Prevalence of Healthy Aging and Factors Associated in Thai Urban Elderly Bangkok Thailand

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ความชุกของการมีสุขภาวะดี และปัจจัยที่เกี่ยวข้อง ในผู้สูงอายุไทยที่อาศัยในเขตเมือง กรุงเทพมหานคร ประเทศไทย

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อรสิริ ปิติสุทธิธรรม : ความชุกของการมีสุขภาวะดี และปัจจัยที่เกี่ยวข้องในผู้สูงอายุไทยที่อาศัยในเขตเมือง กรุงเทพมหานคร ประเทศไทย (Prevalence of Healthy Aging and Factors Associated in Thai Urban Elderly Bangkok Thailand) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ศ. พีระศักดิ์ จันทร์ประทีป, อ.ที่ปรึกษาวิทยานิพนธ์ร่วม: ดร. คาร์ล เจ นีเซอร์, 155 หน้า.

การเติบโตของจำนวนประชากรผู้สูงอายุได้เพิ่มขึ้นอย่างล้นหลามในหลายประเทศทั่วโลก รวมถึงประเทศไทย สถานการณ์นี้นำมาซึ่งความท้าทายหลายประการทั้งในแง่ของเศรษฐกิจ สังคม และระบบสุขภาพ การมีสุขภาวะดีในผู้สูงอายุจึงเป็นปัจจัยสาคัญที่จะนำไปสู่ทางแก้ไขปัญหาเหล่านี้ และเนื่องจากงานวิจัยที่ศึกษาถึงความชุกและปัจจัยที่เกี่ยวข้องกับการมีสุขภาวะดีในผู้สูงอายุไทยนั้นมีจำกัด ผู้วิจัยจึงได้จัดทำงานวิจัยนี้ขึ้นเพื่อศึกษาถึงความชุกของการมีสุขภาวะดี และปัจจัยที่เกี่ยวข้องในผู้สูงอายุไทยที่อาศัยในเขตเมือง กรุงเทพมหานคร การวิจัยนี้เป็นงานวิจัยแบบภาคตัดขวาง เก็บข้อมูลระหว่างเดือนเมษายน-พฤษภาคม พ.ศ.2561 ในผู้สูงอายุไทยอายุ 60 ปีขึ้นไปโดยการใช้แบบสอบถามสัมภาษณ์ผู้เข้าร่วมแบบตัวต่อตัว ณ สวนลุมพินี จังหวัดกรุงเทพมหานคร จำนวนทั้งสิ้น 200 ราย โดยแบ่งเป็นชายและหญิงในอัตราส่วนที่เท่ากัน จากนั้นจึงนำข้อมูลมาวิเคราะห์ด้วยสถิติเชิงพรรณนา ทดสอบด้วยไค-สแควร์ (Chi-Square test) การวิเคราะห์การถดถอยแบบตัวแปรเดียว (Univariate logistic regression) และแบบหลายตัวแปร (Multivariate logistic regression) โดยเกณฑ์ของการมีสุขภาวะดีในงานวิจัยนี้คือ สามารถทำกิจวัตรประจำวันได้โดยไม่ต้องพึ่งผู้อื่น ไม่มีภาวะสมองเสื่อม ไม่มีอาการของโรคซึมเศร้า มีภาวะโภชนาการอยู่ในเกณฑ์ปกติ และมีคุณภาพชีวิตที่ดี จากการวิเคราะห์ข้อมูลได้ผลลัพธ์ดังนี้ ความชุกของการมีสุขภาวะดีในผู้สูงอายุไทยที่อาศัยในเขตเมือง กรุงเทพมหานคร คือ 66% โดยไม่มีความแตกต่างระหว่างเพศชายและหญิงอย่างมีนัยสำคัญ จากผลการวิเคราะห์การถดถอยแบบหลายตัวแปรพบว่า ปัจจัยที่มีผลเกี่ยวข้องกับการมีสุขภาวะดีในผู้สูงอายุไทยคือ รายได้ของครัวเรือน การตระหนักรู้ถึงความสำคัญของสุขภาพ การเคลื่อนไหวร่างกายในชีวิตประจำวัน และการนอนหลับ กล่าวโดยสรุป ประมาณสองในสามของผู้สูงอายุไทยที่อาศัยในเขตเมืองนั้นมีสุขภาวะที่ดี และผลการวิจัยเกี่ยวกับปัจจัยที่เกี่ยวข้องกับการมีสุขภาวะดีของผู้สูงอายุในงานวิจัยนี้ สามารถนำไปเป็นข้อมูลแก่ภาครัฐและเอกชนในการร่วมมือกันส่งเสริมกิจกรรมเพื่อเสริมสร้างสุขภาพและป้องกันโรคในผู้สูงอายุ เพื่อให้ประเทศไทยสามารถก้าวผ่านความท้าทายของสังคมผู้สูงอายุได้อย่างสมบูรณ์ต่อไป

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ONSIRI PITISUTTITHUM: Prevalence of Healthy Aging and Factors Associated in Thai Urban Elderly Bangkok Thailand. ADVISOR: PROF. PEERASAK CHANTARAPRATEEP, D.V.M., CO-ADVISOR: KARL J. NEESER, Ph.D., 155 pp.

Population aging is a global phenomenon affecting many countries including Thailand. Many challenges come with aging population such as economical, social and healthcare system challenges, and healthy aging is the key to these problems. Only a few studies have focused on the prevalence and associated factors of healthy aging in Thailand. This study aims to estimate prevalence of healthy aging and identify factors related to healthy aging among Thai urban elderly in Bangkok, Thailand. Data for this cross-sectional study were collected by face-to-face interviews using questionnaires at Lumpini park, Bangkok between April to May 2018. A total of 200 older persons (100 males and 100 females) aged 60 years or over were recruited non-randomly. Descriptive analysis, Chi-square test, univariate and multivariate regression analyses were used to display the prevalence and associated factors of healthy aging. The prevalence of healthy aging in this population was at 66% based on five components of: totally independent physical function, normal cognitive function, good mental health status, normal nutritional status, and good quality of life. There were no differences in prevalence of healthy aging between males and females. After controlling for other covariates, household income, health awareness, physical activity and sleep were associated factors of healthy aging. In conclusion, about two-thirds of the seniors in the urban part of Bangkok met the criteria of healthy aging. The findings of this study can be used as provisional data for policy makers to help Thailand overcome challenges that come with aging population.

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Introduction

1.1 Background and rationale

The world that we live in is currently going through a dramatic change, particularly in population structure. Today, the world's population is aging much more rapidly than in the past. It is estimated that the number of people who aged 60 or above will be double from the year of 2000 to 2050 (1). Data from the United Nations revealed that in July 2015, the total population of the world was at 7.38 billion while there was a total of 900 million people who aged more than 60 years old, which accounted for 12% of total population (2). By 2050, it is predicted that the elderly population will rise to 2 billion (20.6%) out of the expected total population of 9.7 billion worldwide (2). This phenomenon is driven by the success of public health policy and improvement of health care system. With better access to health care services and the improvement of quality of services, we have seen a significant decline in mortality rate from infectious diseases, resulting in an increase in life expectancy (3). These successes together with a lower fertility rate, are the reasons why the world is aging. As of 2015, global life expectancy is at 71.4 years (69.1 years for males and 73.8 years for females) (4). Moreover, the older population is increasing faster in urban areas than in rural areas. Between 2000 and 2015, there was a 68% increase of the number of people aged 60 years or over in urban areas, compared to

a 25% increase of the elderly in rural areas which leaded to concentration of older persons in urban areas (1). In 2015, about 58% of the world's older persons lived in urban areas, increased from 51% in 2000. The proportion of the oldest-old is even more likely to live in urban areas, with an increase from 56% in 2000 to 63% in 2015 (1).

This aging trend is growing around the globe, not only in developed countries but also in developing and under developing countries. Thailand is also facing with this demographic shift. In 2015, the elderly accounted for 15.6% of total population (10.7 million out of 68.7 million population) and the rate is predicted to be increased to 35% (22.9 million out of 65.4 million population) in 2050 (2). Life expectancy at birth in Thailand is also increasing steadily from 70.6 years in 2000 to 75 years (72 years for male, 78 years for female) in 2015 (5).

Many challenges come with aging population, with changes in family structure, working patterns and disease trends that shift towards non-communicable diseases (NCDs), the government and all the parties involved must develop new health policy to cope with these changes (6). With all these years added to our lives, the biggest question is, are those years accompanied with healthier lives or instead with poor health and disabled lives? Health is a crucial aspect to be considered for the elderly. With increasing age, there will be a decline in functional level of the body both physically and mentally which can lead to chronic diseases such as NCDs and dementia (3). Rising numbers of older persons with these diseases will add a

burden to families, communities and to the countries especially in low-income countries where they are not ready to handle this growing problem (3). A demand in health care services will grow exceptionally as people age and live longer lives. Nonetheless, a data from the world bank showed that healthy aging population need fewer resources and can reduce cost of medical care (7).

Healthy aging is defined by the World Health Organization (WHO) as "The process of developing and maintaining the functional ability that enables well-being in older age" (1). Since birth, the genetic inheritance has already set how we will age. But humans are born into different kinds of environmental exposures, so environmental factors and personal behaviors could influence the expression of those genes (1). Personal characteristics such as sex, ethnicity, occupation, education, wealth as well as health profile such as underlying diseases or injuries also play an important role in aging. Moreover, psychological factors and social participation must not be overlooked because these are one of the major parts of our lives. The elderly who has good social interaction with their loved ones such as families and friends tend to have a more happy and healthy life (1).

Therefore, healthy aging is the key to the world's aging problem. It can reduce medical costs, lower the burden for all and most importantly, can improve quality of life among the elderly so that they can live happy and healthy lives in the longer years to come. There are several studies which conducted to find prevalence of healthy aging in other countries such as in Malaysia conducted by Hamid in 2012

which revealed a prevalence of healthy aging at 13.8% (8), in The United States of America by McLaughlin in 2009 with a prevalence of healthy aging at 10.9% (9) and in Mexico by Arias-Merino in 2012 with a prevalence of healthy aging at 12.6% (10). But all of these studies used secondary data for analyses and studies from other countries might not be applicable to Thailand. Thus, this study is conducted with the aims to determine factors associated with healthy aging in Thai urban elderly and to find the prevalence of healthy aging in Thai urban elderly. In the hope that the results could be used as provisional data to successfully develop needed policies, in order to overcome this global health problem of aging in Thailand.

1.2 Research questions

1. What is the prevalence of healthy aging among Thai urban elderly in Bangkok?
2. Which factors are associated with the course of healthy aging in Thai urban elderly?

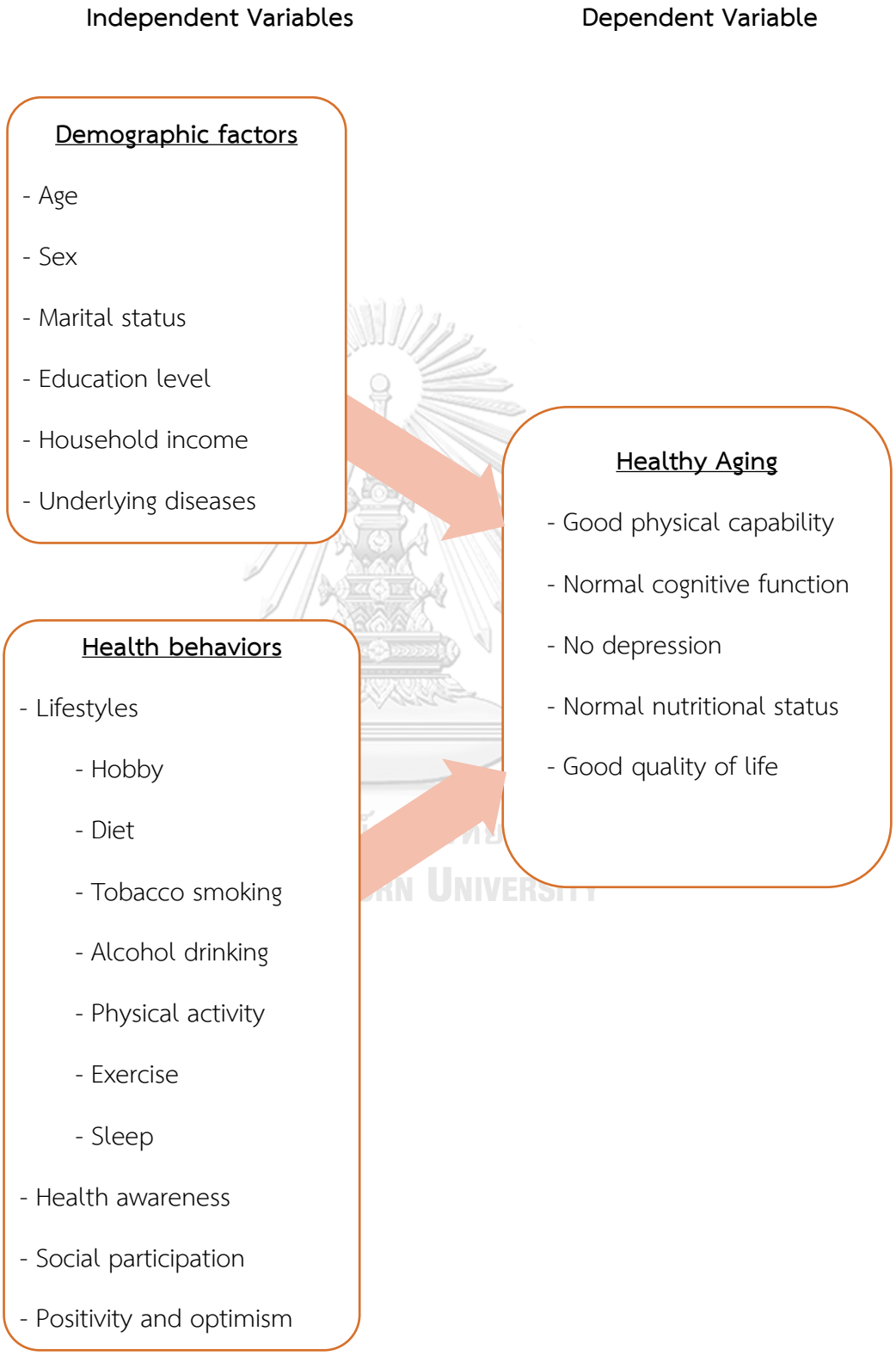
1.3 Hypothesis

1. There is an association between demographic factors and health behaviors with healthy aging

1.4 **Objectives**

1. To find prevalence of healthy aging in Thai urban elderly
2. To identify factors associated with healthy aging in Thai urban elderly

1.5 Conceptual framework



1.6 Operational Definitions

1. **Underlying diseases** are defined as chronic diseases which are comorbidities to individuals such as hypertension, diabetes mellitus type 2 and dyslipidemia.
2. **Hobby** is defined as activity done regularly in leisure time for pleasure.
3. **Healthy aging** is defined as "The process of developing and maintaining the functional ability that enables well-being in older age". The term "healthy aging" is interchangeable with "active aging" or "successful aging". In this study, the concept of healthy aging is based on Bousquet et al' conceptual framework (11). One is considered to be healthy aging only when they are tested with tools to assess physical capability, cognitive function, mental health, nutritional status and quality of life, and score more than the cut points from all of the five tools.
4. **Physical capability** is defined as an individual's functional capacity which include daily activities such as sitting, standing, walking and bathing. One is considered having a good physical capability when they score 20 points from The Barthel Activity of Daily Life Index.
5. **Cognitive function** is defined as cerebral processes which lead to acquiring knowledge through all mechanisms such as attention, memory and reasoning. One is considered having a normal cognitive function when they score more than 21 points, if their educational level is higher than elementary school level, when tested with Thai Mini-Mental State Examination test. If their highest educational

level is elementary school, the cut point is lowered at 17 points. If they are illiterate, the cut point is at 14 points.

6. **Mental health** is defined as a state of psychological and emotional well-being. One is considered to have good mental health or have no depression when they score less than 7 points on The Patient Health Questionnaire test.
7. **Nutritional status** is defined as the condition of the body in those respects influenced by the diet; the levels of nutrients in the body and the ability of those levels to maintain normal metabolic integrity. One is considered to have a good nutritional status when they score more than 11 points from Mini Nutritional Assessment test.
8. **Quality of life** is defined as the general well-being of individuals, outlining negative and positive features of life. One is considered to have a good quality of life when they score more than 60 points from WHOQOL-BREF, an abbreviated version of The World Health Organization Quality of Life assessment tool, WHOQOL-100.
9. **Lifestyles** is defined as individual's way of living. In this study, Lifestyles consist of diet, physical activity, exercise, alcohol drinking, tobacco smoking and sleeping pattern.
10. **Diet** is defined as a sum of food consumed by a person. One is considered to have a good diet regime when they have 3 meals per day and have appropriate

amount of all five food groups which are carbohydrate, protein, fat, vegetables and fruits.

11. **Physical activity** is defined as any body movement from skeletal muscles which requires energy expenditure in daily living. One is considered physically active if they have activities such as walking, stepping up stairs or doing housework and not having a sedentary lifestyle such as office worker who have little or no other activities.
12. **Exercise** is defined as activity which requires physical effort with a purpose to maintain or improve fitness and health. One is considered having exercise regularly when they do exercise more than 2 times a week for at least 3 months.
13. **Alcohol drinking** is defined as consumption of any alcoholic beverages. One is considered having quit drinking only when they have quit for more than 5 years.
14. **Tobacco smoking** is defined as the practice of smoking tobacco or inhaling tobacco smoke. One is considered to be a smoker if they smoke tobacco with any methods such as cigarettes, cigars, pipe smoking or roll-your-own. One is considered to be a quit smoker which considered as normal people who never smoke if they have completely stopped tobacco smoking for at least 20 years.
15. **Sleep** is defined as the natural periodic suspension of consciousness during which the powers of the body are restored. One is considered to have a good sleeping pattern if they have no problem in sleeping at night and do not feel

fatigue during the day. Examples of sleep troubles are insomnia, snoring, sleep walking, sleep apnea and oversleeping.

16. **Health awareness** is defined as to have knowledge and perception of individual's own health status. One is considered to have health awareness when they do annual health check-up for at least five years.
17. **Social participation** is defined as the extent to which individual participates in a range of relationships and social roles in community or society. One is considered to have a good social participation when they have activities with family members or friends or other people at least once a month.
18. **Positivity and Optimism** is defined as a mental attitude reflecting a hope that the outcome of future in general will be positive and desirable.
19. **Thai urban elderly** is defined as Thai individuals aged 60 years old or more who live in the inner Bangkok that consists of 21 districts as follow: Phra Nakhon, Pom Prap Sattru Phai, Samphanthawong, Pathum Wan, Bang Rak, Yan Nawa, Sathon, Bang Kho Laem, Dusit, Bang Sue, Phaya Thai, Ratchathewi, Huai Khwang, Khlong Toei, Chatuchak, Thon Buri, Khlong San, Bangkok Noi, Bangkok Yai, Dindaeng and Watthana.

Chapter II

Literature review

With the objectives to find prevalence and factors related to healthy aging in Thai urban elderly, it is important to understand the process of aging in human being and to know the trends and situations of population aging in Thailand and also across the world. Finally, the most crucial part is to know the concept of healthy aging and how to measure it. Thus, the review of literature in this study focuses on 4 topics as follow:

2.1 Aging

2.2 Trends in population aging

- 2.2.1 Trends in the numbers of older persons
- 2.2.2 Demographic characteristics of the older population
- 2.2.3 Trends in the percentage of older persons
- 2.2.4 Dependency and support ratios

2.3 Healthy aging

- 2.3.1 Definition and conceptual frameworks
- 2.3.2 Prevalence of healthy aging
- 2.3.3 Factors associated with healthy aging

2.4 Measurement tools to assess healthy aging

2.1 Aging

Aging is a process of getting older, represented by the build-up of changes over time which resulted in the decline of body functions (12). The cause and process of aging is very complex and puzzling that until now, there is still no consensus from philosophers and researchers. There are two main proposed theories about aging, damage-based theory and programmed theory. The damage-based theory suggests that aging is a result from DNA damage, wear-and-tear and the accumulation of waste. It has been argued that DNA damage is the most important factor causing aging (13). With DNA damage, the cells in our bodies stop dividing, resulting in a halt of regeneration process and cell death (14). For wear-and-tear theory, some researchers suggested that when many changes are added up, the cells in our bodies will wear out from the repetitive uses (15). The accumulation of waste is another factor in damage-based theory. It focuses on the waste products such as free radicals from cellular processes in our bodies. These waste products interfere with the functioning of cells thus the regenerative process is no longer effective which accompanied by cell death (16). The other theory, programmed theory, believes that how and when we will age has been programmed in advance by our genetics (17). However, aging may be resulted from an overlap of these two main theories or other new theories may be developed in the future. If we can unveil the secret behind aging, there is a possible chance that we can enhance our lifespan.

Besides the biological losses, there are important changes that come with age such as a changeover in social positions, roles and psychological adjustment from the loss of loved ones. Therefore, for the public health sector to successfully respond to aging problem, it is important to not only focus on the physical recovery from biological losses, but also on the adaptation and psychological well-being (1).

2.2 Trends in population aging

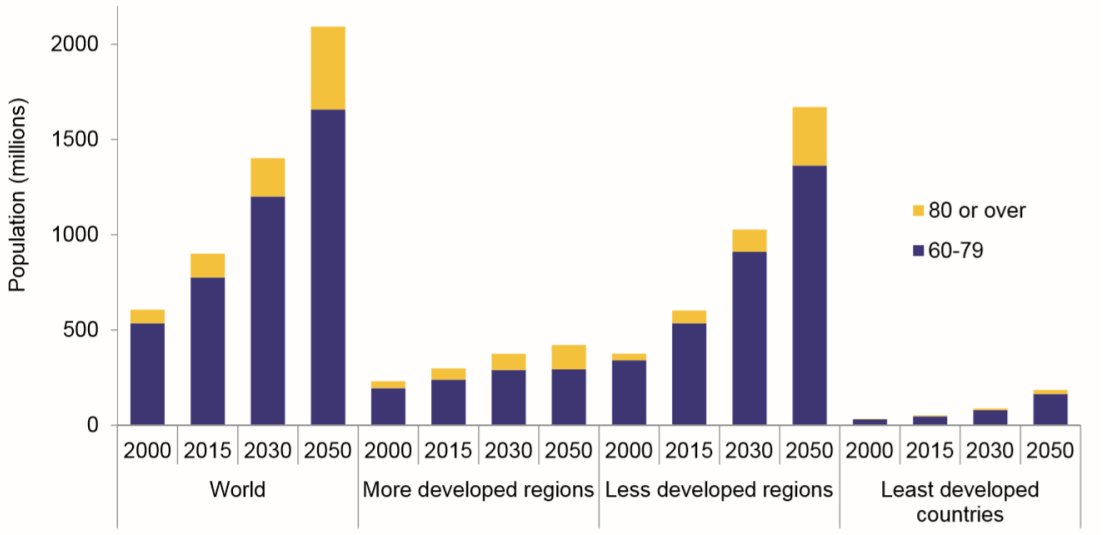
2.2.1 Trends in the numbers of older persons

In 2015, there were 901 million people aged 60 years or over worldwide, an increase of 48% over the 607 million older persons globally in 2000. It is estimated that by 2030, the number of older persons will grow by 56%, to reach 1.4 billion. And population of older persons is expected to increase more than double by 2015 to 2050 globally, reaching about 2.1 billion (figure 1) (18).

Moreover, the number of the “oldest-old” persons, people aged 80 years or over, is increasing more rapidly than the number of older persons overall globally. There were 71 million people aged 80 or over worldwide in 2000. Since then, the number of oldest-old grew by 77% to 125 million in 2015, and in over the next 15 years, it is predicted to increase by 61%, reaching nearly 202 million in 2030. By 2050, there will be 434 million of the oldest-old globally, more than tripled in number since 2015 (figure 1) (18).

Interestingly, about two thirds of the world's older persons live in developing regions and their numbers are growing faster than in the developed regions. The number of aging population in less developed regions had increased for 60% from 376 million in 2000 to 602 million in 2015 and it is expected that by 2050, about 80% of the world's older population will live in less developed regions (18).

Thailand is also facing with an increase of aging population. In 2015, there was 10.7 million of older persons, almost double from around 6 million from 2000. The aging population in Thailand will continue to grow and will rapidly reach almost 23 million by 2050 (figure 2) (2).



Source: United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Ageing 2015 (ST/ESA/SER.A/390).

Figure 1 Population aged 60 years or over by development group in 2000,2015,2030 and 2050

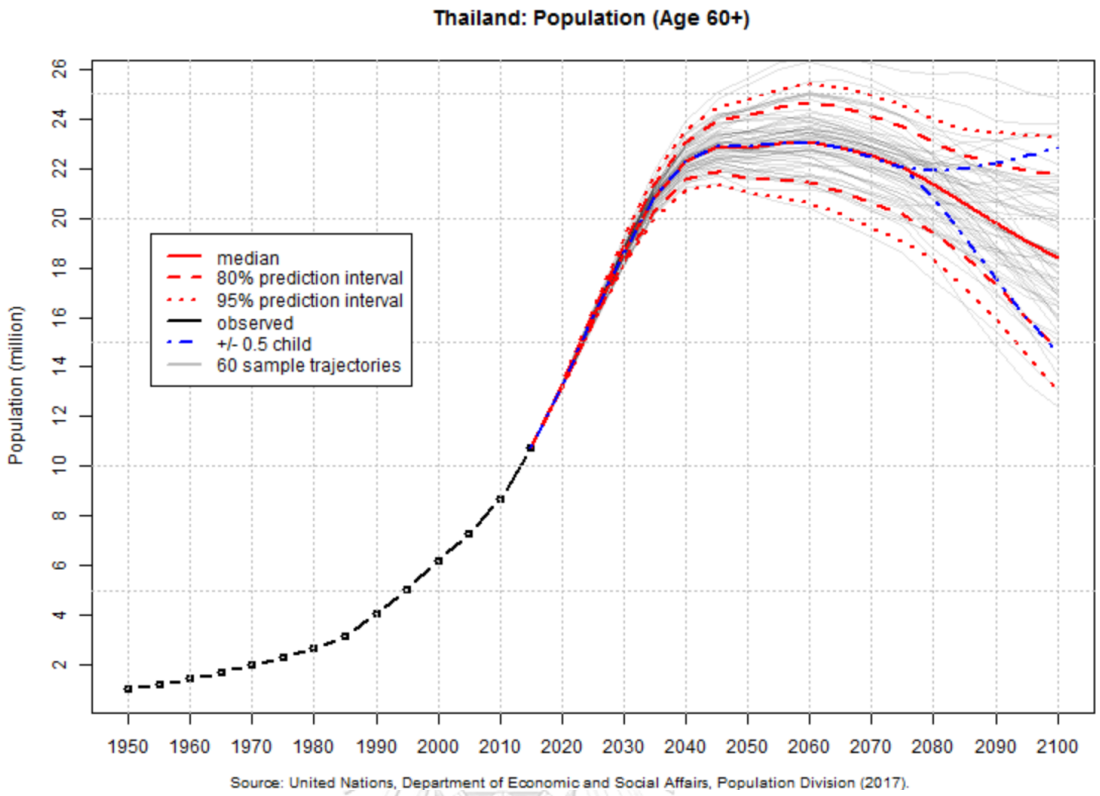
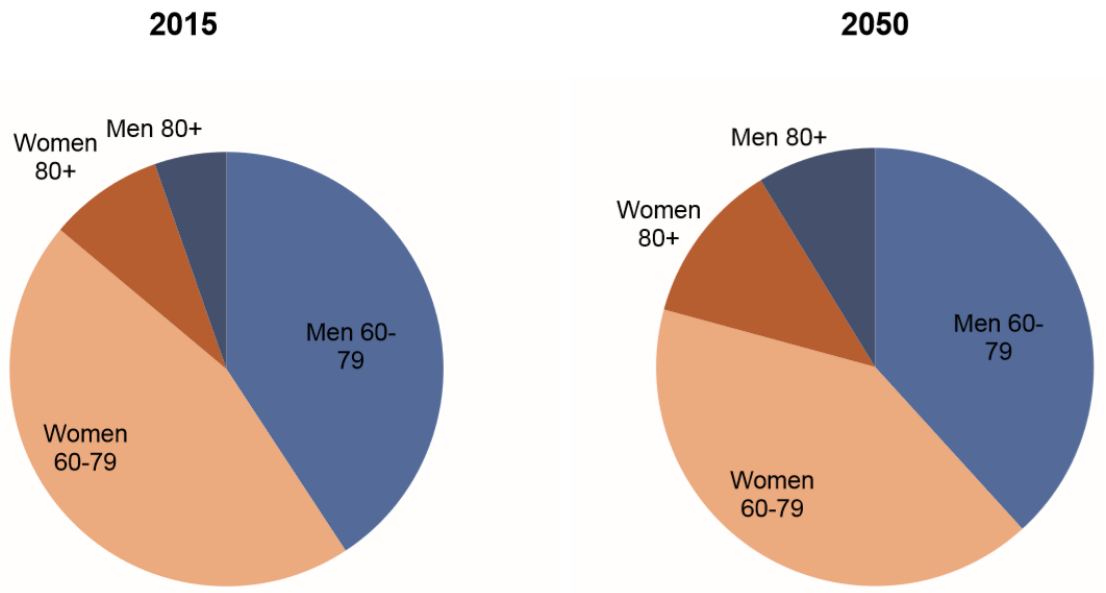


Figure 2 Thailand's population projection of population aged 60 years or over

2.2.2 Demographic characteristics of the older population

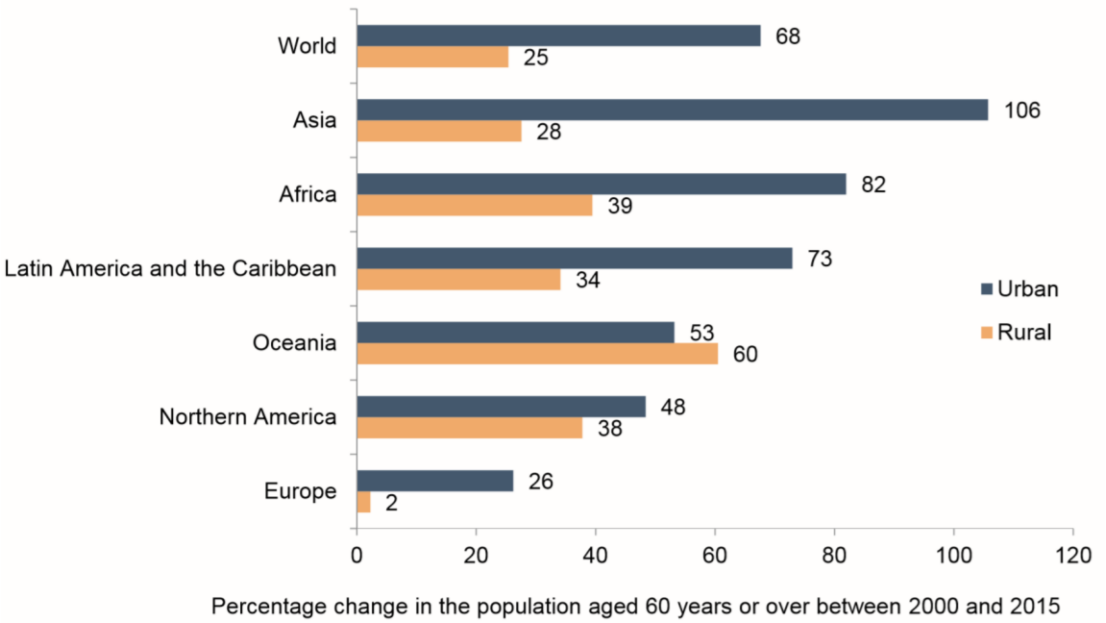
A majority of older persons especially at advanced ages is women. Women tend to live longer than men by an average of 4.5 years during the period of 2010-2015. There was 54% of women out of global population aged 60 years or over and 61% of those aged 80 years or over (figure 3). The sex balance is projected to remain almost unchanged at global level in the coming decades (18).



Source: United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Ageing 2015 (ST/ESA/SER.A/390).

Figure 3 Share of the global older population by age group and sex, 2015 and 2050

Aging population is growing faster in urban areas than in rural areas. There was a 68% increase of people aged 60 years or over in urban areas, compared to a 25% increase in rural area between 2000 and 2015. During this period, Asian aging population in urban areas had been doubled, while there was only about 28% increase in rural areas (figure 4). In addition, more of the older persons tend to reside in urban areas as 58% of the world's older persons lived in these areas in 2015. The proportion of the oldest-old living in urban areas increased from 56% in 2000 to 63% in 2015 (18).



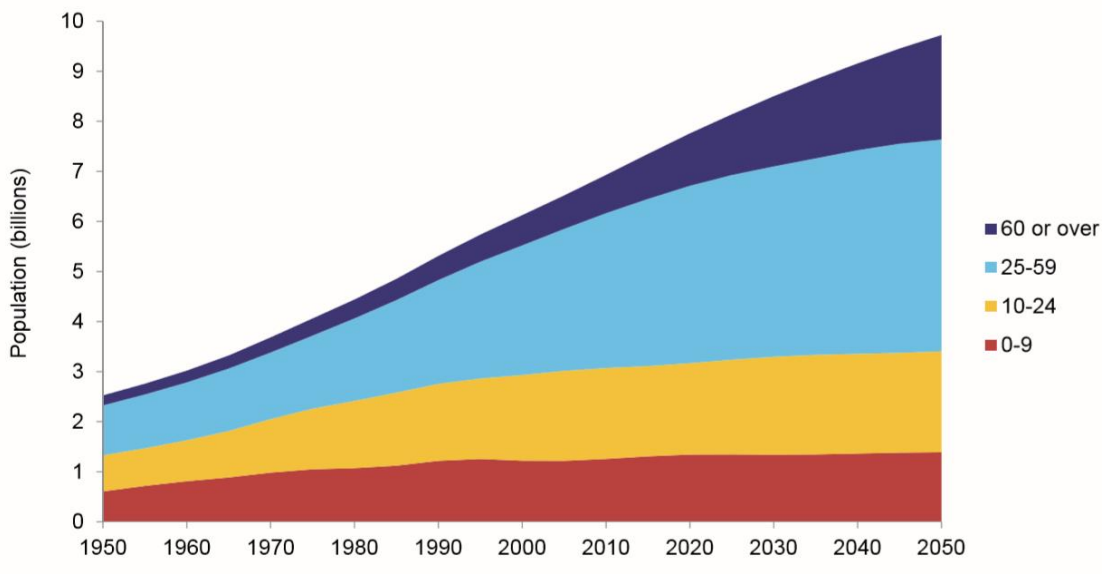
Source: United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Ageing 2015 (ST/ESA/SER.A/390).

Figure 4 Percentage change in the population aged 60 years or over between 2000 and 2015 for the world and region by urban/rural area

2.2.3 Trends in the percentage of older persons

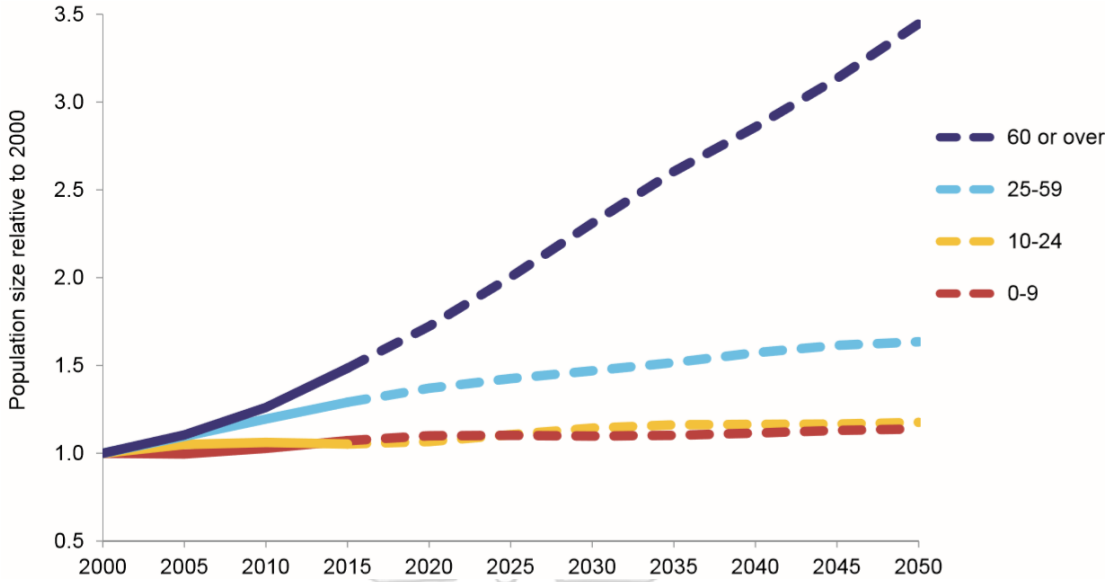
The number of older persons is growing faster than the numbers of people in any other age group. And by 2050, for the first time in human history, there will be more older persons than adolescents and youth aged 10-24 years (2.1 billion versus 2.0 billion) (figure 5) (18). Aging population increased for 48% worldwide from 2000 to 2015, and by 2050, it will continue to grow more than tripled the number since 2000. On the other hand, there will be a very small change in the projected numbers of children under age 10 and adolescents and youth aged 10-24 years. In 2050, the global number of children and adolescents and youth will be increased for 11% from 2000. The number of adults aged 25-59 years is increasing faster than the number of

children, but not as fast as the aging population. There was a 29% increase of the number of adults from 2000 to 2015 and by 2050, there will be 62% more of them than in 2000 (figure 6) (18).



Source: United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Ageing 2015 (ST/ESA/SER.A/390).

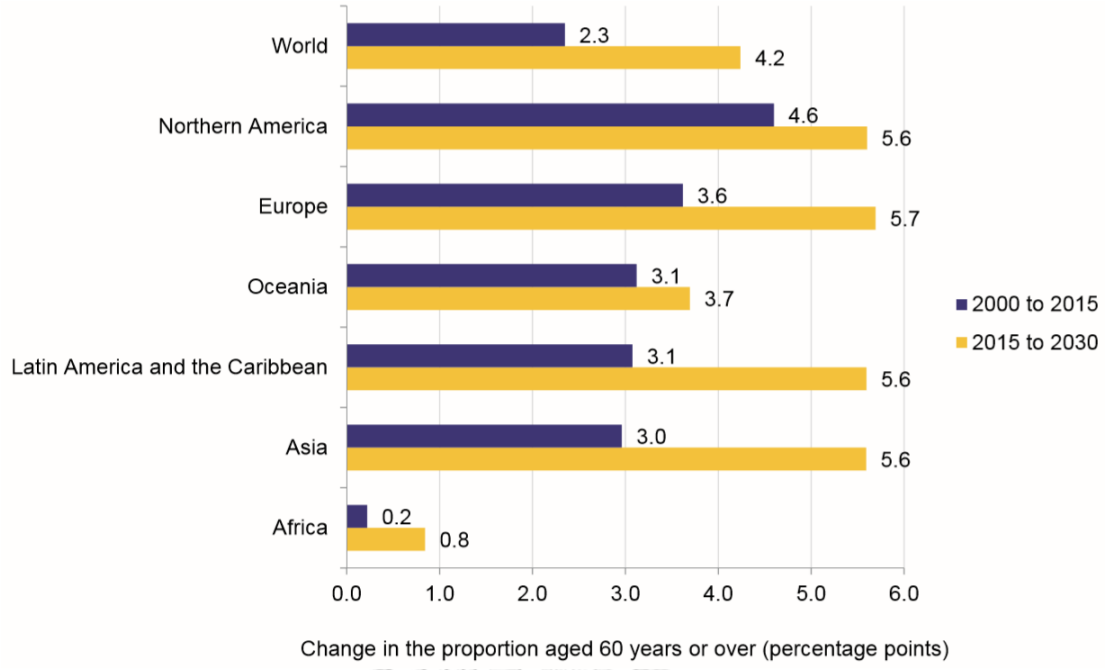
Figure 5 Global population by broad age group, 1950-2050



Source: United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Ageing 2015 (ST/ESA/SER.A/390).

Figure 6 Increase in world population relative to 2000, by broad age group, 2000-2050

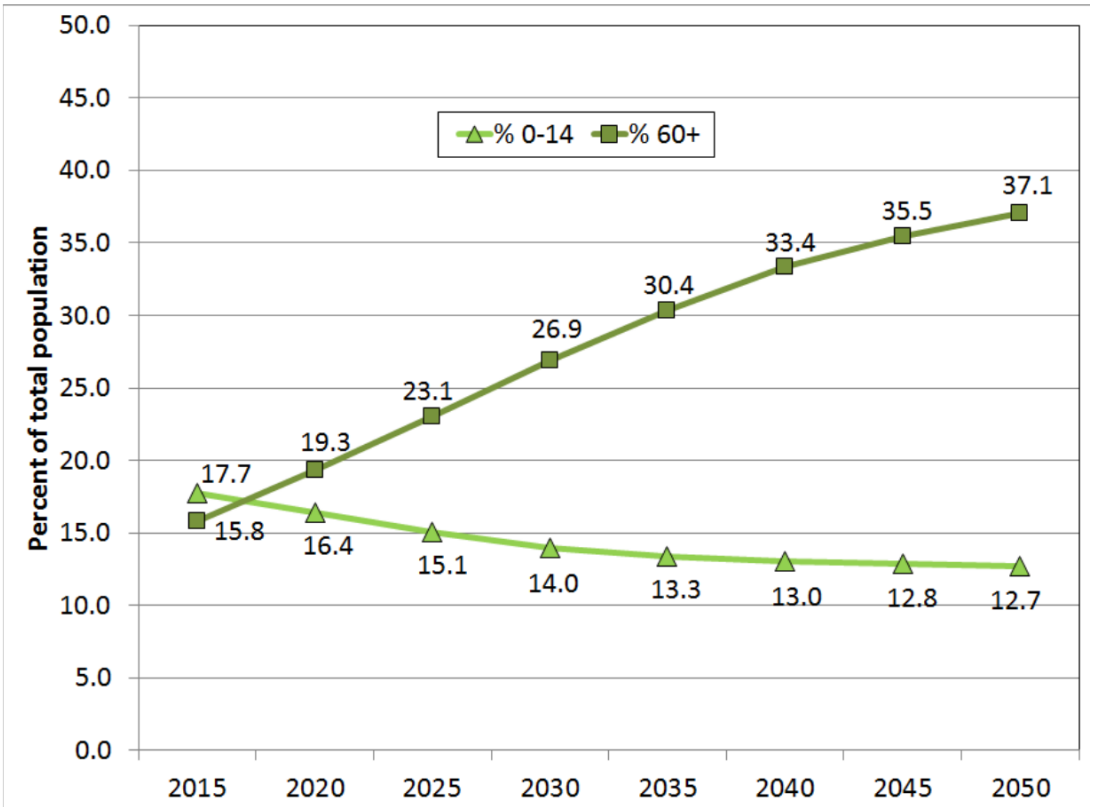
Not only the percentage of people aged 60 years or over is increasing but it is also happening at a faster pace than before. Over the 15 years between 2000 and 2015, the proportion of aging population increased by 2.3 percentage points (from 9.9% to 12.3%). But between 2015 to 2030, it is estimated that the proportion will increase by 4.2 percentage points (from 12.3% to 16.5%). The pace of population aging is accelerating in all six regions (figure 7) (18).



Source: United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Ageing 2015 (ST/ESA/SER.A/390).

Figure 7 Percentage point change in the proportion aged 60 years or over for the world and regions, 2000-2015 and 2015-2030

In many developing countries, aging population is growing much faster than it did in the countries that developed earlier. For example, it took France 115 years, Sweden 85 years, Australia 73 years, the United States 69 years and the United Kingdom 45 years each for the proportion of aging population to increase from 7% to 14%. On the other hand, it has taken China only 34 years and Thailand only 23 years to encounter the same change (18). As for Thailand, the elderly accounted for about 15% of total population in 2015 and the rate is predicted to be increased to 37% in 2050 (figure 8) (2).



Source: 2015 United Nations Population Division population estimates and projections (UN 2015).
Note: Results shown are based on the medium fertility variant that assumes the total fertility rate (TFR) will decline from 1.46 to 1.42 between 2015-20 to 2020-25 and then increase to 1.58 by 2045-50.

Figure 8 Percentage of total population under age 15 and age 60 or older, medium fertility variant, Thailand, 2015-2050

2.2.4 Dependency and support ratios

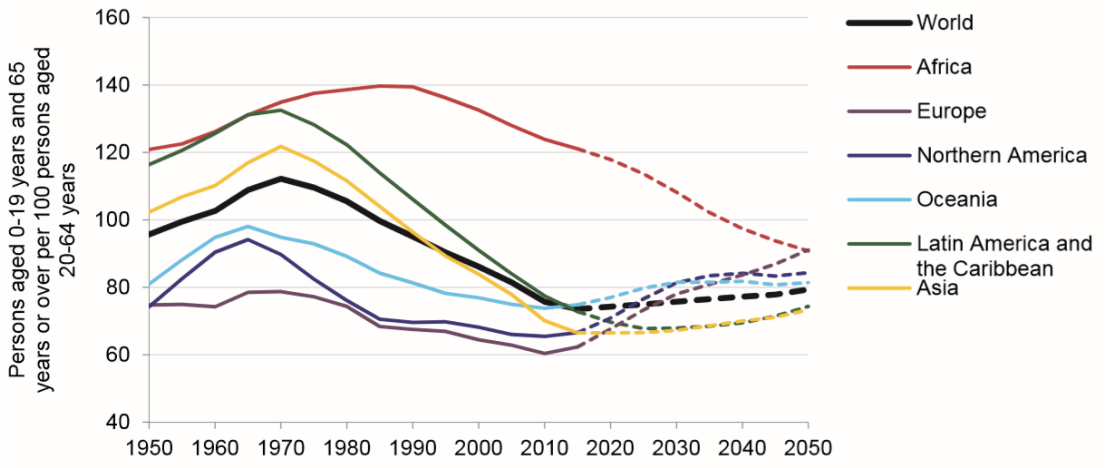
Population aging, which is driven by increasing longevity and declining fertility, suggests that the coming generations can expect to live longer and have fewer adults as potential sources of support in their old age (18).

The commonly used measure of potential support needs is the total dependency ratio. The total dependency ratio is defined here as the ratio of the number of children and young people under age 20 plus the number of persons aged 65 years or over, to the number of persons aged 20 to 64 years. The ratio

provides an indication of how many dependents need to be supported by each person of working age, on average (18).

The total dependency ratio was at its peak during the early-1970s with around 112 dependents per 100 working-age persons. However, the ratio has been in decline constantly since then because of the sustained reductions in global fertility. The ratio fell to reach 74 dependents per 100 working-age persons, which is a historical minimum, in 2015 (18).

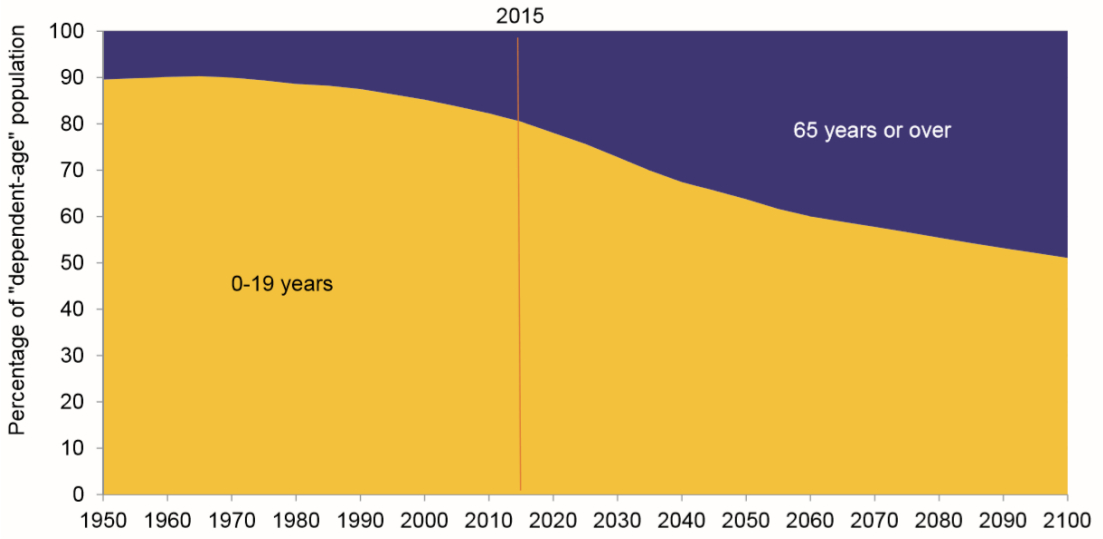
Over the coming decades, the total dependency ratio is projected to rise again because of the rapid growth of aging population. There will be 76 dependents per 100 working-age persons in 2030. And by 2050, there will be 79 dependents per 100 working-age persons. The total dependency ratio is expected to increase in all regions except for Africa (figure 9) (18).



Source: United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Ageing 2015 (ST/ESA/SER.A/390).

Figure 9 Total dependency ratio for the world and regions, 1950-2050

Changes in the total dependency ratio are driven by the changes in the proportions of older persons and of children. In 1950, the older persons accounted for only 10% of the dependent-age population since the majority of dependents globally were children. Nonetheless, the trend was starting to change since the mid-1960s with the proportion of older persons of the world's dependents increased to reach 20% in 2015. And the change of trend will continue to grow steadily that by 2050, older persons will account for 36% of people in the dependent ages worldwide (figure 10) (18).



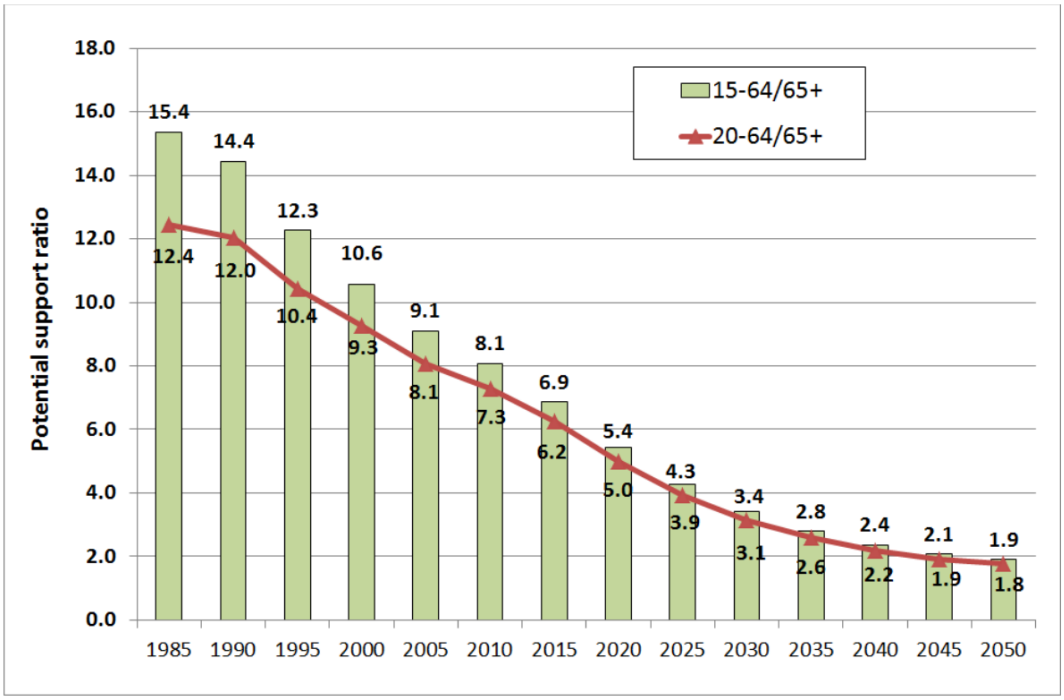
Source: United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Ageing 2015 (ST/ESA/SER.A/390).

Figure 10 Children and young people aged under 20 years and older persons aged 65 years or over as a percentage of the global population in the dependent ages, 1950-2100

A better way to assess the degree of dependency than assuming a status of "dependency" at given ages is to consider the age patterns of production and consumption. Age patterns of production reflect labor earnings and represent the economic contribution of individuals at each age to their own sustenance and to the support of others. In turn, the age patterns of consumption provide a measure of the population's needs at each age. The economic support ratio is defined as the effective number of workers divided by the effective number of consumers in a given population (18).

In many high-income countries, the economic support ratios will start to decline, especially where populations are already aged. For example, the declining of economic support ratios between 2015 and 2050 would diminish economic growth in Japan by about 0.5% per year (18).

In many upper-middle-income countries, the proportion of the working-age population is reaching a peak. In the coming decades, these countries are expected to encounter accelerated population aging and declining economic support ratios, attaining levels similar to those of the high-income countries today. The decline in the support ratio is projected to be more profound in countries with more aged populations, such as Germany, Spain, Republic of Korea, Slovenia and Thailand, where the economic support ratios are projected to decline by more than 0.5% per year over 2015-2050 (18). The economic support ratios of Thailand are as shown in figure 11.



Source: 2015 United Nations Population Division population estimates and projections (UN 2015).
Note: Results shown are based on the medium fertility variant that assumes the total fertility rate (TFR) will decline from 1.46 to 1.42 between 2015-20 to 2020-25 and then increase to 1.58 by 2045-50.

Figure 11 Economic support ratios, Thailand, 1985-2050

2.3 Healthy aging

2.3.1 Definition and conceptual frameworks

Healthy aging as mentioned above is defined by WHO in 2015 as "The process of developing and maintaining the functional ability that enables well-being in older age" (1). The word "healthy aging" is interchangeable with "successful aging" which has been used more often before 2015.

One of the most dominant conceptualizations of healthy aging was defined by Rowe and Kahn in 1997. They defined healthy aging, referred to as "successful aging" as "avoidance of disease and disability, maintenance of high physical and

cognitive function, and sustained engagement in social and productive activities" (19). This concept has been widely used in previous researches to study about successful aging. Most of previous studies conducted to find prevalence of successful aging have used this concept including studies from The United States of America, Mexico and Malaysia. These studies defined successful aging as dependent variable with the criteria of no major disease, no activity of daily living disability, good cognitive functioning and "being actively engaged" (8-10).

However, there has been many commentaries and debates on Rowe and Kahn's conceptualization over the years. With major concerns including that the concept is too narrow with little role of broad structural factors, some researchers stressed the need to establish a better definition and concept of successful aging (20-22).

A newer and broader conceptual framework of healthy aging, referred to as "active and healthy aging" or AHA in the study, was proposed in 2012 by Bousquet et al (Table 1) (11), They identified that there are 3 key domains and 3 key factors that influence healthy aging. The first key domain is physical and cognitive capability over the course of life. Several observational studies have found that physical activity is associated with healthy aging in a positive way, with more physical activity during their life course, they are more likely to age healthily (23, 24).

The second key domain is mental health, social well-being and quality of life along the life course. A study conducted in Louisiana, United States of America in

2016 revealed that social support was associated with individuals' health. Satisfaction with social activities, the amount of time spent outside of home and the number of social clubs that the elderly joined mattered to the health status (24). For psychological and spiritual factors, a Korean study had found a significant link between depression and healthy aging. They also pointed out that leisure activities, high self-esteem and self-achievement were favorable for healthy aging (25).

The third key domain is preventing or delaying an onset of frailty, disability and chronic diseases. Frailty is an age-related syndrome described as the decline in body reserve and resistance to stressors. Frailty heightens the risk of unfavorable health outcomes such as falls, disabilities and mortality. In order to promote healthy aging, we must prevent frailty (26).

For the three key factors which influence healthy aging in Bousquet's conceptual framework, the first factor is Education, lifelong learning, working and caring. A study by Cosco et al (27) showed that an early-life education has an impact on healthy aging in later life, as people with higher education level had better healthy aging trajectories later in life.

The second factor is lifelong lifestyles, health behaviors played an important part in our health outcomes. With fewer behavioral risks such as smoking, drinking and inactivity during middle life, seniors would have a lower disability risk and an increase of survival chance in later life (28). Exercise is known to have a beneficial impact on health and aging is no exception. In the elderly, exercise can help prevent

or reduce frailty, can lower the risk of cardiovascular diseases, can promote a healthy aging of skeletons and muscles and can improve insulin sensitivity (29, 30). Dietary patterns of the elderly also influence how they will age. The studies revealed that higher consumption of protein can decrease risk of frailty. Mediterranean diets which is rich in unsaturated oils, nuts and grains had also been linked to lower frailty risk (31). And consuming high-fiber diet can lower mortality rate (32). Vitamin D is vital for elderly people. The lower the level of vitamin D in plasma, the more the decline of mental health (32). Sleep is another big part of lifestyle factor that can affect health. Insufficient sleep, defined as sleep less than 6 hours a night, leads to many health risks such as a decrease in immune function, brain function and an increase risk to develop hypertension and cardiovascular diseases (6).

The last factor in the conceptual framework is social, economic and physical environment. As the population rises, the world has become more polluted than ever. Air pollution from car emission and industries is known to cause health problems especially respiratory diseases (6). Environment is an important element in health. If the environment is fit for the individuals then they can get better opportunities to maintain their health capacity and functional ability (1). Whenever the interaction between individual and environment is unequal, it will lead to health inequities. For instance, poverty could have many impacts on health across the lifespan. It could limit access to personal and healthcare resources which will result in poor health outcomes in later life (1).

Table 1 Conceptual framework for active and healthy aging from Bousquet et al

Key domains of active and healthy aging
1. Physical and cognitive capability across the life course 2. Psychological and social well-being, mental health, and quality of life across the life course 3. Functioning of underlying physiological systems across the life course, preventing or delaying onset of chronic diseases, frailty, and disability
Key factors influencing active and healthy aging
1. Education, lifelong learning, working, and caring 2. Lifetime lifestyles 3. Lifetime social, economic, and physical environment (including "geographical" environment: rural, urban)

2.3.2 Prevalence of healthy aging

To date, there are limited number of researches which focus on studying prevalence of healthy aging. In 2010, McLaughlin et al (9) conducted a research to study prevalence of successful aging in the United States based on Rowe and Kahn's model. They defined successful aging as having no major disease, no activity of daily living disability, no more than one difficulty with seven measures of physical functioning, obtaining a median or higher score on tests of cognitive functioning and

being actively engaged. They used secondary data from a national survey and the prevalence of successful aging was calculated for adults aged 65 years and over at four time-points. The result showed that prevalence of successful aging was 11.9% in 1998, 11.9% in 2000, 11.0% in 2002 and 10.9% in 2004.

In 2012, Arias-Merino et al (10) conducted a study in Western Mexico to find prevalence of successful aging. They used Rowe and Kahn's model and defined successful aging the same as in McLaughlin et al' study. They used secondary data from the Health, Wellbeing and Aging Study in Jalisco and Colima, Mexico which recruited adults aged 60 years or over, the sample size was equal to 3116. The result showed the prevalence of successful aging at 12.6%.

A study to find prevalence of successful aging in older Malaysians was done in 2012 by Hamid et al (8). They defined successful aging as having no major chronic disease, physical functioning difficulty and maintenance of good psychocognitive functioning. Secondary data from a national survey was used in this data which included adults aged 60 years or over, the sample size was 2742. The prevalence of successful aging was calculated at 13.8%.

In 2014, Gureje et al (33) conducted a study to find profile and determinants of successful aging in Ibadan, Nigeria. They defined successful aging as absence of chronic health conditions, functional independence and satisfaction with life. They recruited 930 adults aged 65 years or over in this study and found prevalence of successful aging at 7.5%.

A population-based study was conducted in Canada to find prevalence of successful aging by Meng in 2014 (34). Meng defined successful aging in the study following Rowe and Kahn's model as absence of major diseases, high cognitive and physical functioning and active engagement with life. Secondary data from Canadian Community Health Survey was used. The result showed that 42% of Canadian adults aged 60 years or over met the criteria for successful aging.

In 2016, Shi et al (35) conducted a study among Chinese elderly living in Longevity Areas in China to find prevalence of successful aging. 2296 adults aged 65 years or over were recruited. Successful aging in this study was defined by having met at least 3 out of 5 criteria which are good self-rated health status, good self-related mood, normal cognitive function which was assessed by using Mini-Mental State Examination, normal activities of daily life and normal physical activity. And the prevalence of successful aging was at 38.81%.

Another population-based study was conducted in Norway in 2017 by Bosnes et al (36). Secondary data from cross-sectional HUNT3 Survey (The Nord-Trondelag Health Study) was used. The study recruited 5773 adults aged 70 years or over. Successful aging was defined based on Rowe and Kahn's model the same as in Meng's study. The result showed overall prevalence of successful aging at 14.5%.

A study about prevalence of successful aging focusing on rural elders living in nursing homes in the northern China was conducted in 2017 by Wu et al (37). Successful aging in this study was defined based on Rowe and Kahn's model as

having few chronic diseases, having good cognitive and physical functioning, having good mental health and active social engagement. The data was collected by interviewing 205 adults aged 60 years or over in the nursing home. The result showed that 17.6% met successful aging criteria.

In Thailand, there is one study that conducted to find prevalence of healthy aging. It was done by using secondary data of 400 older persons in Rayong province from the "Life Happiness of the Elderly in Rayong Province" project in 2011. They used three criteria to define healthy aging which were having a good family relationship, high self-esteem, and high life happiness. They found that 27.5% of the elderly in Rayong province were successful agers (38). However, no study in Thailand have studied about prevalence of healthy aging by using Rowe and Kahn's model or other conceptualizations which cover criteria on physical function, cognitive function, mental health and quality of life.

2.3.3 Factors associated with healthy aging

There are many researches which study about factors or correlates which associated with healthy aging. Among studies of population health, age almost always projects as the most dominant predictor of the states of people's health and the risks of morbidity and mortality they face (18). Age is associated with accruing cell damages which would weaken immune system and diminish body's functions over time. An individual's age also indicates the amount of time he or she may have been

exposed to various health risks whose effects increases over time (1). Accordingly, previous studies found that age is negatively associated with healthy aging (8, 9, 34, 36).

There is a massive diversity in the health status of people at any given age, even though age is a prominent predictor of the average health. That variability is associated with many other factors of health status, such as, genetic factors, individual characteristics, environmental factors and health behaviors. So, there is a vast variation of health profile among the older persons as one 60-year-old might enjoy good health and be totally independent while another at the same age might face multiple morbidities and is in need of health care support (18).

As for individual characteristics, gender appears to be an inconclusive factor to healthy aging. Some studies found that more women met the criteria for healthy aging than men (9, 36, 39). A number of other studies found that male gender is related to healthy aging (35, 40). While many studies found no association of sex and healthy aging (8, 34, 37, 39).

Previous studies found that education level is associated with healthy aging with higher education level indicates more healthy agers (8-10, 27, 36). However, some studies did not find the link between education and healthy aging (34, 36, 37, 39).

Marital status might play a role towards healthy aging as many studies suggest a positive relationship between married status and healthy aging (10, 34, 37). Although other studies found no link between them (9, 36).

Socioeconomic status is a predictor of healthy aging as many studies identified individuals who are better off to be healthier than others (8, 9, 37, 41).

Another important predictors are individual health behaviors. There are evidences which indicate that healthy lifestyles lead to better health statuses (1, 18, 42). Many of the previous studies confirming this knowledge. Non-smokers tend to be healthier than smokers (42). People who take alcohol consumption on a weekly basis, or appropriate alcohol drinkers, tend to be heathier than those who drink more often or do not drink at all (34, 36). Individuals with better nutritional status and people who take Mediterranean diet tend to be healthier than those who are not (31, 32). People who have more physical activity and exercise more will lead healthier lives (6, 29, 34, 42, 43). Good social support and good psychological status have positive effects towards health status (24). More life satisfaction and better perceived health is positively related to healthy aging (34, 36).

Environmental factors also play vital role in healthy aging, with studies stressing the importance of safety home environment and barrier-free external environment to be important correlates to healthy aging (44, 45).

2.4 Measurement tools to assess healthy aging

There is no universal tool to assess healthy aging. Thus, various questionnaires and tests were used to assess aspects of health and well-being of the elderly according to the concept of healthy aging used in each research. There are many variations of tests used in studies of healthy aging, even the studies which used the same concept as Rowe and Kahn's can still vary in the tests used to measure healthy aging. For example, the first criteria of Rowe and Kahn's conceptualization is "high cognitive function". The U.S study measure this criteria by using telephone interview for cognitive status while a study from Malaysia used Automated Geriatric Examination for Computer Assisted Taxonomy, designed for use with the Geriatric Mental State Schedule (AGECAT-GMS) (8, 9). Therefore, the questionnaires and tests used to assess healthy aging can be vary according to different researches and guidelines in different countries.

Healthy aging in this study is based on Bousquet et al' conceptual framework. There are five tests to assess three key domains of healthy aging in this study. All of the tools used to assess healthy aging are recommended by The Ministry of Public Health of Thailand to be used as screening tools for geriatric assessment. The three key domains and five tests used are as follow:

1. Physical and cognitive capability across the life course
    - Use the Barthel Index to assess activities of daily living (ADL)
    - Use Mini-Mental State Examination-Thai version 2002 (MMSE-THAI) to assess cognitive function
2. Psychological and social well-being, mental health, and quality of life across the life course
    - Use Patient Health Questionnaire-9 (PHQ-9) to assess psychological well-being and mental health
    - *Use an* abbreviated version of The World Health Organization Quality of Life assessment tool (WHOQOL-BREF) to assess social well-being and quality of life
3. Functioning of underlying physiological systems across the life course, preventing or delaying onset of chronic diseases, frailty, and disability
    - Use Mini Nutritional Assessment (MNA) to assess functioning of physiological systems

Full example of 5 questionnaires can be found in Appendix C. The details about each of the five tests are as below:

2.4.1 The Barthel Index

For physical capability, the elderly who have no disabilities and can independently do activities of daily living (ADL) are considered healthy (11). The

worldwide tool used to assess ADL is The Barthel Index (46). The Barthel Index was introduced by Dorothea Barthel in 1955 to follow up mobility skills during inpatient rehabilitation (47). This index consists of 10 questions about ADL which include bowels, bladder, grooming, toilet use, feeding, transfer, mobility, dressing, stairs and bathing. The index is scored in one-point increments in which higher score means higher mobility skills and more independent. The maximum score is 20, meaning that the correspondent is totally independent in doing ADL (48).

The interpretation of total score of Barthel Index suggested by Ministry of Public Health, Thailand is as follow (49):

Total score ≥ 12 points: Independent

Total score 5-11 points: Partially dependent

Total score ≤ 4 points: Totally dependent

The index has high test-retest reliability (0.89) and inter-rater reliability (0.95) and also high correlations with other measures of physical disability (0.74-0.8) (46). For Thai version of The Barthel Index, a study conducted to test its validity and reliability was done in 1994 and found a high content validity and high internal consistency with Cronbach's alpha = 0.79 (50).

2.4.2 Mini-Mental State Examination-Thai version 2002 (MMSE-THAI 2002)

For cognitive function, the screening tool that is widely accepted and used in geriatric assessment is Mini-Mental State Examination (MMSE) (51). The

MMSE is a 30-point questionnaire which is globally used in research and clinical settings to measure cognitive impairment. The questionnaire was introduced by Folstein et al (52) in 1975 in order to distinguish functional and organic psychiatric patients. It examines cognitive function in orientation, registration, attention/calculation, recall, language and ability to follow simple commands. The Thai version of this test was officially translated in 2002 by The Ministry of Public Health and has been recommended to be used as a screening tool for cognitive impairment ever since (53).

There are 11 questions in this test with the maximum score of 30. However, the maximum score for the illiterate is 23 since they do not have to answer 3 questions which are related to calculation and written language. The interpretation of the total score to be considered having normal cognitive function is categorized by education level as follow (53):

Illiterate level: More than 14 points out of 23 points

Elementary level: More than 17 points out of 30 points

Higher than elementary level: More than 22 points out of 30 points

Several researchers have studied about validity and reliability of MMSE, for a general community sample, the reliability coefficient ranged from 0.77-0.90. The validity of the test measured as in specificity and sensitivity equal to 80% and 82% respectively (51). Mini-Mental State Examination-Thai version 2002 was

developed by department of medical services, Ministry of Public Health, Thailand. It was validated with standard MMSE in English and adjusted according to educational level. The Thai version also has good content validity and reliability and high specificity (53).

2.4.3 Patient Health Questionnaire-9 (PHQ-9)

The Patient Health Questionnaire-9 (PHQ-9) was developed by Pfizer Inc as an instrument for screening, diagnosing, monitoring and measuring the severity of depression (54). It incorporates Diagnostic and Statistical Manual of Mental Disorders,4th Edition (DSM-IV) depression diagnostic criteria with other leading depressive symptoms into a brief self-report tool. The questionnaire consists of 9 questions asking patients whether they have been bothered by problems related to depression in the past 2 weeks. The patient can answer according to the frequency of related symptoms into Likert scale from 0 (never) to 3 (everyday), with more points given to higher frequency of those symptoms (54). The official Thai version is provided by Pfizer Inc with free access at www.phqscreeners.com.

The interpretation of total score recommended by the Ministry of Public Health, Thailand is as follow (49):

Total score < 7 points: No depressive symptoms

Total score 7-12 points: Mild depression

Total score 13-18 points: Moderate depression

Total score ≥ 19 points: Severe depression

Patient Health Questionnaire-9 (PHQ-9) has high sensitivity (88%) and specificity (88%), the reliability was tested by Kronenke et al in 2001 and found a Cronbach's alpha of 0.89 with the test-retest reliability at 0.84 (54). The Thai version on PHQ-9 was tested and found good sensitivity at 90% and specificity at 89% (55).

2.4.4 Mini Nutritional Assessment (MNA)

The Mini Nutritional Assessment (MNA) is appropriate for malnutrition screening in adults and elderly and should be included in geriatric assessment (56). MNA is a validated nutrition screening and assessment tool which can identify patients who are malnourished or at risk of malnutrition. It was developed almost 20 years ago and it is the most well validate nutrition screening tool for the elderly in clinical use (56). The original version of MNA consists of 18 questions, but the current MNA now comprised of 6 questions. The current version maintains the accuracy and validity of the original version in identifying the elderly who is at risk of malnutrition. The questions in MNA ask the elderly about their appetite, their weight status, their mobility, their neuropsychological problems and their acute illnesses with higher score meaning that the elderly has better nutritional status, the maximum score is 14 points (56).

The interpretation of MNA as recommended by the Ministry of Public Health, Thailand is as follow (49):

Total score 12-14 points: Normal nutritional status

Total score 8-11 points: At risk of malnutrition

Total score 0-7 points: Malnourished

MNA has a sensitivity of 96%, specificity of 98% and positive predictive value of 97% compared to clinical status. The reliability was tested among the elderly persons, the survey has high internal consistency with Cronbach's Alpha at 0.83 and high test-retest reliability with the intraclass correlation coefficient at 0.89 (56). For Thai version of MNA, a study was conducted to find its sensitivity and specificity in cancer patients and found high sensitivity at 95% but low specificity at 35% (57).

2.4.5 An abbreviated version of The World Health Organization Quality of Life assessment tool (WHOQOL-BREF)

The WHOQOL-BREF quality of life assessment was developed by the WHOQOL Group over 20 years ago with fifteen international field centers in order to develop a quality of life assessment which would be applicable cross-culturally (58). The WHOQOL-BREF is *an* abbreviated version of The World Health Organization Quality of Life assessment tool (WHOQOL-100) which comprised of 100 questions to assess quality of life. However, with many questions, the

WHOQOL-100 may require lengthy time for interview and may not be practical. Thus, the WHOQOL-BREF has been developed to provide a short form quality of life assessment. The tool comprises of 26 questions with two items assessing the overall quality of life and general health and the other 24 questions assessing 24 facets of quality of life as in WHOQOL-100 (58). The Thai version which is called WHOQOL-BREF-THAI was officially developed and have high validity with Cronbach's alpha = 0.8406 and high reliability at 0.6515 (59).

The WHOQOL-BREF assesses quality of life in 4 particular domains (58)

1. Physical domain
    - Comprises of 7 questions which are: questions number 3,4,10,15,16,17 and 18
2. Psychological domain
    - Comprises of 6 questions which are: questions number 5,6,7,11,19 and 26
3. Social relationships domain
    - Comprises of 3 questions which are: questions number 20,21 and 22
4. Environment domain
    - Comprises of 8 questions which are: questions number 8,9,12,13,14,23,24 and 25

While question number 1 asks about individual's overall perception of quality of life and question number 2 asks about individual's overall perception of their health.

Of all 26 questions, there are 23 positive direction questions (higher scores denote higher quality of life) and 3 negative direction questions (lower scores denote higher quality of life). The answers are given in Likert scale from 1-5 as follow:

Scale 1: Not at all/Very dissatisfied

Scale 2: A little/Dissatisfied

Scale 3: Moderately/Neither satisfied nor dissatisfied

Scale 4: Mostly/Satisfied

Scale 5: Completely/Very satisfied

Scoring of the WHOQOL-BREF can be done according to these steps (58)

1. Check all 26 items from assessment have a range of 1-5
2. Reverse 3 negatively phrased items (questions number 3,4 and 26)
3. Compute domain scores by adding up scores of each domain
    - Domain 1: Physical (PHYS) = sum score of questions number 3,4,15,16,17 and 18
    - Domain 2: Psychological (PSYCH) = sum score of questions number 5,6,7,11,19 and 26

- Domain 3: Social (SOCIAL) = sum score of questions number 20,21 and 22
- Domain 4: Environmental (ENVI) = sum score of questions number 8,9,12,13,14,23,24 and 25

4. Converting raw scores (PHYS, PSYCH, SOCIAL, ENVI) to transformed scores (PHYS_T, PSYCH_T, SOCIAL_T, ENVI_T) with the maximum scores equal to 100 in each domain. Methods for converting scores is presented in the table 2.
5. Compute overall quality of life score (QOL) by adding up transformed scores of all 4 domains and then divide by 4. Thus, the maximum overall quality of life score is equal to 100

$$QOL = (PHYS\_T + PSYCH\_T + SOCIAL\_T + ENVI\_T) / 4$$

Table 2 Method for converting raw scores to transformed scores

DOMAIN 1		
Raw score	Trasnformed scores	
	4-20	0-100
7	4	0
8	5	6
9	5	6
10	6	13
11	6	13
12	7	19
13	7	19
14	8	25
15	9	31
16	9	31
17	10	38
18	10	38
19	11	44
20	11	44
21	12	50
22	13	56
23	13	56
24	14	63
25	14	63
26	15	69
27	15	69
28	16	75
29	17	81
30	17	81
31	18	88
32	18	88
33	19	94
34	19	94
35	20	100

DOMAIN 2		
Raw score	Trasnformed scores	
	4-20	0-100
6	4	0
7	5	6
8	5	6
9	6	13
10	7	19
11	7	19
12	8	25
13	9	31
14	9	31
15	10	38
16	11	44
17	11	44
18	12	50
19	13	56
20	13	56
21	14	63
22	15	69
23	15	69
24	16	75
25	17	81
26	17	81
27	18	88
28	19	94
29	19	94
30	20	100

DOMAIN 3		
Raw score	Transformed scores	
	4-20	0-100
3	4	0
4	5	6
5	7	19
6	8	25
7	9	31
8	11	44
9	12	50
10	13	56
11	15	69
12	16	75
13	17	81
14	19	94
15	20	100

DOMAIN 4		
Raw score	Transformed scores	
	4-20	0-100
8	4	0
9	5	6
10	5	6
11	6	13
12	6	13
13	7	19
14	7	19
15	8	25
16	8	25
17	9	31
18	9	31
19	10	38
20	10	38
21	11	44
22	11	44
23	12	50
24	12	50
25	13	56
26	13	56
27	14	63
28	14	63
29	15	69
30	15	69
31	16	75
32	16	75
33	17	81
34	17	81
35	18	88
36	18	88
37	19	94
38	19	94

Interpretation of WHOOOL-BREF scores

The four domain scores and overall quality of life score range from 0-100 points. There are 5 levels of quality of life listed according to the scores as follow (60):

0-20 points: Very low quality of life

21-40 points: Low quality of life

41-60 points: Moderate quality of life

61-80 points: Good quality of life

81-100 points: Very good quality of life

The cut-off point for WHOQOL-BREF for quality of life assessment in older adults is at 60 points (61).

Chapter III

Research methodology

3.1 Research design

This study is a cross-sectional study conducted to identify the prevalence of healthy aging and factors associated in Thai urban elderly.

3.2 Study area

The study was conducted at Lumpini park, Bangkok, Thailand as a purposive area. Because Lumpini park is one of the biggest recreational parks in Bangkok and it is located in Pathum Wan district which is at the heart of urban Bangkok. It is a top spot for Thai elderly to go there and have activities or exercise.

3.3 Study population

The study population were the ones who meet these criteria.

Inclusion criteria:

1. Age 60 years old or older
2. Male or female gender
3. Thai nationality
4. Lives in the urban part of Bangkok for at least 10 years
5. Able to respond and give answers to questions asked

Exclusion criteria:

1. Having any psychiatric problem that may interfere with the interview or with memory and judgement

3.4 Sampling technique

This study used quota sampling technique by targeting sex ratio of participants at 1:1 (50% of male participants and 50% of female participants). This ratio is very close to current sex ratio of the total population in Thailand in 2018 at 0.970 (970 males per 1000 females) (2). Researcher and research assistants were on standby at different spots at the park on the interview days in the morning between 7 A.M. to 9 A.M. for about 30 days starting from April 2018 until May 2018. Eligible participants who happened to be there at the same time were invited to join the study with informed consent. Face-to-face interviews were conducted between interviewer and participants within 30 minutes.

3.5 Sample & Sample size

Sample size calculation was done using the formula from Cochran which determines the minimum sample size needed to detect significant differences

$$\text{Sample size (n)} = \frac{Z^2 (p)(1-p)}{d^2}$$

where n = sample size

z = acceptable likelihood of error at 5% = 1.96

p = expected conversion rate, in this study we use prevalence rate of healthy aging from a study conducted in Malaysia (8) = 0.138

d = margin of error = 0.05

So, the least number of samples needed is 182 samples.

In case of a missing data from conducting questionnaire interview, another 10% of the calculated number is added.

$$n = 182 + 10\%(182)$$

$$n = 200$$

Thus, the sample size of this study is equal to 200.

3.6 Measurement tools

The questionnaire used in this study consists of 2 main parts. The first part focuses on demographic data including age, gender, marital status, educational level, household income, and underlying diseases and on individual's health behaviors including hobby, physical activity, exercise, tobacco smoking, alcohol drinking, diet, sleep, health awareness, social participation, and positivity or optimism.

For the first part of the questionnaire, the content was approved by both thesis advisor and thesis co-advisor for validity. The pilot study was conducted at

Lumpini Park to test its reliability with 30 samples, which revealed a Cronbach's alpha = 0.77.

The second part consists of five standardized, validated and reliable tests used to assess healthy aging. In order to be considered healthy agers, participants must be tested and pass the cut points of these five tests below:

1. **<u>The Barthel Index:</u> used to assess physical capability**

   This questionnaire has high content validity and high internal consistency with Cronbach's alpha = 0.79 (50).

   Participants have to score 20 points in this test to be considered to have good physical capability or totally independent physically.

   Researcher have asked for permission from Maryland State Medical Society (MedChi) to use this questionnaire in this research, the permission was granted on 23 March 2018.

2. **<u>Mini-Mental State Examination: Thai version 2002 (MMSE-Thai 2002):</u> used to assess cognitive function**

   MMSE has 80% of specificity and 82% of sensitivity. The reliability coefficient ranged from 0.77-0.90 in general community samples (51).

   Participants have to score according to their educational level as follow to be considered to have good cognitive function:

   Illiterate level: More than 14 points

   Elementary level: More than 17 points

Higher than elementary level: More than 22 points

This questionnaire, as recommended by the Ministry of Public Health of Thailand, can be used as a tool to do cognitive screening in Thai elderly without having to ask for permission.

3. Patient Health Questionnaire-9 (PHQ-9): used to assess mental health

PHQ-9 has specificity of 89% and sensitivity of 90%. It has high reliability with Cronbach's alpha = 0.89 with the test-retest reliability at 0.84 (54).

Participants have to score less than 7 points in this test to be considered to have good mental health and have no depression.

This questionnaire is copyrighted by Pfizer company. The company stated that all Patient Health Questionnaire screeners and translations are downloadable and no permission is required to reproduce, translate, display or distribute them (Appendix C).

4. Mini Nutritional Assessment (MNA): used to assess nutritional status

MNA has a sensitivity of 96% and specificity of 98%. For reliability, the test has high internal consistency with Cronbach's alpha = 0.83 (56).

Participants have to score more than 11 points in this test to be considered to have normal nutritional status.

This questionnaire is under license of Nestle company. The company stated on their website (http://www.mna-elderly.com/mna_forms.html) that no permission is required to reproduce, translate, display or distribute them but the external appearance and content of the form must not be modified.

5. **The World Health Organization Quality of Life Assessment, an Abbreviated Version of WHOQOL-100 Thai Version (WHOQOL-BREF-THAI): used to assess quality of life**

WHOQOL-BREF has high internal consistency with Cronbach's alpha = 0.84. And it also has high discriminant validity in discriminating between the ill and well groups (59).

Participants have to have overall quality of life score of more than 60 points in this test to be considered to have a good quality of life

Researcher have asked for a permission to use this questionnaire in this research. The permission was given by the World Health Organization on 27 March 2018.

3.7 Data collection

Primary data was collected via face-to-face interviews using questionnaires by researcher and research assistants. Before the actual interview, there was a training session for two research assistants to prepare their knowledge and skills in order to be able to conduct the interviews precisely. Researcher and research assistants had

recruited potential participants and informed them about research objectives and research details. If potential participants were vulnerable group such as dementia or disabled then researcher and research assistants would talk to them and observe if they were coherent and able to give answers or not. If they could respond to questions asked then these persons were also included after they agreed to give consent. If during the process of recruiting participants, researcher and research assistants found anyone who was in need of help or care, we would give medical advices according to their conditions. And if there was an urgent condition where we found people who need emergency care, we would take them to Chulalongkorn Hospital.

If the potential participants' characteristics met with inclusion criteria and did not meet with exclusion criteria, then researcher and research assistants would ask for participant's permission to conduct an interview. The informed consent must be signed before conducting the interview. If participants were illiterate who cannot read or write then the informed consent would be stamped with their thumbprint signatures. After that the face-to-face interviews were done using questionnaires. The process took about 20-30 minutes. After finishing the interview, a souvenir was given to show appreciation towards their help in this study. There was no voice recording or camera recording during the interview. The data given by participants was kept confidential and would be destroyed after the research ends.

In process of finding participants, interviewers tried to move around the park at all time except for the time of interview so that we could increase the diversity of characteristics of participants as much as we can. In Lumpini park, there are fixed spots for core activities such as Tai Chi, Yoga, or chess. For example, if the interviewers went across the bridge into a small isle in the middle of the park, we would meet a group of older persons gathered to play chess. So apart from recruiting those joining many activities that the park offers, researcher tried to move around to find the ones to went there to just sit and relax, to have a chat with friends, and also to find those who were not the regulars at the park but happened to be there for whatever reasons on the day of the interview. This method was used mainly because researcher would like to have population sample which could represent the general Thai older persons in urban setting as well as possible.

Moreover, researcher and research assistants had their interviewees' facial recognitions in their memory, thus, if the ones who have already did the interview had wanted to do the interview again, we would have known and would have prevented this situation to happen.

3.8 Data analysis

Descriptive statistics such as mean, standard deviation and percentage were used to describe characteristics of the sample. Chi-square test was used to test if there was any difference among male and female participants. The prevalence of healthy aging was calculated for the total sample and as well as by age group, sex,

educational level, marital status and household income. To determine if socio-demographic characteristics, lifestyles and health behaviors were statistically significant, the unadjusted odds ratio (OR) and 95% confidence interval (95% CI) were calculated using univariate logistic regression analyses. Multivariate logistic regression analyses were then used to determine the association between proposed factors with p-value < 0.20 in previous analyses and healthy aging after adjusting for other covariates.

3.9 Ethical consideration

All participants were informed about the process of the study and voluntarily signed consent form before participating in this study. The data collected in this study was kept confidential. There might be sensitive issues such as questions about income and educational level. The interviewer had not force participants to answer without their willingness. Ethical approval was obtained from the Ethical Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University, Bangkok, Thailand with COA No. 091/2018.

3.10 Limitation

This study was conducted with the elderly who came for recreational activities at Lumpini park, Bangkok. This park offers them breathing exercise, Tai Chi exercise and a few more exercises for the elderly. So, this elderly population tended to have more health awareness and may be healthier compared to the general population. Also, up until present, there is still no universal tool which can be used

to evaluate healthy aging. As a result, many studies used different tools to measure healthy aging which makes it difficult to compare the results with other populations.

3.11 Expected benefit & application

The result of this study can reveal the prevalence rate of healthy aging in Thai urban elderly and also factors that are correlated with healthy aging. These findings can be used as provisional data for the policy makers to help move Thailand towards a healthy aging community in the future. So that Thai elderly can live longer with less burden while having a more quality to life.

3.12 Obstacles and strategies to solve the problems

1. Required a large sample size for face-to-face interview, to conduct this study.
    - Need to recruit at least 2 research assistants
2. There are many aspects to be assessed about healthy aging so the questionnaire may be lengthy and the interview will be time-consuming.
    - Adjust the questionnaire to be precise and brief as possible.
    - There was a preparation process for the interviewers in order to know the questionnaire questions beforehand and practice of communication skills and time management.

Chapter IV

Results

The results include the analyses and interpretations of the primary data derived from 200 Thai urban elderly (100 males and 100 females) at Lumpini park, Bangkok, Thailand.

The results of this research are laid out into 3 parts

4.1 Characteristics of participants

Socio-demographic characteristics, lifestyles and health behaviors of participants are presented by gender with Chi-square test results since it is a statistical method that was used to find the difference of characteristics among male and female gender.

4.2 Prevalence of healthy aging and results of five screening tests

Prevalence of healthy aging was calculated into percentage and presented by gender with Chi-square test results to find the difference between male and female gender. Furthermore, results of all of five screening tests' scores are presented by gender with Mann-Whitney U test results to compare the scores among male and female gender. Finally, the interpretations of five screening tests are also presented after the scores of each test for better understanding.

4.3 Factors associated with healthy aging

Factors, which include socio-demographic characteristics, lifestyles and health behaviors, are presented along with percentage of healthy aging and univariate logistic regression results in order to find significant associations of each factor. Lastly, multivariate logistic regression analyses are presented to identify factors which were significantly associated with healthy aging after adjusting for other covariates.

4.1 Characteristics of participants

A total of 200 participants joined this research with 50% males and 50% females. An average age of all participants was 72.33 with standard deviation equaled to 7.99, with the youngest aged 60 years old and the oldest aged 92 years old. When categorized into four age-group, the data shows that 88 persons (44%) were aged 60 - 69 years old which includes 37 males (18.5%) and 51 females (25.5%). There were 68 persons (34%) who aged 70 -79 years old with 41 males (20.5%) and 27 females (13.5%). There were 40 persons (20%) who aged 80 -89 years old which consisted of equal numbers of males and females (20 males (10%) and 20 females (10%)). Finally, for the 90 years old and over group, there were 4 persons (2%) with an equal male and female numbers (2 persons each or 1% each for male and female). There was no significant difference in age among male and female participants at 95% significant level with $\chi^2 = 5.11$, p-value = .164 (Table 3).

Table 3 Socio-demographic characteristics of participants by gender with Chi-square test (n=200)

Socio-demographic characteristics	Male n (%)	Female n (%)	Total n (%)	χ^2	p-value
Gender	100 (50)	100 (50)	200 (100)		
Age, mean ± SD (min, max)	72.33 ± 7.99 (60, 92)			5.11	.164
60 - 69 years	37 (18.5)	51 (25.5)	88 (44)		
70 - 79 years	41 (20.5)	27 (13.5)	68 (34)		
80 - 89 years	20 (10)	20 (10)	40 (20)		
90+ years	2 (1)	2 (1)	4 (2)		
Marital status				23.43	.000**
Single	8 (4)	20 (10)	28 (14)		
Married	67 (33.5)	33 (16.5)	100 (50)		
Divorced/Separated/ Widowed	25 (12.5)	47 (23.5)	72 (36)		
Education level				8.89	.012*
Elementary school or lower	46 (23)	59 (29.5)	105 (52.5)		
Middle school or high school	21 (10.5)	26 (13)	47 (23.5)		
Bachelor degree or higher	33 (16.5)	15 (7.5)	48 (24)		
Household income, baht/month				5.87	.118
< 30,000	30 (15)	44 (22)	74 (37)		
30,001 - 50,000	23 (11.5)	21 (10.5)	44 (22)		
50,001 - 100,000	29 (14.5)	17 (8.5)	46 (23)		
> 100,000	18 (9)	18 (9)	36 (18)		
Have underlying disease				0.03	.874
Yes	72 (36)	73 (36.5)	145 (72.5)		
No	28 (14)	27 (13.5)	55 (27.5)		

Note: *Significant difference with p-value < .05, **Significant difference with p-value < .01

As for marital status, half of the participants were married (100 persons or 50%) which includes 67 males (33.5%) and 33 females (16.5%). And 36% of the participants (72 persons, of which are 25 males (12.5%) and 47 females (23.5%)), were either divorced, separated or widowed. There were 28 persons (14%) who were single including 8 males (4%) and 20 females (10%). There was a significant difference in marital status among male and female participants at 95% significant level with χ^2 = 23.43, p-value = .000 (Table 3).

Education level is divided into 3 categories which are elementary school or lower, middle school or high school and bachelor degree or higher. A majority of participants (105 persons or 52.5%) finished elementary school or have lower education level which includes 46 males (23%) and 59 females (29.5%). There were 33 males (16.5%) and 15 females (7.5%) or a total of 48 persons (24%) who finished bachelor degree or higher. Lastly, there were 21 males (10.5%) and 26 females (13%) or a total of 47 persons (23.5%) who finished middle or high school. There was a significant difference in education level among male and female participants at 95% significant level with χ^2 = 5.87, p-value = .012 with males tended to have higher education level (Table 3).

Household income consists of 4 categories with the majority of participants (105 persons or 52.5%) earned less than 30,000 baht per month which includes 30 males (15%) and 44 females (22%). A total of 44 persons (22%) had higher

household income at 30,001 – 50,000 baht per month, including 23 males (11.5%) and 21 females (10.5%). About the same number of participants (46 persons or 23%) earned 50,001 – 100,000 baht per month which includes 29 males (14.5%) and 17 females (8.5%). A total of 36 persons (18%) had highest household income with more than 100,000 baht per month including the same numbers of males and females at 18 persons or 9% for each gender. There was no significant difference in household income among male and female participants at 95% significant level with χ^2 = 5.87, p-value = .118 (Table 3).

More than half of the participants had one or more underlying diseases (145 persons or 72.5%) which includes 72 males (36%) and 73 females (36.5%). Only about one-fourth or 55 persons (27.5%) had no underlying diseases, of which are 28 males (14%) and 27 females (13.5%). There was no significant difference in having or not having underlying diseases among male and female participants at 95% significant level with χ^2 = 0.03, p-value = .874 (Table 3).

Table 4 Disease patterns of participants who have underlying diseases with Chi-square test (n=145)

Disease patterns	Male n (%)	Female n (%)	Total n (%)	χ^2	p-value
Have underlying diseases	72 (49.7)	73 (50.3)	145 (100)	13.82	.054
Multiple diseases	24 (16.5)	41 (28.3)	65 (44.8)		
Hypertension	31 (21.4)	18 (12.4)	49 (33.8)		
Dyslipidemia	4 (2.8)	6 (4.1)	10 (6.9)		
Diabetes mellitus	2 (1.4)	4 (2.8)	6 (4.1)		
Heart disease	3 (2.1)	2 (1.4)	5 (3.4)		
Respiratory disease	4 (2.8)	0 (0)	4 (2.8)		
Cancer	2 (1.4)	1 (0.7)	3 (2.1)		
Others	2 (1.4)	1 (0.7)	3 (2.1)		

One of the important characteristics of older persons is underlying disease. Of all 200 participants in this research, 145 persons had underlying diseases (72.5%). There were 72 males (49.7%) and 73 females (50.5%) among participants who had underlying disease. Almost half of them had multiple diseases which accounted for 44.8% (65 persons), of which are 24 males (16.5%) and 41 females (28.3%). Hypertension is next on the list with 49 persons (33.8%) having this disease, among them were 31 males (21.4%) and 18 females (12.4%). These first two disease patterns accounted for almost 80% of all diseases that the participants were having. Dyslipidemia follows by distantly with 10 persons (6.9%) which includes 4 males (2.8%) and 6 females (4.1%). Next is diabetes mellitus, with 10 persons (6.9%) of which are 2 males (1.4%) and 4 females (2.8%); heart disease, with 5 persons (3.4%)

of which are 3 males (2.1%) and 2 females (1.4%); respiratory disease, with 4 persons (2.8%) of which are all males; cancer and other diseases, with 3 persons (2.1%) of which are 2 males (1.4%) and 1 females (0.7%) for each category respectively (Table 4)

Lifestyles characteristics of participants is presented in Table 5. Among male and female participants, there was a significant difference at 95% significant level in their hobbies with χ^2 = 24.09, p-value = .000. With more male participants enjoyed gardening (10 males or 5% versus 1 females or 0.5%), reading (15 males or 7.5% versus 7 females or 3.5%) and watching television (19 males or 9.5% versus 10 females or 5%). While female participants tended to do housework more than their male counterparts (17 females or 8.5% versus 3 males or 1.5%). About the same number of male and female participants had exercise as their hobbies (36 males or 18% and 44 females or 22%). Furthermore, 17 males (8.5%) and 21 females (10.5%) had other category of hobbies. In total, the majority of participants, 80 persons (40%), had exercise as their hobbies followed by 'others' hobby category, 38 persons (19%); watching television, 29 persons (14.5%); reading, 22 persons (11%); doing housework, 20 persons (10%); and gardening, 11 persons (5.5%). There was a significant difference in hobbies among male and female participants at 95% significant level with χ^2 = 24.09, p-value = .000 (Table 5).

Table 5 Lifestyles and health behaviors of participants by gender with Chi-square test (n=200)

Lifestyles/ health behaviors	Male n (%)	Female n (%)	Total n (%)	χ^2	p-value
Hobbies				24.09	.000**
Exercise	36 (18)	44 (22)	80 (40)		
Watching television	19 (9.5)	10 (5)	29 (14.5)		
Reading	15 (7.5)	7 (3.5)	22 (11)		
Doing housework	3 (1.5)	17 (8.5)	20 (10)		
Gardening	10 (5)	1 (0.5)	11 (5.5)		
Others	17 (8.5)	21 (10.5)	38 (19)		
Health awareness				0.80	.370
No	37 (18.5)	31 (15.5)	68 (34)		
Yes	63 (31.5)	69 (34.5)	132 (66)		
Tobacco smoking				72.34	.000**
Never	45 (22.5)	99 (49.5)	144 (72)		
Yes	42 (21)	1 (0.5)	43 (21.5)		
Have quit	13 (6.5)	0 (0)	13 (6.5)		
Alcohol drinking				89.86	.000**
Never	38 (19)	100 (50)	138 (69)		
Yes	47 (23.5)	0 (0)	47 (23.5)		
Have quit	15 (7.5)	0 (0)	15 (7.5)		
Social participation				13.03	.000**
Inactive	45 (22.5)	21 (10.5)	66 (33)		
Active	55 (27.5)	79 (39.5)	134 (67)		
Positivity and optimism				1.30	.254
No	60 (30)	52 (26)	112 (56)		
Yes	40 (20)	48 (24)	88 (44)		
Physical activity				1.50	.220
Inactive	24 (12)	17 (8.5)	41 (20.5)		
Active	76 (38)	83 (41.5)	159 (79.5)		

Exercise				6.42	.093
None	14 (7)	12 (6)	26 (13)		
Less than 2-3 times/week	27 (13.5)	16 (8)	43 (21.5)		
More than 2-3 times/week	40 (20)	57 (28.5)	97 (48.5)		
Everyday	19 (9.5)	15 (7.5)	34 (17)		
Sleeping troubles				4.50	.034*
No	58 (29)	43 (21.5)	101 (50.5)		
Yes	42 (21)	57 (28.5)	99 (49.5)		
Proper diet intake				5.85	.016*
No	24 (12)	11 (5.5)	35 (17.5)		
Yes	76 (38)	89 (44.5)	165 (82.5)		

Note: *Significant difference with p-value < .05, **Significant difference with p-value < .01

A total of 132 persons (66%) which includes 63 males (31.5%) and 69 females (34.5%) had good health awareness. In contrast, 37 males (18.5%) and 31 females (15.5%) or a total of 68 persons (34%) did not have health awareness in this study. There was no significant difference in health awareness among male and female participants at 95% significant level with χ^2 = 0.80, p-value = .370 (Table 5).

For tobacco smoking, a total of 43 persons (21.5%) smoked tobacco which includes 42 males (21%) and only 1 female (0.5%). However, the majority of participants, 144 persons or 72%, have never smoke tobacco, which includes 45 males (22.5%) and 99 females (49.5%). Only a small number of 13 males (6.5%) have quit smoking. There was a significant difference in tobacco smoking among male and female participants at 95% significant level with χ^2 = 72.34, p-value = .000 (Table 5).

The same trend is also identified for alcohol drinking. With 47 persons or 23.5% (all males) drink alcohol while 100 females (50%) and 38 males (19%) or a total of 138 persons (69%) have never drunk alcohol. And there were only 15 males (7.5%) who have already quit drinking. There was a significant difference in alcohol drinking among male and female participants at 95% significant level with χ^2 = 89.86, p-value = .000 (Table 5).

There was a significant difference in social participation among male and female participants at 95% significant level with χ^2 = 13.03, p-value = .000. With a total of 134 persons (67%) being socially active (55 males or 27.5% versus 79 females (39.5%). While 66 persons (33%), of which are 45 males (22.5%) and 21 females (10.5%) were socially inactive (Table 5). As for positivity and optimism, more than half of the participants (134 persons or 67%) had positivity and optimism, of which are 40 males (20%) and 48 females (24%). While 60 males (30%) and 52 females (26%) or a total of 112 persons (56%) did not have positivity and optimism. There was no significant difference in positivity and optimism among male and female participants at 95% significant level with χ^2 = 1.30, p-value = .254 (Table 5).

Most of the participants (159 persons or 79.5%) were considered having active physical activity, of which are 76 males (38%) and 83 females (41.5%). While a small portion of 20.5% or a total of 41 persons which includes 24 males (12%) and 17 females (8.5%) were having inactive physical activity. There was no significant

difference in physical activity among male and female participants at 95% significant level with χ^2 = 1.50, p-value = .220 (Table 5).

For exercise, a small number of 26 persons (13%) did not exercise, of which are 14 males (7%) and 12 females (6%), while 43 persons (21.5%) which includes 27 males (13.5%) and 16 females (8%) exercised less than 2-3 times per week. Most of the participants (a total of 97 persons or 48.5%, 40 males (20%) and 57 females (28.5%)) exercised more than 2-3 times/week but not every day. There were 34 persons (17%) who exercised every day which includes 19 males (9.5%) and 15 females (7.5%). There was no significant difference in exercise among male and female participants at 95% significant level with χ^2 = 6.42, p-value = .093 (Table 5).

About half of the participants faced with troubles sleeping with a total number of 99 persons (49.5%), of which are 42 males (21%) and 57 females (28.5%). However, 101 persons (50.5%) did not have these problems which includes 58 males (29%) and 43 females (21.5%). There was a significant difference in sleeping troubles among male and female participants at 95% significant level with χ^2 = 4.50, p-value = .034 (Table 5).

The last part of lifestyle is about diet intake. The majority of participants had proper diet intake with a total of 165 persons (82.5%), of which are 76 males (38%) and 89 females (44.5%). While only 35 persons (17.5%) did not have proper diet intake which includes 24 males (12%) and 11 females (5.5%). There was a significant

difference in diet intake among male and female participants at 95% significant level with χ^2 = 5.85, p-value = .016 (Table 5).

4.2 Prevalence of healthy aging and results of five screening tests

There was a total of 191 persons (95.5%) who met the first criteria of healthy aging which is normal physical capability, including 96 males (48%) and 95 females (47.5%). The second criteria, normal cognitive function, was met by 193 persons (96.5%) which includes 97 males (48.5%) and 96 females (48%). Normal mental health or no depression which is the third criteria, was met by 175 persons (87.5%), of which are 88 males (44%) and 87 females (43.5%). The fourth criteria, normal nutritional status, was met by 179 persons (89.5%) including 89 males (44.5%) and 90 females (45%). The last criteria which is good quality of life was met by 154 persons (77%), of which are 70 males (35%) and 84 females (42%). The numbers and percentage of older persons who met all of five criteria above to be considered healthy agers were 132 persons (66%), of which are 64 males (32%) and 68 females (34%). In conclusion, the prevalence of healthy aging of Thai urban elderly was at 66% (Table 6).

Table 6 Numbers and percentage of older persons meeting healthy aging criteria by gender with Chi-square test (n=200)

Criteria	Male n (%)	Female n (%)	Total n (%)	χ^2	p-value
Good physical capability	96 (48)	95 (47.5)	191 (95.5)	0.12	.733
Normal cognitive function	97 (48.5)	96 (48)	193 (96.5)	0.15	.700
No depression	88 (44)	87 (43.5)	175 (87.5)	0.05	.831
Normal nutritional status	89 (44.5)	90 (45)	179 (89.5)	0.05	.818
Good quality of life*	70 (35)	84 (42)	154 (77))	5.54	.019
Healthy Aging	**64 (32)**	**68 (34)**	**132 (66)**	**0.36**	**.550**

Note: *Significant difference with p-value < .05

There was no significant difference in all criteria except for quality of life among males and females at 95% significant level with chi-square values and p-values are as follow. For physical capability, χ^2 = 0.12, p-value = .733; for cognitive function, χ^2 = 0.15, p-value = .700; for mental health, χ^2 = 0.05, p-value = .831; for nutritional status, χ^2 = 0.05, p-value = .818; for quality of life which is the only criteria that differed among male and female gender, χ^2 = 5.54, p-value = .019; and finally for healthy aging, χ^2 = 0.36, p-value = .550 (Table 6).

The results of five screening tests are presented below from Table 7 – Table 19.

Table 7 **The Barthel index score results in physical capability screening with Mann-Whitney U test by gender (n=200)**

	Barthel index scores			p-value
	Mean ± SD	Minimum	Maximum	
Total	19.83 ± 0.86	13	20	
Gender				.713
Male	19.88 ± 0.67	15	20	
Female	19.78 ± 1.02	13	20	

The average score of the Barthel test was 19.83 out of 20 with standard deviation equaled to 0.86. The average score of the Barthel test for male was 19.88 ± 0.67 while for female was 19.78 ± 1.02. The minimum score for male was 15, while for female was 13. The maximum score for both gender was 20. When using Mann-Whitney U test to identify differences of Barthel scores among male and female gender, the result shows that there was no significant difference in scores among male and female participants with p-value = .713 (Table 7)

Table 8 **Interpretation of the Barthel index to assess physical capability by gender (n=200)**

Physical capability	Male n (%)	Female n (%)	Total n (%)
Totally independent	96 (48)	95 (47.5)	191 (95.5)
Partially dependent	4 (2)	5 (2.5)	9 (4.5)

Of all 200 participants, 191 persons (95.5%) which includes 96 males (48%) and 95 females (47.5%) were totally independent physically. Only 9 persons (4.5%),

including 4 males (2%) and 5 females (2.5%) were partially dependent physically (Table 8).

Table 9 MMSE-Thai 2002 test results in screening for cognitive impairment by gender (n=200)

Cognitive function	Male n (%)	Female n (%)	Total n (%)
Normal	97 (48.5)	96 (48)	193 (96.5)
Cognitive impairment	3 (1.5)	4 (2)	7 (3.5)

Mini-Mental State Examination: Thai version 2002 (MMSE-Thai 2002) was used in this study to screen for cognitive impairment. The result shows that 193 persons (96.5%) which includes 97 males (48.5%) and 96 females (48%) had normal cognitive function. On the other hand, 7 persons (3.5%), including 3 males (1.5%) and 4 females (2%), had cognitive impairment (Table 9).

Table 10 PHQ-9 test score results in screening for depressive symptoms with Mann-Whitney U test by gender (n=200)

	PHQ-9 scores			p-value
	Mean ± SD	Minimum	Maximum	
Total	2.61 ± 2.70	0	9	
Gender				.548
Male	2.55 ± 2.80	0	9	
Female	2.67 ± 2.62	0	9	

The average score on Patient Health Questionnaire-9 (PHQ-9) was 2.61 with standard deviation equaled to 2.70. The minimum score was 0 for both male and female and the maximum score was 9 for both gender. The average scores were not

significantly different between male and female gender with p-value from Mann-Whitney U test = .548. The average PHQ-9 score of male participant was 2.55 ± 2.80 and the average PHQ-9 score of female participants was 2.67 ± 2.62 (Table 10).

Table 11 Interpretation of PHQ-9 test to screen for depressive symptoms by gender (n=200)

Mental health	Male n (%)	Female n (%)	Total n (%)
Normal	88 (44)	87 (43.5)	175 (87.5)
Mild depressive symptoms	12 (6)	13 (6.5)	25 (12.5)
Severe depressive symptoms	0	0	0

Mental health of participants was assessed by PHQ-9 test. The result shows that 175 persons (87.5%) which includes 88 males (44%) and 87 females (43.5%) had normal mental health status. However, 25 persons (12.5%), of which are 12 males (6%) and 13 females (6.5%) had mild depressive symptoms. No participants were found to have severe depressive symptoms according to the test (Table 11).

Table 12 MNA test score results in screening for malnutrition with Mann-Whitney U test by gender (n=200)

	MNA scores			p-value
	Mean ± SD	Minimum	Maximum	
Total	12.79 ± 0.91	10	14	
Gender				.700
Male	12.77 ± 0.89	11	14	
Female	12.81 ± 0.94	10	14	

Nutritional status of participants was assessed by MNA test. The average score for male was 12.77 ± .89, and for female was 12.81 ± .94. Total average score equaled to 12.79 ± .91. The minimum score for female was lower than male (10 for female, 11 for male), while the maximum score was equal to the maximum score of the test at 14. When using Mann-Whitney U test to test for differences of MNA scores among male and female gender, the result shows that there was no significant difference in scores among male and female participants with p-value = .700 (Table 12).

Table 13 Interpretation of MNA test to screen for malnutrition by gender (n=200)

Nutritional status	Male n (%)	Female n (%)	Total n (%)
Normal	89 (44.5)	90 (45)	179 (89.5)
Risk for malnutrition	11 (5.5)	10 (5)	21 (10.5)
Malnutrition	0	0	0

MNA test result shows that a majority of participants had normal nutritional status, including 89 males (44.5%) and females (45%) or a total of 179 persons (89.5%). Only 21 persons (10.5%) which includes 11 males (5.5%) and 10 females (5%) had risk for malnutrition. However, none of the participants had malnutrition (Table 13).

Table 14 WHOQOL-BREF test score results in testing quality of life with Mann-Whitney U test by gender (n=200)

	WHOQOL-BREF scores			p-value
	Mean ± SD	Minimum	Maximum	
Total	67.22 ± 9.77	38	99	
Gender				.369
Male	66.05 ± 11.43	38	99	
Female	68.39 ± 7.65	50	89	

The average score of WHOQOL-BREF test was 67.22 ± 9.77. Score of male gender was lower with the average score at 66.05 ± 11.43, while the average score for female was 68.39 ± 7.65. Male had lowest score at 38, while the minimum score for female was 50. The highest score for male was 99, while for female was 89. There was no significant difference in WHOQOL-BREF scores among male and female participants when using Mann-Whitney U test with p-value = .369 (Table 14).

Table 15 Interpretation of WHOQOL-BREF in testing on quality of life by gender (n=200)

Quality of life	Male n (%)	Female n (%)	Total n (%)
Very good quality of life	5 (2.5)	7 (3.5)	12 (6)
Good quality of life	65 (32.5)	77 (38.5)	142 (71)
Moderate quality of life	27 (13.5)	16 (8)	43 (21.5)
Low quality of life	3 (1.5)	0 (0)	3 (1.5)
Very low quality of life	0 (0)	0 (0)	0 (0)

WHOQOL-BREF test was used to examine quality of life, its scores can be interpreted into 5 categories as follow: “very good quality of life”, which is the best category, there were 12 persons (6%) which includes 5 males (2.5%) and 7 females (3.5%) in this category; the majority of participants fell into the next category which is “good quality of life”, with 65 males (32.5%) and 77 females (38.5%) or a total of 142 persons (71%); the third category is “moderate quality of life” which accounted for 43 persons (21.5%), of which are 27 males (13.5%) and 16 females (8%); the next category is low quality of life, with 3 males (1.5%) and no female fell into this category; lastly, there was no participants who categorized into “very low quality of life” category (Table 15).

Furthermore, the WHOQOL-BREF assesses quality of life in 4 particular domains; physical domain, psychological domain, social domain and environmental domain. Thus, the scores of each domain are presented in the following tables (Table 16 – Table 19).

Table 16 **WHOQOL-BREF: Physical domain score results with Mann-Whitney U test by gender (n=200)**

	WHOQOL-BREF: Physical domain scores			p-value
	Mean ± SD	Minimum	Maximum	
Total	68.09 ± 12.25	31	94	
Gender				.953
Male	67.41 ± 13.63	31	94	
Female	68.76 ± 10.72	38	94	

The average score of WHOQOL-BREF: Physical domain was 68.09 ± 12.25. The average score for male gender was 67.41 ± 13.63, for female gender was 68.76 ± 10.72. The minimum score for male was lower than female (31 for male, 38 for female) while the maximum score was qual for both genders at 94. There was no significant difference in WHOQOL-BREF: Physical domain scores among male and female participants when using Mann-Whitney U test with p-value = .953 (Table 16).

Table 17 **WHOQOL-BREF: Psychological domain score results with Mann-Whitney U test by gender (n=200)**

	WHOQOL-BREF: Psychological domain scores			p-value
	Mean ± SD	Minimum	Maximum	
Total	67.48 ± 12.29	31	100	
Gender				.321
Male	65.58 ± 13.81	31	100	
Female	69.37 ± 10.28	44	94	

The average score of WHOQOL-BREF: Psychological domain was 67.48 ± 12.29. The average score for male gender was 65.58 ± 13.81, for female gender was

69.37 ± 10.28. The minimum score for male was lower than female (31 for male, 44 for female) while the maximum score was 100 for male gender and 94 for female gender. There was no significant difference in WHOQOL-BREF: Psychological domain scores among male and female participants when using Mann-Whitney U test with p-value = .321 (Table 17).

Table 18 WHOQOL-BREF: Social domain score results with Mann-Whitney U test by gender (n=200)

	WHOQOL-BREF: Social domain scores			p-value
	Mean ± SD	Minimum	Maximum	
Total	64.86 ± 12.53	31	100	
Gender				.139
Male	63.67 ± 14.03	31	100	
Female	66.05 ± 10.28	50	100	

The average score of WHOQOL-BREF: Social domain was 64.86 ± 12.53. The average score for male gender was 63.67 ± 14.03, for female gender is 66.05 ± 10.28. The minimum score for male was lower than female (31 for male, 50 for female) while the maximum score was equal for both genders at 100. There was no significant difference in WHOQOL-BREF: Social domain scores among male and female participants when using Mann-Whitney U test with p-value = .139 (Table 18).

Table 19 **WHOQOL-BREF: Environmental domain score results with Mann-Whitney U test by gender (n=200)**

	WHOQOL-BREF: Environmental domain scores			p-value
	Mean ± SD	Minimum	Maximum	
Total	68.47 ± 10.04	31	100	
Gender				.289
Male	67.54 ± 11.67	31	100	
Female	69.39 ± 8.05	50	100	

The average score of WHOQOL-BREF: Environmental domain was 68.47 ± 10.04. The average score for male gender was 67.54 ± 11.67, for female gender was 69.39 ± 8.05. The minimum score for male was lower than female (31 for male, 50 for female) while the maximum score was equal for both genders at 100. There was no significant difference in WHOQOL-BREF: Environmental domain scores among male and female participants when using Mann-Whitney U test with p-value = .289 (Table 19).

4.3 Factors associated with healthy aging

Univariate logistic regression analyses were done to find socio-demographic characteristics which were related to healthy aging. The result shows that higher education level related to healthy aging with participants who graduated with bachelor degree or higher were 2.43 times more likely to be healthy agers when compared to participants who finished only elementary school or lower (OR = 2.43, 95% CI = 1.12 – 5.28). Household income was also found to be related to healthy aging with higher income related to higher chance to be healthy agers. Older persons whose household earned between 30,001 - 50,000 baht/month had 2.67 times more likely to be healthy agers when compared to those with less than 30,000 baht/month (OR = 2.67, 95% CI = 1.19 – 5.96). While other older persons whose household earned even more at 50,001 – 100,000 baht/month had 2.83 times more likely to be healthy agers when compared to those with less than 30,000 baht/month (OR = 2.83, 95% CI = 1.27 – 6.31). Moreover, older persons whose household earned more than 100,000 baht/month had 4.14 times more likely to be healthy agers when compared to those with less than 30,000 baht/month (OR = 4.14, 95% CI = 1.61 – 10.64). Underlying disease is another characteristic which was found to be related with healthy aging with the elderly who had underlying disease were 0.56 times less likely to be healthy agers (OR = 0.44, 95% CI = 0.22 – 0.91). On the contrary, gender, age and marital status were not related to healthy aging according to univariate logistic regression analyses in this study (Table 20).

Table 20 Univariate logistic regression analyses of socio-demographic characteristics of healthy aging among Thai urban elderly

Characteristics	Healthy aging n (%)	Unadjusted OR	95% CI	p-value
Gender				
Male	64 (64)	1		
Female	68 (68)	1.20	0.67 - 2.15	.551
Age, years				
60 - 69 years	59 (67)	1		
70 - 79 years	48 (70.6)	1.18	0.59 - 2.34	.637
80 - 89 years	23 (57.5)	0.67	0.31 - 1.43	.298
90+ years	2 (50)	0.49	0.07 - 3.67	.489
Marital status				
Single	16 (57.1)	1		
Married	75 (75)	2.25	0.94 - 5.40	.069
Divorced/separated/widowed	41 (56.9)	0.99	0.41 - 2.40	.986
Education level				
Elementary school or lower	61 (58.1)	1		
Middle school or high school	34 (72.3)	1.89	0.89 - 3.98	.096
Bachelor degree or higher	37 (77.1)	2.43	1.12 - 5.28	.025*
Household income, baht/month				
< 30,000	37 (50)	1		
30,001 - 50,000	32 (72.7)	2.67	1.19 - 5.96	.017*
50,001 - 100,000	34 (73.9)	2.83	1.27 - 6.31	.011*
> 100,000	29 (80.6)	4.14	1.61 - 9.64	.003**
Have underlying disease				
No	43 (78.2)	1		
Yes	89 (61.4)	0.44	0.22 - 0.91	.027*

Note: *Significant difference with p-value < .05, **Significant difference with p-value < .01

As with socio-demographic characteristics of participants, lifestyles and health behaviors were analyzed using univariate logistic regression to find its association with healthy aging. All of these factors were found to be related to healthy aging except for tobacco smoking. Different hobbies do play a part in healthy aging as older persons who liked to watch television during their free time had 0.62 times less likely to be healthy agers when compared to those who exercised in their free time (OR = 0.38, 95% CI = 0.16 – 0.94). The same trend was observed in those who did housework and 'others' categories of hobbies with 0.69 times and 0.57 times less likely to be healthy agers when compared to the ones who exercised in their free time (OR = 0.31, 95% CI = 0.11 – 0.86 and OR = 0.43, 95% CI = 0.19 – 0.98 respectively) (Table 21).

Health awareness was significantly related with healthy aging as the elderly who had health awareness had 7.36 times more likely to be healthy agers when compared to those who did not have health awareness (OR = 7.36, 95% CI = 3.81 – 14.21). On the other hand, older persons who have quit alcohol drinking had 0.80 times less likely to be healthy agers when compared to those who have never drunk alcoholic beverage (OR = 0.20, 95% CI = 0.07 – 0.64) (Table 21).

Table 21 Univariate logistic regression analyses of lifestyles and health behaviors of healthy aging among Thai urban elderly

Lifestyles/health behaviors	Healthy aging n (%)	Unadjusted OR	95% CI	p-value
Hobbies				
Exercise	61 (76.3)	1		
Watching television	16 (55.2)	0.38	0.16 - 0.94	.036*
Reading	15 (68.2)	0.67	0.24 - 1.88	.444
Doing housework	10 (50)	0.31	0.11 - 0.86	.025*
Gardening	8 (72.7)	0.83	0.20 - 3.45	.798
Others	22 (57.9)	0.43	0.19 - 0.98	.044*
Health awareness				
No	25 (36.8)	1		
Yes	107 (81.1)	7.36	3.81 - 14.21	.000**
Tobacco smoking				
Never	101 (70.1)	1		
Yes	24 (55.8)	0.54	0.27 - 1.08	.082
Have quit	7 (53.8)	0.50	0.16 - 1.57	.232
Alcohol drinking				
Never	98 (71)	1		
Yes	29 (61.7)	0.66	0.33 - 1.32	.236
Have quit	5 (33.3)	0.20	0.07 - 0.64	.006**
Social participation				
Inactive	28 (42.4)	1		
Active	104 (77.6)	4.71	2.49 - 8.88	.000**
Positivity and optimism				
No	60 (53.6)	1		
Yes	72 (81.8)	3.9	2.02 - 7.52	.000**
Physical activity				
Inactive	11 (26.8)	1		
Active	121 (76.1)	8.68	3.98 - 18.97	.000**

Exercise				
None	10 (38.5)	1		
Less than 2-3 times/week	18 (41.9)	1.15	0.43 - 3.12	.781
More than 2-3 times/week	79 (81.4)	7.02	2.74 - 18.00	.000**
Everyday	25 (73.5)	4.44	1.48 - 13.32	.008**
Sleeping troubles				
No	81 (80.2)	1		
Yes	51 (51.5)	0.26	0.14 - 0.49	.000**
Proper diet intake				
No	17 (48.6)	1		
Yes	115 (69.7)	2.44	1.16 - 5.11	.019*

Note: *Significant difference with p-value < .05, **Significant difference with p-value < .01

Active social participation had a positive relationship with healthy aging as older persons with active social participation had 4.71 times more likely to be healthy agers when compared to those who had inactive social participation (OR = 4.71, 95% CI = 2.49 – 8.88). Furthermore, positivity and optimism also had the same relationship with healthy aging as the ones who had positivity and optimism had 3.9 times more likely to be healthy agers when compared to those who did not have positivity and optimism (OR = 3.9, 95% CI = 2.02 – 7.52) (Table 21).

Physical activity was also related with healthy aging with the elderly who were physically active had 8.68 times more likely to be healthy agers (OR = 8.68, 95% CI = 3.98 – 18.97). Moreover, exercise was related with healthy aging with older persons who exercised more than 2-3 times/week and who exercised everyday had 7.02 and 4.44 times more likely to be healthy agers when compared to those who

did not exercise (OR = 7.02, 95% CI = 2.41 – 18.00 and OR = 4.44, 95% CI = 1.48 – 13.32 respectively) (Table 21).

Older persons who had sleeping troubles had 0.74 times less likely to be healthy agers when compared to those who did not have these problems (OR = 0.26, 95% CI = 0.14 – 0.49). It shows that sleep was significantly related to healthy aging. Lastly, diet was related to healthy aging as well with the elderly who had proper diet intake had 2.44 times more likely to be healthy agers when compared to those who did not have proper diet intake (OR = 2.44, 95% CI = 1.16 – 5.11) (Table 21).

All of the variables above with a p-value < .20 in the initial univariate logistic regression analyses were forwarded for multivariate logistic regression analyses. The results of multivariate logistic regression analyses of socio-demographic characteristics are presented in Table 22 and the multivariate logistic regression analyses of lifestyles/health behaviors are presented in Table 23.

Table 22 Multivariate logistic regression analyses of socio-demographic characteristics of healthy aging among Thai urban elderly

Characteristics	Adjusted OR	95% CI	p-value
Marital status			
Single	1		
Married	1.56	0.58 – 4.24	.381
Divorced/separated/widowed	1.14	0.42 – 3.10	.802
Education level			
Elementary school or lower	1		
Middle school or high school	2.13	0.93 – 4.85	.073
Bachelor degree or higher	1.68	0.71 – 3.98	.237
Household income, baht/month			
< 30,000	1		
30,001 - 50,000	2.96	1.26 – 9.97	.013*
50,001 - 100,000	2.69	1.12 – 6.50	.027*
> 100,000	3.83	1.35 – 10.84	.011*
Have underlying disease			
No	1		
Yes	0.42	0.19 - 0.91	.028*

Note: *Significant difference with p-value < .05

In multivariate logistic regression analyses of socio-demographic characteristics, the characteristics that were significantly associated with healthy aging are household income and underlying diseases. With the older persons who earned between 30,001 – 50,000 baht/month had 2.96 times more likely to be healthy agers when compared to those who earned less than 30,000 baht/month (OR_{adj} = 2.96, 95% CI = 1.26 – 9.97). And the ones who earned even more at 50,001 – 100,000 baht/month and those who earned more than 100,000 baht/month had 2.69 times

(OR_{adj} = 2.69, 95% CI = 1.12 – 6.50). and 3.83 times (OR_{adj} = 3.83, 95% CI = 1.35 – 10.84) more likely to be healthy agers respectively (Table 22). Moreover, those who had underlying disease had 0.58 times less likely to be healthy agers when compared to the ones who did not have underlying diseases (OR_{adj} = 0.42, 95% CI = 0.19 – 0.91) (Table 22).

Table 23 Multivariate logistic regression analyses of lifestyles and health behaviors of healthy aging among Thai urban elderly

Lifestyles/health behaviors	Adjusted OR	95% CI	p-value
Hobbies			
Exercise	1		
Watching television	0.82	0.25 – 3.03	.821
Reading	1.34	0.31 – 5.79	.695
Doing housework	0.55	0.14 – 2.13	.383
Gardening	0.49	0.28 – 14.76	.485
Others	0.53	0.44 – 4.88	.534
Health awareness			
No	1		
Yes	6.20	2.57 - 14.93	.000**
Tobacco smoking			
Never	1		
Yes	0.67	0.16 - 2.81	.588
Have quit	2.91	0.40 – 21.22	.292
Alcohol drinking			
Never	1		
Yes	1.15	0.27 - 4.99	.848
Have quit	0.37	0.06 - 2.35	.289
Social participation			
Inactive	1		
Active	2.04	0.84 - 4.96	.116
Positivity and optimism			
No	1		
Yes	1.57	0.63 - 3.91	.335
Physical activity			
Inactive	1		
Active	4.69	1.60 - 13.80	.005**

Exercise			
None	1		
Less than 2-3 times/week	0.54	0.13 - 2.24	.392
More than 2-3 times/week	1.90	0.48 - 7.57	.361
Everyday	1.87	0.40 - 8.78	.427
Sleeping troubles			
No	1		
Yes	0.24	0.10 - 0.58	.001**
Proper diet intake			
No	1		
Yes	1.28	0.40 - 4.09	.678

Note: *Significant difference with p-value < .05, **Significant difference with p-value < .01

In multivariate logistic regression analyses of lifestyles and healthy behaviors, the factors which were significantly associated with healthy aging are health awareness, physical activity and sleeping troubles. The elderly who had health awareness had 6.20 times more likely to be healthy agers when compared to those who did not have health awareness (OR_{adj} = 6.20, 95% CI = 2.57 - 14.93). For physical activity, the older persons who had active physical activity had 4.69 times more likely to be healthy agers when compared to those who had inactive physical activity (OR_{adj} = 4.69, 95% CI = 1.60 - 13.80). Finally, the ones who had sleeping troubles had 0.76 times less likely to be healthy agers (OR_{adj} = 0.24, 95% CI = 0.10 – 0.58) (Table 23). On the contrary, hobbies, tobacco smoking, alcohol drinking, social participation, positivity and optimism, exercise and diet were not significantly related to healthy aging according to multivariate logistic regression analyses in this study (Table 23).

The socio-demographic and lifestyles/health behaviors variables from Table 22 and Table 23 which have p-value < .20 were then forwarded into subsequent multivariate logistic regression analyses with the results shown in the next table (Table 24).

Household income was the only socio-demographic characteristics that was still significantly related to healthy aging with the older persons who earnd between 30,001 – 50,000 baht/month had 4.22 times more likely to be healthy agers when compared to those with less than 30,000 baht/month (OR_{adj} = 4.22, 95% CI = 1.40 – 12.70). The lifestyles or health behaviors factors which were significantly related to healthy aging in this model are health awareness, physical activity and sleeping troubles. The elderly who had health awareness had 8.84 times more likely to be healthy agers when compared to those who did not have health awareness (OR_{adj} = 8.84, 95% CI = 3.72 – 21.01). For physical activity, the ones who had active physical activity have 7.71 times more likely to be healthy agers when compared to those who had inactive physical activity (OR_{adj} = 7.71, 95% CI = 2.81 – 21.18). Lastly, the older persons who had sleeping troubles have 0.65 times less likely to be healthy agers when compared to those who did not have sleeping troubles (OR_{adj} = 0.35, 95% CI = 0.14 – 0.81) (Table 24).

Table 24 **Multivariate logistic regression analyses of socio-demographic characteristics, lifestyles and health behaviors of healthy aging among Thai urban elderly**

Characteristics/lifestyles/ health behaviors	Adjusted OR	95% CI	p-value
Education level			
Elementary school or lower	1		
Middle school or high school	2.25	0.80 - 6.35	.126
Bachelor degree or higher	1.94	0.66 - 5.74	.230
Household income, baht/month			
< 30,000	1		
30,001 - 50,000	4.22	1.40 - 12.70	.010*
50,001 - 100,000	2.99	0.93 - 9.62	.066
> 100,000	3.32	0.97 - 11.28	.055
Have underlying disease			
No	1		
Yes	0.55	0.20 - 1.49	.239
Health awareness			
No	1		
Yes	8.84	3.72 - 21.01	.000**
Social participation			
Inactive	1		
Active	2.25	0.93 - 5.44	.073
Physical activity			
Inactive	1		
Active	7.71	2.81 - 21.18	.000**
Sleeping troubles			
No	1		
Yes	0.35	0.14 - 0.81	.015*

Note: *Significant difference with p-value < .05, **Significant difference with p-value < .01

Finally, all of the significant variables from Table 24 were subsequently forwarded into final multivariate logistic regression model. The results are as presented in the next table (Table 25).

Table 25 Final multivariate logistic regression model of socio-demographic characteristics, lifestyles and health behaviors of healthy aging among Thai urban elderly

Characteristics/lifestyles/ health behaviors	Adjusted OR	95% CI	p-value
Household income, baht/month			
< 30,000	1		
30,001 - 50,000	3.75	1.32 - 10.65	.013*
50,001 - 100,000	3.5	1.15 - 10.63	.027*
> 100,000	4.01	1.29 - 12.52	.017*
Health awareness			
No	1		
Yes	10.04	4.40 - 22.90	.000**
Physical activity			
Inactive	1		
Active	9.11	3.45 - 24.09	.000**
Sleeping troubles			
No	1		
Yes	0.29	0.13 - 0.64	.002**

Note: *Significant difference with p-value < .05, **Significant difference with p-value < .01

After adjusting for all other covariates, factors that were significantly associated with healthy aging are household income, health awareness, physical activity and sleep. For household income, for older persons who earned between

30,001 – 50,000 baht/month, 50,001 – 100,000 baht/month and more than 100,000 baht/month had 3.75, 3.5 and 4.01 times to be healthy agers when compared to those earned less than 30,000 baht/month respectively (OR_{adj} = 3.75, 95% CI = 1.32 - 10.65, OR_{adj} = 3.5, 95% CI = 1.15 - 10.63 and OR_{adj} = 4.01, 95% CI = 1.29 – 102.52). While the ones who had health awareness also had 10.04 times more likely to be healthy agers when compared to those who did not have health awareness (OR_{adj} = 10.04, 95% CI = 4.40 – 22.90). Additionally, the elderly who had active physical activity had 9.11 times more likely to be healthy agers when compared to those with inactive physical activity (OR_{adj} = 0.11, 95% CI = 3.45 – 24.09). Lastly, sleep was significantly associated with healthy aging as the ones who had sleeping troubles had 0.71 times less likely to be healthy agers when compare to those who did not have sleeping troubles (OR_{adj} = 0.29, 95% CI = 0.13 – 0.64) (Table 25).

Chapter V
Discussion, conclusion and recommendations

This chapter explains study findings in regards to research objectives which are to find prevalence of healthy aging in Thai urban elderly and to find factors that are associated with healthy aging in Thai urban elderly. The discussion focuses on 3 main parts; characteristics of participants, prevalence of healthy aging and factors related with it. Limitations, strengths, conclusion and recommendations are then presented afterwards to summarize the results of this study and to highlight its implication of use.

5.1 Discussion

5.1.1 Characteristics of participants

Socio-demographic characteristics of participants in this study shows that the majority of participants (44%) were the ones who aged between 60 – 69 years old and the percentage declined in the older groups respectively. This demographic data is consistent with population projections of Thailand in which the population ratio is lower in older age group (2). As for marital status, most of the participants were married (50%) followed by widowed and single respectively. These results are of the same trend observed in the 2014 survey of the older persons in Thailand (62). Moreover, there were significantly more female in widowed status than male which is also observed in the national survey (62). Life expectancy is likely the cause of this

finding since female has longer life expectancy than male (78 years for female versus 72 years for male) (4). Concerning the education level of participants, more than half of them finished elementary school or lower (52.5%) and men had significantly higher education level than women. These results are also in accordance with the 2014 survey (62). Many older persons did not have access to school in the past because the education system was rather underdeveloped in Thailand 50 years ago with much less coverage and access than present days. And as male have higher education level than female, this outcome can be explained if we look further into the cultural values during 1950s or earlier, back then parents preferred to send only their sons to school since it was believed that men should be the forefoot of the house while women should just stay in the house doing housework. However, these values have changed gradually and nowadays, women can have access to school as well as men.

For household income, most of the participants had less than 30,000 baht per month (37%), only a small number of them had more than 100,000 baht per month (18%). This finding is also consistent with the 2014 survey (62). The finding highlights Thailand's lack of economical support for older persons. With no appropriate pension systems, Thai elderly's income derived mainly from their own savings or from their children which are mostly not enough (62). During data collection period, we found many older persons mostly the ones joined in various activities had high household income. Whereas the ones who earned less tended to

sit there alone with no social participation and activities. Interviewers also found a few homeless older persons and recruited them if they consented. For underlying diseases, more than half of the participants had underlying diseases (72.5%), 16.5% of which have multiple diseases and the patterns were not different among male and female gender. This finding is the same as in the 2014 survey, with almost half of the elderly had hypertension and about one-third had diabetes mellitus (62).

The results of lifestyles and health behaviors of participants show that male and female participants had significantly different hobbies, although most of them exercised (40%), men tended to read books or do gardening more than women, while women tended to do more housework than men. According to a poll conducted in 2017, reading and exercise were the top two hobbies for older persons which is the same as in this study (63). For health awareness, 66% of participants had health awareness (had regular health check-ups) in the study. The percentage is higher than the data from 2014 survey which was at 38.8% (62). It might be because this research was conducted at Lumpini park where older persons come for exercises and other activities, thus, this group of older persons may have more health awareness than others.

For tobacco smoking, 72% of participants have never smoked. Moreover, men significantly smoked tobacco more than women in this study. The same trend is observed in the 2014 survey, with around 80% of older persons never smoked tobacco with the same gender difference (62). For alcohol drinking, 69% of

participants have never drunk alcoholic beverages, with male tended to drink more than female. This number is slightly lower than in 2014 survey which found that about 83% of older persons did not drink alcoholic beverages although the gender difference is similar (62). The reason why the percentage of older persons for the ones who have never drunk alcohol is lower in this study might be because participants might drink alcoholic beverages during their social participation from time to time but did not drink in a harmful amount and frequency. As for social participation, 67% of participants had active social participation, meaning that they met with family members; friends; or colleagues at least once a month, with significant difference among gender in which female were more active. On the contrary, the 2014 survey found that 33% of older persons have active social participation (62). The percentage is higher in this study, it may due to the same reason for health awareness that is the location of this study. Lumpini park is one of the main spots for Thai elderly to meet with each other, the park offers a variety of clubs and activities such as aerobics, chess, Tai Chi and yoga. Thus, it offers older persons an opportunity to join these activities and to have social participation.

Less than half of the participants had positivity and optimism (44%), while a majority of the participants had neutral outlook on life. Because of many life experiences, older persons tend to look at the world with neutral point of view as they often see things as they are and would not like to think too positively or negatively. For physical activity, most of the participants had active physical activity

(79.5%). It shows that Thai urban elderly were more likely to walk around their home areas or go to shops and stores mostly to meet with others or to shop for food and home supply than just staying at their home for most of the day. The number is quite high since this study was conducted at a recreational park, not at household, hospital or nursing care where the proportion of older persons with inactive physical activity would be higher. Furthermore, 65% of participants exercised regularly more than 2-3 times per week which is higher than the 2014 survey (32.4%). This is clearly because of the location of the study.

Men seemed to have less sleeping troubles than women in this study with 21% of male participants and 28.5% of female participants had sleeping troubles. This finding is in concordance with the study from France which found that women have more sleeping troubles than men. It argued that this outcome might be related to behavioural and hormonal factors (64). Finally, almost all of the participants had proper diet intake (82.5%). Additionally, women significantly had proper diet intake more than men. The number is slightly higher than that of the 2014 survey (65%) since the population in this study seems to have more health awareness than general population. However, the gender difference in diet intake was observed in the survey as well as in this study (62).

5.1.2 Prevalence of healthy aging and results of five screening tests

This study estimates the prevalence of healthy aging based on Bousquet et al' framework. The prevalence of healthy aging was 66% for Thai urban elderly in Bangkok, Thailand. Previous studies have been done to find prevalence of healthy aging based on varied definitions and conceptualizations of healthy aging which resulting in a wide range of prevalence from 0.4 to 95% (65). For this reason, it is not easy to compare study results with the previous ones. A Malaysian study conducted in 2012 by defining healthy aging as the absence of major diseases including cancer, heart problem, diabetes, stroke, hypertension and chronic lung disease together with good mental health, cognitive function and quality of life, found a prevalence of healthy aging at 13.8% (8). In 2006, a study was done in Shanghai, China to find prevalence of healthy aging. The measurement tool used in this study was the Shanghai Successful Aging Project Questionnaire (version 2000) which includes sociodemographic measures and standardized tests including the Chinese version of MMSE, ADL, the Life Satisfaction Index and the Short-Form 36-item health survey. The prevalence of healthy aging in this study was calculated at 46.2% among people aged 65 years or over (40). Another Chinese study was conducted in 2016 by defining five criteria for healthy aging; which are good self-rated health status, good self-related mood, normal cognitive function, normal activities of daily life and normal physical activity. Older persons had to meet at least three out of all five criteria to

be considered healthy aging. The result showed that the prevalence of healthy aging was at 38.81% (35).

In 2014, a research to find profile of healthy aging in Ibadan, Nigeria was conducted by using absence of chronic health conditions, functional independence and satisfaction with life as criteria. They found prevalence of healthy aging at 7.5% for adults aged 65 years or over (33). Moreover, A population-based study was conducted in Canada to find prevalence of successful aging in 2014. They defined successful aging in the study following Rowe and Kahn's model as absence of major diseases, high cognitive and physical functioning and active engagement with life. The result showed that 42% of Canadian adults aged 60 years or over met the criteria for successful aging (34). Another population-based study was conducted in Norway in 2017. Successful aging was defined based on Rowe and Kahn's model the same as in previous study. The result showed overall prevalence of successful aging at 14.5% for older persons aged 70 years or over (36). A study conducted in the US using a similar definition of healthy aging as in Canadian and Norwegian studies, found that no greater than 11.9% of older persons who aged 65 years or over were aging healthily at four time points: 1998, 2000, 2002, and 2004 (9).

The prevalence of healthy aging at 66% in this study is higher than previous literatures and these are four reasons why. Firstly, the conceptualization used in this study is very much different from models used in previous studies, it is broader and less rigid. Most of the previous researches used Rowe and Kahn's model of

successful aging or used their own criteria which based on this model. Rowe and Kahn's model is quite a strict one, established in 1997, the model referred to successful aging as "avoidance of disease and disability, maintenance of high physical and cognitive function, and sustained engagement in social and productive activities" (19). In contrast to the conceptualization used in this study, Bousquet et al', which defines healthy aging as having physical and cognitive capability, psychological, social well-being, mental health and quality of life; this concept is much broader than Rowe and Kahn's. As a study in the US in 2012 found the prevalence of healthy aging could range from 3.3% using rigid definition, to 35.5% using less rigid one. The finding highlights that using conceptualizations that emphasize symptomatic disease and functional health may be more useful for public health purpose (39). Secondly, except for Chinese and Nigerian studies, the rest of the previous researches used secondary data from national surveys to analyze the results. On the other hand, this study was conducted at only one venue that is Lumpini park with quota sampling technique. Researcher and research assistants tried to walk around the park to gather the elderly in various spots in hope to recruit eligible participants with different characteristics equally, meaning that we recruited those who were doing club activities such as chess, Tai Chi, and also those who came just to sit at the park, or those who happened to just be there at that time, but the population in this study still tended to be healthier than general population, thus, explaining the higher prevalence of healthy aging in this study. Thirdly, difference in time period can also

be a crucial factor in prevalence of healthy aging. As demographic patterns, disease profiles, health care systems, access to health care, education on health and many other factors related to health can change over time. Finally, diverse structure of demographic factors in each country may impact prevalence of healthy aging.

There are five screening tests used in this study. The first one is The Barthel Index, used to test physical capability. Almost all of the participants (95.5%) passed this test and considered to be totally independent physically. The participants in this study are more physically independent than general population (73.6%) (62). This difference can be explained by the methods of this study where it was conducted at a park. Thus, most of the older persons who went there must be partially physically independent, if not totally. This study did not conduct on a household level like national survey in which there would be a higher ratio of dependent elderly.

MMSE-Thai 2002 is the second test, used to test cognitive function. The result shows that 96.5% of participants in this study had normal cognitive function which means that 3.5% of them had cognitive impairment. This finding is consistent with a report from Ministry of Public Health, Thailand in 2015 that the prevalence of dementia was at 3-5% (66).

The third test is PHQ-9 test, used to screen for depressive symptoms. This study reveals that 12.5% of participants had mild depressive symptoms. According to a study in Thailand in 2014, the prevalence of depression in Thai elderly was at 15.6% (67). The prevalence of depression is slightly lower in this study. It may be

because participants have more regular social participation by going to Lumpini park than the general population as previous studies pointed out the benefit of social participation on mental health among the elderly (68, 69).

MNA is the fourth test used in this study to screen for malnutrition among the elderly. About 10.5% of participants were at risk for malnutrition, although none of them actually had malnutrition. This number is lower than that in previous study of nutrition status among Thai elderly in Southern provinces of Thailand which found that 37.8% of Thai elderly ware at risk for malnutrition (70). The finding emphasizes that the population in this study is healthier than general Thai elderly.

Lastly, WHOQOL-BREF test was used in this study to test quality of life among Thai older persons. In this research, 77% of participants had good or very good quality of life. Moreover, female participants had significantly better quality of life than male participants. A number of studies were conducted to find quality of life level of Thai elderly but the outcomes are varied. Several study conducted in Buriram, Chachoengsao and Songkla provinces concluded that Thai elderly had high level of overall quality of life (71-73). Another study conducted in southern border provinces of Thailand found that 86.8% of Thai elderly who joined elderly clubs had high level of quality of life (74). In contrast, a study conducted in Pathalung province found that only 48.2% of Thai elderly had high level of quality of life (75). Because quality of life level varied among different provinces of Thailand, it is very difficult to compare study results with one another. Nonetheless, the result in this study falls

between the range suggested by previous studies. As for gender difference in quality of life, it is still controversial on whether or not gender plays a role in this regard. Studies in Chiangmai and Bangkok found no association between the two genders while another study in Bangkok found that male elderly had better quality of life than female elderly (76-78). Interestingly, female participants had better quality of life than male participants in this study. This may be the result from social and psychological domains. The social and psychological domain scores of WHOQOL-BREF test among female participants were higher than their male counterparts when compared to other domains. Even though the differences might not be significant, they can still partially influence this outcome. As when the study was conducted, female participants were often found in groups chatting and having social engagement with one another more than male participants. While male older persons were often found sitting alone more than their female counterparts.

5.1.3 Factors associated with healthy aging

The second objective of this study is to find factors which are associated with healthy aging. From univariate regression analyses, gender was found to have no association to healthy aging. The role of gender on healthy aging is quite controversial as several studies have found no gender differences in healthy aging, the same result as in this study (8, 9, 34). However, one study found that men were more likely to be healthy agers (79), while another study found the result in reverse trend (40). Interestingly, age was also found to have no association to healthy aging, in contrast to previous literatures which concluded that age is negatively associated with healthy aging (8, 9, 34, 36). There is a massive diversity in the health status of people at any given age, even though age is a prominent predictor of the average health. That variability is associated with many other factors such as, genetic factors, individual characteristics, environmental factors and health behaviors. Thus, these factors might contribute to different finding in this study. Retirement syndrome, difficulties faced by individuals as they try to let go at the end of a full career, may also contribute to this irregular outcome. As many participants have just entered their 60s, most of them have just retired from their careers and this situation brought a lot of change onto them mentally and socially. As a result, these participants tend to score lower on their quality of life tests which led to a drop of prevalence of healthy aging in the young-old (aged 60 - 69 years).

No link was found between marital status and healthy aging, the same as in previous researches (9, 36). Although some studies suggested a positive relationship between married status and healthy aging (10, 34, 37). If we look closely into details, we can find that married status has OR of healthy aging at 2.25, while single status and divorced/widowed/separated status has OR equal to 1 and 0.99 respectively. Thus, marriage clearly have positive impact on healthy aging, although not significantly in this study. As for education level, finishing Bachelor degree or higher have a positive relationship to healthy aging and this outcome matched with many of previous studies (8-10, 27, 36). Household income was also significantly related to healthy aging positively, as the more money they had, the more they tended to be healthy agers. This finding is also in accordance with many other pervious researches (8, 9, 37, 41). Finally, having underlying diseases had negative influence on healthy aging which is consistent with another study (80).

From univariate regression analyses, the only lifestyle that has no association with healthy aging in this study is tobacco smoking. Although it was found that smoking has negative impact on healthy aging, the result was insignificant. The result is the same as a study in China (40) although some other studies identified that non-smokers tend to be more healthy agers (42). Older persons who have quit alcohol drinking were found to have less chance to be healthy agers. Because they might have faced with some severe health problems to a certain degree which made them quit drinking. On the other hand, different hobbies had mixed influence on healthy

aging as people who like to watch television, do housework or others have less chance to be healthy agers when compared to those who like to exercise in their free time. The outcome might be explained by the involvement of physical activity. Active physical activity is found to be positively related to healthy aging. It highlights the results from many of previous studies that emphasized the benefit of physical activity (6, 29, 34, 42, 43). Additionally, exercise was found to have positive relationship with healthy aging. The ones who exercise often (more than 2-3 times/week) have a higher chance to be healthy agers, the result is consistent with previous studies (6, 29, 34, 42, 43).

Health awareness was also found to be positively associated with healthy aging. This study is among the first ones to emphasize the positive effect of health awareness (having regular health check-ups) on healthy aging. Another positive factors were social participation and positivity and optimism. Having active social participation and positivity and optimism gives older persons a higher chance to be healthy agers as recognized in previous studies. A strong implication was made that psychological and social aspects in the elderly are as crucial as physical and demographic factors, or perhaps even more (80, 81).Older persons who had no sleeping troubles had higher chance to be healthy agers. This finding is supported by previous literatures (6, 35, 40). The last factor is proper diet intake, it was found to be positively related to healthy aging as well. The importance of proper food intake and adequate nutrients intake was discussed in several studies (6, 31, 32, 40).

Many socio-demographic characteristics, lifestyles and health behaviors factors were found to be significantly related to healthy aging from univariate regression analyses in this study. However, when putting all of these factors into subsequent multivariate regression analyses, it appears that there were only four factors which are associated with healthy aging; household income, health awareness, physical activity and sleep. While the effects of other factors might be diminished when adjusting with other covariates, these four factors remained significant still and proved to be the major factors and predictors of healthy aging. This finding can lead to new health promotion programs that advocates these factors and strengthens health system in an effort to push Thailand into a healthy aging society.

5.2 Limitations

There are several limitations in this study. Firstly, the study to find prevalence of healthy aging using multiple criteria testing physical function, cognitive function, mental health and quality of life is unprecedented in Thailand, thus, the calculation of sample size in this study had to be based on a similar study conducted in Malaysia. Due to differences in socio-economic factors among Malaysian and Thai elderly, this may lead to a flaw in sample size calculation. Secondly, there is no universal tool to assess healthy aging which in turn makes it extremely difficult to compare the prevalence of healthy aging and factors associated among different studies. This emphasizes a great need for a standard conceptualization of healthy

aging. Thirdly, this study was conducted at Lumpini park which served as a purposive area, this may result in selection bias, since the elderly who come to this area might be healthier than general older persons. Finally, there might be some biases in this study as quota sampling technique was used in this study, it could also create selection bias because researchers chose participants non-randomly according to this technique. And some of the questions in the questionnaire required participants to recall back to their past and thus might lead to recall bias.

5.3 Strengths

Previous studies in other countries have mostly used secondary data to analyze the results, only a few of them used primary data. This study is among the first studies in Thailand to explore prevalence of healthy aging in Thailand by using primary data. The uniqueness of this study is that it was done in an urban setting, so the results could give us more in-depth understanding about older persons in inner Bangkok and can be used as a model study for other metropolitan cities. Moreover, the conceptualization used in this study is broader and more suitable for public health purposes as recommended by several literatures that Rowe and Kahn's model, as used by most of the studies with the same objective, is rather too strict and its components should be adapted. Additionally, the five screening tests used in this study are all standardized tests which are used worldwide, and most importantly, they have been recommended by the Ministry of Public Health, Thailand to be used for geriatric assessment by professional clinicians among Thai

elderly. Besides, all of the interviewers in this study are licensed physicians, it not only made the results of the tests among all of the participants more accurate and reliable, but also gave participants a chance for geriatric assessment with trained physicians to know about their own health statuses.

5.4 Conclusion

The main purposes of this study are to find prevalence of healthy aging among Thai urban elderly and to identify factors which are associated with healthy aging in Thai urban elderly. The study was conducted at Lumpini park, Bangkok, Thailand during April to May, 2018. A total of 100 male and 100 female older persons were recruited conveniently for face-to-face interview. There are five screening tests for healthy aging in the questionnaire; The Barthel Index to test for physical capability, MMSE-Thai 2002 to test for cognitive function, PHQ-9 questionnaire to screen for depressive symptoms, MNA to screen for malnutrition, and WHOQOL-BREF THAI to test quality of life. Participants had to pass the cut-points of all of these five tests to be considered healthy agers. Statistically, Chi-square tests were used to determine the differences in characteristics among male and female participants. Moreover, univariate and multivariate logistic regression analyses were used to determine factors which are associated with healthy aging.

Most of the older persons in this study aged between 60 – 69 years old. The socio-demographic data among male and female elderly were not statistically different apart from marital status and education level as women tended to be more

widowed and men had higher level of education. Furthermore, lifestyles of the two genders were statistically different as male elderly liked to do gardening as their hobbies while female elderly liked to do housework. For tobacco smoking and alcohol drinking, the same trend was observed as male significantly tended to smoke and drink more than their female counterparts. In contrast, female older persons were significantly more socially active than male older persons.

The prevalence of healthy aging among Thai urban elderly in Bangkok, Thailand was calculated at 66%. This proportion is higher than most of the previous researches mainly because the conceptualization used in this study is broader than those often used previously and because this study was conducted at a recreational park.

From multiple logistic regression analyses, factors which were significantly related with healthy aging positively are household income, health awareness, and physical activity. While sleeping troubles was significantly associated with healthy aging negatively.

5.5 Recommendations

The findings of this study can be used as provisional data for policy makers to further develop Thailand into a healthy-aging society especially in urban setting where older persons can live their lives with good physical capability, with good quality of life, with appropriate support from their families and from the system, and above all with happiness. As economical factor is proven crucial towards health

status in old age, it highlights the need for Thailand to establish a more suitable pension system for older persons. More health prevention programs for older persons should also be augmented in this country. Annual health check-up should be provided for free for those who aged 60 years or over. Health promotion programs promoting active physical activity and appropriate sleep among Thai elderly should also be implemented.

The prevalence of healthy aging at 66% in this study also underlines one issue that could be raised in regards to aging population which is the retirement age. As about two-thirds of Thai urban seniors were healthy and with the decline of working-age population, a new official retirement age should be set at 65 years old as in other developed countries. This amendment can lead to a lower dependency ratio, can attribute to economic growth of the country, can reduce retirement syndrome in older persons and most importantly it can provide financial security for the elderly themselves as economical factor was proven to be crucial for health in older age.

Since this study focused on Thai elderly in the urban setting, it might not be generalizable for rural setting. And until present, there is no study in Thailand that study the prevalence of healthy aging at national level which includes Thai seniors in all settings. Therefore, further studies about prevalence of healthy aging in Thailand should be done at a household level with multi-stage sampling technique using primary data collected by healthcare professionals such as doctors or nurses.

Multicenter study is also another interesting alternative for further studies in this field for example a multicenter study which includes centers that represent all regions of Thailand to collect and analyze data of their own regions and ultimately using meta-analysis among centers to reveal results of the whole country. Additionally, more socio-economic factors within Thai context such as living arrangement, family support or spiritual belief can be included in further study. Most importantly, there is a great necessity in developing a standard universal conceptualization of healthy aging in order to compare results from different researches in various countries.

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APPENDIX A

Information sheet for participants

ข้อมูลสำหรับกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัย

ชื่อโครงการวิจัย "ความชุกของผู้สูงอายุที่มีสุขภาวะดีและปัจจัยที่เกี่ยวข้อง
ในผู้สูงอายุไทยที่อาศัยในเขตเมือง กรุงเทพมหานคร"

ชื่อผู้วิจัย อรสิริ ปีติสุทธิธรรม ตำแหน่ง นิสิตปริญญาโท

สถานที่ติดต่อผู้วิจัย (ที่ทำงาน) วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย

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1. ขอเรียนเชิญท่านเข้าร่วมในการวิจัยก่อนที่ท่านจะตัดสินใจเข้าร่วมในการวิจัย มีความจำเป็นที่ท่านควรทำความเข้าใจว่างานวิจัยนี้ทำเพราะเหตุใด และเกี่ยวข้องกับอะไร กรุณาใช้เวลาในการอ่านข้อมูลต่อไปนี้อย่างละเอียดรอบคอบ และสอบถามข้อมูลเพิ่มเติมหรือข้อมูลที่ไม่ชัดเจนได้ตลอดเวลา

2. โครงการวิจัยนี้ จัดทำขึ้นด้วยจุดประสงค์เพื่อค้นหาอัตราความชุกของผู้สูงอายุที่มีสุขภาวะดีและปัจจัยที่เกี่ยวข้องในผู้สูงอายุในที่อาศัยในเขตเมือง กรุงเทพมหานคร (ผู้สูงอายุที่มีสุขภาวะดี หมายถึง ผู้ที่มีอายุมากกว่า 60 ปี และยังมีสุขภาพร่างกายแข็งแรงทั้งทางด้านร่างกาย จิตใจ และสังคม รวมถึงมีคุณภาพชีวิตที่ดี)

3. รายละเอียดของกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัย

- ลักษณะของกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัย
  - เกณฑ์การคัดเข้า
    - อายุ 60ปีหรือมากกว่า
    - *เพศชายและหญิง*
    - สัญชาติไทย
    - อาศัยอยู่ในเขตเมือง จังหวัดกรุงเทพมหานคร เป็นเวลานานกว่า 10ปี
    - สามารถพูดคุยและตอบคำถามได้
  - เกณฑ์การคัดออก
    - มีปัญหาทางด้านจิตใจหรือสังคมที่ไม่อาจให้ทำการสัมภาษณ์ได้
- ผู้มีส่วนร่วมมีจำนวนทั้งหมด 200 คน *เป็นชาย 100 คน และหญิง 100 คน*
- วิธีการได้มาซึ่งกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัย
  - ผู้วิจัยและผู้ช่วยวิจัยจะเข้าหากลุ่มประชากรที่มีความน่าจะเป็นที่จะเข้าเกณฑ์ในการคัดเข้าร่วมวิจัย และจะให้ข้อมูลเกี่ยวกับการวิจัย ถ้ากลุ่มประชากรตรงกับเกณฑ์การคัดเข้า ไม่ตรงกับเกณฑ์การคัดออก และยินยอมที่จะเข้าร่วมวิจัย ผู้วิจัยก็จะทำการสัมภาษณ์ผู้ที่ยินยอมหลังจากได้เซ็นต์เอกสารยินยอมแล้ว

4. กระบวนการการวิจัยที่กระทำต่อกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัย

ผู้วิจัยและผู้ช่วยวิจัยจะทำการสัมภาษณ์ผู้มีส่วนร่วมในการวิจัย โดยใช้แบบสอบถามซึ่งแบ่งเป็นสองส่วน ส่วนแรกจะเป็นข้อคำถามซึ่งถามถึงข้อมูลทั่วไป เช่น อายุ เพศ ระดับการศึกษา และสอบถามถึงสุขภาวะนิสัย เช่น การนอนหลับ การรับประทานอาหาร สำหรับส่วนที่สองของแบบสอบถามจะประกอบไปด้วยแบบประเมินสุขภาพที่ได้มาตรฐานเพื่อทำการประเมินสุขภาวะของผู้มีส่วนร่วมในการวิจัยใน 5 ด้าน ซึ่งประกอบได้ด้วย สุขภาวะทางกาย สุขภาวะทางใจ สภาพสมอง ภาวะโภชนาการและคุณภาพชีวิต *แบบสอบถามประกอบด้วยข้อคำถามทั้งหมด 95 ข้อ และไม่มีการขอชื่อนามสกุลของผู้มีส่วนร่วมในการวิจัย โดยจะใช้เวลาสัมภาษณ์ประมาณ 30-40 นาที* การสัมภาษณ์นี้จะไม่มีการบันทึกเสียงหรือภาพใดๆ และเมื่อสิ้นสุดการสัมภาษณ์แล้ว เพื่อเป็นการตอบแทนน้ำใจที่ผู้มีส่วนร่วมวิจัยได้ให้ความร่วมมืออย่างดีในงานวิจัยนี้ ผู้วิจัยและผู้ช่วยวิจัยจะมอบของที่ระลึกให้แก่ผู้มีส่วมร่วมวิจัย

ข้อมูลต่างๆที่ผู้มีส่วนร่วมวิจัยได้ให้ข้อมูลไว้จากการสัมภาษณ์จะถูกเก็บเป็นความลับ และเมื่อเสร็จสิ้นการวิจัยแล้วข้อมูลที่เกี่ยวข้องกับผู้มีส่วนร่วมในการวิจัยจะถูกทำลาย โดยการลบข้อมูลจากไฟล์ดิจิตัล และทำลายเอกสารข้อคำถามที่มีข้อมูลของผู้มีส่วนร่วมวิจัย

5. กระบวนการให้ข้อมูลแก่กลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัย

5.1 ผู้วิจัยและผู้ช่วยวิจัยจะเป็นผู้ให้ข้อมูลเกี่ยวกับการวิจัยนี้แก่ผู้มีส่วนร่วมวิจัยด้วยตนเองและแจกเอกสารเกี่ยวกับโครงการวิจัยให้ศึกษา โดยให้ผู้มีส่วนร่วมในการวิจัยได้ทำความเข้าใจและตัดสินใจที่จะเข้าร่วมหรือไม่ด้วยตนเอง หากผู้มีส่วนร่วมในการวิจัยมีคำถามใดๆเกี่ยวกับงานวิจัยนี้สามารถถามผู้วิจัยหรือผู้ช่วยวิจัยได้ทันที

5.2 หากผู้มีส่วนร่วมในการวิจัยเป็นผู้ที่ไม่สามารถอ่านหรือเขียนหนังสือได้ ผู้วิจัยและผู้ช่วยวิจัยจะเป็นผู้ให้ข้อมูลเกี่ยวกับงานวิจัย หากตกลงยินยอมเข้าร่วมวิจัย เอกสารยินยอมจะถูกประทับตราด้วยลายนิ้วมือนิ้วโป้งข้างขวาแทนลายเซ็นต์ของผู้มีส่วนร่วมในการวิจัย

5.3 หากเป็นกลุ่มผู้ด้อยโอกาส/เปราะบาง เป็นต้นว่า ผู้สูงอายุที่มีความจำบกพร่อง ผู้ป่วยสมองเสื่อม คนพิการ ผู้ป่วยอาการหนัก *แต่สามารถพูดคุยรู้เรื่องและตอบคำถามได้ ผู้วิจัยและผู้ช่วยวิจัยจะขอความยินยอมจากผู้สูงอายุผู้นั้น และหากได้รับความยินยอม จะลงนามในใบยินยอมด้วยลายเซ็นต์หรือลายนิ้วมือนิ้วโป้ง*

6. ในการคัดกรองผู้มีส่วนร่วมในการวิจัยด้วยวิธีใดๆ ก็ตาม หากพบว่าผู้นั้นไม่อยู่ในเกณฑ์คัดเข้าและอยู่ในสภาวะที่สมควรได้รับความช่วยเหลือ/แนะนำ ผู้วิจัยในฐานะที่เป็นแพทย์แผนปัจจุบัน จะให้คำแนะนำทางการแพทย์ที่เหมาะสมแก่ผู้นั้น แต่ถ้าบุคคลผู้นั้นต้องการความช่วยเหลือทางการแพทย์อย่างเร่งด่วน ผู้วิจัยและผู้ช่วยวิจัยจะนำผู้ป่วยส่งโรงพยาบาลจุฬาลงกรณ์ทันที *โดยเรียกหน่วยฉุกเฉิน 1669 ซึ่งบุคคลสัญชาติไทยทุกคนสามารถรับบริการได้โดยไม่เสียค่าใช้จ่ายในกรณีฉุกเฉิน*

7. บางข้อคำถามในแบบสอบถาม อาจเป็นคำถามที่ถามเกี่ยวกับเรื่องที่ละเอียดอ่อนแก่บางบุคคล ถ้าผู้มีส่วนร่วมในงานวิจัยอ่านคำถามข้อใดแล้วรู้สึกไม่สบายใจที่จะให้คำตอบก็ไม่จำเป็นที่จะฝืนตอบสามารถปล่อยว่างไว้ได้ ถ้าเมื่อได้ทำแบบสอบถามแล้วทำให้เกิดผลประทบทางจิตใจแก่ผู้มีส่วนร่วมในงานวิจัย ผู้วิจัยและผู้ช่วยวิจัยจะให้คำช่วยเหลือแนะนำตามความเหมาะสม และหยุดการสัมภาษณ์นั้นได้ทันที

8. ประโยชน์ในการเข้าร่วมวิจัย

- ประโยชน์ส่วนบุคคล

จากแบบสอบถามในงานวิจัยนี้ จะเปิดโอกาสให้ผู้มีส่วนร่วมในงานวิจัยได้ทราบและตระหนักถึงสุขภาวะนิสัยของตนเอง และยังได้เปิดโอกาสในการได้รับการทดสอบคัดกรองด้วยแบบทดสอบมาตรฐานจากแพทย์วิชาชีพ ในการคัดกรองภาวะต่างๆ คือ ภาวะพึ่งพิงทางกาย ภาวะซึมเศร้า ภาวะสมองเสื่อม ภาวะโภชนาการ และคุณภาพชีวิต *โดยหลังจบการสัมภาษณ์ ผู้วิจัยจะแจ้งผลการทดสอบทั้ง 5 ด้าน ด้วยวาจาทันที และถ้ามีภาวะใดที่บกพร่องจะให้คำแนะนำเพื่อไปพบแพทย์ตามเห็นสมควร*

- ประโยชน์ส่วนรวม หรือประโยชน์ทางวิชาการ

ผู้วิจัยคาดหวังว่าข้อมูลที่ได้จากงานวิจัยนี้จะสามารถให้ข้อมูลเกี่ยวกับประชากรผู้สูงอายุที่อาศัยอยู่ในเขตเมืองมากขึ้น เข้าใจถึงพฤติกรรมและความเสี่ยงของกลุ่มประชากรนี้ และนำข้อมูลไปต่อยอดในการวางแผนเพื่อพัฒนาสังคมผู้สูงอายุในประเทศไทยต่อไป

9. การเข้าร่วมในการวิจัยของท่านเป็นโดยสมัครใจ และสามารถปฏิเสธที่จะเข้าร่วมหรือถอนตัวจากการวิจัยได้ทุกขณะ โดยไม่ต้องให้เหตุผลและไม่สูญเสียประโยชน์ที่พึงได้รับ ไม่มีผลต่อการดูแลรักษาหรือสุขภาวะของท่านแต่อย่างใด

10. ข้อมูลที่เกี่ยวข้องกับท่านจะเก็บเป็นความลับ หากมีการเสนอผลการวิจัยจะเสนอเป็นภาพรวม ข้อมูลใดที่สามารถระบุถึงตัวท่านได้จะไม่ปรากฏในรายงาน

11. เพื่อเป็นการตอบแทนในการเข้าร่วมงานวิจัย และสละเวลาของท่านในการตอบแบบสอบถาม ผู้วิจัยและผู้ช่วยวิจัยจะมีของที่ระลึกมอบให้แก่ท่านหลังจากทำการสัมภาษณ์เสร็จ *โดยท่านสามารถเลือกได้ระหว่างพวงกุญแจจุฬาลงกรณ์หรือที่คั่นหนังสือจุฬาลงกรณ์ ถ้าของที่ท่านเลือกหมด ผู้วิจัยจะมอบของที่ระลึกอีกอย่างหนึ่งที่ยังมีเหลืออยู่ให้แทน*

12. หากท่านไม่ได้รับการปฏิบัติตามข้อมูลดังกล่าวสามารถร้องเรียนได้ที่ คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 1 จุฬาลงกรณ์มหาวิทยาลัย 254 อาคารจามจุรี 1 ชั้น 2 ถนนพญาไท เขตปทุมวัน กรุงเทพฯ 10330 โทรศัพท์/โทรสาร 0-2218-3202 E-mail: eccu@chula.ac.th

เอกสารรับรองโครงการวิจัย

เลขที่โครงการวิจัย 058.1/61

วันที่รับรอง 17 เม.ย. 2561

วันหมดอายุ 16 เม.ย. 2562

APPENDIX B

Informed consent form

หนังสือแสดงความยินยอมเข้าร่วมการวิจัย

ทำที่.....

วันที่.....เดือน.....พ.ศ. .....

เลขที่ ประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย.....

ข้าพเจ้า ซึ่งได้ลงนามท้ายหนังสือนี้ ขอแสดงความยินยอมเข้าร่วมโครงการวิจัย

ชื่อโครงการวิจัย "ความชุกของผู้สูงอายุที่มีสุขภาวะดีและปัจจัยที่เกี่ยวข้อง ในผู้สูงอายุไทยที่อาศัยใน เขตเมือง กรุงเทพมหานคร"

ชื่อผู้วิจัย อรสิริ ปิติสุทธิธรรม

ที่อยู่ที่ติดต่อ 777/76 The Room ถ.พระรามสี่ แขวงรองเมือง เขตปทุมวัน กทม. โทรศัพท์ 0818205163

ข้าพเจ้า ได้รับทราบรายละเอียดเกี่ยวกับที่มาและวัตถุประสงค์ในการทำวิจัย รายละเอียดขั้นตอนต่างๆ ที่จะต้องปฏิบัติหรือได้รับการปฏิบัติ ความเสี่ยง/อันตราย และประโยชน์ซึ่งจะเกิดขึ้นจากการวิจัยเรื่องนี้ โดยได้อ่านรายละเอียดในเอกสารชี้แจงผู้เข้าร่วมการวิจัยโดยตลอด และได้รับคำอธิบายจากผู้วิจัย จนเข้าใจเป็นอย่างดีแล้ว

ข้าพเจ้าจึงสมัครใจเข้าร่วมในโครงการวิจัยนี้ ตามที่ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย โดยข้าพเจ้ายินยอมที่จะให้สัมภาษณ์เพื่อตอบแบบสอบถามในงานวิจัย *โดยสัมภาษณ์เพียงหนึ่งครั้ง ใช้เวลาประมาณ 30-40 นาที* และข้อมูลต่างๆที่ได้จากการตอบแบบสอบถามจะถูกเก็บไว้เป็นความลับ และจะถูกทำลายทิ้งหลังจากงานวิจัยนี้ได้สิ้นสุดลง

ข้าพเจ้ามีสิทธิถอนตัวออกจากการวิจัยเมื่อใดก็ได้ตามความประสงค์ โดยไม่ต้องแจ้งเหตุผล ซึ่งการถอนตัวออกจากการวิจัยนั้น จะไม่มีผลกระทบในทางใดๆ ต่อข้าพเจ้าทั้งสิ้น

ข้าพเจ้าได้รับคำรับรองว่า ผู้วิจัยจะปฏิบัติต่อข้าพเจ้าตามข้อมูลที่ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย และข้อมูลใดๆ ที่เกี่ยวข้องกับข้าพเจ้า ผู้วิจัยจะเก็บรักษาเป็นความลับ โดยจะนำเสนอข้อมูลการวิจัยเป็นภาพรวมเท่านั้น ไม่มีข้อมูลใดในการรายงานที่จะนำไปสู่การระบุตัวข้าพเจ้า

หากข้าพเจ้าไม่ได้รับการปฏิบัติตรงตามที่ได้ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย ข้าพเจ้าสามารถร้องเรียนได้ที่คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 1 จุฬาลงกรณ์มหาวิทยาลัย 254 อาคารจามจุรี 1 ชั้น 2 ถนนพญาไท เขตปทุมวัน กรุงเทพฯ 10330 โทรศัพท์/โทรสาร 0-2218-3202

E-mail: eccu@chula.ac.th

ข้าพเจ้าได้ลงลายมือชื่อไว้เป็นสำคัญต่อหน้าพยาน ทั้งนี้ข้าพเจ้าได้รับสำเนาเอกสารชี้แจงผู้เข้าร่วมการวิจัย และสำเนาหนังสือแสดงความยินยอมไว้แล้ว

ลงชื่อ.....

(อรสิริ ปิติสุทธิธรรม)

ผู้วิจัยหลัก

ลงชื่อ.....

(.....)

ผู้มีส่วนร่วมในการวิจัย

ลงชื่อ.....

(.....)

พยาน

เลขที่โครงการวิจัย 058.1/61

วันที่รับรอง 17 เม.ย. 2561

วันหมดอายุ 16 เม.ย. 2562

APPENDIX C

Questionnaire (English Version)

Questionnaire for research participants

DD/MM/YY____/____/____ Number .....

Remark: Your answers will be kept confidential

Part 1: <u>Basic Information</u>

Please make a checkmark (/) to answer questions regarding your basic information

1. Sex ..... Male ..... Female
2. Age ..... Years Old
3. Weight ..... Kg. Height ..... cm.
4. Marital status

   ..... Single ..... Married

   ..... Divorced/Separated ..... Widow/Widower
5. Highest Education level

   ..... Elementary school or lower ..... Middle school

   ..... High school ..... Bachelor degree

   ..... Master's degree ..... Post-doctoral degree
6. Household income per month

   ..... < 30,000 Baht .....30,000 – 50,000 Baht

   ..... 50,001 – 100,000 Baht ..... > 100,000 Baht
7. Do you have any underlying disease which require you to take medication daily?

.....No .....Yes

If Yes please specify .....

8. What are your hobbies?

.....

9. Do you take medical health check-ups annually for the last 5 years?

..... No ..... Yes

10. Do you smoke tobacco whether it is a cigarette, cigar, pipe smoking or other method?

..... No ..... Yes

..... I have quit smoking for …… years

11. Do you drink alcoholic beverages?

..... No

..... Yes, please specify: How often .....

Amount taken .....

..... I have quit drinking alcoholic beverages for …… years

12. During the past 12 months, how often do you meet with your family members, friends and close relatives?

..... None ..... Once every 2-3 months

..... Once a month ..... Once every 2 weeks

..... Once a week ..... A couple of times a week

13. During the past 12 months, which of these sentences best describe you?

..... I have a positive thinking. I always have a positive point of view.

..... I normally have a neutral thinking, not too positive or negative.

..... I have a negative thinking. I tend to view things negatively.

14. During the past 12 months, which of these sentences best describe you regarding your daily life?

..... I barely go outside my own room. I spend most of the time in my room.

..... I tend to spend my time inside my home, step outside in the neighborhood from time to time.

..... I always go out and about in the neighborhood.

..... I mostly work in an office. I have no time for other things.

..... I am always energetic. I have activities whether inside my own home such as cooking and gardening or outside my home such as bicycling and shopping.

15. During the past 12 months, how often do you exercise?

.....Never	.....Once a month
.....Once every 2 weeks	.....Once a week
.....A couple of times a week	.....4-6 times a week
.....Everyday	

16. During the past 12 months, do you have trouble sleeping?

    .....No

    .....Yes if yes please specity,

    ..... Insomnia ..... Oversleep ..... Snoring ..... Sleep walking

17. During the past 12 months, do you feel sleepy or fatigue during the day?

    .....No .....Yes

18. During the past 12 months, do you take 3 meals a day with breakfast, lunch and dinner?

    .....No .....Yes

19. During the past 12 months, do you eat all of five basic food groups every day?)Basic five food groups include: Carbohydrate, Protein, Fat, Vegetables and Fruits(

    .....No .....Yes

Part 2: Five screening tests to assess healthy aging

Please answer truthfully for your own benefit

Test 1 The Barthel index test to assess basic activities of daily life

Bowels
0 = incontinent (or needs to be given enemata)
1 = occasional accident (once/week)
2 = continent
Patient's Score: _____

Bladder
0 = incontinent, or catheterized and unable to manage
1 = occasional accident (max. once per 24 hours)
2 = continent (for over 7 days)
Patient's Score: _____

Grooming
0 = needs help with personal care
1 = independent face/hair/teeth/shaving (implements provided)
Patient's Score: _____

Toilet use
0 = dependent
1 = needs some help, but can do something alone
2 = independent (on and off, dressing, wiping)
Patient's Score: _____

Feeding
0 = unable
1 = needs help cutting, spreading butter, etc.
2 = independent (food provided within reach)
Patient's Score: _____

Transfer
0 = unable – no sitting balance
1 = major help (one or two people, physical), can sit
2 = minor help (verbal or physical)
3 = independent
Patient's Score: _____

Mobility
0 = immobile
1 = wheelchair independent, including corners, etc.
2 = walks with help of one person (verbal or physical)
3 = independent (but may use any aid, e.g., stick)
Patient's Score: _____

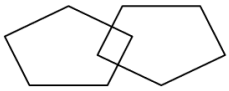
Dressing
0 = dependent
1 = needs help, but can do about half unaided
2 = independent (including buttons, zips, laces, etc.)
Patient's Score: _____

Stairs
0 = unable
1 = needs help (verbal, physical, carrying aid)
2 = independent up and down
Patient's Score: _____

Bathing
0 = dependent
1 = independent (or in shower)
Patient's Score: _____

Total score .....

Test 2 Mini Mental State Examination — English version

Maximum Score	Patient's Score	Questions
5		"What is the year? Season? Date? Day of the week? Month?"
5		"Where are we now: State? County? Town/city? Hospital? Floor?"
3		The examiner names three unrelated objects clearly and slowly, then asks the patient to name all three of them. The patient's response is used for scoring. The examiner repeats them until patient learns all of them, if possible. Number of trials: _____
5		"I would like you to count backward from 100 by sevens." (93, 86, 79, 72, 65, …) Stop after five answers. Alternative: "Spell WORLD backwards." (D-L-R-O-W)
3		"Earlier I told you the names of three things. Can you tell me what those were?"
2		Show the patient two simple objects, such as a wristwatch and a pencil, and ask the patient to name them.
1		"Repeat the phrase: 'No ifs, ands, or buts.'"
3		"Take the paper in your right hand, fold it in half, and put it on the floor." (The examiner gives the patient a piece of blank paper.)
1		"Please read this and do what it says." (Written instruction is "Close your eyes.")
1		"Make up and write a sentence about anything." (This sentence must contain a noun and a verb.)
1		"Please copy this picture." (The examiner gives the patient a blank piece of paper and asks him/her to draw the symbol below. All 10 angles must be present and two must intersect.) 
30		TOTAL

Test 3 The Patient Health Questionnaire)PHQ-9(to screen for depression

PATIENT HEALTH QUESTIONNAIRE-9 (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems? *(Use "✔" to indicate your answer)*	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

FOR OFFICE CODING 0 + _____ + _____ + _____

=Total Score: _____

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
☐	☐	☐	☐

Developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke and colleagues, with an educational grant from Pfizer Inc. No permission required to reproduce, translate, display or distribute.

Test 4 Mini Nutritional Assessment

Screening

A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?
0 = severe decrease in food intake
1 = moderate decrease in food intake
2 = no decrease in food intake ☐

B Weight loss during the last 3 months
0 = weight loss greater than 3 kg (6.6 lbs)
1 = does not know
2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs)
3 = no weight loss ☐

C Mobility
0 = bed or chair bound
1 = able to get out of bed / chair but does not go out
2 = goes out ☐

D Has suffered psychological stress or acute disease in the past 3 months?
0 = yes 2 = no ☐

E Neuropsychological problems
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems ☐

F1 Body Mass Index (BMI) (weight in kg) / (height in m)^2
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater ☐

IF BMI IS NOT AVAILABLE, REPLACE QUESTION F1 WITH QUESTION F2.
DO NOT ANSWER QUESTION F2 IF QUESTION F1 IS ALREADY COMPLETED.

F2 Calf circumference (CC) in cm
0 = CC less than 31
3 = CC 31 or greater ☐

Screening score ☐☐
(max. 14 points)

12-14 points:	☐	Normal nutritional status
8-11 points:	☐	At risk of malnutrition
0-7 points:	☐	Malnourished

Save Print Reset

Ref. Vellas B, Villars H, Abellan G, et al. *Overview of the MNA® - Its History and Challenges*. J Nutr Health Aging 2006;10:456-465.
Rubenstein LZ, Harker JO, Salva A, Guigoz Y, Vellas B. *Screening for Undernutrition in Geriatric Practice: Developing the Short-Form Mini Nutritional Assessment (MNA-SF)*. J. Geront 2001;56A: M366-377.
Guigoz Y. *The Mini-Nutritional Assessment (MNA®) Review of the Literature - What does it tell us?* J Nutr Health Aging 2006; 10:466-487.
Kaiser MJ, Bauer JM, Ramsch C, et al. *Validation of the Mini Nutritional Assessment Short-Form (MNA®-SF): A practical tool for identification of nutritional status.* J Nutr Health Aging 2009; 13:782-788.

For more information: www.mna-elderly.com

<u>Test 5</u> WHOQOL-BREF to assess quality of life

The following questions ask how you feel about your quality of life, health, or other areas of your life. I will read out each question to you, along with the response options. Please choose the answer that appears most appropriate. If you are unsure about which response to give to a question, the first response you think of is often the best one.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last four weeks.**

		Very poor	Poor	Neither poor nor good	Good	Very good
1.	How would you rate your quality of life?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2.	How satisfied are you with your health?	1	2	3	4	5

The following questions ask about **how much** you have experienced certain things in the last four weeks.

		Not at all	A little	A moderate amount	Very much	An extreme amount
3.	To what extent do you feel that physical pain prevents you from doing what you need to do?	5	4	3	2	1
4.	How much do you need any medical treatment to function in your daily life?	5	4	3	2	1
5.	How much do you enjoy life?	1	2	3	4	5
6.	To what extent do you feel your life to be meaningful?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	Extremely
7.	How well are you able to concentrate?	1	2	3	4	5
8.	How safe do you feel in your daily life?	1	2	3	4	5
9.	How healthy is your physical environment?	1	2	3	4	5

The following questions ask about how completely you experience or were able to do certain things in the last four weeks.

		Not at all	A little	Moderately	Mostly	Completely
10.	Do you have enough energy for everyday life?	1	2	3	4	5
11.	Are you able to accept your bodily appearance?	1	2	3	4	5
12.	Have you enough money to meet your needs?	1	2	3	4	5
13.	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
14.	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5

		Very poor	Poor	Neither poor nor good	Good	Very good
15.	How well are you able to get around?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
16.	How satisfied are you with your sleep?	1	2	3	4	5
17.	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
18.	How satisfied are you with your capacity for work?	1	2	3	4	5
19.	How satisfied are you with yourself?	1	2	3	4	5

20.	How satisfied are you with your personal relationships?	1	2	3	4	5
21.	How satisfied are you with your sex life?	1	2	3	4	5
22.	How satisfied are you with the support you get from your friends?	1	2	3	4	5
23.	How satisfied are you with the conditions of your living place?	1	2	3	4	5
24.	How satisfied are you with your access to health services?	1	2	3	4	5
25.	How satisfied are you with your transport?	1	2	3	4	5

The following question refers to how often you have felt or experienced certain things in the last four weeks.

		Never	Seldom	Quite often	Very often	Always
26.	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	5	4	3	2	1

Do you have any comments about the assessment?

_____

_____

APPENDIX D

Questionnaire (Thai version)

แบบสอบถามข้อมูลสำหรับผู้เข้าร่วมวิจัย

วันที่/เดือน/ปี____/____/____ หมายเลข

หมายเหตุ: ข้อมูลจากการตอบแบบสอบถามต่อไปนี้จะถูกเก็บเป็นความลับ

ส่วนที่ 1 : <u>ข้อมูลพื้นฐาน</u>

ต่อไปนี้เป็นข้อคำถามเกี่ยวกับข้อมูลส่วนตัวของท่าน กรุณาตอบตามความเป็นจริง
โดยทำเครื่องหมาย ☑ ในช่องคำตอบหรือเติมคำตอบในช่องว่าง

1. เพศ ..... ☐ ชาย ..... ☐ หญิง
2. อายุ ..... ปี
3. น้ำหนัก ..... กิโลกรัม ส่วนสูง ..... เซนติเมตร
4. สภานภาพปัจจุบันของท่านคือ
   ..... โสด ..... สมรส ..... หย่าร้างหรือแยกกันอยู่ ..... หม้าย
5. ระดับการศึกษาสูงสุด
   .....ระดับชั้นประถมหรือต่ำกว่าชั้นประถม ..... มัธยมศึกษาตอนต้น
   .....มัธยมศึกษาตอนปลาย หรือปวช. ..... ปวส. หรือปริญญาตรี หรืออนุปริญญา
   .....ปริญญาโท ..... ปริญญาเอก
6. รายได้ของครอบครัวต่อเดือน
   ..... < 30,000 บาท .....30,000 – 50,000 บาท
   ..... 50,001 – 100,000 บาท ..... > 100,000 บาท
7. ท่านมีโรคประจำตัวที่ต้องรับประทานยาต่อเนื่องทุกวันหรือไม่
   .....ไม่มี
   .....มี โปรดระบุ .....
8. ท่านมีกิจกรรมยามว่างหรืองานอดิเรกอะไรบ้าง
   .....
9. ท่านได้เข้ารับการตรวจร่างกายประจำปีต่อเนื่องทุกปีในช่วง 5 ปีหลังสุดใช่หรือไม่
   ..... ไม่ใช่ ..... ใช่
10. ท่านสูบบุหรี่หรือไม่
    ..... ไม่สูบ ..... สูบ
    ..... เคยสูบ แต่เลิกบุหรี่มาได้ ..... ปี
11. ท่านดื่มเครื่องดื่มแอลกอฮอล์หรือไม่
    ..... ไม่ดื่ม
    ..... ดื่ม
    โปรดระบุ: ดื่มบ่อยเท่าใด ..... ดื่มปริมาณเท่าใด .....
    ..... เคยดื่ม แต่เลิกดื่มมาได้ ..... ปี
12. *ในช่วง 1 ปีที่ผ่านมา* ท่านมีโอกาสได้พบปะสังสรรค์กับครอบครัว ญาติสนิท หรือเพื่อนฝูงมากน้อยเพียงใด
    .....ไม่มีโอกาสเลย .....2-3 เดือนครั้ง
    .....เดือนละครั้ง .....2 สัปดาห์ครั้ง
    .....สัปดาห์ละครั้ง .....2-3 ครั้งต่อสัปดาห์

13. *ในช่วง 1 ปีที่ผ่านมา* ข้อใดตรงกับแนวคิดของท่านมากที่สุด
    ..... เป็นคนคิดบวก มักมองโลกในแง่บวกเสมอ
    ..... ไม่ได้มองโลกทั้งในเชิงบวกและลบ แต่มักมองให้เป็นกลาง
    ..... เป็นคนค่อนข้างคิดลบ มักมองโลกในแง่ลบ
14. *ในช่วง 1 ปีที่ผ่านมา* ในระหว่างวันปกติ ข้อใดตรงกับชีวิตประจำวันของท่านที่สุด
    ..... อยู่แต่ในห้องของตนเอง ออกไปนอกห้องนอนนานๆครั้ง
    ..... เดินไปมาอยู่ในบริเวณบ้าน ไม่ค่อยได้ออกนอกบ้าน
    ..... เดินไปมาอยู่ในบริเวณบ้าน และออกไปเดินเล่นบริเวณนอกบ้านเป็นประจำ
    ..... นั่งทำงานในออฟฟิศเป็นส่วนใหญ่ ไม่มีเวลาทำอย่างอื่น
    ..... กระฉับกระเฉงตลอดเวลา มีกิจกรรมทำอยู่ตลอดไม่ว่าจะอยู่ในบ้าน เช่น ทำงานบ้าน ปลูกต้นไม้ หรือนอกบ้าน เช่น เดินเล่น ออกกำลังกาย
15. *ในช่วง 1 ปีที่ผ่านมา* ท่านออกกำลังกายบ่อยเพียงใด
    .....ไม่ได้ออกกำลังกาย .....เดือนละครั้ง
    .....2 สัปดาห์ครั้ง .....สัปดาห์ละครั้ง
    .....2-3 ครั้งต่อสัปดาห์ .....*4-6 ครั้งต่อสัปดาห์*
    .....ทุกวัน
16. *ในช่วง 1 ปีที่ผ่านมา* ท่านมีปัญหาในการนอนหลับหรือไม่
    .....ไม่มี
    .....มี โปรดระบุ ..... นอนไม่หลับ ..... นอนมากไป ..... นอนกรน ..... นอนละเมอ
17. *ในช่วง 1 ปีที่ผ่านมา* ท่านมีอาการง่วง อ่อนเพลีย ตอนกลางวันหรือไม่
    .....ไม่มี
    .....มี
18. *ในช่วง 1 ปีที่ผ่านมา* ท่านรับประทานอาหาร*สามมื้อ คือ มื้อเช้า มื้อกลางวัน และมื้อเย็น ใช่หรือไม่*
    .....ไม่ใช่
    .....ใช่
19. *ในช่วง 1 ปีที่ผ่านมา* ท่านรับประทานอาหารครบ 5 หมู่ทุกวันหรือไม่ (อาหาร 5 หมู่ประกอบด้วย แป้งจากข้าว ก๋วยเตี๋ยวหรือขนมปัง โปรตีนจากเนื้อสัตว์ เช่น หมู ไก่ ปลา ไขมันจากน้ำมันต่างๆ ผัก และผลไม้)
    .....ไม่ใช่
    .....ใช่

เลขที่โครงการวิจัย 058.1/61
วันที่รับรอง 17 เม.ย. 2561
วันหมดอายุ 16 เม.ย. 2562

ส่วนที่ 2 : <u>ข้อมูลเพื่อประเมินสภาวะสุขภาพของท่านตามแบบคัดกรองทั้ง 5 ด้าน</u>
กรุณาตอบคำถามต่อไปนี้ตามความเป็นจริง เพื่อประโยชน์ของท่าน

<u>ด้านที่ 1</u> แบบทดสอบ Modified Barthel's index เพื่อประเมินความสามารถในการทำกิจวัตรประจำวัน

1. Feeding (รับประทานอาหารเมื่อเตรียมสำรับไว้ให้เรียบร้อยต่อหน้า)
   - ☐0. ไม่สามารถตักอาหารเข้าปากได้ ต้องมีคนป้อนให้
   - ☐1. ตักอาหารเองได้แต่ต้องมีคนช่วย เช่น ช่วยใช้ช้อนตักเตรียมไว้ให้หรือตัดเป็นเล็กๆไว้ล่วงหน้า
   - ☐2. ตักอาหารและช่วยตัวเองได้เป็นปกติ
2. Grooming (ล้างหน้า หวีผม แปรงฟัน โกนหนวด ในระยะเวลา 24 - 28 ชั่วโมงที่ผ่านมา)
   - ☐0. ต้องการความช่วยเหลือ
   - ☐1. ทำเองได้ (รวมทั้งที่ทำได้เองถ้าเตรียมอุปกรณ์ไว้ให้)
3. Transfer (ลุกนั่งจากที่นอน หรือจากเตียงไปยังเก้าอี้)
   - ☐0. ไม่สามารถนั่งได้ (นั่งแล้วจะล้มเสมอ) หรือต้องใช้คนสองคนช่วยกันยกขึ้น
   - ☐1. ต้องการความช่วยเหลืออย่างมากจึงจะนั่งได้ เช่น ต้องใช้คนที่แข็งแรงหรือมีทักษะ 1 คน หรือใช้คนทั่วไป 2 คนพยุงหรือดันขึ้นมาจึงจะนั่งอยู่ได้
   - ☐2. ต้องการความช่วยเหลือบ้าง เช่น บอกให้ทำตาม หรือช่วยพยุงเล็กน้อย หรือต้องมีคนดูแลเพื่อความปลอดภัย
   - ☐3. ทำได้เอง
4. Toilet use (ใช้ห้องน้ำ)
   - ☐0. ช่วยตัวเองไม่ได้
   - ☐1. ทำเองได้บ้าง (อย่างน้อยทำความสะอาดตัวเองได้หลังจากเสร็จธุระ) แต่ต้องการความช่วยเหลือในบางสิ่ง
   - ☐2. ช่วยตัวเองได้ดี (ขึ้นนั่งและลงจากโถส้วมเองได้ ทำความสะอาดได้เรียบร้อยหลังจากเสร็จธุระ ถอดใส่เสื้อผ้าได้เรียบร้อย)
5. Mobility (การเคลื่อนที่ภายในห้องหรือบ้าน)
   - ☐0. เคลื่อนที่ไปไหนไม่ได้
   - ☐1. ต้องใช้รถเข็นช่วยตัวเองให้เคลื่อนที่ได้เอง (ไม่ต้องมีคนเข็นให้) และจะต้องเข้าออกมุมห้องหรือประตูได้
   - ☐2. เดินหรือเคลื่อนที่โดยมีคนช่วย เช่น พยุง หรือบอกให้ทำตาม หรือต้องให้ความสนใจดูแลเพื่อความปลอดภัย
   - ☐3. เดินหรือเคลื่อนที่ได้เอง
6. Dressing (การสวมใส่เสื้อผ้า)
   - ☐0. ต้องมีคนสวมใส่ให้ ช่วยตัวเองแทบไม่ได้หรือได้น้อย
   - ☐1. ช่วยตัวเองได้ประมาณร้อยละ 50 ที่เหลือต้องมีคนช่วย
   - ☐2. ช่วยตัวเองได้ดี (รวมทั้งการติดกระดุม รูดซิบ หรือใช้เสื้อผ้าที่ดัดแปลงให้เหมาะสมก็ได้)

7. Stairs (การขึ้นลงบันได 1 ชั้น)

☐0. ไม่สามารถทำได้

☐1. ต้องการคนช่วย

☐2. ขึ้นลงได้เอง (ถ้าต้องใช้เครื่องช่วยเดิน เช่น walker จะต้องเอาขึ้นลงได้ด้วย)

8. Bathing (การอาบน้ำ)

☐0. ต้องมีคนช่วยหรือทำให้

☐1. อาบน้ำเองได้

9. Bowels (การกลั้นการถ่ายอุจจาระในระยะ 1 สัปดาห์ที่ผ่านมา)

☐0. กลั้นไม่ได้ หรือต้องการการสวนอุจจาระอยู่เสมอ

☐1. กลั้นไม่ได้บางครั้ง (เป็นน้อยกว่า 1 ครั้งต่อสัปดาห์)

☐2. กลั้นได้เป็นปกติ

10.Bladder (การกลั้นปัสสาวะในระยะ 1 สัปดาห์ที่ผ่านมา)

☐0. กลั้นไม่ได้ หรือใส่สายสวนปัสสาวะแต่ไม่สามารถดูแลเองได้

☐1. กลั้นไม่ได้บางครั้ง (เป็นน้อยกว่าวันละ 1 ครั้ง)

☐2. กลั้นได้เป็นปกติ

คะแนนรวม .....

เลขที่โครงการวิจัย 058.1/61

วันที่รับรอง 17 เม.ย. 2561

วันหมดอายุ 16 เม.ย. 2562

ด้านที่ 2 แบบทดสอบสภาพสมองเบื้องต้นฉบับภาษาไทย (MMSE-Thai 2002)

	บันทึกคำตอบไว้ทุกครั้ง	คะแนน
1. Orientation for time (5 คะแนน)		
(ตอบถูกข้อละ 1 คะแนน)	(ทั้งคำตอบที่ถูกและผิด)	
1.1 วันนี้วันที่เท่าไร	.....	☐
1.2 วันนี้วันอะไร	.....	☐
1.3 เดือนนี้เดือนอะไร	.....	☐
1.4 ปีนี้ปีอะไร	.....	☐
1.5 ฤดูนี้ฤดูอะไร	.....	☐

2. Orientation for place (5 คะแนน) (ให้เลือกข้อใดข้อหนึ่ง)

(ตอบถูกข้อละ 1 คะแนน

2.1 กรณีอยู่ที่สถานพยาบาล

2.1.1 สถานที่ตรงนี้เรียกว่า อะไร <u>และ</u>.....ชื่อว่าอะไร	.....	☐
2.1.2 ขณะนี้ท่านอยู่ที่ชั้นที่เท่าไรของตัวอาคาร	.....	☐
2.1.3 ที่อยู่ในอำเภอ - เขตอะไร	.....	☐
2.1.4 ที่นี่จังหวัดอะไร	.....	☐
2.1.5 ที่นี่ภาคอะไร	.....	☐

2.2 กรณีที่อยู่ที่บ้านของผู้ถูกทดสอบ

2.2.1 สถานที่ตรงนี้เรียกว่าอะไร <u>และ</u>บ้านเลขที่อะไร	.....	☐
2.2.2 ที่นี่หมู่บ้าน หรือละแวก/คุ้ม/ย่าน/ถนนอะไร	.....	☐
2.2.3 ที่นี่อำเภอเขต / อะไร	.....	☐
2.2.4 ที่นี่จังหวัดอะไร	.....	☐
2.2.5 ที่นี่ภาคอะไร	.....	☐

3. Registraion (3 คะแนน)

ต่อไปนี้เป็นการทดสอบความจำ ดิฉันจำบอกชื่อของ 3 อย่าง คุณ (ตา , ยาย....) ตั้งใจฟังให้ดีนะ เพราะจะบอกเพียงครั้งเดียว ไม่มีการบอกซ้ำอีก เมื่อ ผม (ดิฉัน) พูดจบ ให้ คุณ(ตา,ยาย....) **พูดทบทวนตามที่ได้ยิน ให้ครบ ทั้ง 3 ชื่อ** แล้วพยามจำไว้ให้ดี เดี๋ยวดิฉันจะถามซ้ำ

∗ การบอกชื่อแต่ละคำให้ห่างกันประมาณหนึ่งวินาที ต้องไม่ช้าหรือเร็วเกินไป

(ตอบถูก 1 คำได้ 1 คะแนน)

○ ดอกไม้ ○ แม่น้ำ ○ รถไฟ ..... ☐

ในกรณีที่ทำแบบทดสอบซ้ำภายใน 2 เดือน ให้ใช้คำว่า

○ ต้นไม้ ○ ทะเล ○ รถยนต์ ..... ☐

เลขที่โครงการวิจัย 058.1/61

วันที่รับรอง 17 เม.ย. 2561

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4. Attention/Calculation (5 คะแนน) (ให้เลือกข้อใดข้อหนึ่ง)

ข้อนี้เป็นการคิดเลขในใจเพื่อทดสอบสมาธิ คุณ (ตา,ยาย....) คิดเลขในใจเป็นไหม ?

ถ้าตอบคิดเป็นทำข้อ 4.1 ถ้าตอบคิดไม่เป็นหรือไม่ตอบให้ทำข้อ 4.2

4.1 "ข้อนี้คิดในใจเอา 100 ตั้ง ลบออกทีละ 7

ไปเรื่อยๆ ได้ผลเท่าไรบอกมา .... ☐

บันทึกคำตอบตัวเลขไว้ทุกครั้ง (ทั้งคำตอบที่ถูกและผิด) ทำทั้งหมด 5ครั้ง

ถ้าลบได้ 1,2,หรือ3 แล้วตอบไม่ได้ ก็คิดคะแนนเท่าที่ทำได้ ไม่ต้องย้ายไปทำข้อ 4.2

4.2 "ผม (ดิฉัน) จะสะกดคำว่า มะนาว ให้คุณ (ตา , ยาย....) ฟังแล้วให้คุณ (ตา , ยาย....) สะกดถอยหลังจากพยัญชนะตัวหลังไปตัวแรก คำว่ามะนาวสะกดว่า มอม้า-สระอะ-นอหนู-สระอา-วอแหวน ไหนคุณ(ตา,ยาย....) สะกอถอยหลัง ให้ฟังชิ ....

ว า น ะ ม

5. Recall (3 คะแนน)

เมื่อสักครู่ที่ให้จำของ 3 อย่างจำได้ไหมมีอะไรบ้าง" (ตอบถูก 1 คำได้ 1 คะแนน)

○ ดอกไม้ ○ แม่น้ำ ○ รถไฟ ..... ☐

ในกรณีที่ทำแบบทดสอบซ้ำภายใน 2 เดือน ให้ใช้คำว่า

○ ต้นไม้ ○ ทะเล ○ รถยนต์ ..... ☐

6. Naming (2 คะแนน)

6.1 ยื่นดินสอให้ผู้ถูกทดสอบดูแล้วถามว่า

"ของสิ่งนี้เรียกว่าอะไร" ..... ☐

6.2 ชี้นาฬิกาข้อมือให้ผู้ถูกทดสอบดูแล้วถามว่า

"ของสิ่งนี้เรียกว่าอะไร" ..... ☐

7. Repetition (1 คะแนน)

(พูดตามได้ถูกต้องได้ 1 คะแนน)

ตั้งใจฟังผม (ดิฉัน) เมื่อผม (ดิฉัน) พูดข้อความนี้

แล้วให้คุณ (ตา,ยาย)พูดตาม ผม (ดิฉัน) จะบอกเพียงครั้งเดียว

"ใครใคร่ขายไก่ไข่" ..... ☐

8. Verbal command (3 คะแนน)

ข้อนี้ฟังคำสั่ง "ฟังดีๆ นะเดี๋ยวผม (ดิฉัน)จะส่งกระดาษให้คุณ แล้วให้คุณ (ตา , ยาย....)

รับด้วยมือขวา พับครึ่งกระดาษ แล้ววางไว้ที่....."(พื้น,โต๊ะ,เตียง)

ผู้ทดสอบแสดงกระดาษเปล่าขนาดประมาณ เอ-4

ไม่มีรอยผับ ให้ผู้ถูกทดสอบ

○ รับด้วยมือขวา ○ พับครึ่ง ○ วางไว้ที่ะ(พื้น,โต๊ะ,เตียง) ..... ☐

9. Written command (1 คะแนน)

ต่อไปเป็นคำสั่งที่เขียนเป็นตัวหนังสือ ต้องการให้คุณ (ตา , ยาย....) อ่าน แล้วทำตาม (ตา , ยาย....) จะอ่านออกเสียงหรืออ่านในใจ

ผู้ทดสอบแสดงกระดาษที่เขียนว่า "หลับตาได้" ○ หลับตาได้..... ☐

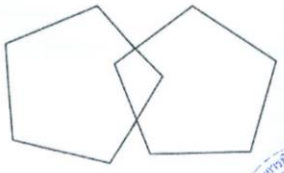
10. Writing (1 คะแนน)

ข้อนี้จะเป็นคำสั่งให้ "คุณ (ตา , ยาย....) เขียนข้อความอะไรก็ก็ที่อ่านแล้วรู้เรื่อง หรือมีความหมายมา 1ประโยค" .....

○ ประโยคมีความหมาย ..... ☐

11. Visuoconstruction (1 คะแนน)

ข้อนี้เป็นคำสั่ง "จงวาดภาพให้เหมือนภาพตัวอย่าง" (ในช่องว่างด้านขวาของภาพตัวอย่าง) ..... ☐



คะแนนรวม .....

เลขที่โครงการวิจัย 058.1/61

วันที่รับรอง 17 เม.ย. 2561

วันหมดอายุ 16 เม.ย. 2562

ด้านที่ 3 แบบทดสอบคัดกรองโรคซึมเศร้าด้วย 9 คำถาม

แบบสอบถามสุขภาพผู้ป่วย-9
(PHQ-9)

ในช่วง 2 สัปดาห์ที่ผ่านมา ท่านถูกรบกวนด้วยปัญหาต่อไปนี้บ่อยเพียงใด *(กรุณาทำเครื่องหมาย "✓" เพื่อเลือกคำตอบของท่าน)*	ไม่เคยเลย	หลายวัน	มากกว่าครึ่งหนึ่งของวันทั้งหมด	เกือบทุกวัน
1. ไม่ค่อยอยากทำ หรือไม่รู้สึกสนุกที่จะทำอะไร	0	1	2	3
2. รู้สึกเศร้า หดหู่ หรือสิ้นหวัง	0	1	2	3
3. มีปัญหานอนไม่หลับหรือนอนหลับไม่สนิทตลอดคืน หรือนอนมากเกินไป	0	1	2	3
4. รู้สึกเหนื่อยหรือไม่ค่อยมีแรง	0	1	2	3
5. ไม่ค่อยอยากกินอะไร หรือกินมากเกินไป	0	1	2	3
6. รู้สึกแย่กับตนเอง — หรือรู้สึกว่าตนเองเป็นคนล้มเหลวหรือทำให้ตนเองหรือครอบครัวผิดหวัง	0	1	2	3
7. ไม่ค่อยมีสมาธิกับสิ่งต่าง ๆ เช่น การอ่านหนังสือพิมพ์หรือดูโทรทัศน์	0	1	2	3
8. เคลื่อนไหวช้า หรือพูดช้าจนคนอื่นสามารถสังเกตเห็นได้ หรือในทางตรงข้ามคือ- อยู่ไม่นิ่งกระสับกระส่าย จนเคลื่อนไหวบ่อยกว่าปกติมาก	0	1	2	3
9. มีความคิดว่า คงจะดีกว่าหากตายไปเสียได้หรือคิดทำร้ายตนเองด้วยวิธีใดวิธีหนึ่ง	0	1	2	3

FOR OFFICE CODING 0 + _____ + _____ + _____

=Total Score: _____

หากท่านตอบว่าถูกรบกวนด้วยปัญหาข้อใด ๆ ข้างต้น ปัญหาเหล่านี้ก่อให้เกิดความยุ่งยากแก่ท่านมากน้อยเพียงใดในการทำงาน การดูแลเรื่องต่าง ๆ ที่บ้าน หรือการมีสัมพันธ์ที่ดีกับผู้อื่น

ไม่ยุ่งยากเลย	ยุ่งยากเล็กน้อย	ยุ่งยากมาก	ยุ่งยากมากที่สุด
☐	☐	☐	☐

ด้านที่ 4 แบบทดสอบประเมินภาวะโภชนาการ MNA ฉบับภาษาไทย

การคัดกรอง

A ในช่วง 3 เดือนที่ผ่านมารับประทานอาหารได้น้อยลง เนื่องจากความอยากอาหารลดลง มีปัญหาการย่อย การเคี้ยว หรือ ปัญหาการกลืนหรือไม่

0 = รับประทานอาหารน้อยลงอย่างมาก
1 = รับประทานอาหารน้อยลงปานกลาง
2 = การรับประทานอาหารไม่เปลี่ยนแปลง ☐

B ในช่วง 3 เดือนที่ผ่านมา น้ำหนักลดลงหรือไม่

0 = น้ำหนักลดมากกว่า 3 กิโลกรัม
1 = ไม่ทราบ
2 = น้ำหนักลดระหว่าง 1 - 3 กิโลกรัม
3 = น้ำหนักไม่ลดลง ☐

C สามารถเคลื่อนไหวได้เองหรือไม่

0 = นอนบนเตียง หรือ ต้องอาศัยรถเข็นตลอดเวลา
1 = ลุกจากเตียงหรือรถเข็นได้บ้าง แต่ไม่สามารถไปข้างนอกได้เอง
2 = เดินและเคลื่อนไหวได้ตามปกติ ☐

D ใน 3 เดือนที่ผ่านมามีความเครียดรุนแรงหรือป่วยเฉียบพลันหรือไม่

0 = มี 2 = ไม่มี ☐

E มีปัญหาทางจิตประสาท (**Neuropsychological problems**) หรือไม่

0 = ความจำเสื่อม หรือ ซึมเศร้าอย่างรุนแรง
1 = ความจำเสื่อมเล็กน้อย
2 = ไม่มีปัญหาทางประสาท ☐

F1 ดัชนีมวลกาย (**BMI**) = น้ำหนัก(กก.) / [ส่วนสูง(ม.)]^2

0 = BMI น้อยกว่า 19
1 = BMI ตั้งแต่ 19 แต่น้อยกว่า 21
2 = BMI ตั้งแต่ 21 แต่น้อยกว่า 23
3 = BMI ตั้งแต่ 23 ขึ้นไป ☐

หากไม่สามารถหาค่าดัชนีมวลกายได้ ให้เปลี่ยนจากคำถามข้อ F1 เป็นการถามข้อ F2.
อย่าตอบคำถาม F2 ในกรณีที่สามารถตอบคำถาม F1 ได้

F2 เส้นรอบวงน่อง (**Calf circumference; CC**) หน่วยเป็นเซนติเมตร

0 = CC น้อยกว่า 31
3 = CC ตั้งแต่ 31 ขึ้นไป ☐

คะแนนการคัดกรอง ☐☐

(เต็ม 14 คะแนน)

12-14 คะแนน: ☐ มีภาวะโภชนาการปกติ
8-11 คะแนน: ☐ มีความเสี่ยงต่อภาวะขาดสารอาหาร
0-7 คะแนน: ☐ ขาดสารอาหาร

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Rubenstein LZ, Harker JO, Salva A, Guigoz Y, Vellas B. *Screening for Undernutrition in Geriatric Practice: Developing the Short-Form Mini Nutritional Assessment (MNA-SF)*. J. Geront 2001;56A: M366-377.
Guigoz Y. *The Mini-Nutritional Assessment (MNA®) Review of the Literature - What does it tell us?* J Nutr Health Aging 2006; 10:466-487.
Kaiser MJ, Bauer JM, Ramsch C, et al. *Validation of the Mini Nutritional Assessment Short-Form (MNA®-SF): A practical tool for identification of nutritional status.* J Nutr Health Aging 2009; 13:782-788.

รายละเอียดเพิ่มเติมที่: www.mna-elderly.com

<u>ด้านที่ 5</u> แบบทดสอบประเมินคุณภาพชีวิต WHOQOL-BREF ฉบับภาษาไทย

คำถามต่อไปนี้จะถามว่าคุณรู้สึกอย่างไรกับคุณภาพชีวิต สุขภาพ หรือด้านอื่น ๆ ในชีวิตของคุณ ดิฉัน/กระผม จะอ่านแต่ละคำถาม พร้อมกับคำตอบที่เป็นตัวเลือกให้คุณฟัง โปรดเลือกคำตอบที่คุณพบว่าเหมาะสมที่สุด ถ้าคุณไม่แน่ใจเกี่ยวกับคำตอบในแต่ละคำถาม คำตอบแรกที่คุณคิดจะเป็นคำตอบที่ดีที่สุด

โปรดระลึกถึง มาตรฐาน ความหวัง ความยินดี และความสนใจของคุณเอง เราจะถามถึงความคิดที่คุณมีเกี่ยวกับชีวิตของคุณเองในช่วง 2 อาทิตย์ที่ผ่านมา

	ไม่ดีอย่างมาก	ไม่ดี	ปานกลาง	ดี	ดีมาก
1. คุณให้คะแนนคุณภาพชีวิตของคุณอย่างไร ?	1	2	3	4	5

	ไม่พอใจมาก	ไม่พอใจ	เฉย ๆ	พอใจ	พอใจมาก
2. คุณพอใจเกี่ยวกับสุขภาพของคุณอย่างไร ?	1	2	3	4	5

คำถามต่อไปนี้ จะถามเกี่ยวกับประสบการณ์ของคุณ ในบางสิ่งบางอย่างว่ามีมากน้อยแค่ไหน ในช่วง 2 อาทิตย์ที่ผ่านมา

	ไม่เลย	เล็กน้อย	ปานกลาง	มาก	มากที่สุด
3. คุณมีความรู้สึกเจ็บปวดทางร่างกายจนไม่สามารถที่จะทำในสิ่งที่คุณอยากทำมากน้อยเพียงใด ?	5	4	3	2	1
4. คุณต้องการ การบำบัดทางการแพทย์มากน้อยแค่ไหน เพื่อให้สามารถปฏิบัติภารกิจประจำวันได้ ?	5	4	3	2	1
5. คุณมีความสุขในการดำเนินชีวิตมากน้อยแค่ไหน ?	1	2	3	4	5
6. คุณรู้สึกว่าชีวิตของคุณมีความหมายมากน้อยแค่ไหน ?	1	2	3	4	5
7. คุณสามารถที่จะมีสมาธิได้ดีเพียงใด ?	1	2	3	4	5

8. คุณรู้สึกว่าชีวิตประจำวันของคุณปลอดภัยมากน้อยแค่ไหน ?	1	2	3	4	5
9. คุณรู้สึกว่าสิ่งแวดล้อมของคุณมีสุขอนามัยอย่างไร ?	1	2	3	4	5

คำถามต่อไปนี้ จะถามเกี่ยวกับสิ่งที่คุณได้รับประสบ หรือ สามารถจะทำบางสิ่งบางอย่างได้สมบูรณ์ครบถ้วนอย่างไร ในช่วง 2 อาทิตย์ที่ผ่านมา

	ไม่เลย	เล็กน้อย	ปานกลาง	ส่วนใหญ่	ได้สมบูรณ์
10. คุณมีพลังงานเพียงพอในการดำเนินชีวิตประจำวันหรือไม่ ?	1	2	3	4	5
11. คุณสามารถที่จะยอมรับรูปร่าง หน้าตาของคุณเองหรือไม่ ?	1	2	3	4	5
12. คุณมีเงินเพียงพอที่จะสนองความต้องการของคุณเองได้หรือไม่ ?	1	2	3	4	5

	ไม่เลย	เล็กน้อย	ปานกลาง	ส่วนใหญ่	ได้สมบูรณ์
13. คุณได้รับข้อมูลที่คุณต้องการในการดำเนินชีวิตประจำวันอย่างไร	1	2	3	4	5
14. คุณมีโอกาสที่จะทำกิจกรรมยามว่างมากน้อยแค่ไหน ?	1	2	3	4	5

	ไม่ดีอย่างมาก	ไม่พอใจ	ปานกลาง	ดี	ดีมาก
15. คุณสามารถที่จะไปไหนมาไหนได้ดีเพียงใด ?	1	2	3	4	5

	ไม่พอใจมาก	ไม่พอใจ	เฉย ๆ	พอใจ	พอใจมาก
16. คุณพอใจกับการนอนหลับของคุณอย่างไร ?	1	2	3	4	5
17. คุณพอใจกับความสามารถของคุณในการดำเนินกิจกรรมในชีวิตประจำวันอย่างไร ?	1	2	3	4	5

18. คุณพอใจกับความสามารถในการทำงานของคุณอย่างไร ?	1	2	3	4	5
19. คุณพอใจกับตัวของคุณเองอย่างไร ?	1	2	3	4	5
20. คุณพอใจกับความสัมพันธ์ส่วนตัวของคุณอย่างไร ?	1	2	3	4	5
21. คุณพอใจกับชีวิตเพศของคุณอย่างไร ?	1	2	3	4	5
22. คุณพอใจเกี่ยวกับการสนับสนุนที่คุณได้รับจากเพื่อน ๆ อย่างไร ?	1	2	3	4	5
23. คุณพอใจเกี่ยวกับสภาพที่อยู่อาศัยของคุณอย่างไร ?	1	2	3	4	5

	ไม่พอใจมาก	ไม่พอใจ	เฉย ๆ	พอใจ	พอใจมาก
24. คุณพอใจเกี่ยวกับการที่คุณสามารถเข้าถึงการบริการทางด้านสุขภาพอย่างไร ?	1	2	3	4	5
25. คุณพอใจเกี่ยวกับการเดินทางของคุณอย่างไร ?	1	2	3	4	5

คำถามต่อไปนี้จะกล่าวถึงความรู้สึก หรือประสบการณ์ที่คุณได้รับ เกี่ยวกับบางสิ่งบางอย่าง ที่เกิดขึ้นบ่อย ๆ ในช่วง 2 อาทิตย์ที่ผ่านมา

	ไม่เคยเลย	น้อยครั้ง	ค่อนข้างบ่อย	บ่อยมาก	ตลอดเวลา
26. คุณมีความรู้สึกในด้านลบ เช่น ความรู้สึกเศร้า ผิดหวัง วิตกกังวล หดหู่ใจบ่อยครั้งแค่ไหน ?	5	4	3	2	1

คุณมีข้อคิดเห็นเกี่ยวกับการประเมินหรือไม่ ?

เอกสารรับรองโครงการวิจัย 058.1/61
วันที่รับรอง 17 เม.ย. 2561
วันหมดอายุ 16 เม.ย. 2562

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Education

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