THE EFFECT OF HOME-BASED LIFESTYLE CHANGE INTERVENTION TOWARD QUALITY OF LIFE AMONG ELDERLY IN SAMSUNG DISTRICT, KHONKEAN PROVINCE, THAILAND

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A Dissertation Submitted in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy Program in Public Health
College of Public Health Sciences
Chulalongkorn University
Academic Year 2013

ประสิทธิผลของโปรแกรมการเปลี่ยนแปลงวิถีชีวิตต่อคุณภาพชีวิตของผู้สูงอายุ อำเภอชำสูง จังหวัดขอนแก่น ประเทศไทย

นางสาวกรวรรณ ยอดไม้

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุขศาสตรดุษฎีบัณฑิต
สาขาวิชาสาธารณสุขศาสตร์
วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2556

Thesis Title	THE EFFECT OF HOME-BASED LIFESTYLE CHANGE INTERVENTION TOWARD QUALITY OF LIFE AMONG ELDERLY IN SAMSUNG DISTRICT, KHONKEAN PROVINCE, THAILAND
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Field of Study	Public Health
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Accepted by the Faculty of College of Public Health Sciences, Chulalongkorn University in Partial Fulfillment of the Requirements for the Doctoral Degree

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กรวรรณ ยอดไม้ : ประสิทธิผลของโปรแกรมการเปลี่ยนแปลงวิถีชีวิตต่อคุณภาพชีวิตของผู้สูงอายุ อำเภอชำสูง จังหวัดขอนแก่น ประเทศไทย. (THE EFFECT OF HOME-BASED LIFESTYLE CHANGE INTERVENTION TOWARD QUALITY OF LIFE AMONG ELDERLY IN SAMSUNG DISTRICT, KHONKEAN PROVINCE, THAILAND) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: รศ. ดร. รัตนา สำโรงทอง, 176 หน้า.

ประเทศไทยมีเปลี่ยนแปลงไปสู่สังคมผู้สูงอายุ เนื่องจากสัดส่วนประชาการผู้สูงอายุเพิ่มขึ้นอย่างรวดเร็ว การศึกษานี้มีวัตถุประสงค์หลักเพื่อ ประเมินผลของโปรแกรม การเปลี่ยนแปลงวิถีชีวิต เพื่อพัฒนาคุณภาพชีวิต ของผู้สูงอายุในอำเภอชำสูง จังหวัดขอนแก่น

การศึกษาครั้งนี้เป็นการศึกษาแบบกึ่งทดลอง ในกลุ่มผู้สูงอายุที่มีอายุระหว่าง 60 ถึง 75 ปี โดยแบ่งเป็นสองกลุ่มคือกลุ่มทดลองจำนวน 55 คน ณ อำเภอชำสูง และกลุ่มควบคุมจำนวน 55 คน ณ อำเภอน้ำพอง จังหวัดขอนแก่น กลุ่มทดลองถูกแบ่ง เป็น กลุ่มย่อย 5 กลุ่ม ซึ่งแต่กลุ่มมีสมาชิก 11 คน ซึ่งสมาชิกในกลุ่มเป็นเพื่อนบ้านกัน กลุ่มทดลองได้ทำกิจกรรม 4 ขั้นตอน คือ ขั้นตอนที่ 1 อบรม เรื่อง 3 อ (อ-อาหาร อ-ออกกำลังกาย และ อ-อารมณ์) โดยการอบรม 3 วัน วันละ 3 ชั่วโมง จากนั้นสมาชิกในกลุ่ม เลือกผู้นำกลุ่ม จำนวนกลุ่มละ 2 คน ขั้นตอนที่ 2 อบรมเรื่องเทคนิคการสร้างแรงจูงใจ ต่อการเปลี่ยนแปลงวิถีชีวิต และการให้คำปรึกษาด้านสุขภาพของผู้สูงอายุ ขั้นตอนที่ 3 ผู้นำกลุ่มเข้าไปเยี่ยมบ้าน สมาชิกในกลุ่ม และทำกิจกรรม เช่น ออกกำลังกาย รับประทานอาหารร่วมกัน และพูดคุยให้กำลังใจซึ่งกันและกัน ขั้นตอนที่ 4 การประชุมกลุ่มและติดตามผลการศึกษาประจำเดือน เพื่อแลกเปลี่ยนประสบการณ์ของกิจกรรม 3 อ. ในแต่ละกลุ่ม จัดขึ้นจำนวน 6 ครั้ง การประเมินผลเมื่อเสร็จสิ้นกิจกรรม ในเดือนที่ 6 และเดือนที่ 9 หลังทำกิจกรรมโดย ประเมินคุณภาพชีวิตของ (WHOQOL-Old) แบบประเมินความซึมเศร้าของผู้สูงอายุ (Thai Geriatric Depression) แบบทดสอบการเคลื่อนไหว (Time-Up and Go test) และแบบทดสอบการทรงตัว(Berge Balance Test)

จากการวิเคราะห์ทางสถิติ (Mixed Model Analysis) พบว่า โปรแกรมการเปลี่ยนแปลงวิถีชีวิตไม่มีผลต่อคุณภาพชิวิตโดยรวมของผู้สูงอายุ เมื่อแยกคุณภาพชีวิตออกเป็น 6 ด้าน พบว่า โปรแกรมการเปลี่ยนแปลงวิถีชีวิตที่บ้านมีผลต่อคุณภาพชีวิตรายด้าน คือ ด้านความเป็นอิสระ ด้านการมีส่วนร่วมในสังคม ด้านความสามารถในการทำกิจกรรมที่ผ่านมาปัจจุบันและอนาคต และด้านความตายและความกลัวตาย มีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติ ที่ (p-value < 0.05) ถึงแม้ว่าภาวะซึมเศร้าของผู้สุงอายุ มีแนวโน้มลดลง หลังการศึกษาวิจัย แต่วิเคราะห์ทางสถิติพบว่า คะแนนของภาวะซึมเศร้าของผู้สูงอายุไม่มีความสัมพันธ์ กับโปรแกรมการเปลี่ยนแปลงวิถีชีวิต ส่วนความสามารถในการทรงตัวกับโปรแกรมการการเปลี่ยนแปลงวิถีชีวิต พบว่า มีความสัมพันธ์ทางสถิติอย่างมีนัยสำคัญ (p-value < 0.05) แต่เมื่อ ตัดตัวแปรกวนออก พบว่า โปรแกรม การเปลี่ยนแปลงวิถีชีวิต ไม่มีความสัมพันธ์กับความสามารถในการทรงตัวของผู้สูงอายุ ความสามารถในการเคลื่อนไหวกับ โปรแกรมการศึกษาไม่มีความสัมพันธ์ทางสถิติอย่างมีนัยสำคัญ แต่เมื่อตัดตัวแปรกวนออก พบว่า โปรแกรมการเปลี่ยนแปลงวิถีชีวิต มีความสัมพันธ์กับความสามารถ ในการเคลื่อนไหว อย่างมีนัยสำคัญทางสถิติ (p-value < 0.05)

สาขาวิชา สาธารณสุขศาสตร์ ลายมือชื่อนิสิต .....

ปีการศึกษา 2556 ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก .....

5279201553 : MAJOR PUBLIC HEALTH
KEYWORDS: HOME-BASED LIFESTYLE CHANGE / QUALITY OF LIFE / ELDERLY

KORRAVARN YODMAI: THE EFFECT OF HOME-BASED LIFESTYLE CHANGE INTERVENTION TOWARD QUALITY OF LIFE AMONG ELDERLY IN SAMSUNG DISTRICT, KHONKEAN PROVINCE, THAILAND. ADVISOR: ASSOC. PROF. RATANA SOMRONGTHONG, Ph.D., 176 pp.

Thailand is degenerating into an aging society. The proportion of elderly people was growing faster than other age groups. This study aims to assess the effectiveness of home-based lifestyle change intervention on improving the quality of life, reducing the depression, and improving the physical function.

The quasi-experimental study with control was conducted at Sam Sung District and Num Phong District, Khon Kean Province. Target population of this study is person aged 60 to 75 years. One-hundred and ten of participants were evaluated at baseline survey (55 persons from Sam Sung District and 55 persons from Num Phong District). Sam Sung District was assigned to be an intervention area. Num Phong District was assigned to be a control area. The intervention group was separated into 5 groups. The members of each group were chosen by their friends or neighbors. Home-Based Lifestyle Change (HBLC) intervention composed of 4 stages; 1) researcher and team trained a triple-E (Exercise, Eating healthy food, and Emotional management) training for intervention group, 2) Technique of the empowerment and monitoring was trained to team leaders of each group by researcher and team, 3) team leaders visited their group members to monitor and reinforce on exercise, eating, and emotional management, 4) all participants from the intervention group attended group meeting monthly. The meetings among the intervention group were conducted 6 times. The meeting activities were included demonstration, discussion, and sharing experience of the intervention program. The outcomes of study were evaluated at 6th month, and 9th month. Measurement tools used 1) WHOQOL-OLD questionnaire to assess the quality of life, 2) Thai Geriatric Depression questionnaire to assess depression, 3) Berge Balance test (BBT) and Time-Up & Go test (TUGT) to assess the physical function. Statistical analysis used Mixed Model Analysis to analysis the effects of the intervention.

Mixed Model Analysis showed that the overall quality of life after implemented HBLC intervention was no statistically difference. While devised the quality of life into 6 facets, the Autonomy (AUT), Social Participation (SOP), Past, Present, and Further activity (PPF) and Death & Dying (DAD) facet of the quality of life were statistically difference (p-value < 0.05) at 6 and 9 months. Depression score was reduced both 6 and 9 months. The statistical analysis showed depression score was statistical difference at 6 months after intervention (p-value < 0.05). In part of the physical function, mean score of TUGT was statistical difference at 9 months (p-value < 0.05) and BBT mean score was no statistical significant.

Field of Study: Public Health Student's Signature .....

Academic Year: 2013 Advisor's Signature .....

ACKNOWLEDGEMENTS

I deeply acknowledge my gratitude and appreciation to my thesis advisor Asst. Prof. Dr. Ratana Somrongthong for her kindness, support, guidance throughout the whole process of this study and curse of PhD as well.

I would like to express thanks to Prof. Dr. Surasak Taneepanichskul as chair, Assoc. Prof. Dr. Sathirakorn Pongpanic, Prof. Dr. Karl J. Neeser, and Asst. Prof. Piyathida Kunhirunyaratn as thesis committee members.

I would like to thank to Prof. Dr. Surasak Taneepanichskul, Dean of the College of Public Health Science, Chulalongkorn University and all of kindness of lectures and staffs.

I would like to thanks to Prof. Dr. Krasae Chanawongse as Committee of the College of Asian Scholars and Dr. Kasom Chanawongse as Dean of the College of Asian Scholars to support me study funding.

My special thanks to Chulalongkkorn University and the 90th years Scholarship Foundation for financial support to research project.

Lastly, my special thanks to Dr. Robert S. Chapman who was advices me on data analysis, and the hospital director of health promotion and other health providers and health volunteers to support me during implementation of an intervention, and all participants who are joined in this study.

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CHAPTER I

INTRODUCTION

1.1 Background and Rationale

Nowadays, most of the countries in the world are becoming aging society, particularly ASEAN countries. Thailand is also a country that is having an increasing number of aging populations. Since the current form of the population pyramid has reversed because of the reduced fertility rate and the increase retirement age, the number of aging is continue increasing every year. In 2007, the percentage of elderly was 10.7% and it increase to 11.2% in 2011 and 14.7% for female and 12.7% for male in 2012 [1, 2]. The rise of elderly community in Thailand assumed as a second fastest expansion in the South East Asia and it will dramatically enlarge in the next 30 years [1].

Concerning about the increasing aging circumstances in Thailand, it has high impact to economic and society as the ratio of people aged 60 and over and younger people between 15 and 59 years (or older dependency ratio) is raise. The ratio of the older dependency in Thailand was 11.02 in 2005 and became 12.7 in 2011 and 13.1 in 2012 [1, 2]. The increasing of older dependency ratio is because of the enlarging aging population and decreasing working population. This implies that working group needs to support an aging population than previous. The supports for life basic needs e.g. health care services, public transportation and health education for elderly are needed to be planned and carried out to meet in the future.

According to this circumstances, Thai Government has set up the long term national plan and approached to continue partially with the previous National plan for aging people as well as second world assembly at Spain on aging care to provide needs and promote the quality of life in elderly people. In Thailand, The Second National Long-term Strategic Plan for older people (it was planning for 2002 - 2021) was set up 5 strategies to encourage well-being of elderly that included dignity, individual, independent, and autonomy, to providing social conscience to respect and recognition of valuable of elderly, to increasing awareness of community to promoting the quality of life in aging, to encourage family, community, local, and private sector take part in an action to involve an aging activities, and to formulate the framework and guideline for good practices on elderly (the 1st revised of the 2nd National Plan for the Elderly by National Committee on Elderly, 2009) [3]. The mainly of this objectives in the National plan is to promote the quality of life and well-being of aging people.

The Quality of Life (QoL) has been used to know the satisfaction of people in the basic-need in their life since the World War II ended [4]. Clearer QoL definition was instructed by World Health Organization Quality of Life (WHOQoL) working group. It was defined as “an individual perception in their life as the concept of culture and value system and related with goal, expectation, standard, and concerning And quality of life in age group depend on autonomy as perception of ability to control, coping, and decision making in daily living, and being independent as ability of activity in daily live function performed. Quality of life (QOL) related with the goal, expectation, standard and concerns of each person in the context of culture and value system in their life” [5].

Thailand had been used quality of life to determine the quality of health services. Several studies were shown that the level of quality of life in elderly was moderate [3, 6-10]. Most common factors related with the quality of life in elderly are health conditions, functional status and social activities [3, 6-10]. Those studies showed both physical and mental health are important to increase quality of life among elderly that chronic diseases are affecting to elderly and its associated with disability, diminished quality of life, and increasing costs of health care and long-term care [3, 6-10].

As documented, chronic diseases such as diabetes, hypertension, and vascular diseases is common found in aging. In Thailand, about 80% of all elderly have at least one chronic condition. More than one-fourth was cause of death in aging related chronic diseases [9, 11]. Poor health and functional status diminished quality of life in elderly and became major factors to concern and prevent in elderly. Triple-E (Exercise, Eating behavior and emotional management) used to determine a good health and independent functions in Thailand. Benefit of eating behavior determined by the behavior of eating nutrient food consuming as its body needs. It noted that adequate nutrient can give energy for body functions. Over consuming nutrient food can cause obesity and chronic diseases such as diabetes, hypertension and dyslipidemia and these diseases can induce pain, loss of function and death in elderly [9, 11, 12]. Over 80 percent of elderly in Thailand have experienced once with chronic disease in their lives [2]. Several nutrition programs give benefit to physical function, dietary behavior change and depression in elderly people who had undergone intervention [13-15].

Moreover, apart from consuming appropriate nutrient, physical activities needed to be practiced more to prevent chronic diseases and be free from disability. Several studies about interventions related with improvement of physical activity such as doing muscle strengthen, bicycle ergometer and 6-min walk lowered the intensity of disease and improved quality of life [16-24] as well as improved the capacity of lung function, relieved endorphin hormone and facilitate muscle relaxation [16]. The exercises can also decrease the mental health problem that is commonly seen in elderly due to limited social activity, loss of companion, fear of death, loss of sensory function and living alone [25].

Due to the dynamic effect of mental and physical health, it can disturb social functions and quality of life in elderly. Depression is found to be highest (4.9%) in elderly compared to the other aged groups[2]. Depression is assumed as brain disorder that can make emotional suffering and impact to physical function such as increase pain, loss of appetite and insomnia which is factors associating with quality of life. Besides, chronic depression can cause suicide due to isolation [26-30]. People with depression can be noticed through expressing thoughts, by emotions and by behaviors. In Buddhism, people are urged to live in the moderate way with no extreme emotions and thoughts. This principle controls people and stands as an essential key to lower depression in elderly.

Regarding needs of support elderly, young adults from rural area moved to urban area, leaving children and parent back home leading to increase concentration of both children and elderly in rural area than urban areas [2]. Rural area as Northeastern of Thailand found the high proportion of aging. Northeastern part of Thailand has a biggest population than others. More than 19 million citizens are living

there and Khon Kean province found they were the second highest of aging in Northern when other age group[31, 32]. Khon Kean province located at the center of Northeast part hat is confronting the challenges of increasing aging community as the second highest amount in that place[31, 32] with the percentage of 9.33% or over 185,000 in 2007 that was raising to 10.7% in 2010 [31, 32]. Concerning with the aging group, dependency ratio in Khon Kean was 11.3% in 2009 which was similar to other Northeastern provinces. Khon Kean province is composing of 28 districts and 226 sub-districts[31, 32].

Among them, Sam Sung district is purposely chosen in this study because of the expanding aging population there. The current proportion of elderly in Sam Sung District is 11.29%. Furthermore, this community has high prevalence of non-communicable diseases such as DM, HT, stroke and Heart diseases with over 30% of elderly diagnosed chronic diseases. As these chronic diseases can cost more for treatment and are common, especially in elderly, it causes more disability and mortality in elderly more. For the high prevalence of chronic diseases in the aging population, preparations need for the further aging situation. However, elderly club implemented in study area but some aging replied they were not joining those activities. Daily duty such as take care grandchild, cooking, and go to farm is a cause of no show in elderly club. However, triple-E was used to give message to change lifestyle and behavior and the interventional technique to apply this message was still needed to explore more due to less participation and short sustainability of intervention shown by previous studies [7]. As gap of this previous intervention, this study was reviewed as a study to determine concepts and theories of behavior change in elderly. Family, neighbors and friends were fundamental things to change

elderly behavior, promote well-being and quality of life, and reduce depression linking with social tie, network and support [7, 33-36]

Social network refers to the link between people with their social ties (relationship, group and institute or organization) and provide emotional, informational and appraisal support for their society [7, 35, 37, 38]. Changing a behavior was in the process of having knowledge, trailing of intervention or procedure, changing attitude and getting adaptation in life. Katheleen M P. et al (2010) mentioned the strong association between decisional balance and perceived benefits to change behavior [39]. Thus, the implemented of the intervention ion provided good outcome to participants, but the process of education and change of attitude is important to change their behavior. Therefore, Peer-education was delivered as health education among social groups such as university, sex-worker group intending to increase safety behavior. Peer-education has benefits when those peers can change behaviors [40-44].

This study was applied with the concept and knowledge of education as mentioned above to change the behavior of the study population to provide health education through health staffs and recommend participants to apply Triple-E education in their daily living and develop social participation among their group at home. This process is called Home-Based Lifestyle Change Intervention (HBLCI) program and aims to improve the quality of life among elderly in the study area. This quasi-experimental design with control group was used in this study. The study aimed to determine the effects of the intervention by using standard of quality of life questionnaire.

Regarding the standard Quality of life questionnaire, this study use adopted the WHOQOL-Old questionnaire. In 1995, The WHOQOL working group created WHOQOL-100 questionnaire which consists of 100 items. However, WHOQoL-100 questionnaire was useful for health providers and policy makers to evaluate the effectiveness of an intervention, program and services included in any health care services. This tool was not easy for elderly to evaluate their QoL. In 2002, the WHOQOL working group developed WHOQOL-brief version to reduce weakness of the WHOQOL-100 questionnaire. WHOQOL-Brief questionnaire still found that the content is widely and it does not specify for aging people [6, 45]. The WHOQoL working group developed a new QoL questionnaire (WHQoL-OLD version) to describe the quality of life for people aged 60 and above. The pilot testing of WHOQOL-Old questionnaire was carried-out in 22 WHOQOL centers, including Japan and China (WHOQOL, 2006). It consists of 24 items in 6 facets and includes sensory ability (SAB), autonomy (AUT), past, present and further activity (PPF), social participation (SOP), death and dying (DAD) and intimacy (INT). It is shorter than previous questionnaire and specific for aging [6]. This study used WHOQOL-Old questionnaire to determine the effect of intervention program.

Thus, quality of life is a goal of this study. In addition, this study also determines the effectiveness of depression after intervention. Several studies were found that depression was commonly found in aging and it has a negative impact on quality of life and increase of the risks of hospitalization and mortality [29, 46-50]. Standards depression measurement as Thai Geriatric Depression Scale (TGDS) used to determinate the level of depression in several studies[51, 52]. The prevalence of depression was found high in aging on the study of Kanchana P. and team, they

found that about 45 percent of aging in Chon Buri province have depression [51]. Over 9 percent of them have moderate and severe depression that they did not treat [51]. To screen depression with standard measurement, this study used Thai Geriatric Depression Scale (TGD Scale) to determine the outcome of the study.

Physical function used Berg Balance Test (BBT) and Time-Up and Go Test (TUGT). According to it was standard test and used in several studies [53-58]. It can measure body fitness and risk of fall in elderly. This study measured BBT and TUGT due to it is a standards measurement to measure physical of elderly and it easy to measure in the community.

1.2 Knowledge Gap

There are several community-based projects applying in Thailand but some elderly said that they cannot join those activities [7]. Previous studies mentioned that home-based projects was found that they could improve quality of life, especially physical functioning facet, increase physical function, and reduce depression and so, it does not make any difference with group-based/community-based projects but it might fill the gap of community-based projects that participants can join activities at home and daily activities at home and routine home visit between neighbors or group member.

1.3 Research Questions

1. Doses the Home-Base Lifestyle Change intervention (HBLCI) program affects to the quality of life, depression, and physical function among elderly in study area?
2. What are the factors associated with Home-Base Lifestyle Change intervention (HBLCI) program among elderly in study area?

1.4 Research Hypothesis

1. There is effect of HBLCI on reducing depression score among elderly in Sam Sung district, Khon Kean province.
2. There is effect of HBLCI on improving physical function among elderly in Sam Sung district, Khon Kean province.
3. There is effect of HBLCI on improving the quality of life among elderly in Sam Sung district, Khon Kean province.

1.5 Objectives of study

1. To develop a program to improve quality of life, depression, and physical function among community-dwelling elderly in Khonkean province
    1) To assess the effects of the home-base lifestyle intervention on the quality of life by using WHOQOL-OLD among elderly in Khonkean province
    2) To assess the effects of the home-base lifestyle intervention on depression symptom by using Thai Geriatric Depression scale among elderly in Khonkean province

3) To assess the effects of the home-base lifestyle intervention on physical function by using Berg Balance test, and Time-Up & Go test among elderly in Khonkean province

1.6 Scope of Study

This study has mixed methods to explore an aging situation in the community and the effects of intervention toward the quality of life. Qualitative study part used in-depth interview to assess the definition of quality of life and factors association, health behavior, lifestyle, social participation of aging and in the study area. The second part of the study used a quasi-experimental with control group and this part assesses the quality of life, depression and physical function before and after the intervention (6th and 9th months). The experimental group provided HBLCI program in study area by using key message of triple-E education (Exercise, Eating, and Emotional management).

1.7 Expected outcome

Expected outcomes of this study are to improve QoL, reduce depression, and promote physical function after conducting HBLCI programs in the study area. This study will provide an evidence-based on the intervention of elderly who are living in rural community and provide information for policy makers to make the decision to develop and implement the program for improving the quality of life among elderly people.

1.8 Operational definitions

The following term are defined for the purpose of this study:

1. Age refer to years at birth devise by current year
2. Elderly refers to people who are aged between 60 to 75 years
3. Gender refers to male and female that indicated in an identification card
4. Marital status refers to the current marital status of the elderly. It was classified into married, single, widowed, and divorced/separated.
5. Education level refers to the highest year of education of the elderly. It was divided into no education, primary education, secondary education, and higher education
6. Current income refers to an amount of money that the elderly receive in return of their work or from other sources such as children, savings, salary, spouse, parent and others
7. Occupation refers to the current working status from which the elderly earned an income. It was divided into no occupation, retired, government official, trader, agriculturist, employee, and others
8. Family member living arrangement refers to the family member who lived with the elderly in the same house during last two months
9. Health status refer to health status by participant perception include hypertension, diabetes, heart disease, pulmonary disease, cancer, grout, eye problem, ear problem, and others
10. Health insurance refer to mode of payment for health care services including government insurance, social welfare, universal coverage, and private sector insurance

11. Health care behavior refer to behavior of participant when they get ill including rest at home, buy medicine at drug store, go to primary care unit, go to clinic, go to private hospital, go to government hospital

12. Quality of life; WHO defined “quality of life as an individual perception in their life as the concept of culture and value system and related with goal, expectation, standard, and concerning. The quality of life in age group depend on autonomy as the perception of ability to control, coping, and decision making in daily living, and being independent as ability of activity in daily live functions are performed”[5]. Quality of life (QOL) is related with the goal, expectation, standard and concerns of each person in the context of culture and value system in their life [5]. It was measure by WHOQOL-OLD questionnaire.

13. Lifestyle behavior refers to the routine behavior of an individual on daily living. In this study in included an exercise, an eating healthy food, and emotions management.

14. Eating behavior refers to behaviors of the elderly in selecting (healthy) food. Healthy eating behaviors were as the following: 1) eating vegetables and fruit, 2) eating protein from fish, 3) avoid eating fatty food, salty food, and sweet food, and 4) drinking water at least six to eight glasses a day.

15. Exercise refers to an activity to generate movements of various body parts, leading to change in various systems of the body, with an aim to improve individual health.

16. Emotional management was used the middle-way of life model by Buddhism. Meditation and pray were promoted in this study. Management of emotional refers

to solve when their mood, stress, and depression. Participants discussed on concentrate of individual such as concentrated with breathing.

17. As depression is defined as psychological disorder expressed through emotional, thought, and behavior that people with depression often feel unworthy, tearful, down hearted, and weary [15, 59, 60]. Depression was measure by using Thai Geriatric Depression Scale (TGDS).

18. Physical function refers to basic mobility skill and body balance. The measures of physical function were Time-Up & Go test and Berge Balance Test.

19. The term "Up & Go" is a practical method to measure the ability of basic mobility skills. By instructing subject to standing up from a standard armchair, walking a distance of three meters, turning, walking back to the chair, and sitting down again. Time was measured since subject start to get up until sitting down.

20. The Berg Balance Scale (BBS) was developed to measure balance among older people with impairment in balance function by assessing the performance of functional tasks.

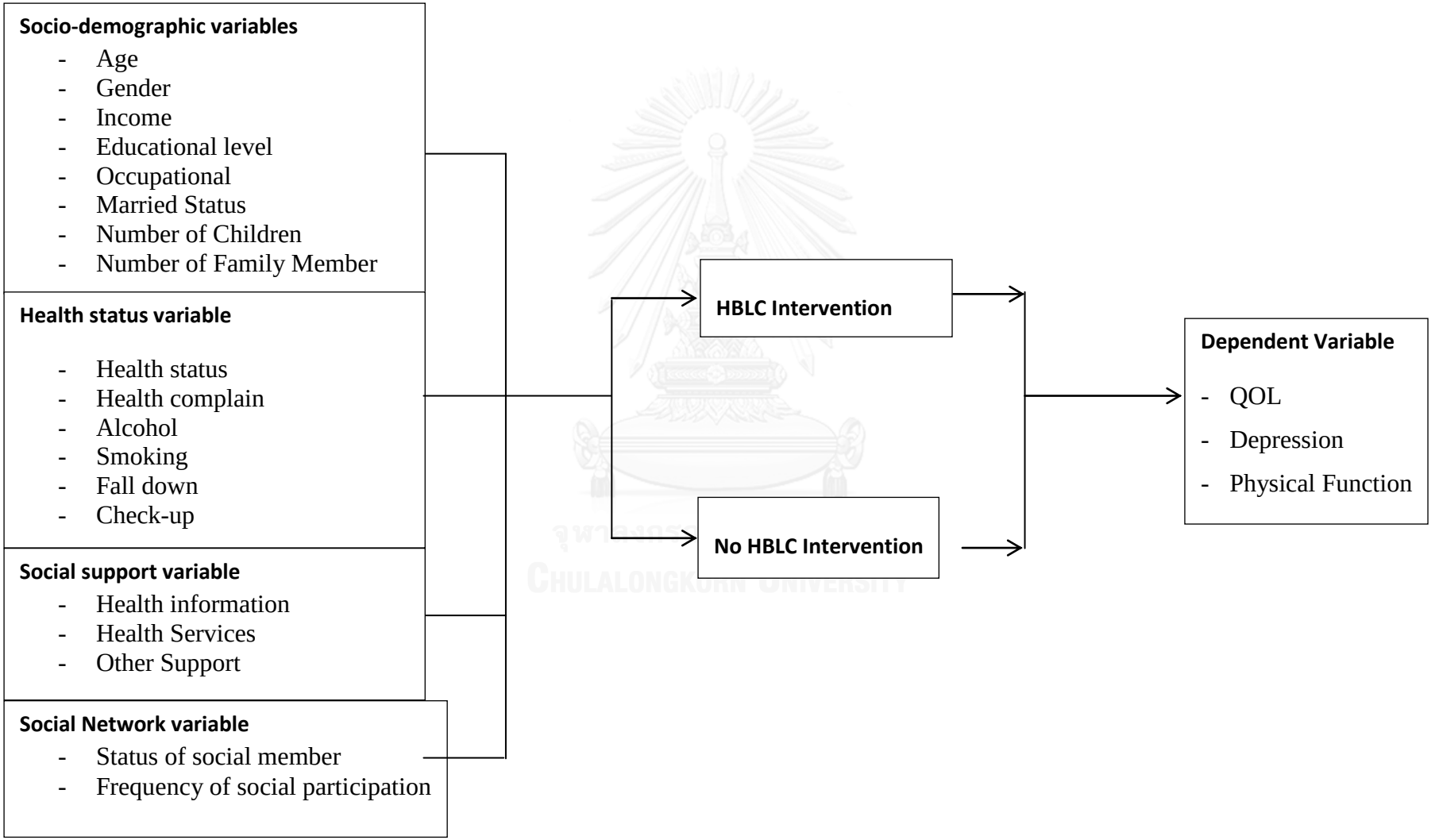
21. Team leader refers to person who monitors participants' activities, motivate the group to continue program by using empowerment technique.

22. Group member refers to person who is participating in the activities followed the Triple – E education as mentioned above. Group members are friends and neighbors of each other. Team leaders are also be one person in a group member.

23. Social support refers to perceive individual supports including instrumental support, emotional support, informational support, and services support

24. Social network refers to a person's contract with, how to contract with, and when connections were.

1.9 Conceptual Frameworks



CHAPTER II

LITERATURE REVIEW

The purpose of review of literature was to explore knowledge regarding intervention on improvement quality of life, reduce depression, and improve physical function among aging people in community. In this chapter, the relevant concepts are based on a review of the literature are presented as the following:

2.1 Concepts of aging and health situation of aging in Thailand

i. Physical change in aging

ii. Psychological change in aging

iii. Health status in aging

iv. Depression in aging

v. Physical function in aging

vi. Nutrition for aging

2.2 Concepts of Quality of Life (QoL) and research relevance

2.3 Concepts and theories of behavior change and research relevance

2.4 Concepts and theories and relevance research on Triple-E education

2.5 Other researches relevance

2.1 Concepts of aging and situation of aging in Thailand

Aging definitions

An aging, elderly, or older person was defined in difference contexts. It depends on value, culture, policy, and situation. Several counties in European

(Switzerland, France, Unite Kingdom, and Germany) defined aging for people aged 65 years and over due to capacity of aging people in working. It was similar with World Bank organization. They defined people aged over 64 years is dependency group to determine older dependency ratio [1]. This cut point is benefits to services and policy in those countries. In Thailand, aging used cut point of aged 60 years and over for elderly people due to the national retirement age [2, 3, 7, 8, 11, 52]. The National Policy and Planning of Thailand defines aged 60 years and over for aging people in the policy [8]. Several organizations and researches used people aged 60 years and over to classified elderly.

National Statistical Organization conducted survey on the eating behavior of Thai population. They classified age group into 4 groups included children aged 6 - 14 years, young adult aged 15 – 24 years, adult aged 25 – 59 years, and aging people aged 60 years and over) [31].

National Health Examination Survey Organization (NHESO) conducted in Thailand in 2008-2009. The samples were included young adult aged 15-29 years, adult aged 30 - 44 years, older adult aged 45 - 59 and aging people aged 60 and over (NHESO, 2010). Aging people were classified into 3 groups: people aged 60 – 69 years (young aging), people aged 70 – 79 years (middle aging), and people aged 80 years and over (Older aging) [2].

In Thailand, the retirement of government staffs are aged 60 years old. Aging people were supported by Thai's policy. Aging people receive free of change services such as health care services and public transportation. Moreover, aging people receive 600 baht per month from government to support their monthly expend [61].

Aging Classification

The classification of elderly is difference depend on policy, benefices, and/or purpose of the study. In addition, Roy J. S. classified older adult according to physical functioning of human are as following:

1) middle age refers to people aged 40 to 65 years old, this group has 10% to 30% of functioning lose,

2) old age refers to people age 65 to 75 years old, this age group is in postretirement period,

3) older aging refers to people aged 75 to 85 years old. This age group, their physical functioning were impaired. It affected to their activity daily living. These aging groups are dependence.

4) oldest aging refers to people aged over 85 years. They usually need special care for nursing home or caretaker

United State Bureau of the census classified aging in to 3 categories. People ages 65 -74 is the young older, ages 75 – 84 years is the old-older, and the oldest old is ages 85 years and over [12].

Ministry of Public Health in Thailand classified aging people as ability of physical function, social participation into 3 levels as following;

1) Independent aging group defined as old people who are totally doing their own daily activities living without any help or caring from their families or care takers. They are also being able to help other people such as their friends and children. There can join the social activities in their communities. In this group, MOPH suggested to encourage them to help other people as volunteer in community and supporting them to enroll in any activity.

2) Partially independent aging group, this group is defined as they are be able to doing some of daily activities in their life with some part of help from their families or care takers. Some of them can do a daily activity at home but they cannot go outside far from their house. Most of them prefer to stay at home rather than go outside and never joined any activities in the community. In this group, MOPH suggested to encourage and support them to join the social activities for increasing their physical functions.

3) Dependent aging group, this group refers to people with illness, disability or paralysis. They cannot do their own daily activities and need supporting or taking care from care takers, children, relatives and community. Mostly, this group should receive close-observe and care from local health providers in their community at least one time a month to prevent severity of disability or diseases.

Aging situation

The proportion of people aged 60 years and above is growing faster than any other age group worldwide [2]. It might be called as “graying world population”, especially in developing country [2, 62]. In 2002, about 400 million people aged 60 and over lived in developing regions. It is estimated that by 2025 number of people over 60 in less developed regions will be increased to 70 percent of all older people worldwide or approximately 840 million [62]. Over half of older people in the world are living in Asia. It might be because of migration of elderly from European countries to Asian countries [62]. Since 2008 the proportion of elderly is increasing throughout Asia [2]. Several countries in Asia are having aging society.

In Thailand, the proportion of elderly was 4.6 percent of the whole population in1960. It was continued increasing to 7.36 percent in 1990, 9.4 percent in 2002, and 10.7 percent in 2007 [9, 62]. Moreover, it was 11.5% or more than 7 million in 2010 [9, 62] Now a day, the proportion of elderly in Thailand and is second faster aging country in South East Asia (3.7% per years)[2, 62]. This proportion was increased due to the high fertility rate after the Second World War. In 1957, the fertility rate was 6 children per woman; people born in this period are called as “Baby Boom”. In contrast, after the successful family planning in Thailand, fertility rate was reducing which changed structure of population in Thailand. In 1987 proportion of fertility was 2 children per women and continuously reduced to 1.8 in 2007 and 1.5 in 2010 [2, 31, 62]. The population structure become to inversion of pyramid.

Accordingly older people are continuously increasing in Thailand, especially in rural area. In addition, the proportion of elderly in the northeast of Thailand is high. The center of northeast of Thailand Khon Kean province was the second highest of older people. In 2007, it had 185,790 elderly people or 9.33% of total population [5, 31].

As the elderly population is increasing, dependency ratio is also increasing that means independent group has to support dependent group more than previous. In 1980, the potential support ratio was 1:10 which mean 10 persons of working group have to support one older person Moreover, in 2008, it declined to 6 persons and it reduced to 2 persons per one older person in 2030 [5] that it will influences the future basic social life, families and also health care system, education, government, media, and economic that also affect to quality of life both elderly and their family.

Young adults from rural area moving to urban area, leaving children and parents back home leading to increased concentration of both children and elderly in rural area than urban areas [2, 5]. More of elderly are commonly economically dependent to their children. In 2009, the National Statistical Office reported that about 63.6 percent of elderly did not worked, About half of elderly or 50.3 percent were supported for money by married daughter, 46.4 percent from married son but only 32.6 percent of them was saving money [63]. Social cost of care has directed to independent group or working population to support and produce goods and services.

However, health care is important to everyone but reaching to health care services was different. In 2006, Benjakul S. studied equality of health care utilization in elderly after economic crisis found that chronic morbidity in elderly was concentrated on low income family and the proportion of health problem in elderly with low income family was higher than rich family [64]. Long-term care is an effect to elderly and their family, especially low-income family. Therefore, government tries to support health care services to everybody by setting health care system to improve the quality of life. In 2001, the Second National Plan for Older Persons (planning for 2001 - 2019) of Thailand was set up with 5 implementation strategies to protect and support Thai elderly which included preparation for the quality of life in aging, promoting well-being among elderly, providing social security for older people, increasing the situation to that national level for management in system and developing in personal, and conducting research in policy and development. The quality of life is the one of major strategies of the National Plan [3, 5, 8, 61].

The changing of aging people

As documented, when people are older, the human organs are changed such as gray hair, skin's wrinkling and sensory impairment that it can cause of physical activity in aging and it was linked to reduce social activities and mental health. This review is brief of the changing of elderly people to understand the changing and situation of aging as follow:

Physical changed in Aging

Physical changed in aging are occurred depend on genetics, lifestyle, and behavior of individual and It is difference between male and female. This review of physical changing among aging people will discuss as following:

Sensory change

Many aging people were complained that they cannot hear, see, taste, feel, and smell as previously. Sensory impairment was commonly found in aging people. Hearing loss is commonly found in aging people, Thailand. In 2002, Bunnag C. et al. reported hearing loss was found 12.4 % had have bilateral with moderate and severe levee of hearing loss among 556 elderly aged 60 to 88 years with pure tone audiometry in urban around Sirsiraj Hospital [65]. Hearing impairment was classified by WHO classification as the better sound of hearing by using pure tone test [66] as following:

1) No impairment of hearing was hearing from audiometry 25 dBHL or less
2) Grade 1 of hearing loss or slightly hearing impairment refers to the better hearing average sound between 26 – 40 dBHL indicated that respondent be able to hear and repeated spoke of normal voice at 1 meter.

3) Grade 2 or moderate hearing impairment refers to the average sound of audiometry at 41-60 dBHL, indicated that respondent be able to hear at raise sound at 1 meter.
4) Grade 3 or severe hearing impairment refers to average sound of audiometry at 61-80 dBHL, indicated that respondent be able to hear when shouted at the better ear.
5) Grade 4 or profound impairment refers to average sound of audiometry over 80 dBHL, indicated that respondent be unable to hear and understand even though shouted voice. (Source information from WHO in 1991 reference in Colin M., 20000) [66].

However, Youmasu J. Siewe determine hearing loss into two kinds are conductivity hearing loss and center nerve loss. The conductivity hearing loss is cause of obstruction of waves sound such as ear infections, wax, and foreign body. The center of nerve loss such as allergies, auditory nerve tumor and aging process cannot be cured [67]. The common react of aging with hearing loss are included less social participation, isolation, depression, labeled as confused, demented, and paranoid behavior that it associated with quality of life in aging people [68].

The second sensory impairments are visual impairment. Visual impairment is the third common chronic condition which was found in aging people following with an arthritis and heart disease [69]. ICD-10 or International Classification of diseases version 10 was defined visual impairment into 4 levels included normal visual, moderate-visual impairment, sever-visual impairment, and blindness. Aging with visual impairment was found increased worldwide, it's specially occur in patient with uncontrolled diabetes. Regarding to global data of visual impairment in 2010, Most of

visual impairment in the world are aged 50 years and over that 65% of them was visual impaired, and 80% of them was blindness [2]. The leading causes of visual impairment are included cataract, glaucoma, age-related macular degeneration, corneal opacities, and diabetic retinopathy and eye conditions. Visual impaired was documented in several studies that it can cause of fall down in aging people due to postural stability [69]. Impaired vision was affects to limitation of physical function, fear of falling, loss of independence, and isolation of aging that it can decline the quality of life [69].

The impaired taste is the one of sensory impairment in elderly that cannot identify of sweetness, saltiness, sourness, and bitterness. It can cause of less appetite that affects to preference and selection, and consuming of foods and linked to inadequate of nutrients as body energy needed, and over consuming of salty food and sweaty food that influence to control of diabetes and hypertension. The factors related with tasted impairment are aging-related diseases, medical condition, administrated medicine and other oral health. The cavity of oral is related with aging process of physical change in aging people [70].

The Impaired smell of aging people is another sensory impairment that found in aging and decline the quality of life. When people get older, olfactory function declines due to nerve cell destroy.

Nervous system

Nervous system consists of two segments are central nervous system (brain and spinal cord) and peripheral nervous system (cranial nervous, spinal nervous, and autonomic nervous system. As documented, nervous system affects both direct and

indirect to the whole body function by neurotransmitters. Unlikely, nervous cell are fairly short-life span and it cannot repeated when it was destroy and die. In aging process, brain cells declined, and weight of brain is low, and neurotransmitter and post-synaptic receptor is diminished. This changing is slowly in adult and it poorly function in aging people. Nervous system is started decrease since aged 25 years old due to the nerve cell and brain cell will decline continually that the weight of brain will reduced 10% of aged 25 to 75 years [4]. This changing of brain and nerves influence to function of brain and nerves, and the conduction of velocity was reduced in aging people. Aging people will slow response of the reflexes, decision and movement that can cause of accident such as fall down. Moreover, recent memory of aging people cannot record a new information but they are remember the previous history of them well that new information for aging people is quite difficult to train and it was reduced their interesting.

Muscle and Bone

Skeleton diminished at older due to reduce of bone density, muscle weakness, and joints dysfunction. Bone mass or density was lost due to loss of calcium and mineral especially women with menopause. Muscle issue was lost fat and lipofusic. Joints cartilage was lost that cause of stiffer and less flexible. The changing of skeleton affects to inflammatory, pain, stiffness and deformity. It also cause of balance and movement is lost. High incident of fall down in aging people was showed in several studies. Sarah D. Berry and team said that falls was found about one-third of community-dwelling senior aged 65 years [71]. Falls is cause of

disability and diminished QoL due to limit of physical function and less of social participation.

Psychological changing of aging people

Psychological process includes personality, sociality, mental function, and also sense of self of people change when they aged. The brain functioning is also related with psychological changing.

Some changes are related with the result of physical changes such as brain function. Loss of cognitive functioning is not inevitable result of aging. The psychological effects of aging are much less well established than the physical effects [34, 35, 50, 72]. Even though such things as memory, learning, intelligence, skills, and motivation to learn are widely assumed to decline with age. Memory and learning ability, for example, do not decline significantly until very late in life for most people, although the speech with which one recalls or analyzes information may slow somewhat, giving the false impression of mental impairment. For most elderly people whose lives are stimulating and rich, such mental abilities as motivation to learn, clarity of thought, and problem-solving capacity do not appear to decline significantly until the late eighties [34, 35, 50, 72]. Even Alzheimer's disease, the progressive deterioration of brain cells that is the primary cause of dementia in old age, is relatively rare in non-institutionalized persons under seventy-five, although it may afflict as many as half of all people over eighty- five. Former president Ronald Reagan is perhaps the most famous example of someone who suffered from Alzheimer [73-77].

Social change in aging

Social age consists of the norms, values, and roles that are culturally associated with particular chronological age. Ideas about social age differ from one society to another and, at least in modern industrial societies, change over time as well. Societies such as Japan and China have traditionally revered elderly people, regarding them as a source of historical memory and wisdom.

Health Situation in Thais aging

Health status

Health problem is the main cause of disability and poor quality of life in aging people [78] that chronic diseases influence physical illness, mental illness such as depression, stress and cost of treatment, and early death that it be related with health risk behavior included lack of physical activities, poor nutrients, tobacco use, and alcohol consumption. Those health risk behaviors are preventable. About 60 percent or about 35 million deaths occurred worldwide from diseases of lifestyle behavior and is estimated that it will increase to 41 million deaths in 2015, if not handled properly (WHO: 2005). In Thailand, about 80% of elderly have at least one chronic condition currently that can cause pain and loss of function[12]. Chronic diseases that can lead to disability and pain among elderly included cerebrovascular diseases, osteoarthritis, diabetes, coronary heart disease, dementia, and cancer. Correspondingly, more than one fourth of deaths were related to diseases with lifestyle behaviors when comparing with other causes of death among Thai people. National Health Examination Survey Office in 2008 – 2009 showed that high prevalence of chronic diseases in Thai elderly were hypertension, metabolic

syndrome, obesity, hyperlipidemia, and diabetes (48.1%, 36.8%, 29.9%, 26.1%, and 15.9%, respectively [2]. Deaths by non-communicable diseases were related with poor diet and low physical activity in several studies and in all region of the world, including developing countries become the leading cause of morbidity, disability [12].

Depression

Depression, anxiety and fear also influence to quality of life in many regions. Mental health problems are commonly found in elderly. It was related with chronic diseases, poor physical activity, functional impairment and depreciation, autonomy, less of social activity, intimacy and others. In addition, depression in Thai elderly was high. In 2009, it was 4.6% of elderly people, especially female [2]. In addition, compared depression between elderly (≥ 60 years) with other aged group (15 – 59 years) found that elderly had more depression than other age group [2]. Mental health and physical health are dynamically affecting each other, if elderly have physical problem they will have stress, depression, unhappy and if they have mental problem they might be upset, less active, and poor health care that it will affect to health outcome.

In addition, chronic disease and health problem was high in elderly in Khonkean province. Seventeen point one percent of hypovitaminosis D was found in elderly living in rural area [79] and at least 34.9 percent in urban area, Khonkean province [80]. In 2009, Chintana S. and term found nutrition intake was associated with chronic illness among elderly in Khonkean Province [81].

Physical function

Exercise program are improved capacity of living, reduced worsen of disease, and it also improve quality of life [82-84]. More exercises and increase activities in elderly can promoted sleep pattern and deep sleep which was affects to the quality of life. However, exercises are important to improve the quality of life by preventing and reducing worsens of diseases but it was less among elderly. In 2007, only 60 % of elderly did not exercise [85]. In Khonkean province, the prevalence of physical exercise in study population was 25.7% (50), 23.5% of elderly in urban and 22.6% in rural area [86, 87]. Although Thai government is concern this situation and created elderly clubs to motivate any activity among elderly but a few elderly was joined. In 2006, the study of Kuhirnyarath P found that elderly clubs in each community was conducted by community health staff monthly that it was inappropriate for some activity and also found that health problem, and family duty are barrier of participation [7]. Not only exercise will affect to health of elderly but nutrition and emotional also affect that.

Nutrition for aging

Appropriate and adequate nutrition are effective to both physical and mental health and it also related with social activity of elderly. When elderly has taken an inadequate nutrition, it would decrease liver size and blood flow, reduce threshold for tests and smile, reduce albumin production and drug clearance, change body composition (reduce muscle mass and increase fat) etc. that it may affect to physical weakness, less activity [13, 88]. Weight loss, self-reported exhaustion, muscle weakness, slow walking speed, and low level of physical activity were clinical

symptoms of frailty in person aged 60 and over that is the predictor of mortality [13, 88]. The delay of diseases onset among aging is exercise and eat healthy food. According to a systematic review of randomized controlled trials in nutritional education for community dwelling older people of Kate Y. found that nutritional education or advising was effective to physical function, dietary change and also reduce depression in people aged 65 years who lived at home [15]. Adequate nutrient is important for both physical and mental health.

Although dietary is important for health but eating behavior among elderly in Thailand still inappropriate. In 2009, the NHESO found that the proportion of vegetable and fruit intake was low in older person, especially people aged 70 years and more [89]. In addition, body mass index (BMI) more than 25 kg/ m2 among elderly was high (35.6 percent of people aged 60 -69, 25.5% in aged 70 – 79 years, and 12.8 % in aged 80 years and more) that this information might be related with prevalence of diabetes in elderly that it was high (16.7% aged 60 – 69years, 15.8% aged 70 – 79 years, and 11.5% aged 80 and more, respectively [89].

Both physical and metal problem are related with quality of life among elderly, several studies try to develop intervention to change lifestyle behavior to prevent and reduce health problem and also improve quality of life.

Exercise is not important only improve physical and mental health in elderly but it also help elderly with chronic disease reduce pain. Jakobsson U. in 2003 was study pain management methods in elderly with chronic pain [90]. They needed more assistance to take care in an activities daily living. Two hundred ninety four elderly aged 76 to 100 reported that elderly who living in special accommodation have more pain that those who living at home. However, the greater of social

support can relief pain for them combine with other pain management such as hot and cold shower. Exercises also can relief pain. [90].

2.2 Concepts of Quality of Life and research relevance

Quality of life was mentioned since the end of World War II to identify the satisfaction of individual life and it related with materials and goods such as house, car, and money to travel and retire [4]. Moreover, QoL was used to evaluate the satisfaction and personal concern for their life that related with education level, economic growth, health and welfare, and the defense of the non-communist world (the National Goal of President Eisenhower's Commission (1960) reference in Morag F, 1995) [4]. The definition of quality of life is as numerous and inconsistent as the methods of assessing it. It is a problematic concept as difference people value difference things [4]. In 1980, quality of life were categorizing into four dimensions by George and Bearon [4]. It was included in general health domain and functional status domain, socioeconomic status domain, life satisfaction domain, and self-esteem domain (reference in Morag F, 1995) [4]. However, Morag F said that "definition of quality of life was as numerous and inconsistent as the methods of assessing it". It is a problematic concept as difference people value difference things [4].

Over two decades, the quality of life was separated by several researchers into domain. Pardill et al., was separated QoL into 3 domains included physiological well-being, psychological well-being and interpersonal well-being [4]. Physiological well- being refers to the attribution of general functions and progress of disease and treatment of each individual. The activities such as moving, bathing, eating, grooving,

and conversation will distributed a good quality of life among people than people who do not doing those daily activities themselves. In case of disease and special treatment, the prognosis of disease refers to affects to patients who are free from medical control such as limited eating, loss of medicine intake, and loss of appointment with doctor. If patient have a severity of disease, they may have a poor quality of life than patient who have no severity disease. In term of psychological well-being is related with cognitive skills, individual copping skills, and a fear of pain and death from disease. Individual life skill as mention previously affects human satisfaction of life. Any human can have a problem but how they solve those problems is the key point. Person with a good coping skill have a good life too. If patient have pain and she/he can reducing pain in the right way, those patient will have a good life than who cannot solve the problem. However, social contexts affect individuals to accept and solve the problems. Social support and social functioning attribution develop attitudes of human that it also influences to satisfaction of their life [33, 91, 92].

Lawton (1991) proposed a Four Sector model in which psychological well-being, perceived quality of life, behavioral competence and objective environment were present in the QoL of older individuals(Lawton in Farquhar, M, 1995) [4].

when they established what is not quality of life: QoL is not equivalent of quality of the environment, is not equal to the quantity of material goods, is not equivalent to the physical health status, or to the quality of health care, just as it is distinct from subjective constructs such as life satisfaction, morale or happiness (Birren and Dieckmann in Farquhar, M, 1995) [4].

In 1997, Fernandez-Ballesteros said that “Quality of life is referred to the successful aging through usual aging to aging with disability (and dependency). Quality of life is a key concept in environmental, social, medical and psychological sciences, as well as in public policy and in the minds of the population at large; nevertheless, there is no consensus regarding the definition of QoL” [93].

In 2002, WHO was defined quality of life as “an individual’s perception in their life as the concept of culture and value system and related with goal, expectation, standard, and concerning, and the quality of life in age group depend on autonomy as the perception of ability to control, coping, and decision in daily living, and independent as ability of activity daily live function are perform” [6, 45]. QOL assessment provides perception of elderly and/ or their caregiver on physical health, psychological health, social relationships, and environment.

Components nominated in older people of study from Bron J. et al in 2004. Several studies from the difference countries, regions, identity in the world were selected in this study. The main aspects of QoL were healthy, independency, good finical support (sufficiency income) , family and social relationships, be active, happiness, good living conditions and neighborhood, opportunities for learning and developing relations[94].

The quality of life measurement have many version included SF-36, WHOQOL-100, WHOQOL-Brief, WHOQOL-OLD etc. However, this literature review is about WHOQOL measurement only because it is developed and used in several countries and this study also uses WHOQOL-OLD version, which was developed from WHOQOL-100, and WHOQOL-Brief version. It was used more often in any context.

And this study was reviewed literature and relevance researches according to WHO definition [6].

In 1991, WHOQOL working group was defined the Quality of life as “an individual perception in their life as the concept of culture and value system and related with goal, expectation, standard, and concerning. And the quality of life in age group depend on autonomy as the perception of ability to control, coping, and decision in daily living, and independent as ability of activity daily live function are perform” (WHO, 2002). WHO was developed measurement tool for determine the quality of life (QoL) as documented, Word Health Organization Quality of Life with 100 questionnaire (WHOQOL-100 questionnaires). WHOQOL-100 version was developed since 1991 and contributed to the pilot testing in 22 counties which was included Thailand. The question upon respondents perceived of quality of life. The final WHOQOL-100 questionnaire has six domain included physical capacity, level of independence, social relationship, and environment which is translated in 30 languages [6, 37, 95, 96].

The second version of WHOQOL questionnaire is WHOQOL-Brief version. In 1996, WHOQOL group found that WHOQOL-100 version may be too lengthy for some user. They were developed WHOQOL-BREF version which consists of 24 items in 4 domains. It included physical, psychological, social relationship, and environment.

Regarding to unspecific of WHOQOL-brief, WHOQOL group was developed the quality of life questionnaire specified for older people due to a failure to operational of the quality of life concept for the elderly, it will endanger many claims, comparisons with other populations, welfare proposals. They were developed WHOQOL for older people as known WHOQOL-Old version. it consisted of 24 items

in 6 facts including Sensory ability (SAB) facet, Autonomy (AUT) facet, Past, Present, and future activities (PPF) facet, Social participation (SOP) facet, Death and dying (DAD) facet, and Intimacy (INT) facet [37, 95, 96]. The definitions of each facet are following;

The first facet, the sensory ability (SAB) facet refers to assess sensory function and its impact of loss on quality of life, 2) autonomy (AUT) facet refer to independence of old age and amount of being able to live autonomously and take own decision; 3) past, present, and future activities (PPF) facet described personal satisfaction in life and the thing that is expected to; 4) social participation (SOP) facet refers to participation in activities of daily living, especially in community; 5) death and dying (DAD) facet refers to concerning, worries, and fears of older person about death and dying; and 6) intimacy (INT) facet described being able to have personal and intimate relationship [37].

The quality of life (QoL) in Thailand was showed moderate level in several regions[7, 10]. Factors influence to the quality of life such as physical function, social function, cognitive, emotional function, personal productivity, and intimacy was documented[22, 33-35, 97-105]. Moreover, health and function status is common found the relationship with the aging quality of life that it was linked to a pain experience, treatment and health conditions. The factors association with quality of life was explained as following;

Socio-demographic characteristics such as age, gender, occupation, income, education, marital status, and family type I s influence to the quality of life. Marie L. was found the female patients with heart failure and female partners of patient with heart failure have low level of depression and improve the quality of life than male

patients with heart failure and male partners [29]. S. Kirchengast and B. Haslinger (2008) were found the quality of life level in young-aged female was higher than male of the same aged group. Among older-aged female was rated the low quality of life than male with the same aged group [106]. The reduce of QoL in older female was explained that life expectancy of female aging is higher than male that it influence to experience of pain, suffer, and less of mobility from medical conditions. Although gender was found difference health-related with quality of life (HQOL) in aging but age of respondent was also playing role of important key. High- aged was associated with the quality of life in aging due to the experience of pain and disability of them.

Several studies demonstrated the quality of life was influence to family support. In 2003, Thiwasa L. found the total quality of life score in patients with post open-heart surgery was 24.54 and also found self-care agency and quality of life had statistically significant positive relationship [107].

Bowling et. al. (2007) found that over a third of respondents had fairly severe to very severe difficulties with daily activities and rated their quality of life as “not good”; almost two-thirds had fairly to very serve difficulties and rated their quality of life as “good”. The most powerful predictor of having a disability and rating one’s life as well was self-efficacy. As self-care agency are important to improve quality of life among elderly. Health provider should educate and motivate them concerning their life and ability to live and empower them to take care of their group as it influences quality of life among elderly [100].

In 2007, Ukati K and Chantajirakhovit N. study self-care agency and quality of life in end stage renal disease patients undergoing continuous ambulatory peritoneal

dialysis. The results showed that the subjects reported a high mean score concerning self-care agency and a medium mean score concerning quality of life. The patients reported better quality of life after undergoing continuous ambulatory peritoneal dialysis than before CAPD. Self-care agency was positively correlated with quality of life. The selected basic conditioning factors of duration of treatment had a significantly positive correlation with self-care agency, whereas age had a significantly negative correlation with quality of life. Marital status and infection rate had a significant positive correlation with quality of life [108].

Weerasak M. and colleague (2008) studied the quality of life of the community-based patients with mild cognitive impairment (MCI) in Bangkok by using WHOQOL-BREF Thai version found that the MCI patient had significantly lower psychological quality of life when compare with normal subjects. They found that low education was related with poorer total quality of life, and poor financial status was related with poorer psychological quality of life and total quality of life score was statistical significant (p-value 0.026) [10].

Coping is the definition of cognitive behavior to manage stress situation in both internal and external demands. It has been studied in health research widely in immediate coping after diagnosis and coping style that related with outcome of treatment. Personality, material resources and social support are important factors relevant with coping technique. Appraisal-focused coping, problem-focused coping and emotion- focused coping were identified as coping skill type [109-115].

Moreover, Somjit W. (2010) studied the relationship between self-care agency and quality of life among older adults with chronic illnesses in elderly club at the health science center, Burapha University by used WHOQOL questionnaire. They

found that the total quality of life score in population studied was high level and self-care agency had significant positive correlation with quality of life [116].

Thusanee K. and Rojjarin J. (2010) studied quality of life and practices of self-care of the elderly in Nongmaksaw community, Kamsa-ard Subdistrict, Sawangdandin District, Sakon Nakhon Province by using WHOQOL-BREF found that the most of elderly have moderate level of the total quality of life score [117].

2.3 Concepts and theories related with behaviors and changing

Successfully of an intervention can be positively influence to change the behavior change that those interventions must to base on understanding of individual, social and environmental context of behavior change. Several factors were contributed the developing, maintaining, and changing behavior such as individual factors, social factors, and environment factors as explained as following:

Individual factors mean general characteristics such as gender, education, believe, attitude, and culture [91, 92, 118]. Gender is both direct and indirect relationship with the successfully of intervention. Some studies showed female was improved the outcome of intervention than male but some studies was showed male was improved the outcome of intervention than female but it was not documented.

Education factor indicated to certification and non-certification identity.

Regarding, the impact of social relationship on health status, health behavior, and health decision making can contribute to the design of effective intervention for promoting health. This study was used two social theories to develop the intervention program as following;

Social Support theory

Social support theory was used three decades. Social support theory was emphasized the function aspects of social support and the other stressing the cognitive appraisal (perception) of social support that belonging to social network communication [91, 92, 118]. It was involved of social activity that can reduce stressor and esteem enhances their self-esteem. Social support are objects that supporter was provided to receiver. The support does not refer to only things but it also refers to the emotional support and information support. Social support is an important factor to play role toward well-being of aging people. The perception of the evaluation among elderly people was transacted of their social network such as friends, neighbors, religious congregants, and coworkers that they represent potential resources, establishing, and maintaining the changes of lifestyle. Social support is more diverse and more predictive of an adult's greater physical activity level that restricted social support networks [7, 37, 86]. In addition, the involvement of religion congregants via church-based health promotion programs has proven effective for lifestyle change. Social support consist of 4 type of supports 1) Instrument support such as equipment, time, money etc. 2) Appraisal support such as feedback, affirmation etc.3) Information support such as education, consulting, advice etc. 4) Emotional support such as caring, respect and satisfaction etc. [91, 92, 118].

Social Network theory

Social network is important in community to influence the behaviors of individuals. Social network is a relationship of one people to other people in both direct and indirect relationship. The understanding of formal and informal groups,

social organization and social structure are affecting to their social network group by getting information, changing the attitude and copping behavior. The conversation among people are influence their decisions and behaviors.

Structure of social network are the relationship between people in their group though communication, behaviors, and interaction during conversation. Several people explained the factors related with social network structure are included;

1) Size of the society that refers to whom there are interaction with and how many people in the interaction
2) Type of relationship that refers to relationship between people who is interaction with. Some study determines the relationship to relative and non-relative that it related to their society is individual such as people in European countries. The relationships between relatives are people who have same kinship and identify by biological and legal relationship. And social network of people without relative or (non-relative group) is included friends, neighbors, and colleagues. However, this social structure could not explain some rural area in ASEAN counties such as Thailand, Myanmar, and Loa because the relationship between their communities is closed. Friends and neighbors might be indicated as the relative because there are married people in the same village and people in the village is known each other as neighbor and relative. In sprint of the society in some ASEAN countries cannot explain the characteristic of society as relatively, the quality of relationship is more cleanly to explain type of society as intimate relationship and non-intimate relationship. Intimate relationship means the relationship between friendship, kinship, and colleagueship that more understanding in this social

type. For non-intimate relationship, it could explain that relationship of economic exchange and warfare etc.

3) Duration of relationship is the length of interaction between people in their relationship. Who have longer duration of the relationship can be influence to behavior change than who have a few of relationship duration.
4) Frequency of relationship is the number of interaction between the societies. People who have more frequency of interaction can influence to other behavior than people who have less interaction.
5) Communication methods are the method to transfer the source to receiver. The methods of communication are verbal and non-verbal communication. Verbal

Social network structures are included reciprocity, intensity, complexity, and formality of their social network. Reciprocity is to extent to which resources and support are both give and receive in a relationship. Intensity or strength refers to extent to which social relationship offer to emotional closeness.

Complexity refers to extent to which social relationships serve many function. Formality refers to extent to which social relationships exits in the context to organization or institutional roles. In part of social network function are the function to human action that is including social capital, social trust, social understanding, social support and companionship. Social capital refer to resource characterize by norms of reciprocity; social trust Social influence refer to process by which thoughts and actions are changed by actions of others; social undermining refer to process by which others express negative affect or criticism or hinder one's attainment of goals;

companionship refer to sharing leisure or other activities with network member; social support refer to aid and assistance exchanged through social relationship and interpersonal transactions.

Regarding to social network affects to behavior of people in the society, several studies were found that averaged 2 to3 aging people was communicated in their society, and the key persons to communication in aging are included family member, friends, neighborhood, and relatives [119]. The study of Keokum S., (2003) found that social support is related with high level of the quality of life among elderly people [120]. Occupation of elderly, health information and other life support should be taken into activity or vision of elderly club and cooperation between family, community, and government to helping elderly that it might improve the quality of life among elderly. Social network are defined as stable but evolving relational fabrics constituted by family members, friends and acquaintances, work and study connection, and relation that evolve out of each individual participate in formal and informal or organizations [121].

Social network model refer to social network and communication among within and between people and groups that influence and constrain behavior in myriad and complex ways. Thomas W.V. said that relationship influence a person's behavior above and beyond the influence of his or her individual attributes such as sex, age, educational level, income, occupation, and ethnicity that are very important to attitude, beliefs, and behaviors in person. These attributes also influences people who know and spend time with in their social network. Social network are evolving relationship fabrics constituted by family member, friend, acquaintances, work and study connections, and organizations [121]. People are easy to communicate and

connect by use of internet and transportations that make social network widely. Social network concepts and techniques are used widely including anthropology, business, communication, computer science, economics, education, marketing, medicine, public health, political science, psychology, and sociology. The reasons that may support the increase of social network research are weakness of behavior theories to explain behavior and increase of electronic communication such as cell phone, internet and mass media that changed community activities[33-35, 37, 86, 91, 92, 120, 122].

2.4 Concepts, theories, and researches relevance on Triple—E education

Most of chronic diseases are related with lifestyle behavior such as eating habits, physical activity, sedentary behavior, and tobacco and alcohol consuming. Tripe – E education was a key message of health education concern to reduce health problem in general population that included aging people. Ministry of Public Health in Thailand was created intervention program to promote good health behavior by using triple-E or 3-อ .Triple – E are included eating behavior, exercise, and emotional that will explain as following;

1) E - Eating behavior, eating behavior was defined the eating of healthy food with adequate nutrients.
2) E-Exercise behavior, it was defined as behavior of exercises and physical activity. More physical activities and exercises is influence to free of disability and chronic condition. Regarding to anatomy and physiology changed, the effects of exercise are increased bone density and joints motion, muscle strengthen, blood circulation

3) E-Emotional management, emotional management was defined the middle way of life as Buddhism recommended. Emotional management

2.5 Other researches relevance

Home-based intervention was defined the intervention at participant house. Most of elderly not joined elderly club or other social activities due to their job in daytime such as take care grandchild, cleaning house, take care house during their children are out site for working or some elderly have less interesting to go outside far away from their house to join activity. Most of elderly spend day time with their neighbor and do not join elderly club [7]. Regarding this an idea, to developing intervention and improve an activity for elderly at their home was documented as below;

The systemic review of van der Bij, A.K., et al (2002) studied the effectiveness of physical activity interventions among older adults by using computerized searches to identify randomized controlled trials[123]. Study was recruited the intervention regarded (1) the study population consisted of older adults (average sample population are aged 50 years and their minimum age are 40 years), (2) the intervention consisted of an exercise program or was aimed at promoting physical activity; and (3) reported on participation (i.e., adherence/compliance) or changes in level of physical activity (e.g., pre–posttest measures and group comparisons). The 38 studies and 57 physical activity interventions found that three types of interventions were identified as home-based, group-based, and educational. In the short-term, both home-based interventions and group-based interventions achieved high rates of participation (means of 90% and 84%, respectively). Participation declined the longer

the duration of the intervention. Participation in education interventions varied widely (range of 35% to 96%). Both group-based education programs were affected in increasing physical activity levels at the short-term of intervention. Information on long-term effectiveness was either absent or showed no difference of physical activity level between the study groups. Home-based, group-based, and educational physical activity interventions can result in increased physical activity, but changes are small and short-lived. Participation rates of home-based and group-based interventions were comparable, and both seemed to be unrelated to type or frequency of physical activity [123].

Mather, A.S., et al., (2002) was study the effect of exercise program among elderly who had depression symptom with poor outcome of treatment. Randomize controlled trail was used to recruit subjects in this study. Health education program on exercise was trained to depression patients for ten weeks. Geriatric Depression Scale was reduced after 10 weeks of the intervention. This study was showed that patient with depression can reduced their symptom of depression by exercises. Routine exercise should be encored for every persons included patients with poor outcome of depression treatment. [124].

The efficacy of home-based daily exercise on muscle strength of upper and lower extremities and QoL in elderly osteoporotic women with a case-controlled study was designed and conducted between 2005 and 2006 [125]. Sixty-three osteoporotic women who are aged over 60 years were randomly assigned to attend a 12 months of muscle exercise intervention at home [125]. The outcomes were changes in muscle strength and quality of life (QoL). Ultimately, sixty-two participants were completed12 months of the program. Before the start of home-exercise

training, the lumbar spine bone mineral density (BMD) and femoral neck BMD values in the intervention group were significantly lower than those in the control group ($p < 0.05$). Grip strength and maximum walking speed increased significantly in the intervention group ($p < 0.05$). In terms of QoL, physical functioning was improved by home-based exercise in the intervention group ($p = 0.05$), while there were no improvements in any of the categories of Short-Form 36 in the control group [125]. Their results suggest that home-based training is effective for elderly osteoporotic women in improving not only muscle strength in upper and lower extremities but also physical functioning in QoL [125].

Pitkälä, K., et al (2013) studied the efficacy of physical exercise for the treatment of depressive symptoms in older adults (60 years) by used systematic review. Both randomized controlled trials and quasi-experimental studies in physical exercise interventions for relief depression were included. Over 80% of participants in those studies were 60 years. Therefore, the short-term of results in nine studies were reduced depression or depressive symptoms. This result of systematic review showed the activities among elderly can reduce depression in elderly. The activities to relief depression should relate with model, intensity, duration, and co-intervention. Unfortunately, the medium to long term intervention of exercise program among patients with depression and their treatment was unclear. The intervention could not explain especially treatment and the intervention. However, only exercise cannot improve the intervention and cannot use in all population but the changing of the outcome might be related with their activities [126].

Elisabeth Rydwik (2010) studied “the effects of a physical and nutritional intervention program on improving the physical activity level and activities of daily

living (ADL) in frail elderly people" [13]. Ninety-six of community-dwelling frail elderly who aged over 75 years were included in the study [13]. They were 58 female elderly and 33 male-elderly. The intervention programs consists of 3 stage included; 1) 12 weeks of physical and nutritional training; 2) six months of home-based exercises at participant's home; and 3) followed up with diaries training [13]. After implementation, physical activity level, walking habits and ADL was screening at 3rd, 6th, 9th, after intervention to compare with baseline intervention. The study showed participants were increase of their physical activity and duration of walking at 1st follow-up when compared with other two groups. Thus, the 2nd follow-up was not showed that the physical and duration of walking was not high increasing but it was maintained at the same level. In the group of nutrition training only was not shown the statistical different. According to previous study, only health training could not change the behaviors of participants but it needs to add some activity. This study was used home-visited to motivate participants for changing their behaviors. However, there were moderate correlations between increases in physical activity level and ADL as well as between the amounts of home-based exercises and ADL for the two training groups [13].

Fiona B.G. (2009) studied the effects of exercise interventions on subjective quality of life (QoL) across adult clinical populations and well people, and to systematical investigated the impact of the exercise setting, intensity and type on these outcomes[127]. From a systematic search of six electronic databases, 56 original studies were extracted, reporting on 7937 sick and well people. A meta-analysis was conducted on change in QoL from pre- to post-intervention compared with outcomes from a no-exercise control group. Three to 6 months post-baseline, a

moderate positive effect of exercise interventions was found for overall QoL in rehabilitation patients, but no significant effect for well or disease management groups. However, physical and psychological QoL domains improved significantly relative to controls in well participants. Psychological QoL was significantly poorer relative to controls in the disease management group. This pattern of results persisted over 1 year. With some exceptions, better overall QoL was reported for light intensity exercise undertaken in-group settings, with greater improvement in physical QoL following moderate intensity exercise[127].

George A.K. (2009) studied the effects of physical activity on health-related quality of life (HRQOL) in older community-dwelling adults[128]. The study shown that a significant (small to moderate) standardized effect size improvement was found for physical function as a result of physical activity (Hedges's g = 0.41, 95% confidence interval [CI] = 0.19, 0.64, $p < .001$). This was equivalent to a common language effect size of 62% and an odds ratio of 2.14 (95% CI = 1.42, 3.24). No significant differences were found for the other nine HRQOL outcomes[128].

Emma P. (2011) studied the effects on physical capacity and HRQoL of an exercise program in elderly patients with CHF in primary care[129]. An exercise intervention was conducted as a prospective, longitudinal and controlled clinical study in primary care in elderly patients with CHF. Endurance exercise and resistance training were conducted as group-training at the primary care center and as home training. Follow-up on physical capacity and HRQoL was done at 3, 6 and 12 months [129]. They found that exercise significantly improved muscle endurance in the intervention group (n=29, mean age 76.2 years) compared to the control group (n=31, mean age 74.4 years) at all follow-ups except for shoulder flexion right at 12

months (shoulder abduction p=0.006, p=0.048, p=0.029; shoulder flexion right p=0.002, p=0.032, p=0.585; shoulder flexion left p=0.000, p=0.046, p=0.004). Six minute walk test improved in the intervention group at 3 months (p=0.013) compared to the control group. HRQoL measured by EQ5D-VAS significantly improved in the intervention group at 3 and 12 months (p=0.016 and p=0.034) and SF-36, general health (p=0.048) and physical component scale (p=0.026) significantly improved at 3 months compared to the control group [129].

Fritz T. (2011) studied the effects of 4 months of increased physical activity on health-related quality of life in overweight individuals with Type 2 diabetes mellitus, normal or impaired glucose tolerance[130]. Subjects were 212 individuals without severe physical or cardiovascular impairments aged 61 (57–64) years with BMI 29 (27.5–32) kg/m2. They were randomized into a control group (n = 125), who maintained unaltered habitual lifestyle, and an exercise intervention group (n = 87), who were directed to engage in Nordic walking with walking poles, 5 h per week over 4 months[130]. Self-reported physical activity and health related quality of life was assessed at the time of inclusion and after 4 months. They found that at baseline health-related quality of life of this study cohort was similar to, or better than, an age- and sex-matched Swedish population sample, for 12 of 13 scales. Quality of sleep and BMI were improved for participants with normal glucose tolerance after 4 months of Nordic walking, with little or no musculoskeletal pain as compared with control subjects. No correlation was evident between improved quality of sleep and improved BM[130]I.

Makoto Hiyamizu (2011) studied the effects of dual task balance training in the elderly on standing postural control while performing a cognitive task by used a

randomized two-group parallel controlled trial. Forty-three subjects (all >65 years old) were enrolled in the study and were assigned randomly to either an experimental group (n¼21) or a control group (n¼22). Subjects in the experimental group were given strength and balance training while performing cognitive tasks simultaneously. Subjects in the control group were given strength and balance training only. The training was administered twice a week for three months. The Chair Stand Test, Functional Reach Test, Timed Up and Go Test and Trail Making Test were measured. All measurements were collected at baseline and after the training period. There were no significant differences in Functional Reach Test, Timed Up and Go Test and sway length at baseline and after training between the two groups. However, the rate of task ($P<0.05$) was significantly higher after training in the experimental group than in the control group[131].

For home-based intervention, Mori Y. and colleagues (2011) studied the long-term effects of home-based bench-stepping exercise training on total health care expenditure (TOHEX) and number of outpatient visits (NOVIS) in elderly adults [132]. A 189-elderly was randomly assigned to intervention and control group. For intervention group, 98-elderly were encouraged to perform home-based bench-stepping exercise training. An individual corresponding with intensity of exercise by step up in benching, this was readjusted at the first 6 weeks. Group exercise sessions were conducted weekly in community at the first 3 months after that twice a week till 18 months. Daily exercise was noted in exercise training log book. Evaluation was taken at 6 months before intervention and at 6 weeks, 3 months, and 18 months after intervention. Results showed that intervention group was increased lactated threshold when compared with pre-intervention. However, during the first 12 months

was no significant difference in total health care expenditure, number of outpatient visits, or outpatient expenditure. In contrast, at 18 months, total health care expenditure; number of outpatient visits, or outpatient's expenditure was lower in intervention group [132].

CHAPTER III

RESEARCH METHODOLOGY

This chapter describes the research methodology comprised of two part of study. The first part of study is a qualitative study with the objective to describe the quality of life and the lifestyle of elderly in Sam Sung District, Khon Kean province, Thailand. The second part of the study is the quasi-experimental study with control group. This study aims to assess the effects of the Home-based lifestyle change (HBLC) intervention to improve the quality of life, reduce depression, and improve the physical function among people aged 60 to 75 years in Sam Sung District, Khon Kean Province, Thailand. The outcome of the experimental group was compared with control group. The control area was located at Num Phong District, Knon Khen province.

3.1 Study area

Khon Kean Province was purposely selected. This province was the second highest of the number of aging in the Northeast of Thailand (NSO, 2010). Khon Kean Province is located at the center of Northeast of Thailand and far from Bangkok about 550 kilometers. The province is connected with Nakornruchasrima province, Udorn Thani province, Kalasin province and Maharsarakarm province. Khon Kan province has 26 districts, 225 sub-districts and 1,732 villages. In 2009, the provincial population was 1,756,719 people (NSO, 2010). The main of occupation in Province is farming.

This study was taken place in Sam Sung district (an experimental area) and Num Phong district (a control area).

1) Sam Sung district is located at the South -Western of Khon Kean Province. The total area of Sam Sung district is 116.7 km2. Over 23 thousand people are living in Sam Sung district. This district is subdivided into 5 sub-districts or into 34 villages. Ban Non sub-district was purposively selected due to they are coming an aging society. In 2010, Ban Non sub-district has 1,207 families. Over 600 of people aged 60 and over live in this sub-district. One hundred and seventy six of elderly live with chronic diseases. Twenty-two elderly are independent.
2) Nam Phong district located North of Khon Kean province. Total area of Nam Phong district is 828.7 km2. About 112,000 people live in Nam Phong district. The district is subdivided into 12 sub-districts or 167 villages. Sai Moon sub-district was purposively selected as a control area due to its economic status and the proportion of elderly is similar with an experimental area.

3.2 Study Design

A quasi-experimental study comprised of two parts includes a qualitative study and a quantitative study.

Part 1: Qualitative study

This part of study was conducted at Sam Sung District, Khon Khean province. The in-depth interview used for describing the quality of life and the lifestyle of aging. The subjects of this interview are persons aged 60 to 75 years in Sam Sung District, Khon Kean Province. Fifteen of aging was interviewed. The questions consists of 5 topics; characteristics of subjects, the meaning of the quality of life by perceived subjects and factors associated with it, perceived economic situation and the effects of it on their life, the activities daily living, and social participations. The

in-depth interview was done at households of subjects. Tape was used to record and notes were taken during interview. In each interview, it's used 30 minutes per an interview. Step of interviewing are included:

1) Explain the purpose of the interview to subject and their family

2) Subjects signed the consent form before interview started

3) Researcher taken a record and note while interview

4) Tapes recorded were transcribed and translated from Issan language to Thai language by researcher.

Content analysis used to describe the context of communication. The words and phrases mentioned most often were important context of concerns in the communication.

Part 2: Quantitative study

A quasi-experimental study with a control group was condected to assess the effects of home-based lifestyle change (HBLC) intervention to improve the quality of life, reduce depression,improve the physical function among elderly in Khon Kean province, Thailand. Two districts were purposely selected due to they are become an aging society. Sam Sung district was assigned to be an experimental area. And Num Phong district was assigned to be a control area.

3.3 Target Population

The target population was people aged 60 to 75 years live in Sam Sung District (an experimental group) and Num Phong District (a control group), Khon Kean Province.

Target population in the experimental area

The target population is people aged 60 to 75 years who live in Ban Noon village, Sam Sung District, Khon Kean Province. Subjects are able to communicate with other. Subjects are chosen to the group by their neighbor or friends. Exclusion criteria of this study are absent of training on triple-e education and absent of community meeting 3 times and over.

Target population in the control area

The target population in the control area is persons aged 60 to 75 years who live in Sai-Moon village, Num Phong District, Khon Kean Province. Subjects in the control group were randomly selected.

3.4 Sample size calculation

Regarding to the study design, the sample size was calculated by using two independent group formulas. Study of Sunnata S. found the improving of the quality of life in her experimental after provide 6 months of the squat exercise [8].

$$n = \frac{2(z\alpha + z\beta)^2 \ \sigma 2}{(x1 - x0)^2}$$

n = Estimated sample size (in each group)

$z\alpha/2$ = Standard score for two-side test of type 1 error (α = 0.05) = 1.96

$z\beta$ = Standard score of type II error (β = 0.1, Power = 90%) = 1.282

x 1- x 0 = the difference of the average score between intervention group and control = 0.54 (Sununta S., 2010)

$\sigma 2$ = Pooled variance = 0.58 (Sununta S., 2010)

Calculation

$$n = \frac{2\,(1.96 + 1.282)2\,(0.58)2}{(0.54)2}$$

$$n = 42$$

A 30% of estimated sample size was added in each group. Total minimum number of study population was 55 persons in each group. Total number of participants in this study was 110 persons.

3.5 The procedure of the quantitative study

The procedure of the quantitative study was divided into 4 phases as following:

Phase 1: Preparation phase

Phase 2: Baseline survey

Phase 3: implementation phase

Phase 4: Post-evaluation phase

Phase 5: Data collection and Analysis

Phase 1: Preparation phase

This phase included intervention developing, study approach, instrument preparation, researcher assistant training, and data collectors' training as follows:

1) Intervention developing and instrument of training was obtained from the literature review of the theory and concepts and research relevancies.
2) This study approached the health volunteers to be the research assistants. Nursing students were approached and trained to be research

assistants and data collectors. Health provider in community was approached to be trainer. And community leaders and health providers were invited to observe in this study.

3) Researcher trained a triple-E education and the monitoring and evaluation technique to five nursing students and ten health volunteers.
4) Ten nursing students were trained to be data collectors. The topics of the training are the meaning of each item in the questionnaires and the ethical of data collector. The training was conducted at Faculty of Nursing Science, College of Asian Scholar, Khon Kean province.
5) Health volunteers in each section approached participants as the criteria mentioned above). Accepted participants signed consent form and sent to researcher before data collection was done.

Phase 2: Baseline Survey

Researcher invited participants to explain the process of this research. Researcher and team assessed baseline information of both intervention and control group. This phase was conducted at community temple. Total participants are 110 persons (55 persons from the intervention group and 55 persons from the control group).

Phase 2: Implementation phase

The implementation phase was conducted at Sam Sung District, Khon Kean Province. An activity was carried out thought community selection. The activity plan was divided into 3 stages:

Stage 1: Triple-E training for all participants

Stage 2: Empowerment and Monitoring training for team leader

Stage 3: Home-visit

Stage 4: Monthly meeting

Stage 1: Triple E training for participants in the intervention group

Triple – E education are the education on the exercises technique, the knowledge of an eating healthy food, and the emotional management. Fifty-five elderly at Sam Sung District attended triple-E training. Triple-E education was provided by researcher, health providers from the health promotion center at Ban Noon, research assistant. The training was done for 3 days (3 hours/ day). The trainings were conducted at Temple in study area. Materials of training are a power point, video, and booklet. The training composed of 3 topics as following

Day 1

The first day trained exercise for participants. The training conducted at temple and used 3 hours for this section. Researcher explained 15 positions of exercise to participants. The technique of the training is demonstration and group exercises.

The first day was training on E – exercise education by health provider and researcher on muscle strength position which included,

1. Warm up 5 minutes,
2. Muscle strength and balance 15 positions about 20 minutes and
3. Cool down 5 minutes.
4. Warm up with stretching by waist stretch, shoulder rotation, neck stretch, lift arm, lift in each leg, stretch one' leg to forward, lift the foot and tip the ankle, step foot and lift one' leg to upper, lift one' leg to side and stand on the tip of toe.

5. Cool down as the same with warn up.

After demonstration, they practiced each step by group. After repeated demonstrations, a poster and a daily booklet were also given to participants

Day 2

The second session trained on eating healthy food. The technique of the training used explanation and group discussion. During the session, subjects were discussed on their eating behaviors. Researcher explained number of food consumer per person.

Day 3

The third day session was discussed Emotional management. Researcher explained the effects of the uncontrolled-emotional toward their life. One elderly discussed the technique to control emotional. Meditation technique was used to control their emotional. Laugh technique was taught to reduce moody. This section taken 3 hours and took place at temple.

Stage 2: Empowerment and Monitoring training for team leader

Two team leaders of each group were chosen from their group members. Researcher and team trained ten team leaders on empowerment and monitoring techniques. Health volunteers and team leader visited the group member at their house. All health volunteers and team-leaders committed to visit their group member regularly. The trainings conducted at a health centers.

Stage 3: Monitoring the intervention

Home visit, team leaders of each group visited their group members at their home. The home visit was conducted at least once a week as a routine activity.

Stage 4: Monthly Meeting

Monthly meeting (3 hours) was conducted at temple on the first or the second of Sunday of each month. Activities were including discussion, exercise, and sharing experience within group and between groups. At least one participant in each group shared the experience on the effectiveness of lifestyle change.

Phase 3: Post-evaluation phase

The evaluation was conducted at 6th and 9th months after implementing the HBLC intervention. It aimed to assess the improvement of the quality of life and physical function, and reduce the depression. All evaluation processed spend 30 minutes per person. It was conducted at community temple by well-trained data collectors.

The research implementation procedure

Intervention

X0----X----X1----X2----X3----X4---- X5----X6----------X9

O0---------- O6----------O9

Control

X0 = pre-evaluation of intervention group

X= Triple-E education of intervention group and Empowerment of intervention group

X1 = the 1st Community meeting

X2 = the 2nd community meeting

X3 = the 3rd community meeting

X4 = the 4th community meeting

X5 = the 5th community meeting

X6 = the 6th community meeting and the 1st evaluation

X9 = the 2nd evaluation

O0 = pre-evaluation of control group

O6 = the 1st evaluation

O9 = the 2nd evaluation

3.6 Measurement tools

The structured questionnaire for quantitative data collection consisted of 6 parts:

Part1: Socio-demographic characteristics

Part2: Health status and Health information

Part 3: Social Activities and Participations

Part 4: Depression assess by Thai Geriatric Depression Scale

Part 5: Quality of life by WHOQOL-OLD questionnaire

Part 6: Physical function by Berg Balance test and Time-Up & Go test

Part I: Socio-Demographic characteristics part

It consists of 11 items including age, gender, marital status, education, occupation, number of family members, individual outcome, status of sufficiency income and savings, house owner, caregiver, caregiver during sickness.

Part II: Health status and behavior related with health

This part had 9 topics as follows:

1) History of illness

The history of illness refers to perceive of subjects on their health status which was diagnosed by medical doctor that it was included diabetes, hypertension, heart diseases, and liver diseases and other chronic diseases.

2) General health

General health complain included back pain, leg pain, urinary incontinence, visual impairment, hearing loose and other impairment, sleeping problem (included insomnia), testing problem, and less power of extremities muscle are rated by subjects. Five point of Likert scales was used to determine the level of health complained among respondents, and it had presented last 4 weeks ago as follows:

- Never mean never occur within last 4 weeks ago (score 0)
- A little mean occurs 1 or 2 times within last 4 weeks ago (score 1)
- Moderate means it occur every two at least 1 or 2 times a week (score 2)
- Often mean occurs every week or two weeks at least 2 or 3 day a week (score 4)
- Always mean always occur with respondent or it occurs every week at least 5 times a week (score 5)

3) History of alcohol consuming

Alcohol consuming refers to beer, alcohol, and any soft drinks that subjects have had drinking routinely or usually. Never drinking refers to no drinking in normally or never drinking before. Ex-drinker refers to subjects who had ever drink alcohol in the previous but currently was stopped to drink more than 2 months ago.

Current drinker refers to subjects who are still drinking alcohol and do not decided to stop drink.

4) Smoking behavior

Smoking behavior refers to smoking of any tobacco including Thai traditional tobacco. Never smoke refers to subjects who had no experience of smoking. Ex-smoker refers to subjects who had experience of smoking but they were stopped smoke more than 2 month ago and decided not to smoke it at all. Current smoke refers to subjects who are currently smoking and do not decided to stop smoking.

5) History of physical check up

Physical checkup refers to any physical examination by health providers such as blood correction and vital signs, visual impairment screening, and weigh at least one times as a previously. And it also included the follow-up of medical treatment.

6) Fall drown history

Fall drown history refers to lose in an upright or erect position suddenly during walk, getting up, and change position. It excluded attach from other things and other accidental such as motorcycle accident.

7) History of access health care services

Access health care services refers to experience of health care visited of subjects when they were sick that consists 5 items including bought medicine from pharmacy, visited medical doctors at hospital/ clinic/ health care center, visited Thai traditional medicine, visited Chinese traditional medicine, and not accessed health care services. If subject indicated never visited, score is 0. If subject indicated ever visited, but it was few time, score is 1. If subjected indicated moderated visited, score

is 2. If subjects indicated usually, score in 3. If subjects indicated always visited (score 4).

8) Health insurance

Health insurance refers to current health care insurance that respondent was used or holed. It will determine as participant have or have no insurance card. The insurance cards included30 baht universal coverage card, social welfare card, private insurance cards, and government insurance card.

9) Activities of subjects within last week which use 4 scale as follows:

a. Never refers to it was never done within 1 week ago

b. Sometime refers to it was done 1 or 2 times a week

c. Often refers to it was done 3 or 4 times a week

d. Always refers to it was done at least 5 times and more a week

Part III: Social activity and social support

This part consists of 6 questions related with social activities and social support as follow:

1. Joint social member
2. Social Activities
3. Social information
4. Instrument support by community
5. Number of closed-friend
6. Stress consultant

Part IV: Thai Geriatric Depression Scale which is consists of 30 items.

The questionnaire consisted 30 items that the respondents answered to determine personal feeling in the last week events. The answer were “yes” or “no” to get a score 1 and 0 respectively. In contrast, 10 items which is item number 1, 5, 7, 9, 15, 19, 21, 27, 29, and 30 is positive feeling. If respondent answer “no” will be given 1 score and if respondent answer “yes” will be given 0 score. The total score ranged from 0 – 30 points. For criteria for depression level among Thais elderly are scoring as follows;

1) Normal or no depression 0 – 12 points
2) Mild depression 13 – 18 points
3) Moderate depression 19 – 24 points
4) Severe depression 25 – 30 points

Part V: Activities Daily Living and Instrument Activities Daily Living (ADL & IADL)

An Activities Daily Living (ADL) and Instrument activities Daily Living (IADL) of elderly was used by Health Information System development version in 2010. It consisted of 18 items. ADL indicated subject was done independent, score is 3, if subject indicated need assistant, and score is 2, if subject indicated dependently score is 1. For the question asking yes or no, if subject indicated yes is 1, no is 0. IADL was scored 3 for independent, 2 for need assistant, 1 for dependent , and 0 if never done.

Part VI: Quality of life by World Health Organization Quality of Life for Older (WHOQOL-OLD)

The WHOQOL-OLD questionnaire consisted of 24 items in 6 facts including Sensory ability (SAB), Autonomy (AUT), Past, Present, and future activities (PPF), Social participation (SOP), Death and dying (DAD), and Intimacy (INT).

The sensory ability refers to assess sensory function and its impact of loss on quality of life, and it has 4 items. The autonomy facts refer to independence of old age and amount of being able to live autonomously and take own decision. It has 4 items. The past, present, and future activities described personal satisfaction in life and the thing that is expected to. It has 4 items. Social participation refers to participation in activities of daily living, especially in community. It has 4 items. Death and dying refers to concerning, worries, and fears of older person about death and dying. It has 4 items. Intimacy described being able to have personal and intimate relationship, also had 4 items as in the table below;

Table 1: Rating score of Quality of Life (WHOQOL-OLD) in each facet

Facts	Items	Possible range of raw score	Abbr.
Sensory Activities	1 + 2 + 10 + 20	4, 20	SAB
Autonomy	3 + 4 + 5 + 11	4, 20	AUT
Past, Present, and Future activities	12 + 13 + 15 + 19	4, 20	PPF
Social participation	14 + 16 + 17 + 18	4, 20	SOP
Death and dying	6 + 7 + 8 + 9	4, 20	DAD

Facts	Items	Possible range of raw score	Abbr.
Intimacy	21 + 22 + 23 + 24	4, 20	INT

Source: WHOQOL-OLD manual by World Health Organization in 2006

The questionnaires used five points Likert scale that had 4 parts, the first part asks about how much respondent had experienced certain things in the last two weeks (have 9 items), and the scores were given as follows:

Not at all	A little	A moderate amount	Very much	Extremely
1	2	3	4	5

The second part asks about how completely respondent experience or were able to do certain things in the last two weeks (4 items) and the scores were as follows:

Not at all	A little	Moderately	Mostly	Completely
1	2	3	4	5

The third part asks about satisfaction, how happy or good respondent have felt about various aspects of life over the last two weeks (6 items) and the score were given as following:

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	very satisfied
1	2	3	4	5

Very unhappy	Unhappy	Neither unhappy nor happy	Happy	very happy
1	2	3	4	5

Very poor	Poor	neither poor nor good	Good	Very Good
1	2	3	4	5

The fourth part was about how intimate relationships respondents have felt about various aspects of life over the last two weeks (6 items) and the score were given as following:

Not at all	A little	Moderate	Very much	An extreme
1	2	3	4	5
Not at all	A little	Moderately	Mostly	Completely
1	2	3	4	5

Evaluation of the quality of life

Items number 1, 2, 6, 7, 8, 9, and 10 are negative questions and scores were reversed before data analysis. After computing the scores compared the level as follows:

Total Quality of Life Level are scored as

- Low Quality of Life 24 – 55 score
- Moderate Quality of Life 56 – 88 score
- High Quality of Life 89 -120 score

Quality of Life of each facet is scored as:

- Low Quality of Life 4 – 9 score
- Moderate Quality of Life 10 – 15 score
- High Quality of Life 16 – 20 score

Part 7: Physical function by Berg Balance Test (BBT) and Time Up & Go Test (TUGT)

Berg Balance Test (BBT)

BBT comprises a set of 14 tasks which subject needs to follow the instruction of assessor to determine the functional mobility of an individual. The test takes about 15–20 minutes. The score is 0 to 4 points as follows:

1. if subject needs total assistant to be assisted she/he, a score is 0

2. if subject needs some assistant to support, score is 1

3. if subjects can do as instruction but unsafely, score is 2

4. if subject can do as instruction safely and independence, score is 3

5. if subject can do as instruction safely, independence, confident and easier, score is 4

Range score is 0 to 56 points. If subjects are scored between 0–20, they are wheelchair bound. If subjects are scored between 21–40 points, they are walking with assistance. And if subjects who are scored between 41–56points, they are independently (Internet Stroke Center, 2011).

Subjects Safety:

1. Location of test is fate and safety.

2. Two assistant is provided during the test.

3. First aids kit needs to be standby during examination.

Time-Up & Go Test (TUGT)

TUGT refers to the test of mobility and requires both static and dynamic balance of subjects by instructing subject to walk normally for three meters. Time was recorded from subjects getting up from chair and turn back to sitting in the same chair. The record was done by assessor. It was recorded in seconds. The evaluation was to determine the change in minute before and after intervention period.

Subjects Safety:

1. Subject can ambulate with or without an assisted device.

2. Regular foot wear can be worn during testing and gait aid may use as a normal during ambulation.

3. A time of the test is not limited to complete that subject can stop and rest (but not sit down) if they need to.

4. Assisted by another person may not be able during test but standby assistance was provided during the test.

3.7 Quality of measurement tools

Validity of measurement tools, this tool was developed by review of literature and relevance study and consults thesis researcher and specialist in physical exercises due to study objective.

The quality of life used standard questionnaire from WHOQOL group which is used in 22 countries. It was tested valid questionnaire by WHOQOL group. WHOQOL-Old questionnaire was authorized by Mike Power (WHOQOL group director) to translate from English to Thai language. The questionnaire was translated from English to Thai and translated back from Thai to English then checked the context of the questionnaire from WHOQOL group.

Ability of daily living was used Activities Daily Living and Instrument Activities Daily Living (ADL & IADL) questionnaire. ADL&IADL measurement was used standard questionnaire of the National health examination Survey in 2009.

Depression symptom used Thai Geriatric Depression questionnaire by Thai Brain Forum which is standard of depression screening in Thailand.

Physical function test used TGUT and Berg Balance Test that was published in website of American Stoke Association.

Reliability of the questionnaire after pilot study, it was found that Cronbach's Alpha coefficient is 0.85.

3.8 Data Collection

Data collection was obtained by:

1) Subjects filled consent form
2) All questionnaires were coded before interviewing.
3) Data collectors conducted the structural interview by using the questionnaire.
4) Researcher checked the completed questionnaire before data entry.

Data collection took place at temple due to physical function test need to safe place to evaluate.

3.9 Data preparation and Analysis

The obtained data was coded and entry into the computer by Researcher and research assistant. Double-data entry was done before analysis to check the error of data.

SPSS program version 16 was used to analyze obtained data. The significance level is accepted at 0.05. The statistics were used as follows:

1) Descriptive statistics as number, percentage, mean, standard deviation, and range were used to determine socio-demographic characteristics data.
2) The similarity of the baseline information between intervention and control used the independent unpaired t-test for continuous data and Chi-square test for nominal data.
3) The overall mean change difference between intervention and control group in difference time used General Linear Repeated-Measure ANOVA with a significant level at 0.05.

4) The interaction of the intervention program was compared with control group at difference times. It used General Linear Mixed Model analysis with statistical significant level at 0.05.

3.10 Ethical Consideration

The Ethical approval of this study was obtained from the investigator's research committee from Ethical Review Board, Chulalongkorn University.

1) The purpose of study, and study plan were explained to subjects before signed the consent form.
2) Name and ID number of subjects were corded in the questionnaire. Data collectors and data entry did not know subjects name.
3) Researcher promised participants to keep data confidentially. It will destroy after analysis completed. The questionnaire could not be traced back to the respondents.
4) Subjects were feel free to participate or withdrawal any time throughout the interview.

CHAPTER IV

RESULTS

This chapter includes analysis and interpretation of the data obtained through both qualitative and quantitative methods. This study was quasi-experimental with control study to assess the effects of home-based lifestyle change intervention toward the quality of life by using WHOQOL-OLD questionnaire. Study had purposive sampling selection method to select study area from two districts in Khon Kean province. Sam Song district was selected as an intervention area and Num Phong district was used as control area. This study was conducted in two different districts to prevent contamination of intervention due to they had different health management from district officer. Two villages of Sam Song district included village number 1 and number 2 to study are study area because they are connected with each other. According to the criteria of study, this study included elderly who are 60 to 75 years old because they are in active aging and are able to encourage other elderly to be more active. A total of 110 elderly were enrolled in this study, Fifty-five elderly were enrolled in intervention group and fifty-five elderly were randomly enrolled for control group as well. During the second evaluation 3 persons of intervention group were dropped out because they left the community to visit their children in another province more than two months during intervention. It was shown in figure 1. The results are presented into two parts including qualitative and quantitative study as following:

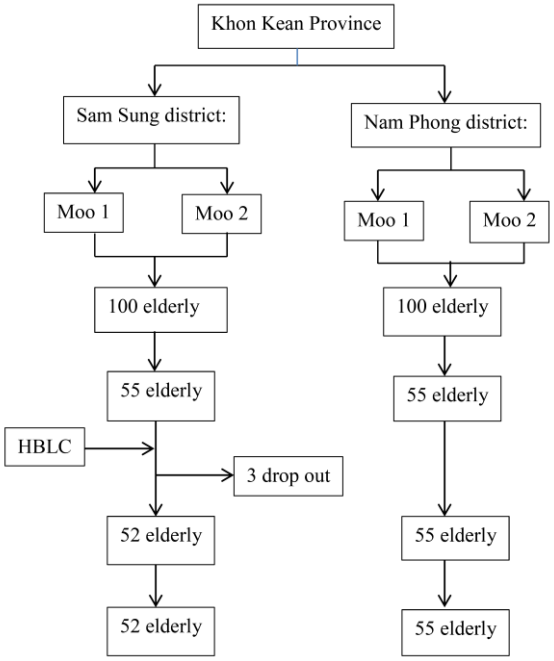


Figure 1: Recruitment procedure

4.1 Qualitative study

The qualitative study conducted at Sam Sung District, Khon Kean Province. Fifteen elderly who aged 60-89 years was interviewed by structural questionnaire. The interviewing was conducted at participants household. Tape recorder was used to record the conversation. Before interviewing, researcher explained the purpose and procedure of the interview and respondents were read and signed consent form. In each interview was used 30-45 minutes. Contents analysis was used to explore the communication. More often of words and phrases appears in the conversation were described.

All respondents aged 60 to 89 years. Most of them are female (11 female and 4 male). The majority of them are married (only five persons were divorced). All of them are farmers and had a primary school.

1) Perceived of the Quality of life in elderly

Most respondent (8 persons in 10 persons) cannot describe the definition of the quality of life. One subject's reply that "*I don't know what the meaning of quality of life is*"

However, they rated their quality of life as moderate when researcher guild it as life satisfaction in any contexts. Over fifty percent of respondents presented that quality of life are happiness and good life, healthy, and sufficient income. However, three of them (3/15) articulated that their QoL was worse due to financial-related and health problems. In the perception of rural elderly on the quality of life was defined by having no stress, free from diseases, and the ability to travel, work and carry on their everyday life.

Health complains such as back pain and leg pains were commonly found in elderly and it's influenced their life. One elderly said that *"I had had back pain several months. I went to hospital but it did not solve. It still pain".*

One male elderly replied that *"free of diseases and have sufficient money for life is my quality of life definition".*

2) Health complain and insurance

Most of elderly complained that their back and leg pain is increasing, especially they become aging. One elderly said, *"My vision is not clear and my children did not allow me to go far away from home. I cannot visit some friends who stay far away from my house".*

Health promotion hospital is first health care unite that all respondent went to, when they had mild health problem such as fever, common cold, and back pain. However, they also received treatment such as stable condition of diabetes,

hypertension. Some of them went to district hospital as their insurance is covered. For travelling to hospital, most of participants (85%) travel by their children or relative vehicles. 25 % of respondent was travelled to district hospital themselves by using public transportation modes. The cost of transportation was not expensive. Moreover, health provider at health promotion hospital also supported them sometimes and sent them to hospital. Economic problem did not influence to access health care services. The major health problem of rural elderly was a arthritis. They often use services from a primary health center for their primary health care. However, some of them preferred utilizing services from a nearby governmental hospital.

3) Perceived economic situation and the effects of it on their life

They also stated that the economic crisis did not affect their health expenditure and everyday life due to the benefit from social welfare system and the support from their children. 13 of them was received money support from their children but two of them are earned themselves by employee or sale food in the maker. The situation of economic crisis was not effects of general life of elderly in rural area because of the supported from their children and did not use money for their life such as foods, coast. In addition, economic problem can cause of lonely of elderly that their children did not come to visit them during long holiday such as Song Karn day. They were complained that "*I understand my children. They have to safe money that why I cannot come to visit me last Song Karn. I would like them to come to visit me but it they cannot come to see me, it ok*." *When my children and grandchildren went to visit me, I was very happiness. Although my older child was not visited me last time but he gave still gave me money. And I understand him*.

4) General activities of subjects

Most of them were spend day times at their home and some of them do not allow from their children to leave their home because their health status.

In terms of life styles, the majority of them were living at home and doing some chore works i.e. house cleaning and cooking. They occasionally made a merit and engaged in community activities. In terms of exercises, most of them preferred doing self-exercises at home rather than participating collective activities outside. Aging males often do jogging, walking, and handicrafts, while female elderly like to feed animals and doing house jobs. "*I just went back from farm. Sometime in the morning, I went to my farm and comeback at late of morning*.

I am going to jogging near my house. I was exercise every day. Sometime, I walked to my farm far from house about 5-8 kilometers. An older man said

In conclusion, general activities of elderly are at house, they were walked up early morning and sleep early too. In their times, some of them stay at house alone that most of times spend with their neighbor, sleep, take care grandchild, feed animal, housing jobs. Their used sometimes with neighbor to talk and eating together. Elderly activities during day time depend on their children decision.

5) Social participations of subjects.

Social participation refers to outside activities in their community such as elderly club, visit friends, joined activities in community, and any activities related with Buddhism or other regions. All of elderly reply that they did not joined any elderly club last two months.

One elderly said that "*I know that in community have elderly club but I don't know when they have activity because I never joined them. Health volunteer*

of my section was invited me several times but I cannot joined them. My children are not in house at day time. I have to stay at home".

"I would like to joined elderly club but I cannot join them. I prefer to do exercise at home. I was exercise by do my house jobs as you see. I went to my farm in the morning and walk back. It took several minutes to reach their, it my exercise" A female subject replies it. *I cannot join an exercise in the evening at community center. I have to cook foods for my children. They went back from work and they were tried. I can do it that why I help them to do it*.

Most of day times of elderly were spend with family (care giver), friends or neighbors of elderly *"If I have free times at noon or after noon, I went to visit my neighbor. Some time, I went his home to talk with him in general information. I cannot go outside far away from my house. I have to talk care my wife, her eyes is blind so I cannot go far away from home."* One older man said.

All of them presented that they went to activities of Buddhism day such as the Buddhism Lent day and the end of Lent day. It occurred one a year. In addition, on Buddhism day or Song-Karn festivals, elderly and their family were spends times together.

In conclusion, perceived of the quality of life in study area was moderated. The meaning of quality of life is not clear for them. The happiness and satisfaction of life was used to describe the meaning of the quality of life. Health status and financial support were affecting to their quality of life. However, health status was found related with perceived of the quality of life but elderly in the study area was not joined social activities such as elderly club. Thus, exercises training for elderly

had been implemented by health care providers. Most of elderly were not joined those training due to the activities located far from their house. Elderly prefer to stay at home rather than join activities outside their house. Moreover, elderly spend day times in their house, farm, family such as grandchild and caretaker, and neighbors. This information is a based-information to describe the situation of lifestyle and health behavior among elderly in the study area. To fill this gap, researcher used this information to develop the intervention program for elderly in this community. Moreover, home-based lifestyle change intervention was used the social network theory and social support theory from literature review.

4.2 Quantitative study

4.2.1 General information of participants at baseline evaluation

4.2.1.1 socio-economic characteristics of study population by using chi-square test

Age of respondents was statistical difference. Mean age of the intervention group was 68.27 (SD = 4.39). In the control group, mean age of them were 65.73± 4.38. The findings revealed that gender between intervention and control group was statistically different (p-value = 0.002). In term of marital status, both intervention and control group were similar. Most of respondent were married (78.2% of control group and 63.6% of intervention group). The majority of elderly finished their education at primary school and higher level (98.2% of intervention and 96.4% of control group) and education between intervention and control group was similar (p-value > 0.05), table 2.

Table 2: Comparison of socio-economic characteristics of the intervention and control at baseline

Socio-demographic	Intervention group		Control group		P-value
	n	%	n	%	
Age (Mean ± SD)	68.27± 4.39		65.73± 4.38		0.003
Gender					
Male	24	46.2	10	18.2	0.002
Female	28	53.8	45	81.8	
Marital Status					
Single/ Divorced/ Widow	19	36.5	12	21.8	0.143
Married	33	63.5	43	78.2	
Education Level					
No education	1	1.9	2	3.6	0.245
Primary School	45	86.5	52	94.5	
High School	6	11.5	1	1.8	

* P-value was calculated by using Chi-square test for nominal data and independent t-test for continuous data (accepted level is 0.05).

Economic Status, independent t-test found that employment status between intervention and control group was statistically different (p-value < 0.05). Most of participants in the intervention group (90.4%) were employee. Over 60 % of participants in the control group were employee. The majority of employee among

intervention (80.0%) and control group (91.3%) were farming. In term of sufficiency income, most of participants reported that their income was insufficient and had debts (40.0% in intervention and 50.9% in control group). Some of them had sufficient income but had no money saving (30.9% of the intervention and 23.6% of control group). Only 21.8% of control group and 14.5% of intervention group had not sufficient income but also not had debt. However, this study found that sufficient income and saving money in intervention group was higher than control group (14.5% of intervention group and 3.6% of control group) shown in table no. 3.

Table 3: Comparison of the economic status among study population

Economic status	Intervention		Control		P-value
	n	%	n	%	
Employment status					
Unemployed	5	9.6	21	38.2	0.003
Employ	50	90.4	34	61.8	
Occupational					
Retired Employees	2	3.8	1	2.9	
Labour	2	3.8	1	2.9	
Agriculturists	37	71.2	31	91.3	
Other	6	11.5	1	2.9	
Sufficiency Income					

Economic status	Intervention		Control		P-value
	n	%	n	%	
Not sufficient and in debt	21	40.4	28	50.9	0.130
Not sufficient not in debt	8	14.5	12	21.8	
Sufficient but not for saving	16	30.8	13	23.6	
Sufficient and enough for saving	7	13.5	2	3.6	

* P-value was calculated by Chi-Square test (accepted level is 0.05).

The statistical findings were shown that number of children and number of family member between the intervention and control group were similar. Fifty percent of the intervention group have 3-4 children, and following with 2 children or less (38.5%) and 5 children and over (11.5%). In the control group, most of them have 2 children and less than, and following with 3-4 children (38.2%), and 5 children and over (12.7%). In term of number of family, Most of intervention group have ≤ 2 persons (40.4%) and follow with 3-5 persons (36.5) and ≥ 5 persons (23.1%). In the control group, they had have ≥ 5 family member (43.6%) and follow with ≤ 2 persons (30.9%), and 3-4 persons (25.5%). It was showed in table no. 4.

In term of number of friends, the statistical finding between the intervention and control group was difference (p-value < 0.05). Most of the intervention group (54.9%) has few friends (0-2 persons) and follow with 3-4 persons (35.3%) and 5 persons and over (9.8%). In the control group, 41.8% of them have 3-4 persons, and

follow with 2 persons and less (29.1%) and ≥ 5 persons (29.1%). It was shown in table no. 4.

Table 4: Comparisons of Socio-demographic characteristics between the intervention groups at baseline

Variable	Intervention		Control		P-value
	Number	%	Number	%	
Number of Children					0.456
≤ 2 persons	20	38.5	26	50	
3 -4 persons	26	50.0	21	38.2	
≥ 5 persons	6	11.5	7	12.7	
Number of Family member					0.078
≤ 2 persons	21	40.4	17	30.9	
3 -4 persons	19	36.5	14	25.5	
≥ 5 persons	12	23.1	24	43.6	
Number of Closed- Friends					< 0.05
≤ 2 persons	28	54.9	16	29.1	
3 -4 persons	18	35.3	23	41.8	
≥ 5 persons	5	9.8	16	29.1	

* P-value was calculated by using Chi-square test (accepted level at 0.05)

In terms of health status, the findings showed that history of illness was found similar between intervention and control group and not statistically significant (p-value = 0.126). Most of respondents had history of chronic illness (63.6% and 50.0% in intervention and control group, respectively). Diabetes was the highest

disease among the non-communicable diseases in both intervention and control group (29.1% and 32.7%, respectively), and followed by Hypertension (27.3% and 25.5%, respectively), heart disease (10.3% and 1.8%, respectively), kidney disease (5.5% and 1.8%, respectively) and other diseases (20.7%).

In part of annual health check-up was not statistically significant (p-value = 0.089). The majority of the elderly participants have been to the annual health check-up at least one time more than 1 year ago (54.7% of intervention group and 69.1% of control group), following with annual check-up within 1 year (32.4% of intervention and 23.6% of control group) and no history of annual check-up (12.7% of intervention and 14.5% of control group).

Similarly with history of fall down was no statistically significant (p-value = 0.919). Most of intervention and control group have no history of fall down (65.5% and 61.8%, respectively). History of fall down was found both in intervention and control (21.8 % and 23.7%, respectively) and only 12.7% and 14.5% of intervention and control group had history of fall down more than 2 years.

History of alcohol drinking was found similar between intervention and control group and not statistically significant (p-value = 0.759). Most of intervention and control group had no history of alcohol drinking (74.5% and 72.7%, respectively), following ex-alcohol drinking (16.4% and 18.2% in intervention group and control group, respectively) and current alcohol drinking (7.3 % and 9.1% in intervention and control group, respectively). Similarly smoking history was not statistically significant (p-value = 0.282). Most of intervention and control group had no history of smoking (69.1% and 81.8%, respectively), following ex-smoker (18.2% and 14.5%,

respectively), and current smoker (12.1% and 3.6%, respectively) as in table number 5

Table 5: Comparison of Health Status among study population at baseline

Socio-demographic	Intervention group		Control group		P-value
	n	%	N	%	
History of illness					
No history of chronic illness	20	36.4	24	43.6	0.126
Have history of chronic illness	35	63.6	28	50.9	
Type of Chronic Disease					
Diabetes	16	29.1	18	32.7	0.680
Hypertension	15	27.3	14	25.5	0.826
Heart Disease	6	10.9	1	1.8	0.113
Kidney disease	3	5.5	1	1.8	0.618
Annual health check up					
Never	7	12.7	16	14.5	0.098
Yes, within 1 year	18	32.7	26	23.6	
Yes, More than 1 year	30	54.5	38	69.1	
History of Fall down					
Never	36	65.5	34	61.8	0.919

Socio-demographic	Intervention group		Control group		P-value
	n	%	N	%	
Yes, within 1 year	12	21.8	13	23.7	
Yes, More than 1 year	7	12.7	8	14.5	
History of alcohol drinking					
Never	41	74.5	40	72.7	0.759
Ex-drinker	9	16.4	10	18.2	
Drinker	5	7.3	5	9.1	
History of smoking					
Never	38	69.1	45	81.8	0.282
Ex-smoker	10	18.2	8	14.5	
Smoker	7	12.7	2	3.6	

***** P-value was calculated by Chi-square test (accepted level is 0.05).

General health complaints including back pain, leg cramp, urinated impairment, constipation, and flatulence, of participant at baseline was similar between intervention and control groups (p-value > 0.05). Hearing loss, taste dysfunction, visual dysfunction, sleep disturbance, and hand shack/less power were statistically different between intervention and control groups (p-value < 0.05). Most of health complaints were found higher in the intervention group than control group. Leg pain was found 84.6 percent of participants in intervention group and 41.8% of control group. Visual dysfunction (82.7%) of participants in the intervention group

had visual dysfunction and (41.8%) of control group. Sleep disturbance is common found in elderly. This study was found that (71.2%) of intervention group had sleep disturbance and 50.9% of control group. Backache was found 65.4 % in the intervention and 47.3% in the control. It was shown in table no. 6.

Table 6: Comparison of health complaints among study population at baseline

	Intervention					Control					p-value
	0	1	2	3	4	0	1	2	3	4	
Back pain	18	17	7	7	3	29	11	3	10	2	0.191
	34.6%	32.7%	13.5%	13.5%	5.8%	52.7%	20.0%	5.5%	18.2%	3.6%	
Leg pain	8	15	6	17	6	21	11	7	12	4	0.103
	15.4%	28.8%	11.5%	32.7%	11.5%	38.2%	20.0%	12.7%	21.8%	11.5	
Urinated problem	25	8	8	9	2	31	5	8	5	6	0.355
	48.1%	15.4%	15.4%	17.3%	3.8%	56.4%	9.1%	14.5%	9.1%	10.9	
Constipation	27	8	8	5	4	33	10	6	5	1	0.587
	51.9%	15.4%	15.4%	9.6%	7.7%	60.0%	18.2%	10.9%	9.1%	1.8	

	Intervention					Control					p-value
	0	1	2	3	4	0	1	2	3	4	
Flatulence	24	12	9	6	1	36	11	4	2	2	0.200
	46.2%	23.1%	17.3%	11.5%	1.9%	65.5%	20.0%	7.3%	3.6%	3.6	
Visual dysfunction	9	8	19	12	4	21	12	6	9	7	0.009
	17.3%	15.4%	36.5%	23.1%	7.7%	38.2%	21.8%	10.9%	16.4%	12.7	
Hearing dysfunction	19	7	13	5	8	41	5	7	1	1	0.001
	36.5%	13.5%	25.0%	9.6%	15.4%	74.5%	9.1%	12.7%	1.8%	1.8	
Sleep disturbance	15	10	13	9	5	27	16	6	4	2	0.032
	28.8%	19.2%	25.0%	17.3%	9.6%	49.1%	29.1%	10.9%	7.3%	3.6	
Taste dysfunction	22	9	9	6	6	46	6	1	1	1	0.001

	Intervention					Control					p-value
	0	1	2	3	4	0	1	2	3	4	
	42.3%	17.3%	17.3%	11.5%	11.5%	83.6%	10.9%	1.8%	1.8%	1.8	
Hand shake /less	21	13	8	4	6	46	4	3	1	1	0.001
power	40.4%	25.0%	15.4%	7.7%	11.5%	83.6%	7.3%	5.5%	1.8%	1.8	

* p-value was calculated by using Chi-square test (accepted level is 0.05).

To compare depression between the intervention and control groups at baseline, independent t-test was used to determine difference of mean score. The results found that both intervention and control group had have similar score of depression (p-value 0.562). Mean score of depression was 13.98 (S.D. = 4.10) and 12.78 (S.D. = 3.53) in intervention and control groups, respectively. Depression symptoms were found 50.9% in intervention group and 56.4% in control group. However this study found that mild depression was 40 % in intervention group and 38.4% in control group, moderate depression was 7.3% among intervention group and 5.5% among control group. Only 1.8% (or 1 participant) of intervention group had a server depression symptom, table 7.

Table 7: Comparison of Depression score by Thai Geriatric Depression scale among study population at baseline

	Intervention		Control		
Level of depression	n	%	n	%	p-value
Depression score					0.562
(Mean ± S.D.)	13.98±4.10		12.78±3.53		
No Depression	28	50.9	31	56.4	
Mild Depression	22	40.0	21	38.2	
Moderate Depression	4	7.3	3	5.5	
Server Depression	1	1.8	0	0	

* Independent t-test was used to compare the depression score at baseline among the study population

Table 8 shows number and percentages of depression scores in each item among participant. Most of items in depression question were found similar (p-value > 0.05). Only item no. 10, 11, 25 and 27 was found statistical significant (p-value < 0.05). Item number 10 asked, "Do you often feel helpless?" 23.1 % of intervention group was response "yes". It's less in control group, only 5.5 % of them reply "Yes". More often to get restless and fidgety in intervention group and control group, 15.4% of intervention group feel like crying, same feeling was found in 1 person in control group. Most of respondent did not enjoy getting up in the morning (84.6% of intervention and 93.6% of control group).

Table 8: Number and percentage of depression in each items at baseline among study population

TGD items	Intervention		Control		P-value
	no	yes	no	yes	
1) Are you basically satisfied with your life?	4 7.7%	48 92.3%	7 7.3%	51 92.7%	0.934
2) Have you dropped many of your activities and interests?	34 65.4%	18 34.6%	44 80.0%	11 20.0%	0.089
3) Do you feel that your life is empty?	43 82.7%	9 17.3%	49 89.1%	6 10.9%	0.341
4) 4. Do you often get bored?	38 73.1%	14 26.9%	46 83.6%	9 16.4%	0.184
5) Are you hopeful about the future?	10	42	4	51	0.067

TGD items	Intervention		Control		P-value
	no	yes	no	yes	
	19.2%	80.8%	7.3%	92.7%	
6) Are you bothered by thoughts you cannot get out of your head?	38 73.1%	14 26.9%	41 74.5%	14 25.5%	0.863
7) Are you in good spirits most of the time? (negative)	8 15.4%	44 84.6%	5 9.1%	50 90.9%	0.319
8) Are you afraid that something bad is going to happen to you?	37 71.2%	15 28.8%	38 69.1%	17 30.9%	0.816
9) Do you feel happy most of the time?	7 13.5%	45 86.5%	4 7.3%	51 92.7%	0.292
10) Do you often feel helpless?	40 76.9%	12 23.1%	52 94.5%	3 5.5%	0.009
11) Do you often get restless and fidgety?	37 71.2%	15 28.8%	48 87.3%	7 12.7%	0.039
12) Do you prefer to stay at home, rather than going out and doing new things?	20 38.5%	32 61.5%	22 40.0%	33 60.0%	0.087
13) Do you frequently worry about the future?	31 59.6%	21 40.4%	39 70.9%	16 29.1%	0.220
14) Do you feel you have more problems with memory than most?	31 59.6%	21 40.4%	31 56.4%	24 43.6%	0.733
15) Do you think it is wonderful to be	9	43	5	50	0.205

TGD items	Intervention		Control		P-value
	no	yes	no	yes	
alive now	17.3%	82.7%	9.1%	90.9%	
16) Do you often feel downhearted and blue?	43 82.7%	9 17.3%	50 90.9%	5 91.%	0.208
17) Do you feel pretty worthless the way you are now?	38 73.1%	14 26.9%	46 83.6%	9 16.4%	0.184
18) Do you worry a lot about the past?	38 73.1%	14 26.9%	48 87.3%	7 12.7%	0.065
19) Do you find life very exciting?	8 15.4%	44 84.6%	15 27.3%	40 72.7%	0.135
20) Is it hard for you to get started on new projects?	33 63.5%	19 36.5%	41 74.5%	14 25.5%	0.215
21) Do you feel full of energy?	11 21.2%	41 78.8%	21 38.2%	34 61.8%	0.056
22) Do you feel that your situation is hopeless?	41 78.8%	11 21.2%	50 90.9%	5 9.1%	0.080
23) Do you think that most people are better off than you are?	42 80.8%	10 19.2%	41 74.5%	14 25.5%	0.440
24) Do you frequently get upset over little things?	39 75.0%	13 25.0%	38 69.1%	17 30.9%	0.498
25) Do you frequently feel like crying?	44 84.6%	8 15.4%	54 98.2%	1 1.8%	0.012

TGD items	Intervention		Control		P-value
	no	yes	no	yes	
26) Do you have trouble concentrating?	40 76.9%	12 23.1%	42 76.4%	13 23.6%	0.946
27) Do you enjoy getting up in the morning?	8 15.4%	44 84.6%	2 3.6%	53 96.4%	0.037
28) Do you prefer to avoid social gatherings?	43 82.7%	9 17.3%	50 90.9%	5 9.1%	0.208
29) Is it easy for you to make decisions?	19 36.5%	33 63.5%	19 34.5%	36 65.5%	0.830
30) Is your mind as clear as it used to be?	9 17.3%	43 82.7%	8 14.5%	47 85.5%	0.696

* Independent t-test

In term of Quality of life (QOL) this study found that an overall of QOL at baseline was statistically difference (p-value = 0.002) between intervention (mean ±SD: 75.6±11.32) and control groups (82.03±10.16). When we analysed each facet separately it was found that only sensory ability facet was similar between intervention and control groups and was not statistically significant (p-value=0.757). Other facets of QOL (autonomy, past, present, and further activity, social participation, death and dying, and intimacy) were statistically different at baseline (p-value < 0.05). In part of muscle strength, Berg balance score was statistically different between intervention and control groups (p-value< 0.05) and time-up and

go test was also statistically different between intervention and control groups (p-value< 0.05) table no. 9

Physical function was found similar (p-value > 0.05) of time-up and go test (mobility) between intervention and control groups (Mean ±S.D: 18.48 ± 3.79 and 19.45±3.50, respectively). In contrast, body balance (balance score) was statistical different (p-value < 0.05) between intervention and control groups (Mean ±S.D: 66.35, 48 ± 3.36 and 67.85 ± 2.45, respectively) as showed at table no. 9.

Table 9: Mean and standard deviation of Quality of life and its 6 facets among study population at baseline

Outcome Variable	Intervention		Control		p-value
	Mean	SD	Mean	SD	
Total Quality of Life	75.60	11.32	82.03	10.16	0.002
● Sensory Ability (SAB)	11.07	2.68	11.27	3.69	0.757
● Autonomy (AUT)	13.363	2.35	15.50	2.10	0.000
● Past, Present, Further Activities (PPF)	13.58	2.97	15.07	2.37	0.004
● Social Participation (SOP)	13.27	3.13	15.22	2.20	0.000
● Death and Dying (DAD)	10.65	3.08	8.72	4.00	0.006
● Intimacy (INT)	13.65	3.07	16.23	3.10	0.000
Berg Balance Test	66.35	3.36	67.85	2.45	0.009
Time Up and Go Test	18.48	3.79	19.45	3.50	0.177

* Independent t-test

4.2.1 Post Intervention Evaluation

Quality of life was grouped into quality of life level by WHOQOL-OLD questionnaire; it was found that at baseline, most of intervention group had moderate quality of life (84.60%) and follows with high quality of life (11.50%) and low quality of life (3.80%). Most of control group had moderate quality of life at baseline (72.70%) followed by high quality of life (27.30%). At 6th month after intervention, most of intervention group had high quality of life (50.00%) and following with moderate quality of life (48.10%) and low quality of life (1.90%). In contrast, most of quality of life in control group had moderate (69.10%) and following with high quality of life (30.90%). At 9th month after intervention, most of intervention group had moderate quality of life (55.80%) and (44.20%) of them had high quality of life. In contrast, most of control group had high quality of life (56.40%) and following with moderate quality of life (43.60%), 10. The rating of QoL questionnaire in each item was shown in table no. 11.

Table 10: Number and percent of the quality of life in each level at baseline, 6th month, and 9th month among study population

	Intervention			Control		
Evaluation	Low (%)	Moderate (%)	High (%)	Low (%)	Moderate (%)	High (%)
Baseline	2 (3.80)	44 (84.60)	6 (11.50)	0 (0.00)	40 (72.70)	15 (27.30)

	Intervention			Control		
Evaluation	Low (%)	Moderate (%)	High (%)	Low (%)	Moderate (%)	High (%)
6th month	1	25	26	0	38	17
	(1.90)	(48.10)	(50.00)	(0.00)	(69.10)	(30.90)
9th month	0	29	23	0	24	31
	(0.00)	(55.80)	(44.2)	(0.00)	(43.60)	(56.40)

Table 11: Number and percent of the Quality of life in each item among study population at baseline

How much do you worry about what the future might hold?	Intervention group					Control group					P-value
	1	2	3	4	5	1	2	3	4	5	
1) To what extent do impairments to your senses (e.g. hearing, vision, taste, smell, touch) affect your daily life?	8 15.4%	13 25.0%	23 44.2%	6 11.5%	2 3.8%	16 29.1%	17 30.9%	6 10.9%	10 18.2%	6 10.9%	0.003
2) To what extent does loss of for example, hearing, vision, taste, smell or touch affects your ability to participate in activities?	10 19.2%	11 21.2%	25 48.1%	4 7.7%	2 3.8%	20 36.4%	12 21.8%	6 10.9%	11 20.0%	6 10.9%	0.000
3) How much freedom do you have to make your own decisions?	1 1.9%	5 9.6%	15 28.8%	25 48.1%	6 11.5%	1 1.8%	0	11 20%	26 47.3%	17 30.9%	0.029
4) To what extent do you feel in control of your future?	2 3.8%	10 19.2%	24 46.2%	14 26.9%	2 3.8%	1 1.8%	4 7.3%	22 40.0%	23 41.8%	5 9.1%	0.172

How much do you worry about what the future might hold?	Intervention group					Control group					P-value
	1	2	3	4	5	1	2	3	4	5	
5) How much do you feel that the people around you are respectful of your freedom?	1 1.9%	6 11.5%	20 38.5%	21 40.4%	4 7.7%	0	1 1.8%	15 27.3%	27 49.1%	12 21.8%	0.041
6) How concerned are you about the way in which you will die?	10 19.2%	16 30.8%	18 34.6.	5 9.6%	3 5.8%	24 43.6%	11 20.0%	11 20.0%	6 10.9%	3 5.5%	0.078
7) How much are you afraid of not being able to control your death?	11 21.2%	16 30.8%	19 36.5	4 7.7%	2 3.8%	22 40.0%	12 21.8%	11 20.0%	7 12.7%	3 5.5%	0.120
8) How scared are you of dying?	8 15.4%	16 30.8%	19 36.5	3 5.8%	6 11.5%	24 43.6%	11 20.0%	11 20.0%	7 12.7%	2 3.6%	0.006
9) How much do you fear being in pain before you die?	3 5.8%	14 26.9%	19 36.5	10 19.2%	6 11.5%	19 34.5%	15 27.3%	13 23.6%	5 9.1%	3 5.5%	0.004
10) To what extent do problems with	8	14	24	3	3	17	12	12	9	5	0.029

How much do you worry about what the future might hold?	Intervention group					Control group					P-value
	1	2	3	4	5	1	2	3	4	5	
your sensory functioning (e.g. hearing, vision, taste, smell, touch) affect your ability to interact with others?	15.4%	26.9%	46.2%	5.8%	5.8%	30.9%	21.8%	21.8%	16.4%	9.1%	
11) To what extent are you able to do the things you'd like to do?	1 1.9%	6 11.5%	26 50.0%	14 26.9%	5 9.6%	1 1.8%	0	10 18.2%	28 50.9%	16 29.1%	0.006
12) To what extent are you satisfied with your opportunities to continue achieving in life?	0	5 9.6%	21 40.4%	21 40.4%	5 9.6%	1 1.8%	1 1.8%	16 29.1%%	32 58.2%	5 9.1%	0.162
13) How much do you feel that you have received the recognition you deserve in life?	1 1.9%	7 13.5%	23 44.2%	15 28.8%	6 11.5%	0	1 1.8%	19 34.5%	29 52.7%	6 10.9%	0.036
14) To what extent do you feel that you	1	11	17	17	6	1	2	22	24	6	0.092

How much do you worry about what the future might hold?	Intervention group					Control group					P-value
	1	2	3	4	5	1	2	3	4	5	
have enough to do each day?	1.9%	21.2%	32.7%	32.7%	11.5%	1.8%	3.6%	40.0%	43.6%	10.9%	
15) How satisfied are you with what you have achieved in life?	1 1.9%	7 13.5%	17 32.7%	20 38.5%	7 13.5%	0	0	18 32.7%	27 49.1%	10 18.2%	0.049
16) How satisfied are you with the way you use your time?	1 1.9%	6 11.5%	20 38.5%	16 30.8%	9 17.3%	0	0	16 29.1%	27 49.1%	12 21.8%	0.031
17) How satisfied are you with your level of activity?	1 1.9%	4 7.7%	23 44.2%	17 32.7%	7 13.5%	0	0	11 20.0%	31 56.4%	13 23.6%	0.005
18) How satisfied are you with your opportunity to participate in community activities?	4 7.7%	6 11.5%	22 42.3%	18 34.6%	2 3.8%	0	4 7.3%	17 30.9%	27 49.1%	7 12.7%	0.049
19) How happy are you with the things you are able to look forward to?	1 1.9%	8 15.4%	18 34.6%	17 32.7%	8 15.4%	0	2 3.6%	16 29.1%	29 52.7%	8 14.5%	0.010

How much do you worry about what the future might hold?	Intervention group					Control group					P-value
	1	2	3	4	5	1	2	3	4	5	
20) How would you rate your sensory functioning (e.g. hearing, vision, taste, smell, touch)?	1 1.9%	5 9.6%	30 57.7%	10 19.2%	6 11.5%	1 1.8%	2 3.6%	16 29.1%	25 45.5%	11 20.0%	0.010
21) To what extent do you feel a sense of companionship in your life?	5 9.6%	8 15.4%	6 11.5%	26 50.0%	7 13.5%	1 1.8%	1 1.8%	3 5.5%	31 56.4%	19 34.5%	0.005
22) To what extent do you experience love in your life?	1 1.9%	7 13.5%	16 30.8%	23 44.2%	5 9.6%	2 3.6%	3 5.5%	6 10.9%	27 49.1%	17 30.9%	0.010
23) To what extent do you have opportunities to love?	1 1.9%	9 17.3%	14 26.9%	26 50.0%	2 3.8%	1 1.8%	2 3.6%	9 16.4%	26 47.3%	17 30.9%	0.200
24) To what extent do you have opportunities to be loved?	1 1.9%	3 5.8%	21 40.4%	24 46.2%	3 5.8%	1 1.8%	1 1.8%	12 21.8%	22 40.0%	19 34.5%	0.004

4.2.2 Effects of Home-based lifestyle change intervention by using General Linear Model repeated-measures ANOVA with Unadjusted and Adjusted variables.

4.2.2.1 Effects of home-based lifestyle change intervention on Quality of life (TQOL) among study population by using General Linear Model repeated-measures ANOVA with Unadjusted variables

Figure 1 shows the average mean of total quality of life score at baseline, 6 month, and 9 month. At baseline, total quality of life score was different between intervention and control groups. Mean score of TQOL of intervention group was increased at 6 month when it was compared with mean score at baseline. But mean score of TQOL was slightly decreased at 9 month. In contrast, mean score of TQOL of control group was high at baseline and it slightly increased both at 6 and 9 month.

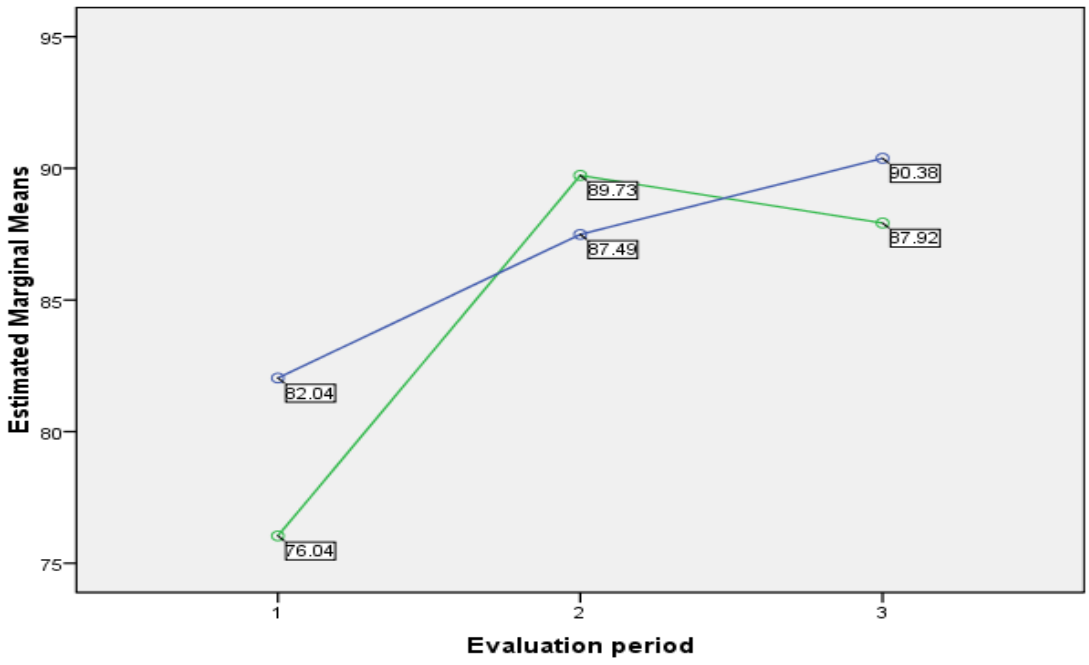


Figure 2: Estimated mean score of the total quality of life (QOL) among the intervention and control group at baseline, 6th, and 9th month

Average mean score of quality of life (QOL) in facet showed that average mean score of sensory ability (SAB) in QOL between intervention and control group was similar at baseline and it was increased both intervention and control group at 6 month. However, 9 month after intervention was decreased SAB score in intervention group but it was increased in control group as shown in figure 2.

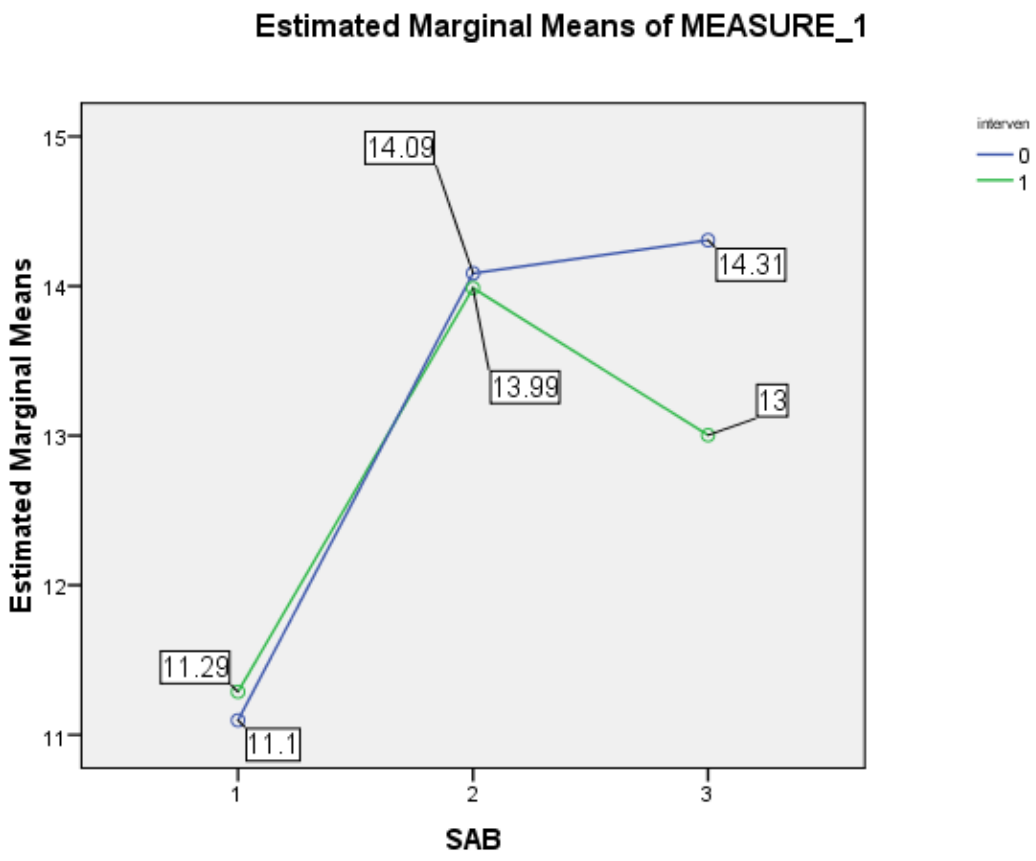


Figure 3: Estimated mean score of sensory ability facet in the QoL among the study population at baseline, 6th, and 9th month

Mean score of autonomy was different between intervention and control groups at baseline. At 6 month after intervention, intervention group showed increase in autonomy facet but control group has decreased autonomy. However, mean score of autonomy facet among control group was increased but it was not higher than intervention group. It is shown in figure 3.

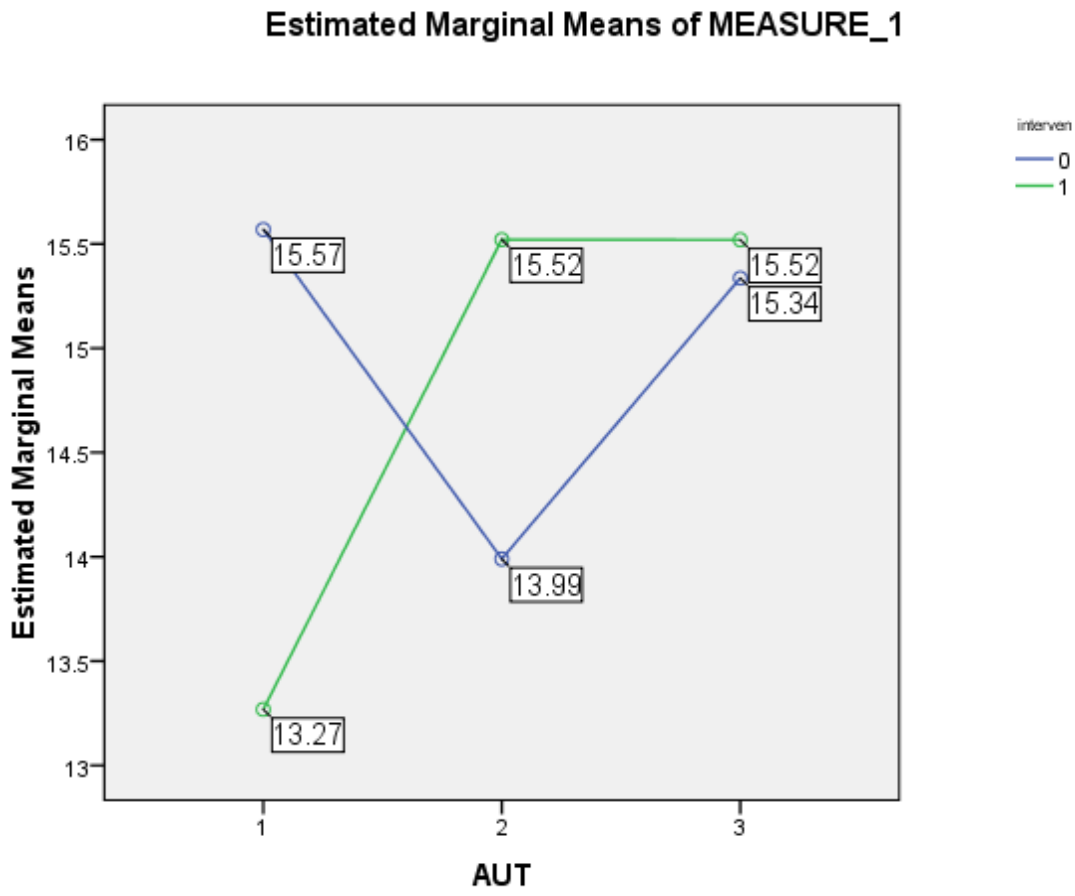


Figure 4: Estimated mean score of Autonomy (AUT) facet in Intervention and control group at baseline, 6 month, and 9 month

Social participation (SOP) refers to participation of participants in their community in daily activity. This study found that average of mean score of SOP

facet was different between intervention and control groups at baseline. Although, the mean of SOP score in control group was higher than intervention group at baseline but it was increased at 6 month and 9 month after intervention in intervention group. 6-month and 9-month later, control group had decreased mean score of SOP facet. It is shown in figure 4

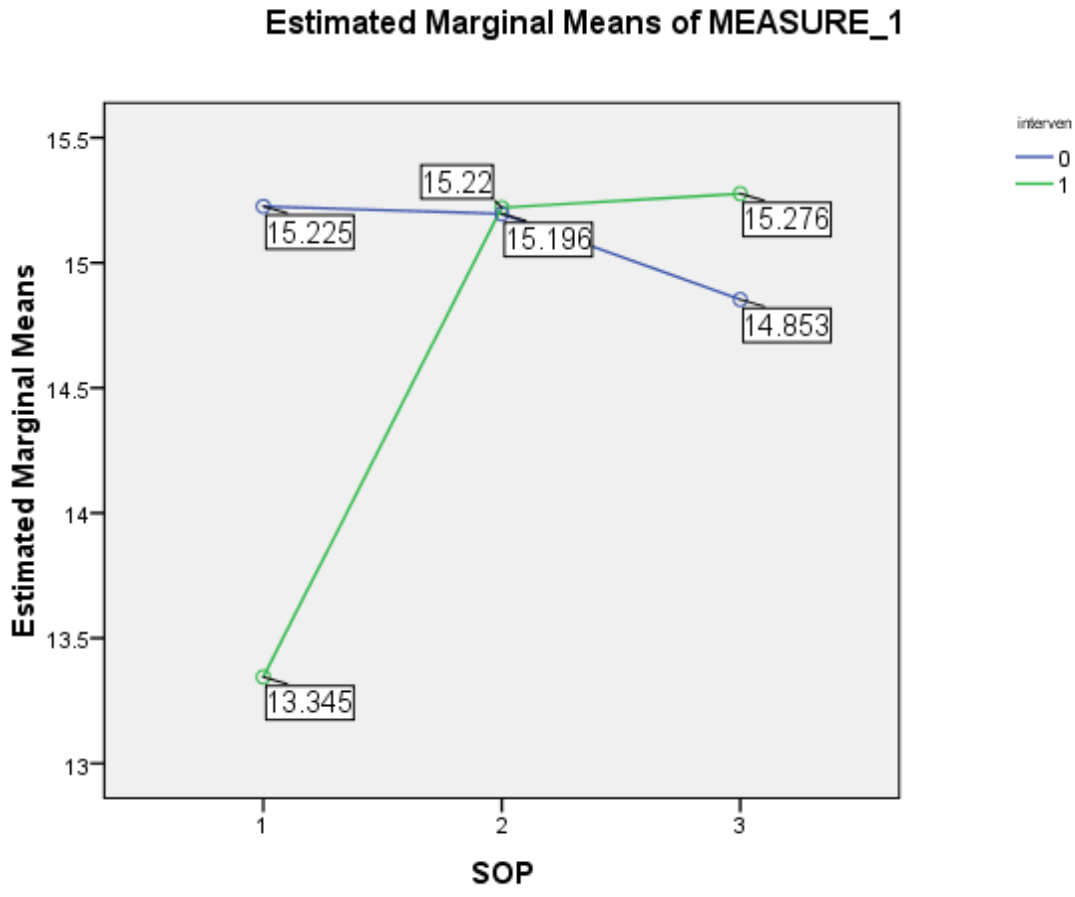


Figure 5: Estimated mean score of Social Participation (SOP) facet in Intervention and control group at baseline, 6 month, and 9 month

In term of Past, Present, and further activities (PPF) facet, mean score was different among intervention and control groups at baseline. At 6 month after intervention, PPF facet was highly increased among intervention group than control group. However, at 9 month of intervention, mean score of both intervention and control group was decreased but the study found that intervention group had less decrease of PPF facet when compared with control group, shown in figure 5.

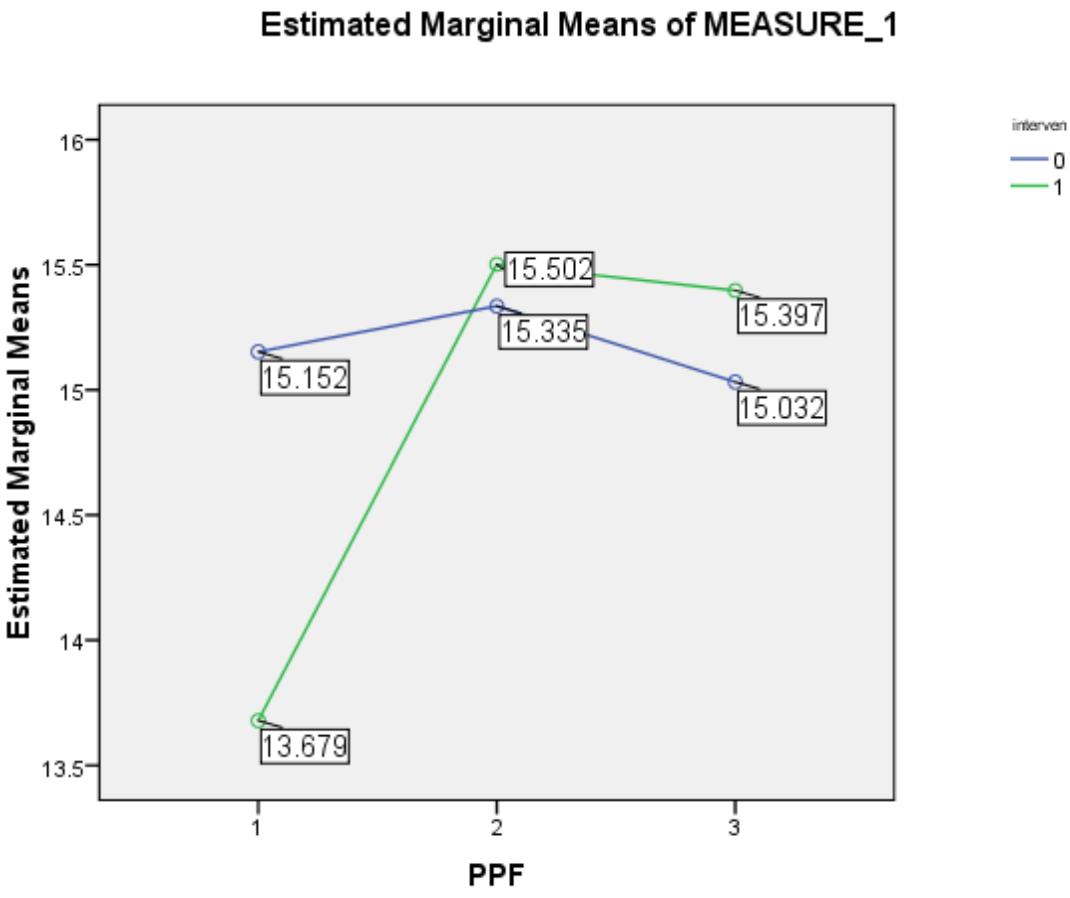


Figure 6: Estimated mean score of Past, Present, and Further (PPF) facet in Intervention and control group at baseline, 6 month, and 9 month

The quality of life in death and dying facet among intervention and control groups, mean score was different at baseline and it was increased at 6 month after intervention among intervention and control group. At 9 month after intervention, mean score of intervention group was decreased. In opposite, mean score of control group in PPF facet was increased as figure 6.

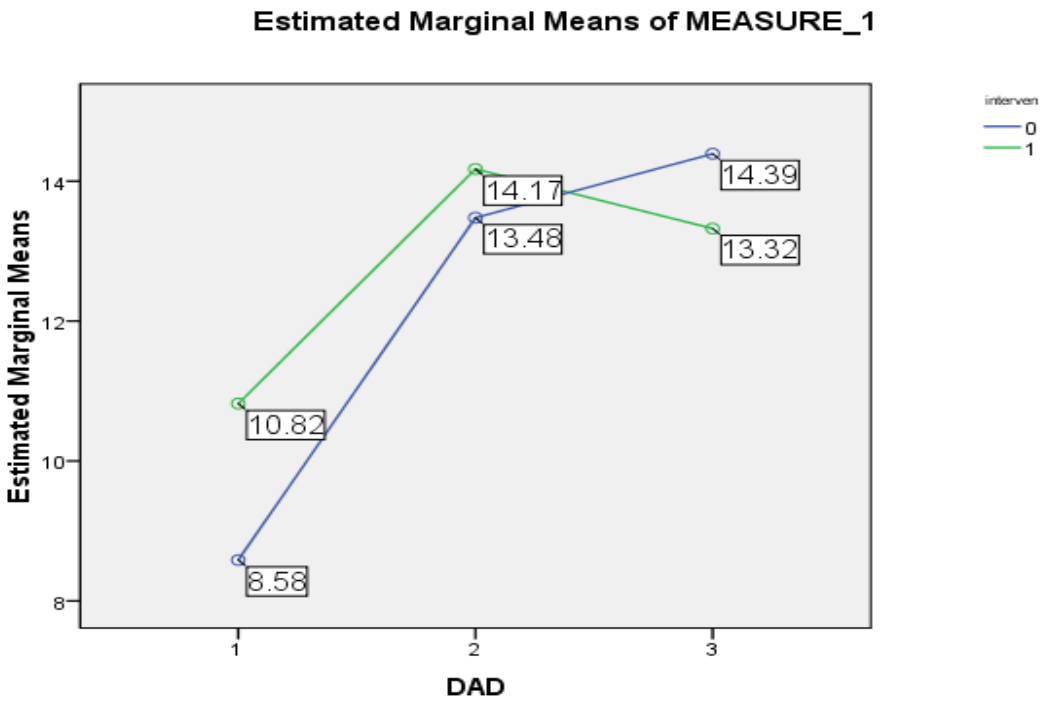


Figure 7: Estimated mean score of Death and Dying (DAD) facet in intervention and control group at baseline, 6 month, and 9 month

Average mean score of Intimacy (INT) facet was different between intervention and control groups at baseline. Mean score of INT facet in intervention group was lower than control group. But 6 month after intervention, INT facet was increased in intervention when compared with intervention group. At 9 month after intervention, control group had mean score higher than intervention group, figure 7.

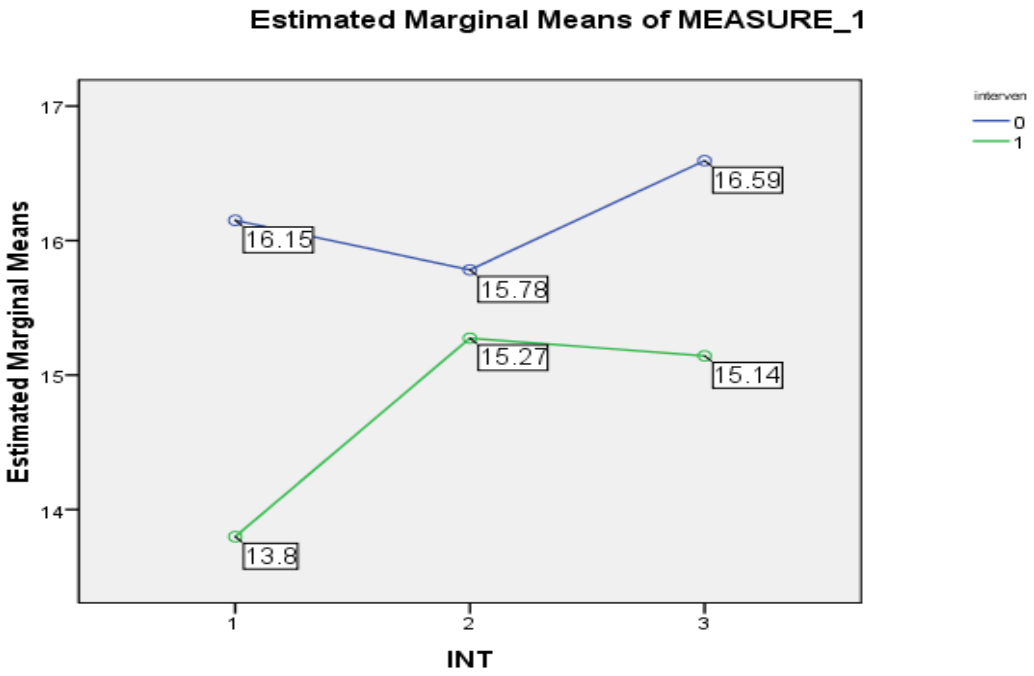


Figure 8: Estimated mean score of Intimacy (INT) facet in Intervention and control group at baseline, 6 month, and 9 month

To determine the effects of intervention among intervention and control group at baseline, 6 month, and 9 month after intervention, General Linear Model repeated-measures ANOVA was used to assess overall effect of intervention in quality of life (QOL) score and 6 facets of QOL. Overall effect of home-based lifestyle change intervention was statistically significant in total QOL after intervention between intervention and control groups (p-value < 0.01). This study showed that most of facets of quality of life included Sensory Ability (SAB), Autonomy (AUT), Sociality Participation (SOP), Past, Present, & Further Activity (PPF) and Death & Dying (DAD) were statistically significant (p-value < 0.05). Only Intimacy (INT) was not

statistically significant between intervention and control groups at baseline, 6 moth, and 9 month after intervention table no. 12.

Table 12: Overall effects of home-based lifestyle change intervention on Quality of life among study population at baseline, 6month, and 9 month by using General Linear Model repeated-measures ANOVA with Unadjusted variables

Variable	F	Hypothesis df	Error df	P-value
Total Quality of Life (TQOL)	27.585	2.00	104	< 0.01
- Sensory Ability (SAB)	18.411	2	104	< 0.01
- Autonomy (AUT)	5.090	2	104	< 0.01
- Sociality Participation (SOP)	3.157	2	104	< 0.05
- Past, Present, & Further Activity (PPF)	4.006	2	104	< 0.05
- Death & Dying (DAD)	40.168	2	104	< 0.01
- Intimacy (INT)	2.192	2	104	> 0.05

* General Linear Model repeated-measures ANOVA, Wilks' Lambda from multivariate test

Moreover, after effect test of within –subject found that total Quality of life (QOL), Sensory Ability (SAB), Autonomy (AUT), Sociality Participation (SOP), Past, Present, & Further Activity (PPF) and Death & Dying (DAD) showed statistically significant association (p-value < 0.05). However, no statistically significant was found in Intimacy (INT) facet (p-value > 0.05) as shown in table 13.

Table 13: The Effects tests of within-Subjects among study population by using General Linear Model repeated-measures ANOVA

Variables	Type III Sum of Squares	df	Mean Square	F	Sig.
TQOL	6923.081	2	3461.540	24.527	.000
SAB	507.717	2	253.859	19.456	.000
AUT	56.159	2	28.079	3.681	.027
PPF	60.345	2	30.172	4.565	.011
SOP	46.339	2	23.170	3.065	.049
DAD	1193.217	2	596.608	30.689	.000
INT	44.312	2	22.156	2.431	.090

* Sphericity Assumed

4.2.2.1 Outcome of the home-based lifestyle change intervention on Quality of life among study population by using General Linear Model repeated-measures ANOVA with Adjusted variables

After adjusted confounding factors, General Linear Model repeated-measures ANOVA showed that total quality of life (QOL) was not difference of after intervention with statistically significant (p-value > 0.05). In each facets of QOL was presented autonomy (AUT), Sociality Participation (SOP), and Death & Dying (DAD) facets were statistically significant (p-value < 0.05). In contract, Sensory Ability (SAB)

Past, Present, & Further Activity (PPF) and Intimacy (INT) facet was showed no statistically significant after implement intervention in this study (p-value > 0.05), shown in table 14. Therefore, the number and percentage of the rating the quality of life in each item was shown in table no. 15.

Table 14: Overall effects of home-based lifestyle change intervention on Quality of life among study population at baseline, 6month, and 9 month by using General Linear Model repeated-measures ANOVA with Adjusted variables

Variable	F	Hypothesis df	Error df	P-value
Total Quality of Life (TQOL)	1.703	2	99	0.188
- Sensory Ability (SAB)	1.172	2	99	0.314
- Autonomy (AUT)	9.951	2	99	< 0.001
- Sociality Participation (SOP)	4.512	2	99	0.013
- Past, Present, & Further Activity (PPF)	3.080	2	99	0.056
- Death & Dying (DAD)	3.106	2	99	0.049
- Intimacy (INT)	2.051	2	99	> 0.134

* General Linear Model repeated-measures ANOVA, Wilks' Lambda from multivariate test

Table 15: Number and percentage of the quality of life in each item at 6 and 9 month after intervention of the intervention group

How much do you worry about what the future might hold?	6 month					9 month				
	1	2	3	4	5	1	2	3	4	5
1) To what extent do impairments to your senses (e.g. hearing, vision, taste, smell, touch) affect your daily life?	4 7.7%	7 13.5%	20 38.5%	11 21.2%	10 19.2%	6 11.5%	11 21.2%	19 36.5%	9 17.3%	7 13.5%
2) To what extent does loss of for example, hearing, vision, taste, smell or touch affects your ability to participate in activities?	1 1.9%	8 15.4%	18 34.6%	8 15.4%	17 32.7%	5 9.6%	7 13.5%	17 32.7%	16 30.8%	7 13.5%
3) How much freedom do you have to make your own decisions?	1 1.9%	5 9.6%	6 11.5%	16 30.8%	24 46.2%	1 1.9%	0	6 11.5%	28 53.8%	17 32.7%
4) To what extent do you feel in control of your future?	3 5.8%	4 7.7%	14 26.9%	13 25.0%	18 34.6%	0 .0%	4 7.7%	21 40.4%	19 36.5%	8 15.4%

How much do you worry about what the future might hold?	6 month					9 month				
	1	2	3	4	5	1	2	3	4	5
5) How much do you feel that the people around you are respectful of your freedom?	0	1 1.9%	12 23.1%	18 34.6%	21 40.4%	0 .0%	9 17.3%	27 51.9%	16 30.8%	0 .0%
6) How concerned are you about the way in which you will die?	3 5.8%	9 17.3%	13 25.0%	7 13.5%	20 38.5%	10 19.2%	4 7.7%	15 28.8%	5 9.6%	18 34.6%
7) How much are you afraid of not being able to control your death?	5 9.6%	9 17.3%	13 25.0%	8 15.4%	17 32.7%	8 15.4%	7 13.5%	14 26.9%	8 15.4%	15 28.8%
8) How scared are you of dying?	5 9.6%	9 17.3%	14 26.9%	9 17.3%	15 28.8%	8 15.4%	7 13.5%	15 28.8%	5 9.6%	17 32.7%
9) How much do you fear being in pain before you die?	8 15.4%	9 17.3%	17 32.7%	4 7.7%	14 26.9%	10 19.2%	11 21.2%	15 28.8%	5 9.6%	11 21.2%
10) To what extent do problems with your sensory functioning (e.g. hearing, vision, taste,	5 9.6%	4 7.7%	15 28.8%	14 26.9%	14 26.9%	1 1.9%	9 17.3%	22 42.3%	11 21.2%	1 1.9%

How much do you worry about what the future might hold?	6 month					9 month				
	1	2	3	4	5	1	2	3	4	5
smell, touch) affect your ability to interact with others?										
11) To what extent are you able to do the things you'd like to do?	2 3.8%	3 5.8%	18 34.6%	14 26.9%	15 28.8%	1 1.9%	2 3.8%	15 28.8%	23 44.2%	11 21.2%
12) To what extent are you satisfied with your opportunities to continue achieving in life?	1 1.9%	2 3.8%	9 17.3%	24 46.2%	16 30.8%		3 5.8%	5 9.6%	36 69.2%	8 15.4%
13) How much do you feel that you have received the recognition you deserve in life?	0	4 7.7%	14 26.9%	24 46.2%	10 19.2%	1 1.9%	2 3.8%	11 21.2%	32 61.5%	6 11.5%
14) To what extent do you feel that you have enough to do each day?	1 1.9%	4 7.7%	20 38.5%	14 26.9%	13 25.0%	1 1.9%	8 15.4%	11 21.2%	27 51.9%	5 9.6%
15) How satisfied are you with what you have achieved in life?	1 1.9%	3 5.8%	9 17.3%	19 36.5%	20 38.5%	1 1.9%	4 7.7%	5 9.6%	27 51.9%	15 28.8%

How much do you worry about what the future might hold?	6 month					9 month				
	1	2	3	4	5	1	2	3	4	5
16) How satisfied are you with the way you use your time?	2 3.8%	4 7.7%	10 19.2%	17 32.7%	19 36.5%	1 1.9%	7 13.5%	4 7.7%	29 55.8%	11 21.2%
17) How satisfied are you with your level of activity?	1 1.9%	2 3.8%	12 23.1%	18 34.6%	19 36.5%	2 3.8%	7 13.5%	30 57.7%	13 25.0%	2 3.8%
18) How satisfied are you with your opportunity to participate in community activities?	2 3.8%	2 3.8%	12 23.1%	26 50.0%	10 19.2%	0 .0%	1 1.9%	7 13.5%	29 55.8%	15 28.8%
19) How happy are you with the things you are able to look forward to?	3 5.8%	4 7.7%	8 15.45	23 44.2%	14 26.9%	1 1.9%	2 3.8%	11 21.2%	29 55.8%	9 17.3%
20) How would you rate your sensory functioning (e.g. hearing, vision, taste, smell, touch)?	2 3.8%	2 3.8%	20 38.5%	20 38.5%	8 15.4%	5 9.6%	23 44.2%	17 32.7%	7 13.5%	5 9.6%
21) To what extent do you feel a sense of companionship in your life?	1 1.9%	5 9.6%	12 23.1%	19 36.5%	15 28.8%	4 7.7%	5 9.6%	7 13.5%	18 34.6%	18 34.6%

How much do you worry about what the future might hold?	6 month					9 month				
	1	2	3	4	5	1	2	3	4	5
22) To what extent do you experience love in your life?	0	6 11.5%	14 26.9%	20 38.5%	12 23.1	2 3.8%	7 13.5%	12 23.1%	21 40.4%	10 19.2%
23) To what extent do you have opportunities to love?	1 1.9%	2 3.8%	18 34.6%	20 38.5%	11 21.2	2 3.8%	1 1.9%	13 25.0%	25 48.1%	11 21.2%
24) To what extent do you have opportunities to be loved?	0	1 1.9%	10 19.2%	19 36.5%	22 24.3%	2 3.8%	1 1.9%	7 13.5%	20 38.5%	22 42.3%

4.2.2.2 Effects of the home-based lifestyle change intervention on depression among study population by using General Linear Model repeated-measures ANOVA with Unadjusted variables

Average mean score of depression score by using Thai Geriatric Depression scale showed high depression score in intervention group than control group at baseline. Mean score of depression was decreased both in intervention and control group at 6 and 9 months after intervention. But average mean score was highly decreased in intervention group than control group at 6 month. At 9 month after intervention, mean of depression score was less decreased in intervention group when compared with control group, shown in figure 8.

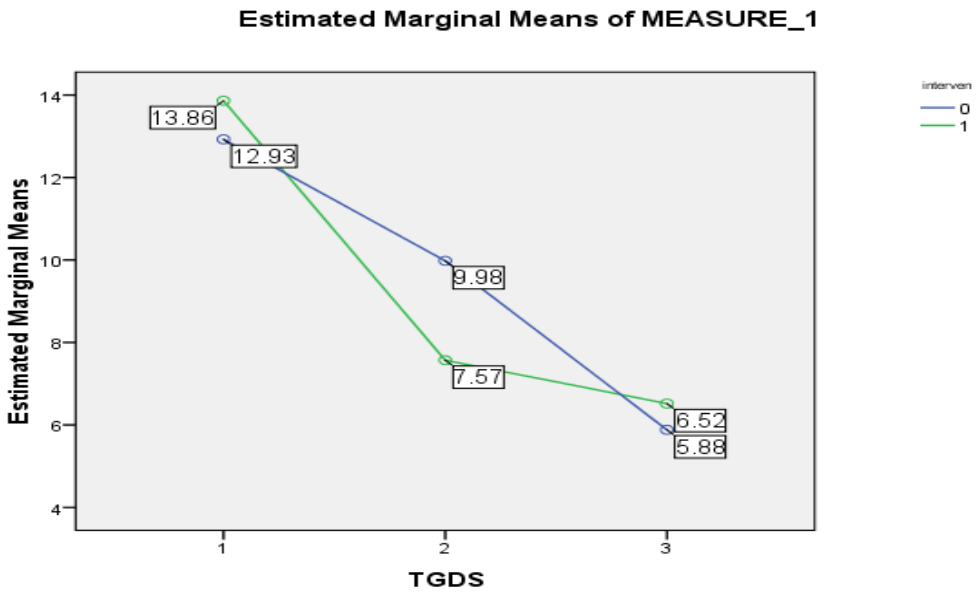


Figure 9: Estimated mean score of depression in Intervention and control group at baseline, 6 month, and 9 month

In part of outcome of home-based lifestyle change intervention on depression, statistical analysis was used General Linear Model repeated-measures ANOVA with Unadjusted variables. The findings showed that the effect of home-based lifestyle intervention was statistically significant between intervention and control group (p-value < 0.01), shown in table no. 16.

Table 16: Effects outcome of home-based lifestyle change intervention on depression among study population at baseline, 6 month, and 9 month by using General Linear Model repeated-measures ANOVA with unadjusted

Variable	F	Hypothesis df	Error df	P-value
Depression score *	77.718	2.00	104	< 0.01

* Depression score from Thai Geriatric Depression

** General Linear Model repeated-measures ANOVA, Wilks' Lambda from multivariate test

Effect test of within subject showed that depression score was statistically significant after implemented home-based lifestyle change intervention in study area (p-value < 0.001). General Linear Model repeated-measures ANOVA (Test of Within-Subjects Effects) shown in table 17.

Table 17: The effects tests of within-Subjects among study population by using General Linear Model repeated-measures ANOVA

Variable	Type III Sum of Squares	df	Mean Square	F	Sig.

Depression score	2821.333	2	1410.666	71.462	.000

* Sphericity Assumed

4.2.2.3 effect of the home-based lifestyle change intervention on depression among study population by using General Linear Model repeated-measures ANOVA with Adjusted variables

General Linear Model repeated-measures ANOVA was used to assess overall effect of home-based lifestyle change intervention on attitude depression after adjusted confounding factors. Overall effectiveness of home-based lifestyle change intervention was highly statistically significant effect on depression at p<0.01 (Wilks' Lambda from Multivariate test), shown table no. 18.

Table 18: Overall outcome of home-based lifestyle change intervention on depression among study population at baseline, 6 month, and 9 month by using General Linear Model repeated-measures ANOVA with Adjusted

Variable	F	Hypothesis df	Error df	P-value
Depression score *	83.47	2	101	< 0.01

* Depression score from Thai Geriatric Depression

** General Linear Model repeated-measures ANOVA, Wilks' Lambda from multivariate test

General Linear Model repeated-measures ANOVA was tested on effect within-subject on depression and showed that the home-based lifestyle change intervention was statistically significant (p-value < 0.01), shown in 19.

Table 19: The effects tests of within-Subjects among study population by using General Linear Model repeated-measures ANOVA with adjusted

Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
depression score	1922.502	1	1922.502	93.815	.000

*** Sphericity Assumed**

4.2.2.4 effects of the home-based lifestyle change intervention on Physical function among study population by using General Linear Model repeated-measures ANOVA with Unadjusted variables

Average mean score of Berge Balance Test (BBT) was different between intervention and control groups that mean score of BBT in intervention group was higher than control group. The trend of mean score of BBT was increased both intervention and control group at 6 and 9 month after intervention. Mean difference of BBT score from baseline to 6 month after intervention was high in intervention group than control group, shown, in figure no. 10.

In part of Time-Up and Go test (TUGT), higher minutes of TUGT in intervention group than control group at baseline. At 6 month after intervention, mean minutes of TUGT was highly decreased in intervention group and it was lower than control group at 9 month after intervention. In control group, mean minutes of TUGT was slightly decreased at 6 month but it also slightly increased at 9 month after intervention, shown figure no. 10

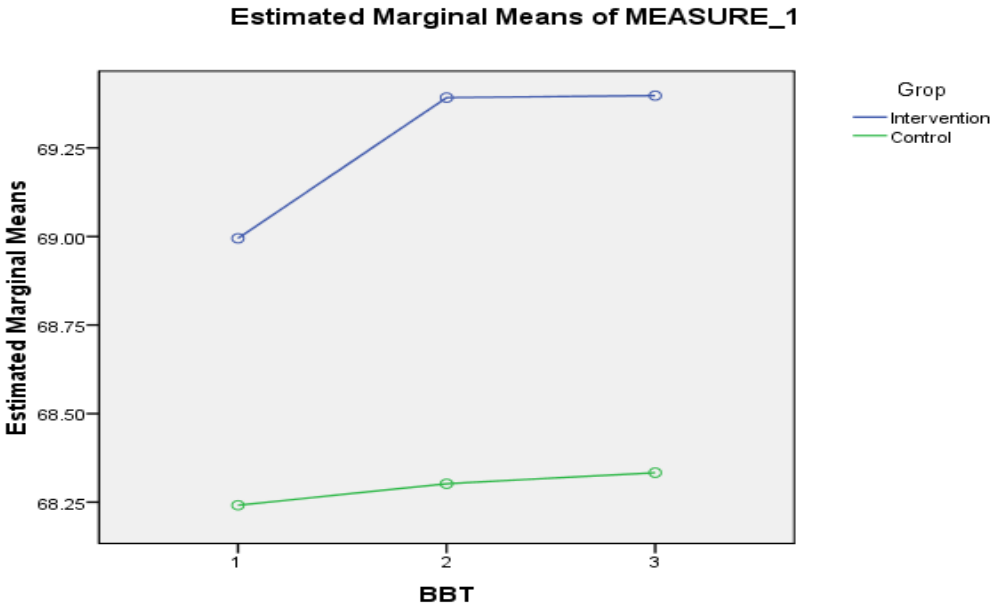


Figure 10: Estimated mean score of total quality of life (QOL) in Intervention and control group at baseline, 6 month, and 9 month

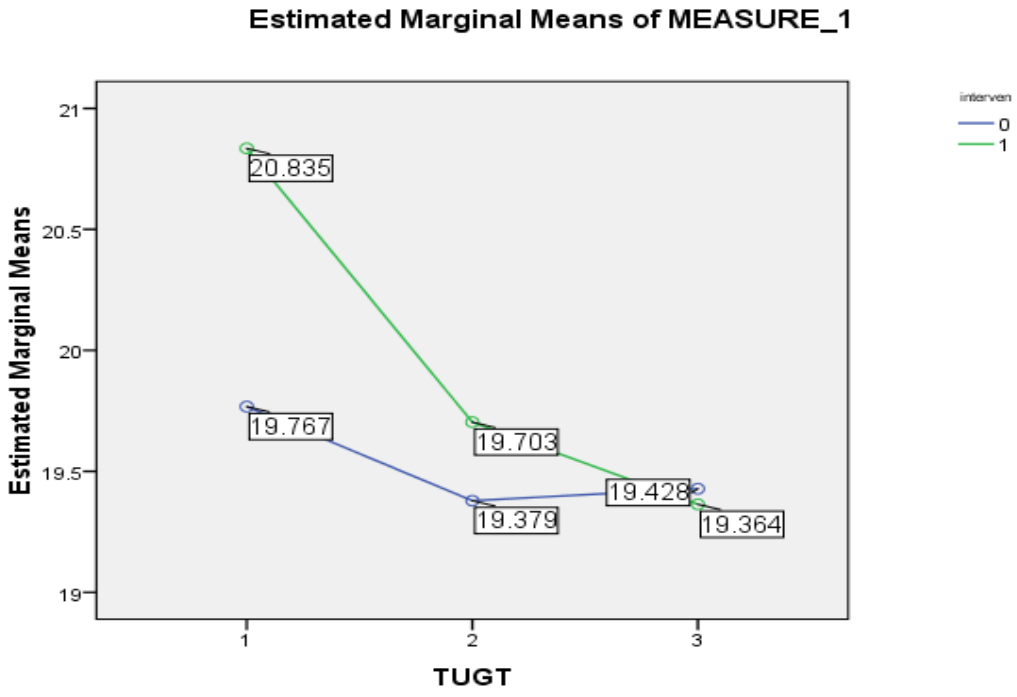


Figure 11: Estimated mean score of total quality of life (QOL) in Intervention and control group at baseline, 6 month, and 9 month

General Linear Model repeated-measures ANOVA with unadjusted was used to assess the effects of home-based lifestyle change intervention on Berg Balance Test (BBT). Score of BBT was statistically significant between intervention and control group at baseline, 6 month and 9 month (p=value < 0.01). Time Up and Go test (TUGT) was also statistically significant after implementation of intervention program (p-value < 0.01), shown in table no. 20.

Table 20: Overall outcome of home-based lifestyle change intervention on physical function among study population at baseline, 6 month, and 9 month by using General Linear Model repeated-measures ANOVA with Unadjusted

Variable	F	Hypothesis df	Error df	P-value
Berg Balance Test	9.292	2.000	104.000	<0.001
Time Up & Go Test (TUGT)	9.081	2.000	104.000	<0.001

* General Linear Model repeated-measures ANOVA, Wilks' Lambda from multivariate test

The effects test of subjects within group with unadjusted (by using General Linear Model repeated-measures ANOVA) was found statistically significant in both BBT and TUGT (p-value < 0.01), shown in table no. 21.

Table 21: The effects tests of within-Subjects among study population by using General Linear Model repeated-measures ANOVA with Unadjusted

Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
BBT	4.021	2	2.011	13.300	<0.001
TUGT	48.160	2	24.080	14.289	<0.001

Sphericity Assumed

4.2.2.5 effects of the home-based lifestyle change intervention on Physical function among study population by using General Linear Model repeated-measures ANOVA with Adjusted variables

After adjusted in General Linear Model repeated-measures ANOVA analysis, the results showed that BBT and TUGT were not statistically significant (p-value 0.943 and 0.06, respectively), shown in table no. 22.

Table 22: Overall outcome of home-based lifestyle change intervention on depression among study population at baseline, 6 month, and 9 month by using General Linear Model repeated-measures ANOVA with Adjusted

Variable	F	Hypothesis df	Error df	P-value
Berg Balance Test	9.181	2.000	98.000	< 0.001
Time Up & Go Test (TUGT)	9.769	2.000	99.000	< 0.001

Highly statistical significant of effects test within subjects in study population by using General Linear Model repeated-measures ANOVA showed that Berg Balance

Test (BBT) and Time Up and Go Test (TUGT) (p-value < 0.001) has highly statistical significant effects, shown in table no. 23.

Table 23: The effects tests of within-Subjects among study population by using General Linear Model repeated-measures ANOVA with adjusted

Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
BBT	.018	2	.009	.058	.943
TUGT	9.047	2	4.524	2.845	.060

4.2.3 Effects of Home-based lifestyle change intervention by using Linear Mixed Model with Unadjusted and Adjusted variables.

4.2.3.1 Effects of the home-based lifestyle change intervention on Quality of life and the facets of Quality of life among study population by using Linear Mixed Model with Unadjusted variables

Linear Mixed Model with unadjusted was used to assess the effects of home-based lifestyle change intervention at difference times. The results shown that the estimated of mean change in total quality of life at follow-up 1 is 8.23 (1.28-15.19) with statistically significant (p-value < 0.05) but it was not statistically significant at follow-up 2 (p-value > 0.05). After comprised in each facets of quality of life was found that AUT, SOP, and PPF facets, they were presented the difference of mean at follow-up 1 and 2 were significantly (p-value < 0.05). The mean difference of AUT are

3.96 (2.35-5.56) at follow-up 1 and 2.59 (1.34-3.85) at follow-up 2. The mean difference of SOP at follow-up 1 is 1.60 (0.38-2.82) and follow-up 2 is 2.54 (1.20-3.89) and mean difference of PPF at follow-up 1 is 1.64 (0.10-3.18) and follow-up 2 is 1.89 (0.59-3.19). DAD facet was no statistical significant at follow-up 1 of intervention (p-value: > 0.05, and mean change: -1.84 (-4.02-0.33)) but it was statistical significant at follow-up 2 (p-value < 0.01, mean change: -3.89 (-6.20-1.59)). In term of INT, an intervention was found effect to INT facet of QOL at follow-up 1 p-value < 0.05, mean change: 2.14 (0.52-3.75) but it was not statistical significant at follow-up 1 (p-value: > 0.05, mean change: 1.34 (-0.37-3.05)). Only SAB was not difference after intervention between both follow-up 1 and 2 (mean change: 0.25 (-1.87-2.37), -0.94 (-2.76-0.87), respectively, and p-value > 0.05). It was showed in table 24.

4.2.3.2 Effects of the home-based lifestyle change intervention on Quality of life and the facets of Quality of life among study population by using Linear Mixed Model with Adjusted variables

After adjusted variable, the results of the study were presented that total QOL was not statistical difference at both follow-up (mean change: 7.51 (-0.52-15.54) at follow-up 1 and 2.73 (-3.81-9.27) at follow-up 2, p-value > 0.05). Only AUT and SOP facets were shown statistical significant (p-value < 0.05). Mean change of AUT are 3.83 (1.97-5.69) at follow-up 1, and 2.48 (1.01-3.95) at follow-up 2. Mean change of SOP are 1.56 (0.17-2.96) at follow-up 1 and 2.30 (0.73-3.86) at follow-up 2. Therefore, this study was found not difference of PPF and DAD at follow-up 1 (p-value > 0.05, mean change are 1.64 (0.10-3.18) and -1.53 (-4.02-0.94), respectively) but it was shown statistically significant at follow-up 2 (p-value < 0.05 and mean

change are1.89 (0.59-3.19) and -3.30 (-5.98-(-0.62), respectively). However, DAD facet of QOL was statistically difference but it was negatively finding. After adjusted variable, INT facet was still found statistically significant difference at follow-up 1 but it was not statistical significant at follow-up 2. It was showed in table 25. SAB facet was still not showed statistically significant at both follow-up 1 and 2. It was showed in table 25.

4.2.3.3 Effects of the home-based lifestyle change intervention on Depression symptom among study population by using Linear Mixed Model with Unadjusted variables

After intervention, this study was showed the home-based lifestyle change intervention was decreased the depression score of intervention group than control group at follow-up 1 (p-value < 0.05, mean change -2.46 (-4.87-(-0.05)) but it was not statistically significant at follow-up 2 (p-value > 0.05, mean change -0.55 (-2.86-1.76)). It was showed in table no. 24.

4.2.3.4 Effects of the home-based lifestyle change intervention on Depression symptom among study population by using Linear Mixed Model with Adjusted variables

After statistical analysis with adjusted variable, depression score still shown that it was decreased significantly at follow-up 1 (p-value < 0.05, mean change is-3.34 (-6.02-(-0.66)) but not shown that statistical significant at follow-up 2 (p-value > 0.05, mean change is -0.29 (-2.95-2.36) as showed in table no. 25.

4.2.3.5 Effects of the home-based lifestyle change intervention on Physical Function among study population by using Linear Mixed Model with Unadjusted variables

Linear Mixed Model analysis was showed TUGT was not statistical significant at both follow-up 1 and 2 (p-value > 0.05). Mean change are -0.26 (-1.09-0.56) at follow-up 1 and -0.54(-1.40-0.31) at follow-up 2. It was showed in table no. 4.22.

In contrast, BBT was found statistically significant both follow-up with p-value < 0.05. Mean change of BBT score are 0.23 (0.01-0.47) and 0.23 (0.01-0.46). It was showed table no. 24.

4.2.3.6 Effects of the home-based lifestyle change intervention on Physical Function among study population by using Linear Mixed Model with Adjusted variables

After adjusted variables, the results were showed TUGT was statistically significant at follow-up 2 (p-value < 0.05). The mean difference is negative result but it was not showed at follow-up 1 as table no. 4.23. In term of BBT, it was showed no statistically significant at both follow-up. It was showed table no. 25.

Table 24: Effects of home-based lifestyle change intervention at follow-up 1 and 2 by using Linear Mixed Model Analysis with Unadjusted

Outcome	Follow-Up 1	Follow – Up 2

variable	Estimate Mean Change	95% CI	P-value	Estimate Mean Change	95% CI	P-value
Depression	-2.46	-4.87-(-0.05)	0.045	-0.55	-2.86-1.76	0.637
TUGT	-0.26	-1.09-0.56	0.530	-0.54	-1.40-0.31	0.214
BBT	0.23	0.01-0.47	0.047	0.23	0.01-0.46	0.044
TQOL	8.23	1.28-15.19	0.021	3.53	(-2.15-9.23)	0.220
- SAB	0.25	-1.87-2.37	0.815	-0.94	-2.76-0.87	0.307
- AUT	3.96	2.35-5.56	<0.001	2.59	1.34-3.85	<0.001
- PPF	1.64	0.10-3.18	0.036	1.89	0.59-3.19	0.005
- SOP	1.60	0.38-2.82	0.010	2.54	1.20-3.89	0.000
- DAD	-1.84	-4.02-0.33	0.095	-3.89	-6.20-1.59	0.001
- INT	2.14	0.52-3.75	0.010	1.34	-0.37-3.05	0.124

* Linear Mixed Model

Table 25: Effects of home-based lifestyle change intervention at follow-up 1 and 2 by using Linear Mixed Model Analysis with Adjusted

outcome variable	Follow-Up 1			Follow – Up 2		
	Estimate Mean Change	95% CI	P-value	Estimate Mean Change	95% CI	P-value
Depression	-3.34	-6.02-(-0.66)	0.015	-0.29	-2.95-2.36	0.824
TUGT	-0.74	-1.68-0.20	0.123	-1.13	-2.10-(-0.15)	0.023
BBT	0.23	-0.03-0.50	0.088	0.18	-0.07-0.45	0.166
TQOL	7.51	-0.52-15.54	.067	2.73	-3.81-9.27	0.410
- SAB	-0.28	-2.71-2.14	0.814	-1.49	-3.59-0.61	0.162
- AUT	3.83	1.97-5.69	0.000	2.48	1.01-3.95	0.001
- PPF	1.64	-0.12-3.40	0.068	1.83	0.33-3.34	0.017
- SOP	1.56	0.17-2.96	0.028	2.30	0.73-3.86	0.004
- DAD	-1.53	-4.02-0.94	0.222	-3.30	-5.98-(-0.62)	0.016
- INT	1.84	0.03-3.64	0.045	0.90	-1.04 -2.84	0.361

* Linear Mixed Model

CHAPTER V

DISCUSSIONS, CONCLUSIONS, AND RECOMMENTATIONS

This chapter is the discussion, conclusion, and recommendation of the research finding and guidance for further research. The main purpose of this study to evaluate the effects of a home-based lifestyle change intervention program using triple-E education for improving the quality of life, reducing depression, and improving physical function in elderly in Sam Sung District, Khon Kean Province, Thailand. The quasi-experimental study with control group was conducted at Sam Sung district (the intervention area) and Num Phong District (the control area). The total of participants at baseline survey was 110 persons (55 persons from intervention area and 55 persons from control area). After implementation of the intervention, three of the participants in intervention group dropped from study (1 person die and 2 persons moved to other places). The total number of participants enrolled in this study was 107.

Home-Based Lifestyle Change (HBLC) intervention consists of 4 steps of intervention as following: Step 1) Triple-E training: Triple-E education (Exercise, eating healthy food, and emotional management) was trained to participants in the intervention group. Training conduced at the community temple for 3 days (3 hours per day). The techniques of training comprise explanation, demonstration, role model technique; Step 2) Team Leader Training: ten team leaders attended the training of empowerment, monitoring, and counseling techniques from the research team; Step 3) Home-visit: team leaders visited their members as routine activity,

as friend, neighbor; Step 4) Monthly Meeting: all participants attended monthly meeting at the temple as commitment to their group. This part was conducted by researcher and team aiming to monitor the intervention program. They demonstrated their improvement of exercise and explained the improvement of health after having adapted triple-E in their daily living.

Outcome assessment was carried out at 6 months and 9 months after implementation of the intervention in study area. The measurement tools used WHOQOL-OLD questionnaire and Thai Geriatric Depression questionnaire. Physical function was tested by Berg Balance test and Time-Up & Go test.

Statistical analysis used percentage, mean, median to determine socio-demographic characteristics of the study population and General Linear Model repeated Measure ANOVA and Linear Mixed Model analysis to assess the effects of HBLC intervention.

5.1 The discussion of findings

5.1.1) Socio-demographic of characteristics of participants

All the responders were aged 60 to 75 years (68.27± 4.39 in the intervention and 65.73± 4.38 in the control group). Most of the characteristics between the intervention and control group was similar. The similarly characteristics of the intervention and control group are marital status, education level, sufficiency income, number of children, number of family member, and the average monthly income. The results showed that majority of them are marital (63.6% in an intervention group and 78.2% in the control group). The marital status was similar

with the NHES in 2009. The National Health Examination Survey was found 79 % of male-aging and 45 % of female-aging was married (NHESO, 2009). Most of respondents had the primary education (87.3% in the intervention group and 94.5% in the control group). Several respondents reported that they were insufficient income and in debt (40.0% in the intervention group and 50.9% in the control group). Average numbers of children are 3.13±1.56 persons in the intervention group and 2.75±1.57 persons in the control group. Average numbers of family member in the intervention and control group are 3 or 4 persons.

Some characteristics between the intervention and control group was statistical difference included gender, employment status, age and number of the closed-friend. The majority of respondents were female (54.5% in intervention and 81.8% in control group). In-spite the sufficiency income was similar among the intervention and control group but the employment status was difference. Employments status refers to the current occupation of the respondents. This study found the difference of the employment status among the intervention and control group. Most of respondents (90.4%) replied that they are employee. It was higher than the control group that only 61.8% of them are employee. This study, the age-rang of respondents was narrow at the criteria of the recruitment (60-75 years), but the mean age of the intervention group (68.27±4.39) was higher than the control group (65.73± .38). However, the mean age of the intervention group was higher than the control group but employment status was opposite.

In term health status, health status consists of 6 items included the history of chronic illness, type of chronic diseases, history of annual health check-up, history of fall down, history of alcohol drinking, and history of smoking. All items of health

status among the intervention and control group were similar. Over 50 % of respondents (63.6% vs 50.9%) reported that they have had at least one chronic disease such as diabetes (29.1% vs 32.7%), hypertension (27.3% vs 25.5%), heart disease (10.9% vs 1.8%), and kidney disease (5.5% vs 1.8%). The majority of respondents (90.0% vs 88.0%) have been checked the annual health check-up. Thirty-four point five of respondent in the intervention group have been fall down and 38.2% in the control group. Over 70% of respondent (74.5% vs 72.7%) have never drinking an alcohol. The history of smoking was found 30.9 % in the intervention and 18.1% in the control group.

In this study, a health complaint refers to the previous complaining of respondent on their current health. It consists of 10 items included rollback pain, leg ache, urinate problem, constipation, flatulence, visual impairment, hearing loses, sleep disturbance, taste impairment, and hand shaking. Five items of the health complaint (rollback pain, leg ache, urinate problem, constipation, and flatulence) were similar. In addition, some health complaints were difference between the study populations. Those complaints were included visual impairment, hearing lose, taste dysfunction, sleeping disturbance and hand shake.

The differences of characteristics between the intervention and control group in this study were found. Because of the recruitment was voluntary-based. The participants were friends and neighbors of each other. It was selection bias that it might affects to the results. Consequently, some variables included gender, employment status, age, and number of the closed-friend were adjusted by using General linear repeated-measure ANOVA and Linear Mixed Model.

5.1.2) Effects of Home-based Lifestyle Change (HBLC) intervention on the Quality of Life (by using WHOQOL –OLD questionnaire)

The average mean score of the quality of life were 76.03 in the intervention group and 82.04 in the control group. The statistical different of the quality of life score at baseline between the intervention and control group was shown in the study. The quality of life was classified into 3 levels included high Qol (QoL score = ≥ 89 score), moderate QoL (QoL score = 56-88 score), and fair QoL (QoL score = 24 – 55 score). At baseline, it found that the majority of participants have had a moderate quality of life (84.60% vs 72.70%). This finding was similar with several studies [133-135].

General Linear Model repeated-measure ANOVA with unadjusted variables was shown that the overall effects of home-based lifestyle change intervention on the total quality of life and its 6 facets were statistical significant difference. After adjusted variables, the statistical was found that the total quality of life and SAB, PPF, and INT facets was not statistical significant difference. However, only AUT, SOP, DAD facets were statistical significant difference in this study.

The finding appears to be consistent to the study of Helena A. F. et al (2012). It researched on a 12 weeks of the intervention program in Brazil[25]. This study was shown that the Sensory Ability (SAB) facet, Social participation (SOP) and Death and Dying (DAD) facets were statistical difference [25]. However, Sensory Ability (SAB) facet of our study was not statistical significant difference after the intervention. Therefore, sensory aids such as glasses should be support the elderly with sensory impairment. In term of Intimacy (INT) facet, there was strongly statistically significant

difference after 6th month intervention. This finding was in line with study of Helena A.F. et al. which was evaluated at 3 months intervention.

To measure the effects of the intervention in over times, this study was used Linear Mixed Model Analysis with **unadjusted variable** to assess the mean change of the quality of life and its facets from baseline to nine month intervention. The statistical analysis was shown that the total quality of life score was statistical significant difference at 6 months after intervention. In the facets of the quality of life, the study found that autonomy (AUT), past, present and further activities (PPF), social participation (SOP), and intimacy (INT) facets were statistical significant difference at 6 months. However, the statistical analysis was found that the total quality of life and SAB and INT facets were not statistical difference at 9th month of the intervention. The finding shown that AUT, PPF, SOP, DAD facets of the quality of life were statistically significant difference at 9th moth of the intervention. According to the difference of the characteristics at baseline, the study was analyzed the effects of the intervention by using Linear Mixed Model Analysis with **adjusted variable**. The results were shown that the total quality of life was not statistical significant at both 6th and 9th months. Therefore, the study found that the intervention was affects to the AUT, SOP, and INT facets at 6th months with statistical significant difference. At 9th months of the study, the intervention was positive - affects to the AUT, PPF, and SOP facets with statistical significant difference. Only **DAD** facet presents the **negative-outcome** of the study.

The finding appears that the intervention was successfully on AUT, PPF, and SOP due to the intervention motivated elderly to increase frequency of social activity and social participation. However, this study cannot find the evidence to explain the

cause of the invers of outcome of DAD. It might be that increasing participation with friends and join several activities the elderly want to live longer and afraid of death.

5.1.3) Effects of Home-based Lifestyle Change (HBLC) intervention on Depression

In this study, the mean score of depression in the intervention group is 13.98±4.1 and 12.78±3.53 in the control group. Over 40 % of respondents in this study had depression (49.1% in the intervention group vs 44.6% in the control group). The results of this study found that depression was higher in the study area when compared with other studies [51, 52]. A study on depression in simi-urban area by Orasa Y. & Peeraphone L. reported that depression among elderly was 13.2% (7.8% of mild depression, 5.2% of moderate depression, and 0.2% of severe depression) [52]. Our study which was conducted in rural area was shown that the percentage of people with depression in each level was higher than Orasa study. In other countries, depression in elderly was at 15 – 20% (15.2% in Korea, 19.8% in Japan, and 15-20% in USA) [12, 136] It can be conclude that the prevalence of depression of our study was higher than other areas.

After implementation of HBLC intervention, the trend of depression was declined. The mean score of depression in the intervention group was reduced from 13.89% to 8.4%. The percentage of depression in the intervention group was reduced from 49.1% at baseline to 19.2% at 6th month and to 11.5% at 9th month.

According to the statistical analysis, the overall effect of the HBLC intervention reduced the depression mean scores with the statistical difference (by

using General Linear repeated-measure ANOVA analysis). Moreover, this study assessed the effects of the intervention in each period by using Linear Mixed Model Analysis. The results showed that HBLC intervention reduced the depression at 6th month after intervention with statistical significant difference. These findings are similar with previous studies. Several studies found that depression was reduced after implementation of the intervention [20, 33, 72, 124, 137, 138]. One possible reason of depression reduction might be the participants increased their physical activities including exercise and joining more social activities [20, 33]. Several studies observed that exercise can reduce muscle pain, increase relaxing hormones as endorphins hormone, and promote healthy sleep patterns. Improving of the physical function is considered to be a non-pharmacological approach to prevent depression and combine with depression treatment in patients suffering from sadness and depression [124, 126]. The systematic review of Jeffrey T. G et al was showed that all types of exercises can benefit to both physical and mental health of subjects (Jeffrey T. G., 2008). However, the duration of exercise was different but the benefits and gain of health may be similar [138]

Our study based on social network and social support to neighboring and team leader that can reduce social isolation and increase social connectedness. Social isolation plays an important role in depression [33]. Social connectedness is the reason to explain the outcome of any social process that the individual see him/ herself as being part of community. The reduction in depression from this study could explain it according to the previous studies found. The study of Emma B & Spencer M reported that a good neighbor network relationship was strongly associated with reducing depression [33]. Being a part of groups typically confers

benefits to mental health, and the greater part a person is, the merrier (or the less depressed) the individual will be [139]. The risk of depression was reduced by a person who had joined more groups [139]. Moreover, the support of their network is an important for reduction of depression. The support from their group included instrumental, emotional, and financial support are predicting the physical and mental health [33, 139, 140].

5.1.4) Effects of Home-Based Lifestyle Change (HBLC) intervention on Physical function

The study was shown that the HBLC intervention had affected the physical function. The Berg Balance score had shown statistically significant difference after the intervention. In term of physical movement, Time Up and Go test (TUGT) was used in this study, the findings shown different between the intervention and control groups. TUGT mean score was decreased at both 6th and 9th month. The finding appears to be consistent with studies by Elisabeth & Akiko on the effects of exercise to improve physical function (body balance and movement). It was shown that home-based exercise improved the habit of physical activity in elderly. Both the exercise training with or without nutritional training can change the activity of daily living scores [13]. In contrast, the study by van der Bij, A.K., et al on home-based muscle training for osteoporotic women found that TUGT was not statistical different but it improved the physical function of the quality of life [123].

In conclusion, Home-based lifestyle change intervention through increasing social participation among elderly affects their quality of life, depression, and physical function. This intervention was developed and implemented in the community to fill the gap that elderly people prefer to join the activity at home with

their peers than other places. This intervention leads to increase social participation among elderly. Social participation, in this study might be related with the leadership of team leader, relationship among group members, and the activities during their participation.

5.2 Conclusion

The main purpose of this study was to evaluate the effectiveness of home-based lifestyle change intervention to improve the quality of life among elderly by using social network theory to encourage the participation and the change of behavior related to health within a group.

Lack of quality of life, sadness and depression especially, touches people in their old age and can have enormous depth and staying power. At advanced age it is often more than a passing bout of sadness or dejection, or feeling down in the dumps. It can leave elderly people feeling continuously burdened and can sap the joy of life out of once pleasurable activities, reducing their quality of life. This has physical as well as emotional symptoms. Today, yet too many people in Thailand struggle silently with this problem as the present study has shown.

The good news is that the present study has shown the effectiveness of an intervention based on lifestyle changes by a strong social support to improve quality of life, especially a relief for depression and a change for the better in physical functions. Dealing with the stigma of depression, sorting through health, familial or financial issues, can seem like insurmountable obstacles, but the outcome of this study has shown that they can be overcome. A strong social support seems to be the basis.

This home-based lifestyle change intervention may pave the way for better understanding and treatment, the way for a natural treatment without medication to restore mood, joy and quality of life in elderly people.

5.3 Limitation of study

1. This study used quasi-experimental study. It cannot randomly select the participants in the intervention and control group. Therefore, there may be selection bias. The results might not be able extrapolation to other population.
2. Some socio-demographic characteristics of intervention and control group were different since recruitment. This might affects to the outcome of the study.
3. This study could not control the external confounder and external co-intervention such as information from mass-media, and locale health providers in control group.
4. The limitation of self-reported, some variables such as food intake, medical diagnosed, smoking and alcohol drinking may be contain error.
5. Time limitation, the study duration was 9 months. It was not enough to assess the sustainability of the outcome.
6. The improving of nutrition in this study was not evaluated. The changing of eating healthy food as recommended didn't show in this study.
7. Limitation of generalization, this study was purposively selected to conduct the HBLC program in the study area. The participants were elderly in rural area, had generally low income, primary education, and reported that they

spend day times with their friends or neighbors. The findings appear may not be transferable to other community.

5.4 Recommendations

1. The intervention bias a social network should be considered applying in the community, especially in the rural area of Thailand, as many people in the communities are socially connected.
2. Refreshment training should be carried out from time to time for retaining of triple-E education and empowering for team leaders.
3. The prevalence of sensory impairments such as visual impairment, hearing loose, smell impairment and taste impairment was high in elderly. It was associated with the social participation and the life satisfaction in elderly. Sensory aids such as hearing aids and glasses needs to be supported the elderly. Only provide education on health is not enough to improve the quality of life and increase social participation. Providing a health education and sensory support is needed to implement together.
4. Several elderly are not cooking food themselves. Caretakers such as family members need to be provided with education on food and nutrition for the elderly. Healthy nutrition advice should be given to both, caretaker and the elderly.
5. This study used Thai Geriatric Depression Scale which is a standard questionnaire. The study has found that the prevalence of depression among elderly in the study area was very high. This fact should be taken seriously into consideration in order to reduce this health issue. Screening of

depression with TGDS should be highly recommended for the elderly at least once a year.

6. In this study, the side effect of the exercise such as muscle pain or accident is not reported, but regular exercise has virtually no serious adverse effects and should therefore be recommended. Regular exercise may improve mood in elderly people, especially people with depression and improving quality of life.

REFERENCES

1. Bank, W. *Age dependency ratio (% of working-age population*. 2013 [cited 2013 May 2013]; Available from: http://data.worldbank.org/indicator/SP.POP.DPND/countries?display=default.
2. United Nation Population Founds, *Population ageing and well-being of older persons Thailand: Past Trends, Current situation and future challenges*, ed. N.C. John Knodel. 2008, Bangkok: United Nation Population Found,.
3. The National Commission on the Elderly, T.M.o.S.D.a.H.S., *The 2 nd National Plan on The Elderly ational Plan on The Elderly (2002-2021) 2002-2021)* ed. s.R.o.e.o. 2009. Bangkok: Bureau of Empowerment for Older Persons.
4. Farquhar, M., *ELDERLY PEOPLE'S DEFINITIONS OF QUALITY OF LIFE.* Soc. Sci. Med. , 1995. **41**(10): p. 1439-1446.
5. John Knodel, N.C. *Population Ageing and the Well-being of Older Persons in Thailand*. 2008 [cited 2010; Available from: http://www.psc.isr.umich.edu/pubs/pdf/rr08-659.pdf.
6. Word Health Organization-Quality of Life Working Group, *Development of the WHOQOL-OD module. Quality of life research*, M. Power, Editor 2006, Word Health Organization: Edinburgh. p. 2197-2214.
7. Piyathida Kuhirunyaratn, S.P., Ratana Somrongthong, Edgar J Love, Robert Sedgwick Chapma, *Social Support among elderly in Khon Kean Province, Thailand.* Sountheast Asian J Trop Med Public Health, 2007. **38**(5).
8. Sutthichai Jitapunkul, S.W., *National Policies and Programs for the Aging Population in Thailand.* Ageing Int, 2009. **33**: p. 62-74.
9. Churnrurtai Kanchanachitra, C.P., Kritay Archavanitkul, Umaporn Pathara,, *Thai Health 2007: The Scent of The Lamduan Flower Preparing for an Aging Society*. 2007, Bangkok: Institude for Population and Sociel Research, Mahidol University, & Thai Health Promotion Fundation.
10. Weerasak M., P.A., Somboon I., and Doojpratana P., *Quality of life of the community - base patients with mild cognitive impairment.* Geriatr Gerontol Int, 2008. **8**: p. 80-85.
11. Foundation of Thai Gerontology Research Development Institute, *Situation of the Thai Elderly in 2009*. 2009, Bangkok: Foundation of Thai Gerontology Research Development Institute, .
12. Promotion, N.C.f.C.D.P.a.H., *Healthy Aging improving and extending quality of life among older Americans: Impproving Health and Quality of life for all People*,

2009, the Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion Atlanta, GA.

13. Rydwik, E., K. Frandin, and G. Akner, *Effects of a physical training and nutritional intervention program in frail elderly people regarding habitual physical activity level and activities of daily living--a randomized controlled pilot study.* Arch Gerontol Geriatr, 2010. **51**(3): p. 283-9.
14. Bowling, T.E., *Nutrition support in benign and malignant disease: a practical guide.* Eur J Gastroenterol Hepatol, 2007. **19**(5): p. 351-2.
15. George, L.K., *Chapter 11 - Social Factors, Depression, and Aging*, in *Handbook of Aging and the Social Sciences (Seventh Edition)*, R.H. Binstock and L.K. George, Editors. 2011, Academic Press: San Diego. p. 149-162.
16. Morey, M.C., et al., *Effects of home-based diet and exercise on functional outcomes among older, overweight long-term cancer survivors: RENEW: a randomized controlled trial.* JAMA, 2009. **301**(18): p. 1883-91.
17. Daley, A., et al., *Exercise participation, body mass index, and health-related quality of life in women of menopausal age.* Br J Gen Pract, 2007. **57**(535): p. 130-5.
18. Gonzalez-Garcia, M., et al., *Effectiveness of Mindfulness-Based Cognitive Therapy on the Quality of Life, Emotional Status, and CD4 Cell Count of Patients Aging with HIV Infection.* AIDS Behav, 2013.
19. Heli M. Ba¨ckmand a, J.K.a., b, Urho M. Kujala c, Seppo Sarna, *Physical activity, mood and the functioning of daily living: A longitudinal study among former elite athletes and referents in middle and old age* Archives of Gerontology and Geriatrics, 2009. **48**: p. 1-9.
20. Jing Sun, N.B., Rohan Jayasinghe, *Effects of community-based meditative Tai Chi programme on improving quality of life, physical and mental health in chronic heart-failure participants.* Aging & Mental Health: p. 1-7.
21. McAuley, E., et al., *Non-Exercise Estimated Cardiorespiratory Fitness: Associations with Brain Structure, Cognition, and Memory Complaints in Older Adults.* Ment Health Phys Act, 2011. **4**(1): p. 5-11.
22. McAuley, E., et al., *Physical activity, function, and quality of life: design and methods of the FlexToBa trial.* Contemp Clin Trials, 2012. **33**(1): p. 228-36.
23. Motl, R.W., et al., *Lifestyle physical activity and walking impairment over time in relapsing-remitting multiple sclerosis: results from a panel study.* Am J Phys Med Rehabil, 2011. **90**(5): p. 372-9.
24. Paolo Onorati, R.A., Gabriele Valli , Emanuela Berton, Francesca De Marco, Pietro Serra, Paolo Palange, *Non-invasive evaluation of gas exchange during a*

shuttle walking test vs. a 6-min walking test to assess exercise tolerance in COPD patients. Eur J Appl Physiol, 2003. **89**: p. 331-336.

25. Helena A Figueira, A.A.F., Samária A Cader, Andrea C Guimarães, Ricardo J De Oliveira, Joana A Figueira, Olivia, *Effects of a physical activity governmental health programme on the quality of life of elderly people.* Scandinavian Journal of Public Health, 2012. **0**: p. 1-5.
26. Campbell, K.H., et al., *Association between estimated GFR, health-related quality of life, and depression among older adults with diabetes: the Diabetes and Aging Study.* Am J Kidney Dis, 2013. **62**(3): p. 541-8.
27. Tamari, K., *Baseline comorbidity associated with the short-term effects of exercise intervention on quality of life in the Japanese older population: an observational study.* Arch Phys Med Rehabil, 2010. **91**(9): p. 1363-9.
28. J, E.M., F.M. D, and S.H. K, *Behavioral and psychological signs and symptoms of dementia: a practicing psychiatrist's viewpoint.* Dialogues Clin Neurosci, 2000. **2**(2): p. 139-55.
29. Pihl, E., et al., *Depression and health-related quality of life in elderly patients suffering from heart failure and their spouses: a comparative study.* Eur J Heart Fail, 2005. **7**(4): p. 583-9.
30. Muhtz, C., et al., *Effects of chronic posttraumatic stress disorder on metabolic risk, quality of life, and stress hormones in aging former refugee children.* J Nerv Ment Dis, 2011. **199**(9): p. 646-52.
31. National Statistical Office, *Report on the 2007 survey of the older persons in Thailand*. 2007, Bangkok: : National Statistical Office,.
32. National Statistics Organization, *National Statitics Suvey 2013*, 2013, National Statistics Organization: Bangkok.
33. Emma Bassett, S.M., *Social capital and depressive symptoms: The association of psychosocial and network dimensions of social capital with depressive symptoms in Montreal, Canada* Social Science & Medicine, 2013. **86**: p. 96-102.
34. Dlugonski, D., et al., *Social cognitive correlates of physical activity in inactive adults with multiple sclerosis.* Int J Rehabil Res, 2011. **34**(2): p. 115-20.
35. White, S.M., T.R. Wojcicki, and E. McAuley, *Social cognitive influences on physical activity behavior in middle-aged and older adults.* J Gerontol B Psychol Sci Soc Sci, 2012. **67**(1): p. 18-26.
36. Alan J. Gow, A.i.P., Ma rtha C. Whiteman, Lawrence J. Whalley, d Ian J. Deary, *Social Support and Successful Aging Investigating the Relationships Between Lifetime*

Cognitive Change and Life Satisfaction. Journal of Individual Differences, 2007. **28**(3): p. 103-115.

37. Baxter, J., et al., *Social network factors associated with perceived quality of life. The San Luis Valley Health and Aging Study.* J Aging Health, 1998. **10**(3): p. 287-310.
38. Echt, M.A., et al., *Psychotropic drug initiation or increased dosage and the acute risk of falls: a prospective cohort study of nursing home residents.* BMC Geriatr, 2013. **13**: p. 19.
39. Kathleen M. Potempa, S.W.B., Marna K. Flaherty-Robb, William L. Gaynor, *The Healthy Ageing Model: Health behaviour change for older adults.* Collegian 2010. **17**: p. 51-55.
40. Clark, A.M., et al., *Peer support to promote physical activity after completion of centre-based cardiac rehabilitation: evaluation of access and effects.* Eur J Cardiovasc Nurs, 2012. **11**(4): p. 388-95.
41. Xiao-ming SUN, J.-f.Z., Feng-ming YAN, Qin YIN, Jing-shu MAO, Cai-ying HUANG, Bo TAO, *Study of Peer-led Intervention on Reproductive Health Education and AIDS Prevention in Joint Venture Factories in Kunshan County.* Journal of Reproduction & Contraception, 2007. **18**(2): p. 133-144.
42. Pedrosa, I., et al., *MR classification of renal masses with pathologic correlation.* Eur Radiol, 2008. **18**(2): p. 365-75.
43. A, S.A., B.C. H, and S.S. J, *Application of UV-spectrophotometric methods for estimation of tenofovir disoproxil fumarate in tablets.* Pak J Pharm Sci, 2009. **22**(1): p. 27-9.
44. J, B.H., et al., *[Retroperitoneal sarcomas: a single center experience].* Cancer Radiother, 2008. **12**(5): p. 331-5.
45. World Health Oganization, *Aging: exploding the myths, Aging and Health program, WHO, international Year of Older Persons* 1999, Geneva: WHO.
46. Motl, R.W., et al., *Effects of change in fatigue and depression on physical activity over time in relapsing-remitting multiple sclerosis.* Psychol Health Med, 2011. **16**(1): p. 1-11.
47. Nyman, A., S. Josephsson, and G. Isaksson, *Being part of an enacted togetherness: Narratives of elderly people with depression.* Journal of Aging Studies, 2012. **26**(4): p. 410-418.
48. Mokhtari, M., M. Nezakatalhossaini, and F. Esfarjani, *The Effect of 12-Week Pilates Exercises on Depression and Balance Associated with Falling in the Elderly.* Procedia - Social and Behavioral Sciences, 2013. **70**(0): p. 1714-1723.

49. Polyakova, M., et al., *Prevalence of minor depression in elderly persons with and without mild cognitive impairment: A systematic review.* Journal of Affective Disorders, 2014. **152–154**(0): p. 28-38.
50. Aylaz, R., et al., *Relationship between depression and loneliness in elderly and examination of influential factors.* Archives of Gerontology and Geriatrics, 2012. **55**(3): p. 548-554.
51. Kanchana Piboon, R.S., Pornpat Hengudomsub, PairatanaWongnam, Bonnie Louise Callen,, *A Causal Model of Depression Among Older Adults in Chon Buri Province, Thailand.* Mental Health Nursing, 2012. **33**: p. 118-126.
52. Orasa Yaiyong, P.L., *Depression and Grief of the Elderly at the Elderly Associate in Nonthaburi Province.* J Psychiatr Assoc Thailand, 2011. **56**(2): p. 117-128.
53. Toomey, E. and S. Coote, *Between-rater reliability of the 6-minute walk test, berg balance scale, and handheld dynamometry in people with multiple sclerosis.* Int J MS Care, 2013. **15**(1): p. 1-6.
54. Suzuki, M., et al., *Relationship between the Berg Balance Scale and Static Balance Test in Hemiplegic Patients with Stroke.* J Phys Ther Sci, 2013. **25**(8): p. 1043-9.
55. Hiengkaew, V., K. Jitaree, and P. Chaiyawat, *Minimal detectable changes of the Berg Balance Scale, Fugl-Meyer Assessment Scale, Timed "Up & Go" Test, gait speeds, and 2-minute walk test in individuals with chronic stroke with different degrees of ankle plantarflexor tone.* Arch Phys Med Rehabil, 2012. **93**(7): p. 1201-8.
56. Brovold, T., D.A. Skelton, and A. Bergland, *The efficacy of counseling and progressive resistance home-exercises on adherence, health-related quality of life and function after discharge from a geriatric day-hospital.* Arch Gerontol Geriatr, 2012. **55**(2): p. 453-9.
57. Chou, C.H., C.L. Hwang, and Y.T. Wu, *Effect of exercise on physical function, daily living activities, and quality of life in the frail older adults: a meta-analysis.* Arch Phys Med Rehabil, 2012. **93**(2): p. 237-44.
58. Yoon, J.E., et al., *The effects of cognitive activity combined with active extremity exercise on balance, walking activity, memory level and quality of life of an older adult sample with dementia.* J Phys Ther Sci, 2013. **25**(12): p. 1601-4.
59. Hammen, C. and J.H. Shih, *Chapter 18 - Stress Generation and Depression*, in *Risk Factors in Depression*, K.S. Dobson and D.J.A. Dozois, Editors. 2008, Elsevier: San Diego. p. 409-428.

60. Wolfsdorf, B.A., et al., *Chapter 4 - Mood States: Depression, Anger, and Anxiety*, in *Evaluating and Treating Adolescent Suicide Attempters*, A. Spirito, J.C. Overholser, and J. Overholser, Editors. 2003, Academic Press: San Diego. p. 53-88.
61. Ministry of Social Development and Human Security of Thailand, *Thailand Implimentation of the Madrid International Plan of Action on Aging (MIOAR) 2012*, 2012, Bureau of Empowerment for Older Persons (OPPO), Office of Welfare Protection and Empowerment of Vulnerable Groups,: Bangkok. p. 17.
62. United Nation Population Funds. *Population Aging in Thailand*. 2006; Available from: http://thailand.unfpa.org/documents/thai_ageing_englishversion.pdf.
63. Niphon Darawuttimaprakorn, S.P., *Living Arrangements and Elderly Depression : Kanchanaburi DSS, Thailand*, in *Institute for Population and Social Research*, Mahidol University, Thailand: Bangkok.
64. Benjakul, S. *Equity of Health Care Utilization by the Elderly Population in Thailand during the Periods of the Economic Bubble and after the Economic Crisis: Human Security and Health Policy Options*. Policy and Governance Working Paper Series No. 52, 2004; Available from: http://coe21-policy.sfc.keio.ac.jp/ja/wp/WP52.pdf.
65. Bunnag, C., et al., *Ear diseases and hearing in the Thai elderly population. part II. A one year follow-up study.* J Med Assoc Thai, 2002. **85**(5): p. 532-9.
66. Colin Mathers1, A.S., Marisol Concha, *Global burden of hearing loss in the year 2000*, in *Global Burden of Disease 20002*002, World Health Organization.
67. Siewe, Y.J. *Understanding the Effects of Aging on the Sensory System*. 1914 [cited 2012 Jan 21]; Available from: http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Version-6692/T-2140web.pdf.
68. Margriet van der Werf, M.v.B., Frans Verhey, Jelle Jolles, Viviane Thewissen, Jim van Os, *Mild hearing impairment and psychotic experiences in a normal aging population*
Schizophrenia Research, 2007. **94** p. 180-186.
69. Rebecca J. Reed-Jones, G.R.S., Katherine A. Lawsond, Amanda M. Loyae, Donna Cude-Islasf, Candyce S. Bergerf, *Vision and falls: A multidisciplinary review of the contributions of visual impairment to falls among older adults.* Maturitas 2013. **75**: p. 22-28.
70. Ship, J.A., *The Influence of Aging on Oral Health and Consequences for Taste and Smell.* Physiology & Behavior, 1999. **66**(2): p. 209-215.
71. Berry, S.D., et al., *Repeat bone mineral density screening and prediction of hip and major osteoporotic fracture.* JAMA, 2013. **310**(12): p. 1256-62.

72. Jung Eun Yoon, S.M.L., Hee Sung Lim, Tae Hoon Kim, Ji Kyeng Jeon, Mee Hyang Mun, *The Effects of Cognitive Activity Combined with Active Extremity Exercise on Balance, Walking Activity, Memory Level and Quality of Life of an Older Adult Sample with Dementia.* J. Phys. Ther. Sci., 2013. **25**: p. 1601-1604.
73. Arrighi, H.M., *Chapter 11 - Alzheimer's Disease Mortality and Patient Retention in Clinical Trials: The Impact of Alzheimer's Disease on Mortality*, in *Global Clinical Trials for Alzheimer's Disease*, M. Bairu and M.W. Weiner, Editors. 2014, Academic Press: San Diego. p. 179-195.
74. Swerdlow, R.H., *Brain aging, Alzheimer's disease, and mitochondria.* Biochimica et Biophysica Acta (BBA) - Molecular Basis of Disease, 2011. **1812**(12): p. 1630-1639.
75. Bakkour, A., et al., *The effects of aging and Alzheimer's disease on cerebral cortical anatomy: Specificity and differential relationships with cognition.* NeuroImage, 2013. **76**(0): p. 332-344.
76. Leal, S.L. and M.A. Yassa, *Perturbations of neural circuitry in aging, mild cognitive impairment, and Alzheimer's disease.* Ageing Research Reviews, 2013. **12**(3): p. 823-831.
77. Vernooij, M.W. and M. Smits, *Structural Neuroimaging in Aging and Alzheimer's Disease.* Neuroimaging Clinics of North America, 2012. **22**(1): p. 33-55.
78. Darnton-Hill, I., *Healthy aging and the quality of life.* World Health Forum, 1995. **16**(4): p. 335-43; discussion 344-72.
79. Soontrapa S., S.S., Boonsiri P., Khampitak T.,, *The prevalence of hypovitaminosis D in the elderly women living in the rural area of Khonkean province, Thailand.* J Med Assoc Thai, 2009. **92**(5): p. 21-25.
80. Soontrapa S., S.S., Pongchaivakul C., Somboonporn C., Somboonporn W., Chailurkit LO.,, *The prevalence of hypovitaminosis D in the elderly women living in the rural area of Khonkean province, Thailand.* J Med Assoc Thai,, 2001. **84**(2): p. 534-541.
81. Chintana S., P.S., Kiatirat K.,, *Dietary intake of elderly in the slum areas of Khonkean metropolitan district. .* The Public Health Journal of Burapha University, 2009. **4**(2).
82. Levasseur, M., J. Desrosiers, and G. Whiteneck, *Accomplishment level and satisfaction with social participation of older adults: association with quality of life and best correlates.* Qual Life Res, 2010. **19**(5): p. 665-75.
83. Jindawong, B., Kuhirunyaratn, P.,Prasomrak, P., , *Type, Duration, and Effect of Physical Exercise on Chronic Health Diseases Among Urban Elderly in Khon Kaen*

Province, Thailand. The Southeast Asian Journal of Tropical Medicine and Public Health 2007. **44**(5): p. 906-915

84. Elward, K. and E.B. Larson, *Benefits of exercise for older adults. A review of existing evidence and current recommendations for the general population.* Clin Geriatr Med, 1992. **8**(1): p. 35-50.
85. Department of Health, M.o.P.H.o.T., *Annual report 2009: Thais Healthy Promotion*. 2010, Bangkok: Manjarun company.
86. Piyathida Kuhiranyaratn, B.J., Suchada Paileeklee, Amornrat Ratanasiri, Weerapong See-Ubpalad. *Social Support and Physical Exercise Among Rural Elderly in Khon Kaen Province, Thailand*. 2007 [cited 2011; Available from: http://www.humankinetics.com/article-archives/aacc-archived-articles/social-support-and-physical-exercise-among-rural-elderly-in-khon-kaen-province-thailand.
87. Bangonsri Jindawong, P.K., Suchada Paileeklee, Amornrat Ratanasiri, Weerapong See-Ubpalad. *Type, Duration, and Effect of Physical Exercise on Chronic Health Diseases Among Urban Elderly in Khon Kaen Province, Thailand*. Human Kinatic 2007; Available from: http://www.humankinetics.com/article-archives/aacc-archived-articles/type-duration-and-effect-of-physical-exercise-on-chronic-health-diseases-among-urban-elderly-in-khon-kaen-province-thailand.
88. Rydwik, E., et al., *Effects of a physical and nutritional intervention program for frail elderly people over age 75. A randomized controlled pilot treatment trial.* Aging Clin Exp Res, 2008. **20**(2): p. 159-70.
89. Office, N.H.E.S., *Report of Healthy Survey in Thai population by physical examination (2008 -2009).* . 2009, Nonthaburi province,: Graphic system company, .
90. Jakobsson, U., I.R. Hallberg, and A. Westergren, *Pain management in elderly persons who require assistance with activities of daily living: a comparison of those living at home with those in special accommodations.* European Journal of Pain, 2004. **8**(4): p. 335-344.
91. Stansfeld, S. and Y. Khatib, *Social Support and Social Networks*, in *Encyclopedia of Environmental Health*, J.O. Nriagu, Editor. 2011, Elsevier: Burlington. p. 119-123.
92. Lepore, S.J., *Social Support*, in *Encyclopedia of Human Behavior (Second Edition)*, V.S. Ramachandran, Editor. 2012, Academic Press: San Diego. p. 493-496.
93. Fernández-Ballesteros, R., *Quality of Life in Old Age: Problematic Issues.* Applied Research Quality Life, 2011. **6**: p. 21-40.

94. Brown, J., Bowling, Ann and Flynn, Terry, *Models of quality of life: a taxonomy, overview and systematic review of the literature.* European Forum on Population Ageing Research, 2004: p. 113.

95. Barrett, S.J. and M.A. Stark, *Factors associated with labor support behaviors of nurses.* J Perinat Educ, 2010. **19**(1): p. 12-8.

96. Battaglia, S., et al., *Effects of aging on sensation of dyspnea and health-related quality of life in elderly asthmatics.* Aging Clin Exp Res, 2005. **17**(4): p. 287-92.

97. Mosher, C.E., et al., *Associations between lifestyle factors and quality of life among older long-term breast, prostate, and colorectal cancer survivors.* Cancer, 2009. **115**(17): p. 4001-9.

98. Ronnie Willenheimer, E.R., Charles Cline, Kristian Broms, Birgitta Hillberger, and L.E. Lena O¨ berg, *Effects on quality of life, symptoms and daily activity 6 months after termination of an exercise training programme in heart failure patients.* International Journal of Cardiology, 2001. **77 (2001)** p. 25-31.

99. Arslantas, D., et al., *Life quality and daily life activities of elderly people in rural areas, Eskisehir (Turkey).* Arch Gerontol Geriatr, 2009. **48**(2): p. 127-31.

100. Bowling, A., et al., *Quality of life among older people with poor functioning. The influence of perceived control over life.* Age Ageing, 2007. **36**(3): p. 310-5.

101. Keister, K.J. and C.E. Blixen, *Quality of life and aging.* J Gerontol Nurs, 1998. **24**(5): p. 22-8.

102. Luttik, M.L., I. Lesman-Leegte, and T. Jaarsma, *Quality of life and depressive symptoms in heart failure patients and their partners: the impact of role and gender.* J Card Fail, 2009. **15**(7): p. 580-5.

103. Shiovitz-Ezra, S., et al., *Quality of life and psychological health indicators in the national social life, health, and aging project.* J Gerontol B Psychol Sci Soc Sci, 2009. **64 Suppl 1**: p. i30-7.

104. Guse, L.W. and M.A. Masesar, *Quality of life and successful aging in long-term care: perceptions of residents.* Issues Ment Health Nurs, 1999. **20**(6): p. 527-39.

105. Muangpaisan, W., et al., *Quality of life of the community-based patients with mild cognitive impairment.* Geriatr Gerontol Int, 2008. **8**(2): p. 80-5.

106. Sylvia Kirchengast, B.H., *Gender Differences in Health-Related Quality of Life Among Healthy Aged and Old-Aged Austrians: Cross-Sectional Analysis.* Gender Medicine, 2008. **5**(3): p. 1-9.

107. Leewattana T, I.S., Punthusena C., *Basic conditioning factors, Self-care agency, and quality of life of patients with post open heart surgery.* Songklanagarind Medical Journal, 2008. **26**(2).

108. Ukati K, C.N., *Self-care agency and quality of life in end stage renal disease patients undergoing continuous ambulatory peritoneal dialysis.* Med J Aust, 2007. **25**(3): p. 171-177.

109. dos Santos, W.J., et al., *[Coping with functional disability among the elderly by means of religious beliefs].* Cien Saude Colet, 2013. **18**(8): p. 2319-28.

110. Kimhi, S., et al., *Elderly people coping with the aftermath of war: resilience versus vulnerability.* Am J Geriatr Psychiatry, 2012. **20**(5): p. 391-401.

111. Helvik, A.S., et al., *Factors associated with perceived health in elderly medical inpatients: a particular focus on personal coping recourses.* Aging Ment Health, 2012. **16**(6): p. 795-803.

112. Holt-Hill, S.A., *Stress and coping among elderly African-Americans.* J Natl Black Nurses Assoc, 2009. **20**(2): p. 1-12.

113. de Souza-Talarico, J.N., et al., *[Stress symptoms and coping strategies in healthy elderly subjects].* Rev Esc Enferm USP, 2009. **43**(4): p. 803-9.

114. Poderico, C., et al., *Coping strategies and cognitive functioning in elderly people from a rural community in Italy.* Psychol Rep, 2006. **98**(1): p. 159-68.

115. Kraaij, V., E. Pruymboom, and N. Garnefski, *Cognitive coping and depressive symptoms in the elderly: a longitudinal study.* Aging Ment Health, 2002. **6**(3): p. 275-81.

116. Wongbanjeadsang, S., *Relationship between self-care agency and quality of life among older adults with chronic illness in the elderly club at the health science center, Burapha University.* The journal of faculty of nursing Burapha University, 2010. **18**(4): p. 64-77.

117. J., T.K.a.R. *Quality of life and practices of self care of the elderly in Nongmaksaw community, Kamsa-ard Subdistrict, Sawangdandin District, Sakon Nakhon Province*. 2010.

118. Bisconti, T.L., et al., *Chapter 102 - The Role of Social Support in the Health and Well-Being of Older Adult Widows*, in *Women and Health (Second Edition)*, M.B. Goldman, R. Troisi, and K.M. Rexrode, Editors. 2013, Academic Press. p. 1503-1514.

119. Kadushin, C. *Introduction to Social Network Theory*. 2004 [cited 2010 May 15]; Available from: http://melander335.wdfiles.com/local--files/reading-history/kadushin.pdf.

120. S., K., *Social Support Affecting Quality of Life in Eldelry Club at Wangsaipoon District, Phichit Province*, in *Graduate School,*2003, Chiang Mai University,: Chiang Mai

121. de Belvis, A.G., et al., *Factors associated with health-related quality of life: the role of social relationships among the elderly in an Italian region.* Public Health, 2008. **122**(8): p. 784-793.

122. Stewart, M.J., *Social support intervention studies: a review and prospectus of nursing contributions.* Int J Nurs Stud, 1989. **26**(2): p. 93-114.

123. van der Bij, A.K., M.G.H. Laurant, and M. Wensing, *Effectiveness of physical activity interventions for older adults: a review.* American Journal of Preventive Medicine, 2002. **22**(2): p. 120-133.

124. Mather, A.S., et al., *Effects of exercise on depressive symptoms in older adults with poorly responsive depressive disorder: randomised controlled trial.* Br J Psychiatry, 2002. **180**: p. 411-5.

125. Kanemaru, A., et al., *The efficacy of home-based muscle training for the elderly osteoporotic women: the effects of daily muscle training on quality of life (QoL).* Arch Gerontol Geriatr, 2010. **51**(2): p. 169-72.

126. Pitkälä, K., et al., *Efficacy of physical exercise intervention on mobility and physical functioning in older people with dementia: A systematic review.* Experimental Gerontology, 2013. **48**(1): p. 85-93.

127. Gillison, F.B., et al., *The effects of exercise interventions on quality of life in clinical and healthy populations; a meta-analysis.* Social Science & Medicine, 2009. **68**(9): p. 1700-1710.

128. George A. Kelley, K.S.K., Jennifer M. Hootman, Dina L. Jones, *Exercise and Health-Related Quality of Life in Older Community-Dwelling Adults: A Meta-Analysis of Randomized Controlled Trials.* Journal of Applied Gerontology, 2009. **28**(3): p. 369-394.

129. Pihl, E., et al., *Exercise in elderly patients with chronic heart failure in primary care: effects on physical capacity and health-related quality of life.* Eur J Cardiovasc Nurs, 2011. **10**(3): p. 150-8.

130. Fritz, T., et al., *Effects of Nordic walking on health-related quality of life in overweight individuals with type 2 diabetes mellitus, impaired or normal glucose tolerance.* Diabet Med, 2011. **28**(11): p. 1362-72.

131. Hiyamizu, M., et al., *Effects of dual task balance training on dual task performance in elderly people: a randomized controlled trial.* Clin Rehabil, 2012. **26**(1): p. 58-67.

132. Mori, Y., et al., *Long-term effects of home-based bench-stepping exercise training on healthcare expenditure for elderly Japanese.* J Epidemiol, 2011. **21**(5): p. 363-9.

133. K., P., *Strengthening social support among the elderly in Khonkean, Thailand*, in *College of Public Health Science,* 2006, Chulalongkorn University.

134. Thongsomboon, J., *Health Promotion Behaviors and Quality of Life among The Elderly in Srisamrong District, Sokhothai Province*, in *College of Public Health Sciences*2005, Chulalongkorn University.

135. Ratana Somrongthong, S.W., Chochuoy Tawee, Pongpanich Sathirakorn. *Quality of life and Health Status among Thai Muslime Elderly after Economic Crisis, Trung Province, Thailand*. in *the 5th International Asian anf Ethinic Minority Health and Wellbeing Conference*. July 2012. Faculty of Medicince and Health Science, The University of Auckland.

136. Kang, S.K., *The Effects of Social Activities and Fear of Death on Depression in the Elderly.* Health and Social Welfare Review, 2010. **30(2)**: p. 085-109.

137. Carlbring, P., et al., *The effects on depression of Internet-administered behavioural activation and physical exercise with treatment rationale and relapse prevention: study protocol for a randomised controlled trial.* Trials, 2013. **14**: p. 35.

138. Jeffrey T. Graddy, G.J.N., *Effects of Exercise on the Prevention and Treatment of Depression.* Journal of Clinical Activities, Assignments & Handouts in Psychotherapy Practice, 2002. **2**(3).

139. Tegan Cruwys, G.A.D., Catherine Haslam, S. Alexander Haslam, Jolanda Jetten, Thomas A. Morton, *Social group memberships protect against future depression, alleviate depression symptoms and prevent depression relapse.* Social Science & Medicine, 2013. **98**: p. 179-186.

140. George, L.K., *Social Factors, Depression, and Aging*. 2011, Durham: Department of Sociology and Center for the Study of Aging, Duke University.

APPENDIX

APPENDIX A

Questionnaire

ลำดับที่.....

ส่วนที่ ข้อมูลทั่วไป 1	กรุณาทำเครื่องหมายถูกต้อง (√) ในช่องที่ท่านเลือก	สำหรับผู้วิจัย
1 .เพศ	☐ 1.ชาย ☐ 2.หญิง	2Gen……..
2. อายุ	อายุ ……. ปี	3Age…..
3 .สถานะภาพสมรส	☐ 1.โสด ☐ 2.สมรส ☐ 3.หย่าแยกกันอยู่/ ☐4. หม้าย	4MS…..
4 .การศึกษา	☐ 1.ไม่ได้รับการศึกษา ☐ 2.ประถมศึกษา ☐ 3.มัธยมศึกษา ☐ 4.อนุปริญญา ☐5. ปริญญาตรีและสูงกว่า	5Edu…..
5 .อาชีพ	☐ 0.ไม่ได้ประกอบอาชีพ ☐ 1.ประกอบอาชีพ(อาชีพหลัก) ☐ 1.ข้าราชการเกษียณ ☐ 2.ค้าขาย ☐ 3.เกษตรกร ☐ 4.รับจ้าง ☐ 5.ธุรกิจส่วนตัว/เจ้าของธุรกิจ ☐ 6.เจ้าของห้องเช่าบ้านเช่า/ ☐ 7.อื่นๆ .....(ระบุ)	6Work….. 6Occu……
6 .รายได้	☐ 0.ไม่มี ☐ 1. มี	7Inco……. 7Bath/M……..

ส่วนที่ ข้อมูลทั่วไป 1	กรุณาทำเครื่องหมายถูกต้อง (√) ในช่องที่ท่านเลือก	สำหรับผู้วิจัย
	.....เดือน/บาท.	
7 .รายได้ของท่าน เพียงพอต่อการดำรงชีวิตของตัวท่านเองหรือไม่	□1.ไม่เพียงพอใช้จ่าย และเป็นหนี้ □ 2.ไม่เพียงพอใช้จ่ายไม่เป็นหนี้ □ 3.เพียงพอใช้จ่าย แต่ไม่เหลือเก็บ □ 4.เพียงพอใช้จ่าย และเหลือเก็บ	8Effi.....
8.จำนวนบุตร	คน.....	9Child.....

<u>ส่วนที่ 2 ภาวะสุขภาพและพฤติกรรมสุขภาพ</u>

2.1 ท่ามีโรคประจำตัวหรือไม่

□ .0 ไม่มี

□ .1มี ถ้ามีโปรดระบุ ท่านเป็นโรคใด _____

2.2 ท่านมีปัญหาด้านสุขภาพดังต่อไปนี้หรือไม่ อย่างไร กรุณาทำเครื่องหมายถูกต้อง)√ (ลงในชองคำตอบที่ท่านเลือก

ท่านมีปัญหาด้านสุขภาพดังต่อไปนี้หรือไม่	**ไม่มีเลย**	**น้อยครั้ง**	**ปานกลาง**	**บ่อยครั้ง**	**เป็นเสมอ**
1. มีอาการปวดหลัง					
2. มีอาการปวดขา					
3. ไม่สามารถกลั้นปัสสาวะได้					
4. อุจจาระลำบาก					
5. ท้องอืด มีลมในกระเพราะ					
6. มองไม่เห็น ตาพร่ามัว					
7. การได้ยินไม่ค่อยชัดเจน					
8. นอนไม่หลับ					
9. การรับรสไม่ดี					
10. มือสั่น หยิบจับของลำบาก					

2.3 ท่านดื่มสุราหรือไม่

☐0. ไม่เคยดื่มเลย ☐ 1. เคยดื่มสุรา แต่ปัจจุบันเลิกดื่มแล้ว ☐ 2. ปัจจุบันยังคงดื่มสุรา

2.4 ท่านสูบบุหรี่หรือไม่

☐0. ไม่เคยสูบเลย ☐ 1. เคยสูบบุหรี่ แต่ปัจจุบันแล้ว ☐ 2. ปัจจุบันยังคงสูบบุหรี่

2.5 ท่านเคยตรวจร่างกายประจำปีหรือไม่ในช่วง 2 ปีที่ผ่านมา

☐0. ไม่เคย ☐ 1. เคย

2.6 ท่านเคยมีประวัติหกล้มหรือไม่ อย่างไร

☐0. ไม่เคยมีประวัติหกล้ม

☐ 1. เคยมีประวัติหกล้ม เมื่อ 1 เดือนที่แล้ว

☐ 2. เคยมีประวัติหกล้ม เมื่อ 1 ปีที่แล้ว

☐ 3. เคยมีประวัติหกล้ม มากกว่า 1 ปีที่แล้ว

2.7 เมื่อท่านเจ็บป่วย ท่านจะเข้ารับการรักษาที่ใด

กรุณาทำเครื่องหมายถูกต้อง)V) บนช่องที่ท่านเลือก เมื่อท่านเจ็บป่วยท่านจะ	**ไม่เคยเลย**	**น้อยครั้ง**	**ปานกลาง**	**บ่อยครั้ง**	**ทุกครั้ง**
1. ท่านไปซื้อยาแผนปัจจุบันรับประท่าน					
2. ไปพบแพทย์ที่โรงพยาบาล / คลินิก / รพสต					
3. ไปรักษากับแพทย์แผนไทย					
4. ไปรักษากับแพทย์แผนจีน					
5. นอนพักผ่อนที่บ้าน ไม่ไปพบแพทย์					

2.8 ท่านมีสิทธิการรักษาสุขภาพ อาทิเช่น สิทธิประกันสุขภาพ สิทธิข้าราชการ สิทธิผู้สูงอายุ สิทธิรัฐวิสาหกิจ

☐0. ไม่มี ☐ 1. มี โปรดระบุ_____

2.9 ท่านได้ปฏิบัติกิจกรรมต่อไปนี้อย่างไร

กรุณาทำเครื่องหมายถูกต้อง) **v)** บนช่องที่ท่านเลือก	**สม่ำเสมอ**	**บ่อยครั้ง**	**ปานกลาง**	**น้อยครั้ง**	**ไม่เลย**
1. รับประท่านอาหารที่มีผักและผลไม้					
2. รับประทานอาหารจำพวกแกงกะทิ หรืออาหารทอด					
3. รับประทานอาหารที่มีโปรตีน เช่น เนื้อ หมู ปลา ไก่ ไข่					
4. รับประทานอาหารรสชาติเค็ม เช่น ปลาร้า น้ำปลา และซอสต่างๆ					
5. รับประทานขนมหวาน เช่น มันเชื่อม ขนมหวานใส่กะทิ					
6. รับประทานจากร้ายอาหาร หรือซื้ออาหารจากรถขายอาหาร					
7. ออกกำลังกายอย่างเป็นกิจจะลักษณะอย่างน้อย 30 นาที					
8. ออกกำลังกายโดยการเหยียดยืดกล้ามเนื้อขณะอยู่ที่บ้าน					
9. เดินออกนอกบ้าน หรือเดินภายในบ้านอย่างต่อเนื่อง อย่างน้อย 30 นาที					
10.ทำกิจกรรมเกี่ยวไร่ สวน ทำนา					

<u>ส่วนที่ 3 เครือค่ายทางสังคมและการสนับสนุนทางสังคม</u>

3.1 ท่านเป็นสมาชิกชมรมกลุ่มใดหรือไม่ /

☐0. ไม่มี กรุณาตอบข้อ 3.3 เป็นต้นไป ☐ 1. มี กรุณาตอบข้อ 3.2

3.2 ถ้าท่านเป็นสมาชิกของชมรมกลุ่ม ใด /

☐ 1.ชมรมออกกำลังกายของชุมชน ☐ 2.กลุ่มผู้สูงอายุ ☐

3.กลุ่มเพื่อนสังสรรค์ตอนเช้า

☐ 4.กลุ่มเกษตรกรรม ☐ 5.กลุ่มหัตถกรรม ☐ 6. กลุ่มอื่นๆโปรดระบุ

3.3 ท่านเข้าร่วมกิจกรรมดังต่อไปนี้ภายในชุมชนอย่างไร

กรุณาทำเครื่องหมายถูกต้อง)v) บนช่องที่ท่านเลือก	สม่ำเสมอ	อย่างน้อย 1 ครั้งต่อสัปดาห์	อย่างน้อย 1ครั้งต่อเดือน	อย่างน้อย 1 ครั้งต่อปี	ไม่เคยเลย
1. พูดคุยกับเพื่อนบ้าน					
2. ออกนอกบ้านไปพูดคุยกับเพื่อนภายในหมู่บ้าน					
3. เข้าร่วมกิจกรรมต่างๆที่ชมชนจัดขึ้น					
4. ไปทำบุญที่วัด ฟังเทศน์ นั่งสมาธิที่วัดภายในหมู่บ้าน					
5. ไปทำบุญที่วัด ฟังเทศน์ นั่งสมาธิที่วัดนอกหมู่บ้าน					
6. เข้าร่วมกิจกรรมชมรมผู้สูงอายุ					
7. เข้าเป็นสมาชิกในชมรม คณะกรรมการหมู่บ้าน /					
8. เข้าร่วมกิจกรรมประจำปีของหมู่บ้าน					
9. เข้าร่วมแสดงความคิดเห็นทางการเมืองภายในหมู่บ้าน					
10. เข้าร่วมกิจกรรมด้านสุขภาพของ รพสต.					

3.4 ท่านได้รับข้อมูลข่าวสาร ข้อมูลด้านสุขภาพจากแหล่งใด และมากน้อยเพียงใด

กรุณาทำเครื่องหมายถูกต้อง)v) ในช่องที่ท่านเลือก	ไม่เลย	เล็กน้อย	ปานกลาง	บ่อยครั้ง	มากที่สุด
1. สมาชิกในครอบครัว					
2. เพื่อนบ้าน					
3. กลุ่มผู้สูงอายุ					
4. เจ้าหน้าที่สาธารณสุข					
5. เจ้าหน้าที่ อบตผู้ใหญ่บ้าน .					
6. วิทยุ โทรทัศน์					
7. หอกระจ่ายข่าว					

3.5 ท่านได้รับการช่วยเหลือ หรือสนับสนุนเกี่ยวกับค่าอาหาร ค่าใช้จ่ายในการดำรงชีวิตประจำวัน อุปกรณ์และของใช้ในการดำรงชีวิตประจำวันจากใครบ้าง ท่านสามารถเลือกตอบได้มากกว่า)1 คำตอบ (

☐ ไม่มี ☐ สามีภรรยา / ☐ บุตรหลาน /ธิดา / ☐ ญาติ พี่น้อง

□ เพื่อนข้างบ้าน □ คนในชุมชน □ เจ้าหน้าที่ของรัฐ □ อื่นๆ_____

3.6 ท่านมีเพื่อนสนิทที่ท่านพูดคุยด้วยอย่างสม่ำเสมอกี่คน_____

3.7 เมื่อท่านเกิดความเครียด ท่านมักจะพูดคุยหรือปรึกษากับใครหรือไม่

ถ้าท่านพูดคุยหรือปรึกษาปัญหาความเครียด ส่วนใหญ่ท่านจะปรึกษาใคร ท่านสามารถ)เลือกตอบได้มากกว่า 1 (คำตอบ

□ ไม่มี □ สามีภรรยา / □ บุตรหลาน /ธิดา / □ ญาติ พี่น้อง

□ เพื่อนข้างบ้าน □ คนในชุมชน □ เจ้าหน้าที่ของรัฐ □ อื่นๆ_____

<u>ส่วนที่ 4 แบบประเมินความเครียดของผู้สูงอายุ</u>

กรุณาทำเครื่องหมายถูกต้อง)V) ในช่องว่างที่ท่านเลือก	ใช่	ไม่ใช่
1. คุณพอใจกับชีวิตความเป็นอยู่ตอนนี้		
2. คุณไม่อยากทำสิ่งต่างๆที่คุณเคยสนใจหรือเคยทำเป็นประจำ		
3. คุณรู้สึกชีวิตของคุณช่วงนี้ว่างเปล่า ไม่รู้จะทำอะไร		
4. คุณรู้สึกเบื่อหน่ายบ่อยๆ		
5. คุณหวังว่าจะมีสิ่งดีๆเกิดขึ้นกับตัวคุณในวันข้างหน้า		
6. คุณมีเรื่องกังวลอยู่ตลอดเวลา และเลิกคิดไม่ได้		
7. ส่วนใหญ่แล้ว คุณรู้สึกอารมณ์ดี		
8. คุณรู้สึกกลัวว่าจะมีเรื่องไม่ดีเกิดขึ้นกับคุณ		
9. ส่วนใหญ่แล้วคุณรู้สึกมีความสุข		
10.บ่อยครั้งที่คุณรู้สึกว่าไม่มีที่พึ่ง		
11.คุณรู้สึกกระสับกระส่วย กระวนกระวายบ่อยๆ		
12.คุณส่วนใหญ่ชอบอยู่ที่บ้านมากกว่าออกนอกบ้าน		
13.บ่อยครั้งที่คุณรู้สึกวิตกกังวลกับชีวิตข้างหน้า		
14.คุณคิดว่าความจำของคุณไม่ดีเท่าคนอื่น		
15.คุณคิดว่าการที่มีชีวิตอยู่ปัจจุบันนี่เป็นเรื่องหน้ายินดี		
16.คุณรู้สึกหมดกำลังใจ หรือเศร้าใจบ่อยๆ		

กรุณาทำเครื่องหมายถูกต้อง)v) ในช่องว่างที่ท่านเลือก	ใช่	ไม่ใช่
17.คุณรู้สึกว่าชีวิตคุณไม่มีคุณค่า		
18.คุณรู้สึกว่าคุณกังวลกับชีวิตที่ผ่านมา		
19.คุณรู้สึกว่าชีวิตคุณมีเรื่องสนุกให้ทำอีกมากมาย		
20.คุณรู้สึกว่าคุณลำบากที่จะเริ่มต้นทำสิ่งใหม่ๆ		
21.คุณรู้สึกกระตือรือร้นเสมอ		
22.คุณรู้สึกสิ้นหวังอยู่เสมอ		
23.คุณคิดว่าคนอื่นดีกว่าคุณ		
24.คุณอารมณ์เสียง่ายกับเรื่องเล็กๆน้อยอยู่เสมอ		
25.คุณรู้สึกอยากร้องไห้อยู่บ่อยๆ		
26.คุณมีความตั้งใจในการทำสิ่งใหม่ๆได้ไม่นาน		
27.คุณรู้สึกสดชื่นเวลาตื่นนอนตอนเช้าเสมอ		
28.คุณไม่อยากพบปะพูดคุยกับบุคคลอื่นๆ		
29.คุณสามารถตัดสินใจเรื่องต่างๆได้อย่างรวดเร็ว		
30.คุณมีจิตใจสบาย แจ่มใสเหมือเมื่อก่อน		

ส่วนที่ คุณภาพชีวิตของผู้สูงอายุ 5(WHO)

คำถามต่อไปนี้ ถามถึงการมีประสบการณ์ในเรื่องต่างๆ ที่ระบุในข้อคำถามแต่ละข้อ มากน้อยเพียงใด ในช่วง 2 สัปดาห์ที่ผ่านมา

ที่	คำถาม	ไม่เลย 0	เล็กน้อย 1	ปานกลาง 2	มาก 3	มากที่สุด 4	QOL
1	การเสื่อมถอยของระบบการรับรู้) สัมผัส/ เช่น การได้ยินเสียง, การมองเห็น,						QOL1 …..

ที่	คำถาม	ไม่เลย 0	เล็กน้อย 1	ปานกลาง 2	มาก 3	มากที่สุด 4	QOL
	การได้กลิ่น, การรับรส, การสัมผัสมีผลต่อคุณภาพชีวิตของท่าน (เพียงใด						
2	การสูญเสียระบบระบบการรับรู้ สัมผัส / ตัวอย่างเช่น การได้ยิน การมองเห็น, การได้กลิ่น, การรับรส, การสัมผัสมีผลต่อความสามารถในการเข้าร่วมกิจกรรมต่างๆ						QOL2 …..
3	ท่านมีอิสระในการตัดสินใจเรื่องต่างๆด้วยตัวเอง						QOL3 …..
4	ท่านรู้สึกว่าท่านสามารถควบคุมอนาคตของตนเองได้เพียงใด						QOL4 …..
5	ท่านรู้สึกว่าผู้คนรอบตัวท่านเคารพความเป็นอิสระของเพียงใด						QOL5 …..
6	ท่านกังวลว่าท่านจะตายอย่างไรมากน้อยเพียงใด						QOL6 …..
7	ท่านกลัวว่าจะไม่สามารถความคุมความตายของตนได้มากน้อยเพียงใด						QOL7 …..
8	ท่านกลัวการตายที่จะเกิดขึ้นกับท่านเพียงใด						QOL8 …..
9	ท่านกลัวการเจ็บปวดก่อนการตายเพียงใด						QOL9 …..

คำถามต่อไปนี้ ถามถึงประสบการณ์ และความสามารถในการกระทำต่าง ๆ ของท่านใน อาทิตย์ที่ผ่านมา 2

ข้อที่	คำถาม	ไม่เลย	เล็กน้อย	ปานกลาง	ส่วนมาก	ทุกครั้ง	
10	ระบบ การรับรู้ เช่น) สัมผัส/ การได้ยินเสียง, การมองเห็น,						QOL10…..

ข้อที่	คำถาม	ไม่เลย	เล็กน้อย	ปานกลาง	ส่วนมาก	ทุกครั้ง	
	การได้กลิ่น, การรับรส, การสัมผัส (ของทานอาหารมีผลกระทบต่อ การปฏิสัมพันธ์กับผู้อื่นเพียงใด						
11	ท่านสามารถทำกิจกรรมต่างๆที่ท่านอยากทำ ได้มากน้อยเพียงใด						QOL11 …..
12	ท่านมีความพึงพอใจกับโอกาสที่ท่านได้รับ อันจะนำไปสู่ความสำเร็จของชีวิตของท่านเพียงใด						QOL12 …..
13	ท่านได้รับการยอมรับและคุณคุณค่าของชีวิตท่านเพียงใด						QOL13 …..
14	ท่านรู้สึกว่าท่านมีทุกอย่างครบหรือมีเพียงพอ ต่อการดำรงชีวิตแต่ละวันเพียงใด						QOL14 …..
15	ท่านมีความพึงพอใจกับความสำเร็จในชีวิตปัจจุบันของท่านเพียงใด						QOL15 …..
16	ท่านมีความพึงพอใจกับการใช้ชีวิตตามแบบฉบับของท่านเพียงใด						QOL16 …..
17	ท่านมีความพึงพอใจกับระดับความสามารถในการทำกิจกรรมต่างของท่านเพียงใด						QOL17 …..
18	ท่านมีความพึงพอใจต่อโอกาสที่ตนได้เข้าร่วมกิจกรรมต่างๆในชุมชนเพียงใด						QOL18 …..
19	ท่านคิดว่าท่านมีความสุขในสิ่งต่างๆที่ท่านรอคอยวันข้างหน้าที่จะเกิดขึ้นเพียงใด						QOL 19…..
20	ท่านคิดว่าการทำงานของระบบ						QOL

ข้อที่	คำถาม	ไม่เลย	เล็กน้อย	ปานกลาง	ส่วนมาก	ทุกครั้ง	
	สัมผัสเช่น การได้ยินเสียง)รับรู้/, การมองเห็น, การได้กลิ่น, การรับรส, การสัมผัสของท่านเป็นอย่างไร (						20…..

ข้อที่	คำถาม **ในช่วง สัปดาห์ที่ผ่านมา 2**	ไม่เลย	เล็กน้อย	ปานกลาง	มาก	มากที่สุด	
21	ท่านรู้สึกว่าท่านมีเพื่อนชีวิต (ไม่ได้อยู่คนเดียว (หรือมีคนที่ท่านสามารถพูดคุยปรึกษาได้ทุกเรื่องมากน้อยเพียงใด						QOL21…..
22	ในชีวิตของท่านท่านเคยมีโอกาสได้แสดงออกเรื่องความรักกับบุคคลรอบข้างเพียงใด						QOL22…..
23	ในชีวิตของท่านท่านมีโอกาสเลือกที่จะรักในสิ่งต่างๆ ด้วยตัวของท่านเองมากน้อยเพียงใด						QOL23…..
24	ท่านมีโอกาสได้รับความรักจากคนรอบข้างของท่านมากน้อยเพียงใด						QOL24…..

<u>ส่วนที่ 6 การประเมินสมรรถภาพร่างกาย</u>

TUGO test

แจ้ให้ผู้สูงอายุเดินไปกลับเป็นระยะทาง 3 เมตรพร้อมกับจับเวลา

ผลที่ได้_____ วินาที

Berg Balance Test (BBT)

1. SITTING TO STANDING

INSTRUCTIONS: Please stand up. Try not to use your hand for support.

( ) 4 able to stand without using hands and stabilize independently

( ) 3 able to stand independently using hands

( ) 2 able to stand using hands after several tries

( ) 1 needs minimal aid to stand or stabilize

( ) 0 needs moderate or maximal assist to stand

2. STANDING UNSUPPORTED

INSTRUCTIONS: Please stand for two minutes without holding on.

( ) 4 able to stand safely for 2 minutes

( ) 3 able to stand 2 minutes with supervision

( ) 2 able to stand 30 seconds unsupported

( ) 1 needs several tries to stand 30 seconds unsupported

( ) 0 unable to stand 30 seconds unsupported

If a subject is able to stand 2 minutes unsupported, score full points for sitting unsupported. Proceed to item #4.

3. SITTING WITH BACK UNSUPPORTED BUT FEET SUPPORTED ON FLOOR OR ON A STOOL

INSTRUCTIONS: Please sit with arms folded for 2 minutes.

( ) 4 able to sit safely and securely for 2 minutes

( ) 3 able to sit 2 minutes under supervision

( ) 2 able to able to sit 30 seconds

( ) 1 able to sit 10 seconds

( ) 0 unable to sit without support 10 seconds

4. STANDING TO SITTING

INSTRUCTIONS: Please sit down.

( ) 4 sits safely with minimal use of hands

( ) 3 controls descent by using hands

( ) 2 uses back of legs against chair to control descent

( ) 1 sits independently but has uncontrolled descent

( ) 0 needs assist to sit

5. TRANSFERS

INSTRUCTIONS: Arrange chair(s) for pivot transfer. Ask subject to transfer one way toward a seat with armrests and one way toward a seat without armrests. You may use two chairs (one with and one without armrests) or a bed and a chair.

( ) 4 able to transfer safely with minor use of hands

( ) 3 able to transfer safely definite need of hands

( ) 2 able to transfer with verbal cuing and/or supervision

( ) 1 needs one person to assist

( ) 0 needs two people to assist or supervise to be safe

6. STANDING UNSUPPORTED WITH EYES CLOSED

INSTRUCTIONS: Please close your eyes and stand still for 10 seconds.

( ) 4 able to stand 10 seconds safely

( ) 3 able to stand 10 seconds with supervision

( ) 2 able to stand 3 seconds

( ) 1 unable to keep eyes closed 3 seconds but stays safely

( ) 0 needs help to keep from falling

7. STANDING UNSUPPORTED WITH FEET TOGETHER

INSTRUCTIONS: Place your feet together and stand without holding on.

( ) 4 able to place feet together independently and stand 1 minute safely

( ) 3 able to place feet together independently and stand 1 minute with supervision

( ) 2 able to place feet together independently but unable to hold for 30 seconds

( ) 1 needs help to attain position but able to stand 15 seconds feet together

( ) 0 needs help to attain position and unable to hold for 15 seconds

8. REACHING FORWARD WITH OUTSTRETCHED ARM WHILE STANDING

INSTRUCTIONS: Lift arm to 90 degrees. Stretch out your fingers and reach forward as far as you can. (Examiner places a ruler at the end of fingertips when arm is at 90 degrees. Fingers should not touch the ruler while reaching forward. The recorded measure is the distance forward that the fingers reach while the subject is in the most forward lean position. When possible, ask subject to use both arms when reaching to avoid rotation of the trunk.)

( ) 4 can reach forward confidently 25 cm (10 inches)

( ) 3 can reach forward 12 cm (5 inches)

( ) 2 can reach forward 5 cm (2 inches)

( ) 1 reaches forward but needs supervision

( ) 0 loses balance while trying/requires external support

9. PICK UP OBJECT FROM THE FLOOR FROM A STANDING POSITION

INSTRUCTIONS: Pick up the shoe/slipper, which is place in front of your feet.

( ) 4 able to pick up slipper safely and easily

( ) 3 able to pick up slipper but needs supervision

( ) 2 unable to pick up but reaches 2-5 cm(1-2 inches) from slipper and keeps balance independently

( ) 1 unable to pick up and needs supervision while trying

( ) 0 unable to try/needs assist to keep from losing balance or falling

10. TURNING TO LOOK BEHIND OVER LEFT AND RIGHT SHOULDERS WHILE STANDING

INSTRUCTIONS: Turn to look directly behind you over toward the left shoulder. Repeat to the right. Examiner may pick an object to look at directly behind the subject to encourage a better twist turn.

( ) 4 looks behind from both sides and weight shifts well

( ) 3 looks behind one side only other side shows less weight shift

( ) 2 turns sideways only but maintains balance

( ) 1 needs supervision when turning

( ) 0 needs assist to keep from losing balance or falling

11. TURN 360 DEGREES

INSTRUCTIONS: Turn completely around in a full circle. Pause. Then turn a full circle in the other direction.

( ) 4 able to turn 360 degrees safely in 4 seconds or less

( ) 3 able to turn 360 degrees safely one side only 4 seconds or less

( ) 2 able to turn 360 degrees safely but slowly

( ) 1 needs close supervision or verbal cuing

( ) 0 needs assistance while turning

12. PLACE ALTERNATE FOOT ON STEP OR STOOL WHILE STANDING UNSUPPORTED

INSTRUCTIONS: Place each foot alternately on the step/stool. Continue until each foot has touched the step/stool four times.

( ) 4 able to stand independently and safely and complete 8 steps in 20 seconds

( ) 3 able to stand independently and complete 8 steps in > 20 seconds

( ) 2 able to complete 4 steps without aid with supervision

( ) 1 able to complete > 2 steps needs minimal assist

( ) 0 needs assistance to keep from falling/ unable to try

13. STANDING UNSUPPORTED ONE FOOT IN FRONT

INSTRUCTIONS: (DEMONSTRATE TO SUBJECT) Place one foot directly in front of the other. If you feel that you cannot place your foot directly in front, try to step far enough ahead that the heel of your forward foot is ahead of the toes of the other foot. (To score 3 points, the length of the step should exceed the length of the other foot and the width of the stance should approximate the subject's normal stride width.)

( ) 4 able to place foot tandem independently and hold 30 seconds

( ) 3 able to place foot ahead independently and hold 30 seconds

( ) 2 able to take small step independently and hold 30 seconds

( ) 1 needs help to step but can hold 15 seconds

( ) 0 loses balance while stepping or standing

14. STANDING ON ONE LEG

INSTRUCTIONS: Stand on one leg as long as you can without holding on.

( ) 4 able to lift leg independently and hold > 10 seconds

( ) 3 able to lift leg independently and hold 5-10 seconds

( ) 2 able to lift leg independently and hold ≥ 3 seconds

( ) 1 tries to lift leg unable to hold 3 seconds but remains standing independently.

( ) 0 unable to try of needs assist to prevent fall

********** **ขอขอบคุณในความร่วมมือและตอบแบบสอบถามค่ะ**********

APPENDIX B

Picture















VITA

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Education:

2004 Bachelor of Nursing Science, Saint Louis College, Thailand

2007 Master of Science in Reproductive Health and Population planning, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Thailand

2013 Philosophy of Public Health, College of Public Health sciences, Chulalongkorn University, Thailand

Working Experiences:

October 2007 – May 2009: Nursing Lecture, Faculty of Nursing Science, Assumption University, Bangkok, Thailand

August 2011 – August 2013: Reproductive and Child Health (RCH) & Community Health Education (CHE) coordinator, American Refugee Committee, Based in Umphang, Tak, Thailand

August 2013 – November 2013Nurse, Emergency Response Unit, International Organization for Migration, Thailand (based in Mukdahan nd Ubon Ratchathani)

May 2009 – Present: Nursing Lecture, Faculty of Nursing Science, College of Asian Scholar, Khon Kean, Thailand