, Tel: (662) 503-1093 or you may reach my faculty supervisor, Gayle Acton, Ph.D. R.N., at The University of Texas at Austin, School of Nursing, 1700 Red River, Austin Texas 78701, USA., Tel: 0011-(512) 471-9081 or email: gayle.acton@mail.utexas.edu. We will be happy to answer them. This letter is for you to keep.

# Cover Letter (Thai Version)

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Í¹–ÒµáÅÇà·Ò¹¹ ¨ÐäÁÁ¡ÒÃÐºªÍ¢Í§·Ò¹ã¹á°°ÊÍº¶ÒÁáµ¨Ðãª àÅ¢ÃËÊá·¹ àÍ¡ÊÒÀ·ºÍ¡ËÁÒÂ
àÅ¢ÃËÊáÅÐªÍ¨Ð¶¡Ã¡ÉÒäÇà»¹¤ÇÒÁÅºáÅÐ¨Ð¶¡·ÓÁÒÂàÁÍ¡ÒÈ¡ÉÒ¹Ê¹Ê´Å§ ¢ÍÁÅ·ÀÇºÀÇÁ
ä´·§ËÁ´¨Ð¹ÒÁÒÀÒÂ§Ò¹ã¹Å¡É³Ðà»¹¡ÅÁ áÅÐ¨ÐäÁÁ¡ÒÃÐºªÍ¢Í§·Ò¹ã¹ÀÒÂ§Ò¹ã¹´æ

¡ÒÃµ´Ê¹ã¨à¢ÒÇÁËÃÍäÁà¢ÒÀÇÁ¡ÒÃÈ¡ÉÒ¤Ã§¹ ¨ÐäÁÁ¼ÅµÍ¤ÇÒÁÊÁ¾¸ÃÐËÇÒ§
·Ò¹¡ºÁËÒÇ·ÂÒÅÂà·¡«Ê àÁÍ§ÍÍÊµ¹ËÃÍ¡ºË¹ÇÂ§Ò¹ã´æ à³¹Ê¶Ò¹Í¹ÒÁÂËÃÍâÃ§¾ÂÒºÒÅÍóàÍ
ã¹ªÁª¹¢Í§·Ò¹ Í¹§ ¶Ò·Ò¹µ´Ê¹ã¨à¢ÒÇÁãË¢ÍÁÅáÅÇ ·Ò¹ÍÒ¨···ÐÂ¡àÅ¡àÁÍã´¡ä´

·Ò¹¨Ðà¡º¨´ËÁÒÂ¹äÇä´ËÒ¡·Ò¹µÍ§¡ÒÃ ¶Ò·Ò¹Á¢ÍÊ§ÊÂã´æ ã¹¢³Ð¹¡Ã³ÒÊÍº¶ÒÁ áÅÐ¶ÒËÒ¡
·Ò¹Á¢ÍÊ§ÊÂã¹ÀÒÂËÅ§ ¡Ã³Òµ´µÍ´©¹ä´·¾Ã·¾Â ÁÒÅÒ¸ÃÃÁ 53/1360 Á. ¡ÄÉ´Ò¹¤Ã
¶. á¨§Ç²¹Ð µ. ºÒ§µÅÒ´ Í. »Ò¡à¡Ã´ ¨. ¹¹·ºÃ 11120 â·ÃÈ¾· (02) 503-1093
ËÃÍÍÒ¨ÒÃÂ¢Í§´©¹ Gayle Acton, Ph.D., R.N., at The University of Texas at Austin School of Nursing, 1700 Red River Austin Texas &8751-1499, U.S.A. â·ÃÈ¾· 0011-(512) 471-9081 ËÃÍ
Email address: gayle.acton@mail.utexas.edu àÃÒÂ¹´µÍº¤Ò¶ÒÁ¢Í§·Ò¹

## Appendix D

## Personal Information Sheet

**Personal Information Sheet**

Please provide the following information that is most relevant to your characteristics.

1. Gender
    1. Male
    2. Female

2. Age _____years old (Year_____)

3. Marital status
    1. Married and living together
    2. Married, but separated
    3. Single
    4. Widow, Divorced
    5. Other _____

4. How many years did you have formal education? _____years

    Please specify:

    1. No formal education
        1.1. Unable to read and/or write
        1.2. Able to read/write
    2. Elementary school
    3. Middle school
    4. Junior high school
    5. High school
    6. Post high school (e.g., Technical school)
    7. College and above

5. Occupation

In the past _____

At present_____

6. Living situation

1. Live alone

2. Live with spouse

3. Live with child/children/grandchild (children)

Please specify the number: _____person (s), including yourself

4. Live with other relatives

Please specify the number: _____person (s), including yourself

5. Other _____

7. In general, how would you rate your health over the past month?

1. Very poor 2. Poor 3. Fair 4. Good 5. Excellent

The reason for rating that health status_____

_____

**Personal Information Sheet (Thai Version)**

á°°ÊÍº¶ÒÁ¢ÍÁÅÊÇ¹º¤Å

¡Ã³ÒµÍºá°°ÊÁÀÒÉ³·µÃ§¡ºÅ¡É³Ð¢Í§·Ò¹ÁÒ¡·Ê´

----------1.

1) à¾È

1) ªÒÂ 2) Ë-§

2) ÍÒÂ _____ »¨ (à¡´ ¾.È. _____)

3) Ê¶Ò¹ÀÒ¾ÊÁÃÊ

1) ¤ ÍÂ´ÇÂ¡¹ 2) ¤ áÂ¡¡¹ÍÂ 3) âÊ´ 4) ËÁÒÂ 5) Í¹æ

4) ¨Ó¹Ç¹»¨·Ò¹ä´Ãº¡ÒÃÈ¡ÉÒ_____ »¨

·Ò¹¨º¡ÒÃÈ¡ÉÒÃÐ´ºã´ ÃÐº_____

1) äÁä´àÃÂ¹

1.1 Í Ò¹ à¢Â¹ä´

1.2 Í Ò¹ à¢Â¹äÁä´

2) »ÃÐ¶ÁÈ¡ÉÒµÍ¹µ¹

3) »ÃÐ¶ÁÈ¡ÉÒµÍ¹»ÅÒÂ

4) Á¸ÂÁÈ¡ÉÒµÍ¹µ¹ »Ça,

5) Á¸ÂÁÈ¡ÉÒµÍ¹»ÅÒÂ »ÇÊ,

6) Í¹»Ã--Ò

7) »Ã--ÒµÄËÃÍà·Âºà·Ò áÅÐÊ§¡ÇÒ

5) ÍÒª¾ ¢Í§·Ò¹ã¹Í´µ_____

ã¹»¨¨ºº¹_____

6) »····º11·Ò1¾¡ÍÒÈÂ¡º㤤Ã

1) ÍÂ¤1à´ÂÇ

2) ÍÂ¡º¤ÊÁÀÊ

3) ÍÂ¡º¤ÊÁÀÊ áÅÐºµÃ/ËÅÒ1 ¨Ó1Ç1ÊÁÒª¡_____¤1 (ÃÇÁ·Ò1´ÇÂ)

4) ÍÂ¡º-Òµ ¨Ó1Ç1ÊÁÒª¡_____¤1 (ÃÇÁ·Ò1´ÇÂ)

5) Í1æ_____

7) ·Ò1¤´ÇÒÊ¢ÀÒ¾â´ÂÃÇÁ¢Í§·Ò1ã1ªÇ§àÇÅÒ 1 à´Í1·¼Ò1ÁÒ¨1¶§»····º1à»1ÍÂÒ§äÃ

1. äÁ´àÅÂ 2. äÁ´ 3. »Ò1¡ÅÒ§ 4. ´ 5. ´ÁÒ¡

à¾ÃÒÐÍÐäÃ·Ò1¨§àÅÍ¡ÀÒÇÐÊ¢ÀÒ¾´§¡ÅÒÇ

_____

_____

## Appendix E

## The Family APGAR Questionnaire

**Family APGAR Questionnaire***

Directions: The following questions have been designed to help us better understand you and your family. You should feel free to ask questions about any item in the questionnaire. "Family" is the individual(s) with whom you usually live. If you live alone, consider family as those with whom you now have the strongest emotional ties.

Comment space should be used if you wish to give additional information or if you wish to discuss the way the question applies to your family. Please try to answer all questions. No right or wrong is applied to these questions.

0 = Never 1 = Hardly ever 2 = Some of the time
3 = Almost always 4 = Always

| | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 1. I am satisfied with the help that I receive from my family when something is troubling me. Comments:_____ | | | | | |
| 2. I am satisfied with the way my family discusses items of common interest and shares problem solving with me. Comments:_____ | | | | | |
| 3. I find that my family accepts my wishes to take on new activities or make changes in my life-style. Comments:_____ | | | | | |
| 4. I am satisfied with the way my family expresses affection and responds to my feelings such as anger, sorrow, and love. Comments:_____ | | | | | |
| 5. I am satisfied with the amount of time my family and I spend together. Comments:_____ | | | | | |

*The instruments "may be reproduced without cost for clinical or research use" (Swain & Harrigan, 1994, p. 48).

**Family APGAR Questionnaire (Thai Version)**

á°°ÊÍ°¶ÒÁ¤ÇÒÁ¾§¾Íã¨áÀ§Ê¹°Ê¹¹¨Ò¡¤ÀÍ°¤ÀÇ

¤Óá¹Ð¹Ó á°°ÊÍ°¶ÒÁ¹à»¹á°°ÊÍ°¶ÒÁà¡ÂÇ¡°¤ÇÒÁ¾§¾Íã¨¢Í§·Ò¹µÍ¤ÀÍ°¤ÀÇã¹´Ò¹µÒ§æ

¡Ã³ÒµÍ°á°°ÊÁÀÒÉ³ã¹¢Í¤ÇÒÁ·µÃ§¡°¤ÇÒÁ¤´àË¹¢Í§·Ò¹ÁÒ¡·Ê´ (àª¹ ¾Íã¨àÊÁÍ

¾Íã¨à»¹ÊÇ¹ãË– ¾Íã¨à»¹°Ò§¤Ã§ äÁ¤ÍÂ¾Íã¨ ËÃÍ äÁà¤Â¾Íã¨)

¤ÃÍ°¤ÀÇËÁÒÔ¶§°¤¤Å·|·Ò¹ÍÒÈÂÍÂ´ÇÂ ËÒ¡·Ò¹ÍÂ¤¹à´ÎÂÇ ãË¶ÍÇÒ°¤¤Å·|·Ò¹Á¤ÇÒÁ

¼¡¾¹ÁÒ¡·|Ê´à»¹°¤¤Åã¹¤ÃÍ°¤ÀÇ ã¹·¹äÁÁ¤ÓµÍ°·¶¡ËÃÍ¼´

0 = äÁà¤Â¾Íã¨ 1 = äÁ¤ÍÂ¾Íã¨ 2 = ¾Íã¨à»¹°Ò§¤Ã§

3 = ¾Íã¨à»¹ÊÇ¹ãË– 4 = ¾Íã¨àÊÁÍ

| | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 1. ©¹¾Íã¨¡°¤ÇÒÁªÇÀàËÅÍ·|©¹ä´Ò°<br>¨Ò¡¤ÃÍ°¤ÀÇ àÁÍ©¹Á¤ÇÒÁÅÓ°Ò¡<br>¢Í¤´àË¹à¾ÁàµÁ_____ | | | | | |
| 2. ©¹¾Íã¨¡°Ç¸¡ÒÀ·|¤ÀÍ°¤ÀÇ¾´¤Â¡°©¹<br>ã¹àÃÍ§·|Ê¹ã¨áÅÐáÅ¡à»ÅÂ¹Ç¸¡ÒÃá¡»–ËÒ¡¹<br>¢Í¤´àË¹à¾ÁàµÁ_____ | | | | | |
| 3. ©¹¾°ÇÒ¤ÃÍ°¤ÀÇÂÍÁÀ°¤ÇÒÁµ§ã¨¢Í§©¹<br>àÁÍ©¹ÍÂÒ¡·|ÓÊ§ãËÁæ ËÃÍà»ÅÂ¹á»Å§<br>¤ÇÒÁà»¹ÍÂ (àª¹ ÍÂÒ¡ÍÍ¡¡ÓÅ§¡ÒÂ<br>ËÃÍ·|ÓÍ¹æ·|©¹ªÍ°)<br>¢Í¤´àË¹à¾ÁàµÁ_____ | | | | | |
| 4. ©¹¾Íã¨·|¤ÃÍ°¤ÀÇáÊ´§¤ÇÒÁÀ¡ àÍÒã¨ãÊ<br>áÅÐµÍ°Ê¹Í§¤ÇÒÁÃÊ¡¢Í§©¹ à²¹àÁÍ©¹â¡Ã¸<br>àÊÂã¨ ËÃÍ Ã¡<br>¢Í¤´àË¹à¾ÁàµÁ_____ | | | | | |
| 5. ©¹¾Íã¨·|¤ÃÍ°¤ÀÇáÅÐ©¹ãªàÇÀÒÍÂ´ÇÂ¡¹<br>¢Í¤´àË¹à¾ÁàµÁ_____ | | | | | |

**Family APGAR Questionnaire**
**(Back Translation)**

Directions: The following questions have been designed to help us better understand you and your family. You should feel free to ask questions about any item in the questionnaire. "Family" is the individual(s) with whom you usually live. If you live alone, consider family as those with whom you now have the strongest emotional ties.

Comment space should be used if you wish to give additional information or if you wish to discuss the way the question applies to your family. Please try to answer all questions. No right or wrong is applied to these questions.

0 = Never 1 = Hardly ever 2 = Some of the time
3 = Almost always 4 = Always

| | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 1. I am satisfied with the help that I receive from my family when I have any difficulty.<br>Comments:_____ | | | | | |
| 2. I am satisfied with the way my family gives their opinions in a common interest/or solves a problem together.<br>Comments:_____ | | | | | |
| 3. I find that my family accepts my ideas when I want to try a new activity or change my living patterns (such as my wish to exercise or do things I enjoy).<br>Comments:_____ | | | | | |
| 4. I am satisfied with the way my family shows me their love, cares about, and responds to my feelings, such as anger, sadness, and love.<br>Comments:_____ | | | | | |
| 5. I am satisfied with the period of time my family and I spend together.<br>Comments:_____ | | | | | |

## Appendix F

## The Friend APGAR Questionnaire

**Friend APGAR Questionnaire***

Directions: The following questions have been designed to help us better understand you and your friends. Friends are non-relatives from your community with whom you have a sharing relationship.

Comment space should be used if you wish to give additional information or if you wish to discuss the way the question applies to your friends. Please try to answer all questions. No right or wrong is applied to these questions.

0 = Never 1 = Hardly ever 2 = Some of the time
3 = Almost always 4 = Always

| | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 1. I am satisfied that I can turn to my friends for help when something is troubling me.<br>Comments: | | | | | |
| 2. I am satisfied with the way my friends talk over things with me and share problems with me.<br>Comments: | | | | | |
| 3. I am satisfied that my friends accept and support my wishes to take on new activities or directions.<br>Comments: | | | | | |
| 4. I am satisfied with the way my friends express affection, and respond to my emotions, such as anger, sorrow, or love.<br>Comments: | | | | | |
| 5. I am satisfied with the way my friends and I share time together.<br>Comments: | | | | | |

*The instruments "may be reproduced without cost for clinical or research use" (Swain & Harrigan, 1994, p. 48).

**Friend APGAR Questionnaire (Thai Version)**

á°°ÊÍ°¶ÒÁ¤ÇÒÁ¾§¾Íã¨áÅ§Ë¹°Ë¹¹¨0¡à¾Í¹

¤Óá¹Ð¹Ó á°°ÊÍ°¶ÒÁ¹à»¹á°°ÊÍ°¶ÒÁà¡ÂÇ¡°¤ÇÒÁ¾§¾Íã¨¢Í§·Ò¹µÍà¾Í¹ã¹´Ò¹µÒ§æ ¡Ã³ÒµÍ°á°°ÊÁÀÒÉ³ ã¹¢Í¤ÇÒÁ·µÃ§¡¡°¤ÇÒÁ¤´àË¹¢Í§·Ò¹ÁÒ¡·Ê´ (à°¹ ¾Íã¨àÊÁÍ ¾Íã¨à»¹ÊÇ¹ãË- ¾Íã¨à»¹°Ò§¤Ã§ äÁ¤ÍÂ¾Íã¨ ËÃÍ äÁà¤Â¾Íã¨)

à¾Í¹ ËÁÒÂ¶§ °¤¤Å·äÁãª-Òµ¢Í§·Ò¹áµÁ¤ÇÒÁ¼¡¾¹µÍ·Ò¹ «§ÍÒ¨à»¹à¾Í¹°Ò¹ ËÃÍ°¤¤Å··Ò¹¶ÍÇÒà»¹à¾Í¹ ã¹·¹äÁÁ¤ÓµÍ°·¶¡ËÃÍ¼´

0 = äÁà¤Â¾Íã¨ 1 = äÁ¤ÍÂ¾Íã¨ 2 = ¾Íã¨à»¹°Ò§¤Ã§

3 = ¾Íã¨à»¹ÊÇ¹ãË- 4 = ¾Íã¨àÊÁÍ

| | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 1. ©¹¾Íã¨·©¹ÊÒÁÒÀ¶¢Í¤ÇÒÁªÇÂàËÅÍ ¨Ò¡à¾Í¹ä´ àÁÍ©¹Á¤ÇÒÁÅÓ°Ò¡ ¢Í¤´àË¹à¾ÁàµÁ_____ | | | | | |
| 2. ©¹¾Íã¨¡°Ç¸¡ÒÀ·à¾Í¹¾´¤Â »À¡ÉÒËÒÀÍ ¡°©¹ã¹àÃÍ§µÒ§æ áÅÐáÅ¡à»Å¤Â¹»-ËÒ¡¹ ¢Í¤´àË¹à¾ÁàµÁ_____ | | | | | |
| 3. ©¹¾Íã¨·à¾Í¹ÂÍÁÀ°áÅÐÊ¹°Ê¹¹¤ÇÒÁµ§ã¨ ¢Í§©¹ àÁÍ©¹ÍÂÒ¡·ÓÊ§ãËÁæ ¢Í¤´àË¹à¾ÁàµÁ_____ | | | | | |
| 4. ©¹¾Íã¨¡°Ç¸¡ÒÀ·à¾Í¹áÊ´§¤ÇÒÁÀ¡ àÍÒã¨ãÊ áÅÐµÍ°Ê¹Í§¤ÇÒÁÃÊ¡¢Í§©¹ à°¹àÁÍ©¹â¡Ã¸ àÊÂã¨ ËÃÍ Ã¡ ¢Í¤´àË¹à¾ÁàµÁ_____ | | | | | |
| 5. ©¹¾Íã¨·à¾Í¹áÅÐ©¹ãªàÇÅÒÍÂ´ÇÂ¡¹ ¢Í¤´àË¹à¾ÁàµÁ_____ | | | | | |

**Friend APGAR Questionnaire**
**(Back Translation)**

Direction. This questionnaire is about your satisfaction with your friends in various aspects. Please choose the answers that are most relevant to your opinion.
Friends are those who are not your relatives but have relations to you. They may be neighbor or anyone in the community whom you think they are friends
There is no "right" or "wrong" answer in this questionnaire
0 = Never 1 = Seldom 2 = Some of the time
3 = Most of the time 4 = Always

| | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| I am satisfied that I can seek help from my friends when I am in a difficult situation.<br>Additional opinion:_____ | | | | | |
| I am satisfied with the way my friends discuss and share problems with me.<br>Additional opinion:_____ | | | | | |
| I am satisfied that my friends accept and support my intention when I would like to do something new.<br>Additional opinion:_____ | | | | | |
| I am satisfied with the way my friends express their love, care about, and respond to my feelings, such as anger, sadness, or love.<br>Additional opinion:_____ | | | | | |
| I am satisfied with the time my friends and I spend together.<br>Additional opinion:_____ | | | | | |

## Appendix G

## The Chronic Health problem Checklist

**Chronic Health Problem Checklist**

Directions: Please indicate any of the following health problems that you have.

_Anemia (e.g., low blood, iron deficiency)
_Arthritis
_Asthma
_Cancer
_Chronic Bronchitis
_Chronic lung disease (e.g., emphysema, tuberculosis)
_Chronic urinary tract infection
_Diabetes
_Heart disease (arrhythmia, valvular heart disease, ischemic heart disease)
_Hemorrhoids
_Hypercholesterolemia
_Hypertension (high blood pressure)
_Liver disease (yellow jaundice, chronic hepatitis)
_Mental troubles
_Thyroid gland disorder
_Visual impairment (e.g., retinal tear, detachment, cataract, glaucoma)
_Stomach, peptic or duodenal ulcers
_Stroke
_Serious injury or accident with sequelae (Please be specific)_____
_Other (Please be specific)_____

Total number of chronic health problems:_____

*Written permission to use this instrument, translate into Thai, and modify as necessary has been received from Gayle J. Acton.

**Chronic Health Problem Checklist (Thai Version)**

á°°»ÅÐàÁ¹»-ËÒÊ¢ÀÒ¾àÀÍÀ§

¡Ã³ÒµÍºá°°ÊÍº¶ÒÁ ÇÒ·Ò¹Á»-ËÒÊ¢ÀÒ¾´§µÍä»¹ËÃÍäÁ

_«´

_¢ÍÍ¡àÊº

_ËÍºË´

_ÁÐàÃ§

_ËÅÍ´ÅÁÍ¡àÊºàÀÍÀ§

_âÃ¤»Í´àÀÍÀ§ (à³¹ ¶§ÅÁâ»§¾Í§ Ç³âÃ¤)

_·Ò§à´¹»ÊÊÒÇÐÍ¡àÊºàÀÍÀ§

_à°ÒËÇÒ¹

_ËÇã¨ (ËÇã¨àµ¹¼´¨§ËÇÐ Å¹ËÇã¨ÀÇ ¡ÅÒÁà¹ÍËÇã¨µÒÂ)

_Ã´Ê´Ç§·ÇÒÃ

_ä¢Á¹ã¹àÅÍ´Ê§

_¤ÇÒÁ´¹âÅËµÊ§

_âÃ¤µº (à³¹ µºÍ¡àÊºàÀÍÀ§)

_äÁÊºÒÂã¨

_µÍÁ¸ÂÃÍÂ´¼´»Ã¡µ

_¡ÒÃÁÍ§àË¹¼´»Ã¡µ à³¹ µÍ¡ÀÐ¨¡ µÍË¹ µÒÁÇ

_âÃ¤¡ÅÐà¾ÒÐ

_ÍÁ¾Òµ ÍÁ¾Ä¡É

_ä´Ãº ÍºµàËµ ºÒ´à¨ºÊÒËÊ áÅÐÁ¤ÇÒÁ¾¡ÒÃËÅ§àËÅÍ ÃÐº_____

_Í¹æ ÃÐº_____

¨Ó¹Ç¹¢Í§»-ËÒÊ¢ÀÒ¾àÀÍÀ§ _____

## Appendix H

## The Modified Barthel Activities of Daily Living Index

**The Modified Barthel Activities of Daily Living Index (MBAI)***

Please provide the following information that is most relevant to your abilities. For each item, please give information about the activities that you can do.

1. Feeding
    0 Unable
    1 Feeds self, but needs help to cut food into pieces or be served
    2 Feeds self without help

2. Grooming (washing face, combing, brushing teeth, shaving)
    0 Unable
    1 Able to do (although needs help in preparing groom materials)

3. Transferring (moves out of bed or transfers from bed to chair)
    0 Unable to sit, needs help from others (at least 2 people) to get up
    1 Needs much help from other to support
    2 Needs some help with little support or needs attendance
    3 Able to do without help

4. Toilet use
    0 Unable to go to the toilet or clean self
    1 Able to clean self, but need some help
    2 Able to go in the toilet room, clean self, and arrange clothes

5. Mobility
    0 Unable
    1 Needs wheelchair, but can use the wheelchair by him/herself
    2 Able to walk, but needs some help, such as support or attendance
    3 Able to do

6. Dressing
    0 Unable
    1 Needs help from other
    2 Able to do, including buttoning, zipping, or arranging clothes

7. Climbing stairs (one floor)
    0 Unable
    1 Needs help
    2 Able to do (if use a walker, should carry it by him/herself)

8. Bathing
    0 Needs help
    1 Able to do

9. Bowel continence (over the past week)
    0 Incontinence or constipation that needs enema
    1 Partially incontinent, fewer than once a week
    2 Totally continence

10. Bladder continence (over the past week)
    0 Incontinent or have a urinary catheter, but unable to care
    1 Partially incontinent, fewer than once a day
    2 Totally incontinent

*Written permission to use this instrument has been received from Sutthichai Jitapunkul.

**The Modified Barthel Activities of Daily Living Index (MBAI)***
**(Thai Version)**
á°°»ÃÐàÁ¹¤ÇÒÁÊÒÁÒÃ¶ã¹¡ÒÃ»¯ºµ¡¨ÇµÃ»ÃÐ¨ÓÇ¹ ´ª¹ºÒÀà¸Å

¡Ã³ÒàÅÍ¡¢Í¤ÓµÍº·µÃ§¡ºÅ¡É³Ð¢Í§·Ò¹ÁÒ¡·Ê´
1. Feeding (Ãº»ÃÐ·Ò¹ÍÒËÒÀàÁÍàµÃÎÂÁÊÓÃºäÇãËàÃÎÂºÃÍÂµÍË¹Ò)
0. äÁÊÒÁÒÃ¶µ¡ÍÒËÒÀà¢Ò»Ò¡ä´ µÍ§Á¤¹»Í¹ãË
1. µ¡ÍÒËÒÀàÍ§ä´ áµµÍ§Á¤¹ªÇÂ à ª¹ ªÇÂãªªÍ¹µ¡àµÃÎÂÁäÇãË ËÃÍ
µ´ãËà»¹ª¹àÅ¡æ äÇÅÇ§Ë¹Ò
2. µ¡ÍÒËÒÀáÅÐªÇÂµÇàÍ§ä´à»¹»¡µ

2. Grooming (ÅÒ§Ë¹Ò, ËÇ¼Á, á»Ã§¿¹, â¡¹Ë¹Ç´, ã¹ÃÐÂÐ 24 - 48 ªÇâÁ§·¼Ò¹ÁÒ)
0. µÍ§¡ÒÃ¤ÇÒÁªÇÂàËÅÍ
1. ·Óä´àÍ§ (ÀÇÁ·§·Ó·Óà Í§ä´¶Òàµ ÃÎÂÁÍ»¡Ã³äÇãË)

3. Transfer (Å¡¨Ò¡·Ó¹Í¹ ËÃÍ¨Ò¡àµÎÂ§ä»Â§à¡ÒÍ)
0. äÁÊÒÁÒÃ¶¹§ä´ (¹§áÅÇ¨ÐÅÁàÊÁÍ) ËÃÍµÍ§ãª¤¹ÊÍ§¤¹ªÇÂ¡¹Â¡¢¹
1. µÍ§¡ÒÃ¤ÇÒÁªÇÂàËÅÍÍÎÂÒ§ÁÒ¡¨§¨Ð¹§ä´ à ª¹ µÍ§ãª¤·¡á¢§áÃ§ËÃÍÁ·¡ÉÐ 1 ¤¹
ËÃÍãª¤·Çä» 2 ¤¹¾Â§ ËÃÍ´¹¢¹ÁÒ ¨§¨Ð¹§ÍÂä´
2. µÍ§¡ÒÃ¤ÇÒÁªÇÂàËÅÍºÒ§ à ª¹ ºÍ¡ãË·ÓµÒÒÁ ËÃÍªÇÂ¾Â§àÅ¡¹ÍÂ
ËÃÍµÍ§Á¤¹´áÅ à¾Í¤ÇÒÁ»ÅÍ´ÀÂ
3. ·Óä´àÍ§

4. Toilet use (ãªËÍ§Ê¢Ò)
0. ªÇÂµÇàÍ§äÁä´
1. ·ÓàÍ§ä´ºÒ§ (ÍÂÒ§¹ÍÂ·Ó¤ÇÒÁÊÐÍÒ´µÇàÍ§ä´ËÅ§¨Ò¡àÊÃ¨¸ÃÐ)
áµµÍ§¡ÒÃ¤ÇÒÁªÇÂàËÅÍãº¹Ò§Ê§
2. ªÇÂµÇàÍ§ä´´ (¢¹¹§áÅÐÅ§¨Ò¡â¶ÊÇÁä´àÍ§,
·Ó¤ÇÒÁÊÐÍÒ´ä´àÃÂºÃÍÂËÅ§¨Ò¡àÊÃ¨¸ÃÐ, ¶Í´âÊàÊÍ¼Òä´àÃÂºÃÍÂ)

5. Mobility (¡ÒÃà¤ÅÍ¹·ÀÒÂã¹ËÍ§ËÃÍºÒ¹)
    0. à¤ÅÍ¹·ä»äË¹äÁä´
    1. µÍ§ãªÀ¶à¢¹ªÇÂµÇàÍ§ãËà¤ÅÍ¹·ä´àÍ§ (äÁµÍ§Á¤¹à¢¹ãË) áÅÐ¨Ðµ Í§à¢ÒÍÍ¡ÁÁËÍ§ ËÃÍ»ÃÐµä´
    2. à´¹ËÃÍà¤ÅÍ¹·â´ÂÁ¤¹ªÇÂ à ª¹ ¾Â§ ËÃÍºÍ¡ãË·ÓµÒÁ ËÃÍµÍ§ãË¤ÇÒÁÊ¹ã¨´áÅ à¾Í¤ÇÒÁ»ÅÍ´ÀÂ
    3. à´¹ËÃÍà¤ÅÍ¹·ä´àÍ§
6. Dressing (¡ÒÃÊÇÁãÊàÊÍ¼Ò)
    0. µÍ§Á¤¹ÊÇÁãÊãË ªÇÂµÇàÍ§á·ºäÁä´ËÃÍä´¹ÍÂ
    1. ªÇÂµÇàÍ§ä´ÃÍÂÅÐ 50 ·àËÅÍµÍ§Á¤¹ªÇÂ
    2. ªÇÂµÇàÍ§ä´´ (ÀÇÁ·§¡ÒÃµ´¡ÃÐ´Á Ã´«» ËÃÍãªàÊÍ¼Ò·´´á»Å§ãËàËÁÒÐÊÁ¡ä´)
7. Stairs (¡ÒÃ¢¹Å§º¹ä´ 1 ª¹)
    0. äÁÊÒÁÒÃ¶·Óä´
    1. µÍ§¡ÒÃ¤¹ªÇÂ
    2. ¢¹Å§ä´àÍ§ (¶ÒµÍ§ãªà¤ÃÍ§ªÇÂà´¹ à ª¹ walker ¨ÐµÍ§àÍÒ¢¹Å§ä´´ÇÂ)
8. Bathing (¡ÒÃÍÒº¹Ó)
    0. µÍ§Á¤¹ªÇÂ ËÃÍ·ÓãË
    1. ÍÒº¹ÓàÍ§ä´
9. Bowel (¡ÒÃ¡Å¹¡ÒÃ¶ÒÂÍ····ÒÃÐã¹ÃÐÂÐ 1 Ê»´ÒË·¼Ò¹ÁÒ)
    0. ¡Å¹äÁä´ ËÃÍµÍ§¡ÒÃ¡ÒÃÊÇ¹Í····ÒÃÐÍÂàÊÁÍ
    1. ¡Å¹äÁä´à»¹ºÒ§¤Ã§ (à»¹¹ÍÂ¡ÇÒ 1 ¤Ã§µÍÊ»´ÒË)
    2. ¡Å¹ä´à»¹»¡µ
10. Bladder (¡ÒÃ¡Å¹»ÊÊÒÇÐã¹ÃÐÂÐ 1 Ê»´ÒË·¼Ò¹ÁÒ)
    0. ¡Å¹äÁä´ ËÃÍãÊÊÒÂÊÇ¹»ÊÊÒÇÐ áµäÁÊÒÁÒÃ¶´áÅàÍ§ä´
    1. ¡Å¹äÁä´à»¹ºÒ§¤Ã§ (à»¹¹ÍÂ¡ÇÒÇ¹ÅÐ 1 ¤Ã§)
    2. ¡Å¹ä´à»¹»¡µ

*Written permission to use this instrument has been received from Sutthichai Jitapunkul.

# Appendix I

## The Chula Activities of Daily Living Index

**The Chula Activities of Daily Living Index (CAI)***

Please provide the following information that is most relevant to your characteristics. For each item, please give information about the activities that you "actually do," not "can do."

1. Walking outdoors (Distance 50+ meters, use of stick/frame permitted)
   0 Unable
   1 Wheelchair independent, walk with help of two persons (physical)
   2 Walks with help of one person (verbal or physical)
   3 Independent

2. Cooking (Independent if contributes to household cooking without need for supervision)
   0 Unable
   1 Needs help but can do something alone
   2 Independent

3. Heavy housework (Independent if does at least one of house cleaning, cloth hand-washing, ironing without help)
   0 Unable
   1 Independent

4. Using money (Independent if manages own money, able to give change)
   0 Unable
   1 Independent

5. Accessing transportation (Independent if uses alone or without need for supervision)
   0 Unable
   1 Need help of one person (verbal or physical)
   2 Independent

*Written permission to use this instruement has been received from Sutthichai Jitapunkul.

**The Chula Activities of Daily Living Index ***

**(Thai Version)**

á°°»ÃÐàÁ¹¤ÇÒÁÊÒÁÒÀ¶ã¹¡ÒÅ»¯°µ¡¨ÇµÅ»ÃÐ¨ÓÇ¹ ´ª¹¦¨ÌÒ

¡Ã³ÒàÅÍÍ¡¢Í¤ÓµÍº·¦µÃ§¡ºÅ¡É³Ð¢Í§·Ò¹ÁÒ¡·¦Ê´ ¡¨¡ÃÃÁã¹·¦¹ËÁÒÒÂ¶§¡¨¡ÃÃÁ·¦·Ò¹·Ó¨Ã§æ

äÁãª¡¨¡ÃÃÁ·¦·Ò¹ÊÒÁÒÒÃ¶·Óä´áµäÁä´·Ó

1. Walking out door (à´¹ËÃÍà¤ÅÍ¹·¦¹Í¡ºÒ¹)

0. à´¹äÁä´

1. ãªÃ¶à¢¹ áÅÐªÇÂµÇàÍ§ä´ ËÃÍµÍ§¡ÒÃ¤¹»ÃÐ¤Í§ 2 ¢Ò§

2. µÍ§¡ÒÃ¤¹ªÇ¾Â§ ËÃÍä»´ÇÂµÅÍ´

3. à´¹ä´àÍ§ (ÃÇÁ·§·¦ªà¤ÃÍ§ªÇÂà´¹ à³¹ walker)

2. Cooking (·ÓËÃÍàµÃÂÁÍÒËÒÀ Ë§¢ÒÇ)

0. ·ÓäÁä´

1. µÍ§¡ÒÃ¤¹ªÇãª¡ÒÃ·Ó ËÃÍ¨´àµÃÂÁ¡ÒÃºÒ§ÍÂÒ§äÇÅÇ§Ë¹Ò ¨§¨Ð·Óä´

2. ·Óä´àÍ§

3. Heavy house work (à³¹ ·Ó¤ÇÒÁÊÐÍÒ´¶ºÒ¹ «¡Ã´àÊÍ¼Ò)

0. ·ÓäÁä´/µÍ§Á¦¤¹ªÇÂ

1. ·Óä´àÍ§

4. Money exchange (·Í¹à§¹/áÅ¡à§¹)

0. ·ÓäÁä´ µÍ§Á¦¤¹ªÇÂ

1. ·Óä´àÍ§

5. Transportation (à³¹ ã³ºÀ¡ÒÃ¶àÁÅ Ã¶ÊÍ§á¶Ç ËÃÍ¢ºÀ¶àÍ§)

0. äÁÊÒÁÒÒÀ¶·Óä´

1. ·Óä´áµµÍ§Á¦¤¹ªÇÂ´áÅä»´ÇÂ

2. ä»ÁÒàÍ§ä´

*Written permission to use this instrument has been received from Sutthichai Jitapunkul.

## Appendix J

## The Self-Rated Abilities for Health Practices Scale

**Self-Rated Abilities for Health Practices Scale***

**DIRECTIONS**: The following 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. Avoiding 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 |
| 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 to 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 sore, breathing problems) | 0 | 1 | 2 | 3 | 4 |

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

| | | | | | |
|---|---|---|---|---|---|
| 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 | 0 | 1 | 2 | 3 | 4 |
| 27. Know my rights and stand up for myself effectively | 0 | 1 | 2 | 3 | 4 |
| 28. Get help from other when I need it | 0 | 1 | 2 | 3 | 4 |

*Written permission to use this instrument, translate into Thai, and modify as necessary has been received from Alexa K. Stuifbergen.

**Self-Rated Abilities for Health Practices Scale**

**(Thai Version)**

á°°»ÃÐàÁ¹¤ÇÒÁÊÒÁÒÀ¶¢Í§µ¹àÍ§ã¹¡ÒÃ»¯ºµµÇ´Ò¹Ê¢ÀÒ¾

¤Óá¹Ð¹Ó ¢Í¤ÇÒÁµÍä»¹ ¶ÒÁ·Ò¹à¡ÂÇ¡º¤ÇÒÁÊÒÁÒÀ¶ã¹¡ÒÃ»¯ºµà¡ÂÇ¡ºÊ¢ÀÒ¾ã¹´Ò¹µÒ§æ µÒÁÅ¡É³ÐÇ¶¯ªÇµ áÅÐ¢Í¨Ó¡´µÒ§æ¢Í§·Ò¹ ÃÇÁ·§¤ÇÒÁªÇÂàËÅÍ·Ò¹ä´Ã° (à³¹ ¨Ò¡¼ªÇÂàËÅÍàÁÍ·Ò¹ÍÍ¡¡ÓÅ§¡ÒÂ) äÁÁ¤ÓµÍº´¶¡ËÃÍ¼´ ¡Ã³ÒÍÒ¹áµÅÐ¢Í¤ÇÒÁ áÅÐãªÁÒµÃÇ´µÍä»¹ã¹¡ÒÃº§ª¶§¤ÇÒÁÊÒÁÒÀ¶·Ò¹¨Ð·ÓµÒÁ¢Í»¯ºµ´Ò¹Ê¢ÀÒ¾ä´´à¾Â§ã´ ·§¹äÁãª¤ÇÒÁ¶ËÒ§·Ò¹»¯ºµ¨Ã§æ

0 = ·ÓäÁä´àÅÂ 1 = ·Óä´àÅ¡¹ÍÂ 2 = ·Óä´¾Í¤ÇÃ 3 = ·Óä´à»¹ÊÇ¹ÁÒ¡ 4 = ·Óä´ÍÂÒ§ÊÁºÃ³

| ©¹Á¹ã¨ÇÒ©¹ÊÒÁÒÀ¶ | | | | | |
|---|---|---|---|---|---|
| 1. ¨´ËÒÍÒËÒÀ·Á»ÃÐâÂª¹ä´µÒÁ¡ÓÃ§·Ã¾Â·Á | 0 | 1 | 2 | 3 | 4 |
| 2. Àº»ÃÐ·Ò¹ÍÒËÒÀä´Ê´ÊÇ¹·àËÁÒÐÊÁ | 0 | 1 | 2 | 3 | 4 |
| 3. ËÒÇ¸ÃÇÒ©¹¤ÇÀÁ¹ÓË¹¡à·ÒäÀ¨§¨ÐÁÊ¢ÀÒ¾´ | 0 | 1 | 2 | 3 | 4 |
| 4. á»Ã§¿¹ÍâÒ§ÊÁÓàÊÁÍ | 0 | 1 | 2 | 3 | 4 |
| 5. ºÍ¡ä´ÇÒÍÒËÒÀª¹´ã´Á¡Ò¡ËÀÍàÊ¹ãÂÁÒ¡ | 0 | 1 | 2 | 3 | 4 |
| 6. ËÒÇ¸µÒ§æ à¾ÍÂÇÒÍÒËÒÀª¹´ã´´ÊÒËÀºÒ© ¹ (àª¹ ÍÒ¹©ÁÒ¡ ¤ÓÍ¸ºÒÂ·¡ÅÍ§ Ë¹§ÊÍ ËÀÍ¶ÒÁ¼·Ã) | 0 | 1 | 2 | 3 | 4 |
| 7. ´Á¹Ôä´ÁÒ¡à·Ò·ÂÒ§¡ÒÂµÍ§¡ÒÂ·¡Ç¹ | 0 | 1 | 2 | 3 | 4 |
| 8. ËÒÇ¸¾¡¼Í¹ËÂÍ¹ã¨ | 0 | 1 | 2 | 3 | 4 |
| 9. ·ÓÊ§·ªÇÂãË©¹äÁÀÊ¡àË§Ò | 0 | 1 | 2 | 3 | 4 |
| 10. ·ÓÊ§·ªÇÂãË©¹ÀÊ¡ÇÒµÇàÍ§Á¤Ò | 0 | 1 | 2 | 3 | 4 |
| 11. ËÅ¡àÅÂ§¤ÇÒÁÀÊ¡àºÍË¹ÒÂ | 0 | 1 | 2 | 3 | 4 |
| 12. ¤Â¡ºà¾Í¹ËÀÍ¤¹ã¹¤ÀÍºÀÇàÁÍÁàÀÍ§äÁÊºÒÂã¨ | 0 | 1 | 2 | 3 | 4 |
| 13. ËÒÇ¸·à¼ª–¡ºÇÒÁà¤ÀÂ´ä´ | 0 | 1 | 2 | 3 | 4 |
| 14. à»ÄÂ¹á»Å§Ê§µÒ§æã¹ªÇµà¾ÍÂ´¤ÇÒÁà¤ÀÂ´ | 0 | 1 | 2 | 3 | 4 |
| 15. ÍÍ¡¡ÓÅ§¡ÒÂ·ÁÅ¼Â´µÍ©¹ | 0 | 1 | 2 | 3 | 4 |
| 16. ÍÍ¡¡ÓÅ§¡ÒÂä´ÍÂÒ§ÊÁÓàÊÁÍ | 0 | 1 | 2 | 3 | 4 |

0 = ·ÓäÁä´àÅÂ 1 = ·Óä´àÅ¡¹ÍÂ 2 = ·Óä´ºÒ§ 3 = ·Óä´à»¹ÊÇ¹ÁÒ¡ 4 = ·Óä´ÍÂÒ§ÊÁºÃ³

| ©¹Á¹ã¨ÇÒ©¹ÊÒÀÒÀ¶ | | | | | |
|---|---|---|---|---|---|
| 17. ËÒÇ¸¡ÒÀÍÍ¡¡ÓÅ§¡ÒÂ·©¹ªÍº | 0 | 1 | 2 | 3 | 4 |
| 18. ËÒÊ¶Ò¹·ÍÍ¡¡ÓÅ§¡ÒÂã¹ªÁª¹ | 0 | 1 | 2 | 3 | 4 |
| 19. ÀÇÒàÁÍäÅ¤ÇÀËÂ´ÍÍ¡¡ÓÅ§¡ÒÂ | 0 | 1 | 2 | 3 | 4 |
| 20. ÍÍ¡¡ÓÅ§¡ÒÂâ´Â¡ÒÀàËÂÂ´à¡À§¡ÅÒÁà¹ÍÊÇ¹µÒ§æ | 0 | 1 | 2 | 3 | 4 |
| 21. »Í§¡¹µÇàÍ§äÁàËä´ÀºÍ¹µÀÒÂ¨Ò¡¡ÒÀÍÍ¡¡ÓÅ§¡ÒÂ | 0 | 1 | 2 | 3 | 4 |
| 22. ËÒáËÅ§¢ÍÁÅ¢ÒÇÊÒÀà¡ÂÇ¡º¡ÒÀ´áÅÊ¢ÀÒ¾ | 0 | 1 | 2 | 3 | 4 |
| 23. Ê§à¡µ¤ÇÒÁ¼´»¡µ¢Í§ÁÒ§¡ÒÂ (à ª¹ Áá¼Å Á»-ËÒà¡ÂÇ¡º¡ÒÀËÒÂã¨ ËÃÍÍ¹æ) | 0 | 1 | 2 | 3 | 4 |
| 24. ÀÇÒÁÍÒ¡ÒÀÍÂÒ§äÅ·¤ÇÀ»À¡ÉÒËÁÍËÀÍ¾ÂÒºÒÅ | 0 | 1 | 2 | 3 | 4 |
| 25. ãªÂÒä´ÍÂÒ§¶¡µÍ§ | 0 | 1 | 2 | 3 | 4 |
| 26. ËÒËÁÍËÀÍ¾ÂÒºÒÅ·ÊÒÁÒÀ¶ãË¤Óá¹Ð¹Ó·´à¡ÂÇ¡º¡ÒÀÀ¡ÉÒÊ¢ÀÒ¾ | 0 | 1 | 2 | 3 | 4 |
| 27. ÀáÅÐ»¡»Í§Ê·¸¢Í§µ¹àÍ§ä´ÍÂÒ§Á»ÀÐÊ·¸ÀÒ¾ (à ª¹ äÁãË¤¹Í¹ àÍÒà»ÃÂº) | 0 | 1 | 2 | 3 | 4 |
| 28. ¢Í¤ÇÒÁªÇÂàËÅÍ¨Ò¡¤¹Í¹àÁÍ©¹µÍ§¡ÒÀ | 0 | 1 | 2 | 3 | 4 |

**Self-Rated Abilities for Health Practices Scale**
**(Back Translation)**

**DIRECTIONS**: The following 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 sure that I am able to | | | | | |
|---|---|---|---|---|---|
| 1. Find healthy food within an affordable finance | 0 | 1 | 2 | 3 | 4 |
| 2. Eat food proportionately | 0 | 1 | 2 | 3 | 4 |
| 3. Find ways to know how much I should weigh for a good health | 0 | 1 | 2 | 3 | 4 |
| 4. Brush my teeth regularly | 0 | 1 | 2 | 3 | 4 |
| 5. Tell what kinds of food have a lot of fibers | 0 | 1 | 2 | 3 | 4 |
| 6. Find out what kind of food is good for me by various ways (e.g., ask persons who know, read from the label) | 0 | 1 | 2 | 3 | 4 |
| 7. Drink adequate amount of water as I need | 0 | 1 | 2 | 3 | 4 |
| 8. Find out ways to rest and engage in recreation | 0 | 1 | 2 | 3 | 4 |
| 9. Keep me away from a lonely feeling | 0 | 1 | 2 | 3 | 4 |
| 10. Do things that promote my self-esteem | 0 | 1 | 2 | 3 | 4 |
| 11. Avoid boredom | 0 | 1 | 2 | 3 | 4 |
| 12. Talk to a friend/family member about things bothering me | 0 | 1 | 2 | 3 | 4 |
| 13. Find ways to deal with my stress | 0 | 1 | 2 | 3 | 4 |
| 14. Modify things in life to reduce my stress | 0 | 1 | 2 | 3 | 4 |
| 15. Exercise for my benefit | 0 | 1 | 2 | 3 | 4 |
| 16. Make exercise as a part of my daily routine | 0 | 1 | 2 | 3 | 4 |
| 17. Find a pleasant exercise for myself | 0 | 1 | 2 | 3 | 4 |
| 18. Find a place to exercise in the community | 0 | 1 | 2 | 3 | 4 |
| 19. Know when I should stop exercising | 0 | 1 | 2 | 3 | 4 |
| 20. Do stretching exercises | 0 | 1 | 2 | 3 | 4 |
| 21. Avoid injury when I exercise | 0 | 1 | 2 | 3 | 4 |
| 22. Find sources of health care information | 0 | 1 | 2 | 3 | 4 |
| 23. Notice unusual physical symptoms (e.g., wound, breathing problems) | 0 | 1 | 2 | 3 | 4 |

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

| | | | | | |
|---|---|---|---|---|---|
| 24. Know symptoms that I should tell a physician/nurse | 0 | 1 | 2 | 3 | 4 |
| 25. Use medicine appropriately | 0 | 1 | 2 | 3 | 4 |
| 26. Search for a physician/nurse who is able to suggest me good health care | 0 | 1 | 2 | 3 | 4 |
| 27. Know my rights and protect them efficiently (e.g., do not let others take unfair advantages of me) | 0 | 1 | 2 | 3 | 4 |
| 28. Seek help from others when I need it | 0 | 1 | 2 | 3 | 4 |

## Appendix K

## Permission Letters for Using the Instruments

SCHOOL OF NURSING
THE UNIVERSITY OF TEXAS AT AUSTIN

*1700 Red River • Austin, Texas 78701-1499 • (512) 471-7311 FAX (512) 471-4910*

November 2, 2000

Porntip Malathum, R.N.
Doctoral Candidate
The University of Texas at Austin
School of Nursing
1700 Red River
Austin, TX 78701

Dear Ms. Malathum,

You have my permission to use the Chronic Health Problem Checklist in your dissertation research.

Sincerely,

Gayle J. Acton, Ph.D., R.N.
Assistant Professor

Gerontology Unit, Department of Internal
Medicine, Faculty of Medicine
Chulalongkorn University
Patumwan, Bangkok, 10330
THAILAND
Fax: (662) 251-1296, Tel: (662) 256-4449

Porntip Malathum
4210 Red River # 122
Austin, TX, 78751
Tel & Fax: (512)-374-9842

January 27, 2000

Dear Ms. Malathum:

I am pleased you are interested in the Modified Barthel ADL Index (Thai version) and the Chula ADL Index for your study in Thai older adults. You have our permission to use them in your dissertation.

If you need any other information, please let me know.

Sincerely yours

Sutthichai Jitapunkul, MD.
Professor

SCHOOL OF NURSING
THE UNIVERSITY OF TEXAS AT AUSTIN

*1700 Red River • Austin, Texas 78701-1499 • (512) 471-7311 FAX (512) 471-4910*

January 15, 2000

Porntip Malathum
Doctoral Student
The University of Texas at Austin
School of Nursing
Austin, TX 78701

Dear Ms. Malathum,

I have received your request to use the Self-Rated Abilities for Health Practices instrument in your dissertation research. You have my permission to use this instrument, translate it into Thai and modify as necessary, and to include a copy of the scale in your final dissertation. I understand that the final dissertation will be sent to University Microfilms.

Best wishes in your research endeavors.

Sincerely,

Alexa K. Stuifbergen, PhD, RN, FAAN
Professor
Associate Dean for Research

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