# CHAPTER 1

# INTRODUCTION

## Background and significance of the problem

The life expectancy of humans is now longer than in the past. In Thailand the number of people 60 years of age or older was 4.02 million in 1960, projected to increase to 10.78 million by 2020 (Jitapunkul, 1998; Intachat, 2002). With increasing age, the elderly face many changes and challenges. One of the most common complaints among the elderly is impaired cognitive status (Pararas–Carayannis, 2000).

Cognitive status is comprised of perception, memory, and thinking (Stromborg & Olsen, 1997). Cognitive decline ranges from normal, mild cognitive impairment, to dementia (Bennett, Wilson, Schneider, Evans, Beckett, Aggarwal, & et al., 2002; Pararas–Carayannis, 2000). Approximately 10 to 15% of mild cognitive impairment develops into Alzheimer's disease (Darby, Maruff, Collie & McStephen, 2002; Pararas–Carayannis, 2000), the most frequent cause of dementia (Heil, Hogh & Waldemar, 2002). Dementia is a clinical syndrome characterized by acquired loss of cognitive and emotional abilities severe enough to interfere with daily functioning and the quality of life (Jitapunkul, Phoolcharoen, Kunanusont & Suriyawongpaisai, 2001). Once the elderly reach the state of dementia, there are many problems and tasks that both the elderly and their families have to face and cope with.

Decline of cognitive status with increased age (Yurick, Spier, Robb & Ebert, 1989) is due to reduced production of acetylcholine  (Greenwell, 2000), which results in poor memory, diminished learning ability, and general cognitive decline (Botwinick, 1977, cited in Yurick, Spier, Robb & Ebert, 1989; Greenwell, 2000). Rinn (1988) and Shaie (1989), cited in McDougall (1999), stated that memory loss was a reality of aging; individuals usually experience cognitive changes from 65 to 85 years of age.

With an increase in the aging population at risk of dementia (Suh & Shah, 2001), the prevalence rate of dementia doubles approximately every 5 years of age, from 2-3% in the 65 - 75 year age range  to more than 30% in the elderly aged 85 years and older (Hendrie, 1997 cited in Chou, LaMontagne & Hepworth, 1999). In Thailand, the prevalence of dementia at age of 60 and older is 3.3 %, whereas for those aged 90 and older, it is 31.3% (Jitapunkul, Phoolcharoen, Kunanusont & Suriyawongpaisai, 2001).

The overall prevalence of dementia has increased due to several reasons. First, the population is aging rapidly, thus more people are reaching the age of highest risk. Secondly, with improvements in socioeconomic conditions and advances in medical care, survival after the onset of dementia is increasing, thus contributing to increased prevalence. Thirdly, life expectancy is now longer than in the past (Suh & Shah, 2001).

The increasing number of elderly in both developed and developing countries over the last two decades will undoubtedly increase the social burdens of dementia in the future. Dementia not only burdens the affected persons but also their families, due

to impairment of daily living activities, and threatens independence at home. The burden on the family results from increased demands for caring for relatives with dementia (Chou, LaMontagne & Hepworth, 1999). Rabins, Mace and Lucus (1982), cited in Jamsomboon et al. (1995), found that 87% of persons caring for patients with dementia had symptoms such as tiredness, irritability, and depression. A number of studies have reported loss or curtailment of employment associated with being caregivers as well as feelings of helplessness, guilt, anger, apprehension, and social alienation (Biegel, Milligan, Putman & Song, 1994 cited in Chou, LaMontagne & Hepworth, 1999). In addition, cognitive impairment is a risk factor for increased home health care use (Ganguli et al., 1993 cited in Bassuk, Wypij & Berkman, 2000; Storandt, Grant, Miller & Morris, 2002), hospitalization (Callahan, Hendrie & Tierney, 1995, cited in Bassuk, Wypij & Berkman, 2000), and mortality (Bassuk, Wypij & Berkman, 2000; Bennett et al., 2002; Frisoni, Fratiglioni, Fastbom, Viitanen & Winblad, 1999).

McNamee, Bond and Buck (2001) postulated that future increases in the population 65 years and over would lead to rising formal care costs. However, the magnitude of cost changes depends on the prevalence of dementia and levels of mental and physical functioning. Nevertheless, the government would have to use considerable funds in helping this group of patients.

As a decline in cognitive status is a predictor of dementia, many studies have explored factors related to cognitive status; these have examined personal data such as age (Yaffe, Sawaya, Lierburg & Grady, 1998; Greiner, Snowdon & Schmitt, 1996; Schofield, Marder, Dooneief, Jacobs, Sano & Stern, 1997), gender (Dufouil, Fuhrer, Dartigues & Alperovitch, 1996; Olafsdttir, Marcusson & Skoog, 2001; Axelrod, 2002;

Yaffe, Sawaya, Lierburg & Grady, 1998), income (Tubmanee, 1998), marital status (Harel et al., 1994, cited in Hebert, Brayne & Spiegelhalter, 1999), location of residence (Jitapunkul, Phoolcharoen, Kunanusont & Suriyawongpaisal, 2001; Suntranu, Sriplang, Galumphahati, Kururundpun, Intongosade, Phokakul, & et al., 1989), living alone and social isolation (Hebert, Brayne & Spiegelhalter, 1999; Moritz, Kasl & Berkman, 1995), education level (Devanand, Sano, Tang, Taylor, Gurland, Wilder, et al., 1996; Fraser, Singh & Bennett, 1996; Greiner, Snowdon & Schmitt, 1996; Shofied, Marder, Dooneief, Jacobs, Sano & Stern, 1997), and occupation (Dartiques, Gagnon, Letenneur, Barberger-Gateau, Commenges, Evaldre & Salomon, 1992; Stern, Gurland, Tatemichi, Tang, Wilder & Mayeux, 1994). Health-related factors were cited, such as daily living activities (Grener, Snowdin & Schmitt, 1996; Lindsay, Laurin, Verreault, Hebert, Helliwell, Hill, & et al., 2002; Moritz, Kasl & Berkman, 1995), chronic illness (Gale, Martyn & Cooper, 1996; Zuccala et al., 1997), depression (Yaffe, Blackwell, Gore, Sands, Reus & Browner, 1999; Wilson, Barnes, Leon, Aggarwal, Schneider, Bach, & et al., 2002), and drug (Fraser, Singh & Bennett, 1996; Shaner, 2000; Yurick, Spier, Ronn & Ebert, 1989). Other factors, such as coffee consumption, regular wine consumption, and nutritional deficiencies (Fraser, Singh & Bennett, 1996; Gale, Martyn & Cooper, 1996; Lindsay et al., 2002) have also been investigated.

Some of these factors can be treated or controlled to improve cognitive status, such as depression, low levels of physical activity, and social isolation. Koga et al. (2002) stated that studies clarifying the risk factors or early findings of cognitive decline can potentially be used for the early detection and prevention of dementia. Preventing or decreasing the progression of cognitive decline can be an important

strategy in dealing with the progression of cognitive decline among the elderly. Therefore, studies of factors related to cognitive status are significant to the issue of cognitive status among the elderly.

There have been only a few studies in Thailand that have explored factors related to cognitive decline. Jitapunkul, Phoolcharoen, Kunanusont and Suriyawongpaisal (2001) studied prevalence of dementia among elderly Thais by conducting a national survey. The subjects were 4,048 elderly aged 60 and older, selected throughout Thailand. They found a 3.3 % prevalence of dementia, and discovered the factors associated with cognitive status were age, literacy, and location of residence. Increased age, low level of education, and location of residence were associated with cognitive decline. Elderly in the northern region had the least cognitive impairment, while those in Bangkok, and the south, north-east, and central regions had the highest rates of cognitive impairment.  Senanarong et al. (2001) also explored risk factors of dementia and impaired cognitive status in Thai elderly by using questionnaires. The subjects were 550 elders aged 55 and older who lived in communities within 10 kms of Siriraj Hospital, Bangkok, Thailand. They found that the factors associated with low cognitive status were high blood pressure (systolic and diastolic), low serum albumin, high serum cholesterol levels, and heavy body weight. As the numbers of previous studies are limited with few variables included, it would be interesting to study factors related to cognitive decline, including more demographic and health-related variables. Finding more factors related to cognitive status would contribute to creation of a data base enabling identification of a high risk groups, early detection, prevention, and the implementation of programs to slow the process of cognitive impairment.

**Objectives of research**

1. To examine the prevalence of cognitive impairment among the elderly.

2. To examine the relationship of personal characteristics and health-related factors with cognitive impairment among the elderly.

**Research questions**

1. What is the prevalence of cognitive impairment among the elderly?

2. Are personal characteristics and health-related factors associated with cognitive impairment among the elderly?
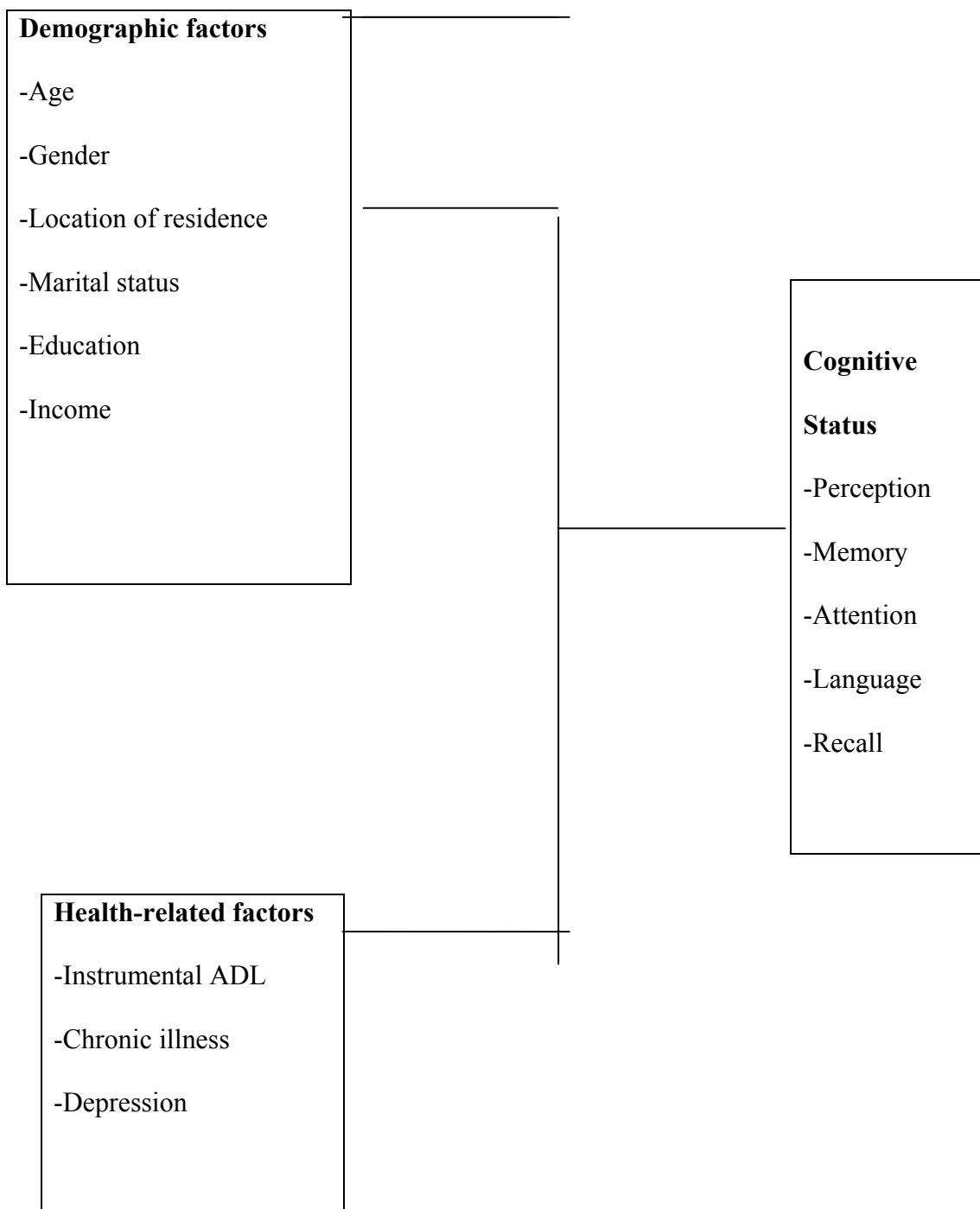
**Conceptual framework**

This study explored cognitive status and related factors in elders aged 65 and older. The cognitive status consists of five components: perception, memory, attention, language, and recall (Jitapunkul, 1998). Perception is the intellectual function that integrates sensory impressions into meaningful data and memory. Memory is the intellectual function that registers stimuli, stores them as perceptions, and retrieves them at will. Attention is the ability to focus in a sustained manner on a single activity. Language is an expressive intellectual function through which information is communicated or acted upon. Recall is immediate and delayed memory (Stone, Wyman, & Salibury, 1999). Cognitive status in this study was assessed using the Chula Mental Test: CMT form (Jitapunkul, 1998).

Previous research has found many factors related to cognitive status. These factors may be classified as demographic factors and health-related factors. Demographic factors include age (Crum, Anthony, Bassett & Folstein, 1993; Shofied,

Marder, Dooneief, Jacobs, Sano & Stern, 1997; Suh & Shah, 2001), gender (Axelrod, 2002; Dufouil, Fuhrer, Dartigues & Alperovitch, 1996; Olafsdttir, Marcusson & Skoog, 2001; Yaffe, Sawaya, Lierburg & Grady, 1998), marital status (Harel et al., 1994 cited in Hebert, Brayne & Spiegelhalter, 1999; Tilley et al., 1985), location of residence (Jitapunkul, Phoolcharoen, Kunanusont & Suriyawongpaisal, 2001; Suntranu et al., 1989), educational level (Crum, Anthony, Bassett & Folstein, 1993; Dartigues et al., 1992; Shofied, Marder, Dooneief, Jacobs, Sano & Stern, 1997), and income (Lindsay et al., 2002; Stern, Gurland, Tatemichi, Tang, Wilder & Mayeux, 1994; Fraser, Singh & Bennett, 1996; Tubmanee, 1998). Health-related factors comprise daily living activities (Grener, Snowdon & Schmitt, 1996; Moritz, Kasl & Berkman, 1995), chronic illness (Grener, Snowdon & Schmitt, 1996; Moritz, Kasl & Berkman, 1995), and depression (Dufouil, Fuhrer, Dartigues & Alperovitch, 1996; Shofied, Marder, Dooneief, Jacobs, Sano & Stern, 1997; Wilson et al., 2002).

This study explored the association of the selected demographic characteristics and health related factors with cognitive status. Demographic factors included age, gender, marital status, residential area, education, and income. Health-related factors included daily living activities, chronic illness, and depression.

The framework of this study is illustrated in the following diagram:

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┌─────────────────────────────┐────────────────────┐
│ Demographic factors         │
│                             │
│ -Age                        │
│                             │
│ -Gender                     │
│                             │       ┌──────────────────┐
│ -Location of residence      │───────│                  │
│                             │       │ Cognitive        │
│ -Marital status             │       │                  │
│                             │       │ Status           │
│ -Education                  │       │ -Perception      │
│                             │       │                  │
│ -Income                     │       │ -Memory          │
│                             │       │                  │
│                             │       │ -Attention       │
│                             │       │                  │
│                             │       │ -Language        │
│                             │       │                  │
└─────────────────────────────┘       │ -Recall          │
                                       │                  │
       ┌─────────────────────┐        └──────────────────┘
       │ Health-related factors│──────
       │                       │
       │ -Instrumental ADL     │
       │                       │
       │ -Chronic illness      │
       │                       │
       │ -Depression           │
       │                       │
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**Definition of terms**

      **Elderly** refers to a person aged 65 or older.

**Cognitive status** refers to the individual's ability regarding perception, memory, attention, language, and recall, which were assessed by the Chula Mental Test: (CMT) (Jitapunkul, 1998). The CMT yields scores of 0 −19; a score lower than 15 indicates cognitive impairment.

**Factors related to cognitive status** refer to demographic factors and health-related factors.

**Demographic factors** included age, gender, marital status, education, income, and location of residence assessed by use of a personal questionnaire.

**Health-related factors** included instrumental activities of daily living, chronic illness, and depression.

**Instrumental activities of daily living** refers to an individual's ability to perform more advanced daily activities such as walking outdoors, cooking, housework, money transactions, and taking public transport. The degree of ability to perform these was assessed by Chula ADL index: CAI (Jitapunkul, 1998).

**Chronic illness** refers to an illness reported by an elderly or family member that has a duration of more than 6 months, and that has been diagnosed by a doctor as a condition such as diabetes mellitus, hypertension, heart disease, cerebrovascular disease, anemia, thyroid, Parkinson's, brain infection, or accidental brain injury. Measurement can be divided into 2 groups: disease and no disease**.**

**Depression** refers to the elderly's report of symptoms related to depression such as unhappiness, hopelessness, and helplessness. This was measured by the Thai Geriatric Depression Scale (TGDS) (Jitapunkul et al., 1994).

**Significance of the study**

       The study provided the prevalence of cognitive impairment among the sample and risk factors. Nurses can use the findings as a database for early detection of those with high risk of cognitive decline. The appropriate treatment and intervention can then be implemented earlier to eliminate some risk factors as well as to delay the process of cognitive impairment.