

**EFFECTS OF A SLEEP PROMOTION PROGRAM
ON SLEEP QUALITY IN OLDER ADULTS**




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Thesis
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EFFECTS OF A SLEEP PROMOTION PROGRAM ON SLEEP QUALITY IN OLDER ADULTS**SASIWIMON WANTHONG 4737727 NSMH/M****M.N.S. (MENTAL HEALTH AND PSYCHIATRIC NURSING)****THESIS ADVISORS: WANNA KONGSURIYANAVIN, Ed.D., ATIRAT WATTANAPAILIN, Ed.D, ATITTAYA PORNCHAIKATE, Ph.D.****ABSTRACT**

This study employed a randomized controlled trial research design to examine the effects of a sleep promotion program on sleep quality in older adults. The study was conducted among older adults living in Sanamchai Subdistrict, Muang District, Supanburi Province, Thailand. Sixty two subjects met inclusion criteria. They were randomly assigned into either an experimental group or a control group. Sleep quality was assessed before and after intervention by using The Pittsburgh Sleep Quality Index scale. The experimental group received a sleep promotion program consisting of sleep education and the qigong psychophysical exercise. The 12-session program was continuously delivered three times a week on Monday, Wednesday and Friday for 4 weeks from 15 March until 10 April, 2006. Participants in the control group performed their regular activities. Data were analyzed with percentage, chi-square and t-test. Comparison of the sleep quality was analyzed by using paired t-test and independent t-test.

The results indicated that the sleep quality of participants in the experimental group after receiving the sleep promotion program was better than before receiving the program ($t = 6.95, p < .05$). In addition after the intervention, the sleep quality of the experimental group was better than those of the control group ($t = 4.96, p < .05$). This study shows that a sleep promotion program can improve sleep quality in older adults. Therefore, this method might be useful for promoting sleep quality among other elderly.

**KEY WORDS : SLEEP PROMOTION/ SLEEP EDUCATION/ QIGONG PSYCHO-
PSYSSICAL EXERCISE/ SLEEP QUALITY/ OLDER ADULT**

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ผลของโปรแกรมส่งเสริมการนอนต่อคุณภาพการนอนหลับในผู้สูงอายุ
(EFFECTS OF A SLEEP PROMOTION PROGRAM ON SLEEP QUALITY IN
OLDER ADULTS)

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บทคัดย่อ

การศึกษานี้เป็นวิจัยเชิงทดลองแบบ randomized controlled trial เพื่อศึกษาผลของโปรแกรมส่งเสริมการนอนต่อคุณภาพการนอนหลับในผู้สูงอายุ กลุ่มตัวอย่างเป็นผู้สูงอายุที่อาศัยอยู่ในชุมชนตำบลสนามชัย อำเภอเมือง จังหวัดสุพรรณบุรี คัดเลือกกลุ่มตัวอย่างตามคุณสมบัติที่กำหนดจำนวน 62 คน แล้วจับสลากแบ่งเข้ากลุ่มทดลองและกลุ่มควบคุม กลุ่มละ 31 คน ประเมินคุณภาพการนอนหลับก่อนและหลังทดลอง กลุ่มทดลองได้เข้าร่วมโปรแกรมส่งเสริมการนอน โดยให้ความรู้ร่วมกับการบริหารกายจิตแบบซิงโครนัสอย่างต่อเนื่อง สัปดาห์ละ 3 ครั้ง ๆ ละ 60 นาที ในวันจันทร์ พุธ และศุกร์ เป็นระยะเวลา 4 สัปดาห์ รวม 12 ครั้ง ส่วนกลุ่มควบคุมดำเนินชีวิตประจำวันตามปกติ ดำเนินการทดลองระหว่างวันที่ 15 มีนาคม – 10 เมษายน พ.ศ. 2549 วิเคราะห์ข้อมูลโดยใช้สถิติร้อยละ chi-square และ t-test เปรียบเทียบคุณภาพการนอนหลับโดยใช้สถิติ paired t-test และ independent t-test

ผลการวิจัยพบว่า ภายหลังการทดลอง กลุ่มทดลองมีคุณภาพการนอนหลับดีกว่าก่อนการทดลอง อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 ($t = 6.95$) และกลุ่มทดลองมีคุณภาพการนอนหลับในระยะหลังการทดลองดีกว่ากลุ่มควบคุม อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 ($t = 4.96$) ผลการวิจัยแสดงให้เห็นว่า โปรแกรมส่งเสริมการนอนสามารถเพิ่มคุณภาพการนอนหลับในผู้สูงอายุได้ ควรนำไปเป็นกิจกรรมในการส่งเสริมการนอนให้กับผู้สูงอายุกลุ่มอื่นต่อไป

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CHAPTER I

INTRODUCTION

Background and Significance of the Study

Sleep is an important natural phenomenon that is essential for the maintenance of human's physical and mental health because it enables the body to relax and to repair the degenerated parts, to keep concentration and to control emotion. Older adults tend to have sleep problems or to be awoken from their sleep easier than people at other ages because of the increasing dysfunction of the central nervous system that controls the circadian rhythm, causing decreased amount of deep sleep. (Neil, 2005; Neu, McCrae, Cook and Lichsterin, 2005; Haesler, 2004; Montrogony and Dennis, 2004; Miller, 1999; Morgan and Closs, 1999; Miaskowski, 1998). This is consistent with a finding that sleep problems are mostly found in older adults (Rocha et al., 2002; Ramsiri, 2000; Office of the National Statistics, 1998; Sukying and Nilkowitz, 1997).

Sleep problems in the elderly derive from physical, psychological and environmental factors such as discomfort, frequent urination, stress, anxiety, sadness, loud noise, or light (Neil, 2005; Ramsiri, 2000; Miller, 1999; Morgan and Jose closs, 1999; Richads, 1996). The sleep problems have impacts on both physical and mental condition, causing tiredness, decreased immune, lack of concentration, lack of enthusiasm, decreased motivation, irritability, increased stress and depression (Neil, 2005; Thase, 2005; Miller, 1999; Morgan and Jose closs, 1999; Richads, 1996). Persons who suffer insomnia for longer than 48 hours will have inaccurate perception of time, places and persons. Severe insomnia may lead to psychiatric symptoms such as chronic insomnia, depression, or may be so serious to the extent of suicide ideation (Thase, 2005; Agargun, Kara and Solmaz, 1997).

Older adults with sleep difficulties may cope the problems with self-prescribed medication (Su, Huang and Chou, 2004; Rocha et al, 2002). However, long-term use

of sleep-induced medication will have adverse effects on the elderly. Even though the non-rapid eyes movement stage of sleep is increased thus the persons taking sleeping pills will fall asleep more easily, the rapid eyes movement phase will be decreased thus the person will awake frequently. Increased dose of medications and decreased sleep quality for a long term would affect thinking and memorizing thus increasing the risk of accidents. (Haesler, 2004; Backhaus, Hohagan, Voderholzer and Riemann, 2001). Therefore, Sleep promotion is important for the elderly. A number of studies show that at least two approaches should be combined for effective non-pharmacological sleep promotion in the elderly (Edinger and Means 2005; Heasler, 2004; Maryland, 1999; Richards, 1996). There are a number of non-pharmacological approach for sleep promotion such as sleep hygiene education, sleep restriction, stimulus control, cognitive therapy, relaxation techniques, listening to music and exercise (Nau et al, 2005; Montgomery and Dennis, 2004; Petit, Azad, Byszewski, Francine, Sarazan and Power, 2003; Morin, Mimeault and Gagne, 1999)

Sleep education is a way to decrease sleep problems and to reduce long-term use of sleeping pills (Bruno, Denis, Silvia, Vasiliki, Luciana and Luigi, 2005; Oosterhuis and Klip, 1997). However, some studies reported that only the distribution of brochure cannot solve sleep problems (Driver and Taylor, 2000; Guilleminault, Clerk, Black, Labanowski, Pelayo, and Claman, 1995). Therefore, other activities should be included for sleep promotion.

Exercise can enhance sleep quality (Li et al., 2004; Tanaka and Shirakawa, 2004; Chootueng, 2003; Tanaka et al, 2002; Tanaka, Taira et al, 2001; Resnick, 2000; King, Oman, Brassington, Bliwise and Haskell, 1997). It can also reduce stress, anxiety and depression and can relieve other symptoms (Donpaew, 2003; Raknui, 2002; Nitut, 2001; Driver and Tyler, 2000; Taweerat, 2000; Tang, 1994; Beng-Yeong, 1999; Ross et al., 1999; Dejkong, 1999; Piras, 1999). Regular exercise with low to medium intensity such as physical exercise, tai-chi, qigong, etc., is a practice of regular breathing, meditation, and body movement in every part thus it induces muscular and mental relaxation naturally (Dejkong, 2004; Driver and Tyler, 2000; King et al., 1997). Regular exercise will lead to muscular relaxation, vascular dilatation, improved blood circulation, and decreased heart rate and respiratory rate.

The endorphins will be increasingly released, leading to relaxation and decreases in stress and anxiety. Also, serotonin will be increasingly released thus the bulbar synchronizing region functions more whereas the reticular activating system functions less, making it easier to fall asleep (Li et al, 2004; Tanaka and Shirakawa, 2004; Driver and Taylor, 2000; Resnick, 2000; Beng-Yeong, 1999; King et al, 1997). Moreover, the aforementioned exercises do not cause physical impact and involve gentle movements. They are simple, economic and do not require any tool or device, thus suitable for the elderly in community.

The review of studies on sleep problems in the elderly found that the prevalence rate is fairly high and the problems have impacts on both physical and mental aspects. It is evident that non-pharmacological management for sleep promotion is essential. As a nurse, I have a significant role in health promotion and in being healthcare leader, which is an independent role. I am, therefore, interested in developing a sleep promotion program by providing sleep education in combination with the training of qigong psychophysical exercise in order to promote and encourage self-care practice among the elderly in community. The elderly who have good sleep quality will subsequently be healthy in both physical and mental condition.

Research Question

Can sleep promotion program improve sleep quality of older adults?

Objectives of the Study

To examine the effects of a sleep promotion program on sleep quality in older adults.

Research Framework

Sleep is a physiological process occurring from the reaction of biochemical system in the brain in combination with balanced functioning of various body systems, including decreased stimulation of five senses. Consequently, the sleep controlling areas in the brain changes in response: the reticular activating system (RAS) functions less and the bulbar synchronizing region (BSR) functions more thus increasing

serotonin release. These brain reactions, in addition to suitable environment such as darkness and silence, induce the relaxed condition and a person will finally fall asleep (Neil, 2005; Hilliker & Muehlbach, 2003; Miller, 1999; Richads, 1996). Insomnia in older adults may result from physical, mental and environmental factors such as stress, anxiety, light, sound, etc.

For this study, researcher developed a program consisting of sleep education and the qigong psychophysical exercise to promote sleep quality in older adults. The program was given continuously and regularly three times a week for four consecutive weeks. Sleep education, which was gradually provided, was concerned with the importance of sleep, sleep in the elderly, factors affecting sleep and sleep hygiene such as relaxation, diet and environment setting (Petit et al., 2003). The program was aimed to promote the knowledge about sleep hygiene and practice of regular breathing, concentration and body movement, which will lead to muscular relaxation, vascular dilatation, improved blood circulation, and decreased heart rate and respiratory rate. The endorphins will be increasingly released, leading to relaxation and decreases in stress and anxiety. Also, serotonin will be increasingly released thus the BSR functions more whereas the RAS functions less, making it easier to fall asleep (Li et al, 2004; Tanaka and Shirakawa, 2004; Driver and Taylor, 2000; Resnick, 2000; Beng-Yeong, 1999; King et al, 1997). This program could be applied to daily living; for instance, the elderly who used to have irregular bedtime would learn to have regular bedtime and waking time, and would reduce their coffee consumption. Moreover, they could continuously practice the qigong exercise at home (Petit et al., 2003).

Research Hypotheses

1. After the intervention, sleep quality in the experimental group better than sleep quality before the intervention.
2. After the intervention, sleep quality in the experimental group better than sleep quality in the control group.

Scope of the Study

This study examined the effects of a sleep promotion program on sleep quality in older adults living in community at Sanamchai Subdistrict, Muang District, Supanburi Province, Thailand, from 15 March to 10 April 2006.

Definition of Terms

Sleep quality refers to individuals' perception of adequacy, depth, and continuity of their sleep and satisfaction toward their sleep. It is an overall result of sleep assessment in two ways quantity and efficiency of sleep. Sleep quantity contents topic such as Sleep latency, number of awakening, Sleep duration. Sleep efficiency includes the following topic: the amount of deep sleep, feelings toward sleep and impacts on daytime functioning. Sleep quality was measured by an interview questionnaire for measuring sleep quality, which Jirapramukpitak and Tancaisawasd (1997) translated from the Pittsburgh Sleep Quality Index (PSQI) develop by Buysse and associates (1989).

Sleep promotion program refers activities of the programs with design by the researcher of the study for older adults. It was composed of sleep education and the training of qigong psychophysical exercise. The program was continuously delivered three times a week on Monday, Wednesday and Friday for four weeks, with total 12 sessions as follows:

- | | |
|-------------------------|--|
| 1 st Session | Orientation and Qigong psychophysical exercise. |
| 2 nd Session | Sleep in older adults and Qigong psychophysical exercise. |
| 3 rd Session | Sleep quality and Qigong psychophysical exercise. |
| 4 th Session | Factors related to sleep quality and Qigong psychophysical exercise. |
| 5 th Session | Sleep hygiene practice and Qigong psychophysical exercise. |
| 6 th Session | Exercise and sleep and Qigong psychophysical exercise. |
| 7 th Session | Relaxation to sleep and Qigong psychophysical exercise. |
| 8 th Session | Diet for sleep and Qigong psychophysical exercise. |
| 9 th Session | Environments for good sleep and Qigong psychophysical exercise. |

- 10th Session Sleep promotion (1) and Qigong psychophysical exercise.
- 11th Session Sleep promotion (2) and Qigong psychophysical exercise.
- 12th Session Evaluate the outcome of groups.

Expected Benefits of the Study

1. The program could be used as a model for sleep promotion in older adults.
2. For nursing practice and professional development, this study may provide guidelines for nursing practice that could be conducted independently for health promotion, healthcare leading and stimulating community to participate in self-healthcare.
3. For study and future research, this sleep promotion program may be applied to nursing study and may be used as a guideline for further study in other elderly.

CHAPTER II

LITERATURE REVIEW

Related literature and research papers were reviewed for the study of the effects of a sleep promotion program on sleep quality in older adults living in the community of Sanarmchai Subdistrict, Muang District, Suphanburi Province, Thailand, as presented in the following topics:

1. Sleep in the elderly
2. Sleep promotion for the elderly
3. Concept of qigong psychophysical exercise

1. Sleep in the elderly

1.1 Meaning and importance of sleep

Sleep is a human's natural phenomenon resulting from biochemical reactions of neurotransmitters in the brain in combination with integrative changes in the peripheral nervous system, endocrine system, cardiovascular system, respiratory system and musculoskeletal system (Miller, 1999). The brain areas that control sleep are the reticular activating system (RAS) in the upper part of the brain and the bulbar synchronizing region (BSR) in the pons and the medial forebrain. The stimulation and suppression of these areas have effects on sleep. Sleep occurs when the stimuli on the receptors of the five senses in the RAS decrease, leading to the dominant function of BSR. As a result, the brain releases serotonin, which induces the sense of relaxation. Darkness and silence, in addition to serotonin release, contribute to decreases in level of consciousness, decreased responses to stimuli, reduction of voluntary movement or no movement. (Poithiros, 1995). They feel relaxed and will eventually fall asleep (Neil, 2005; Hilliker & Muehlbach, 2003; Miller, 1999; Richads, 1996). Sleep is a basic need that is essential and very important for human living. It is found that human spend one thirds of their lifetime sleeping in order to maintain their physical, psychological and social well-being.

Sleep deprivation or insomnia has physical and psychological impacts. It causes tiredness, discomfort, decreased immune response, mood, irritability, lack of concentration, decreased motivation and depression (Neil, 2005; Thase, 2005; Moller, Barbera, Kayumov and Shapio, 2004; Hilliker and Muehlbach., 2003; Miller, 1999). Persons who have insomnia more than 48 hours will have misperception of time, place and persons. Severe insomnia may lead to psychiatric symptoms; for instance, chronic insomnia may cause depression and may be so severe to the extent of inducing suicidal idea (Thase, 2005; Agargun, Karaand and Solmaz, 1997).

1.2 Sleep physiology

Sleep physiology involves stages of sleep, sleep cycles and sleep requirement, as reviewed below.

1.2.1 Stages of sleep. Studies of human sleep from the record of physiological changes with the polysomnography have established stages of sleep in normal people, as reviewed below (Neil, 2005; Moller, et al, 2004; Miller, 1999; Bunchan, 1995).

1. Non-rapid eye movement (NREM) divided four stages:

NREM Stage 1, the stage of entering into sleep. It is a transition stage, from wakefulness to sleep, the autonomic nervous system functions less, e.g. decreasing respiratory rate and lowering blood pressure. A person is easily woken up in this stage. The duration of NREM stage 1 is usually longer than 2 – 3 minutes. In the elderly, this stage may increase to occupy 8 – 15 % of the total sleep time. Therefore, the elderly have frequent night-time awakenings and always feel like they could not sleep or still feel tired in the morning.

NREM Stage 2, the stage of deep sleep onset, which is also called sleep spindle. It takes about 10 – 20 minutes to reach this stage and the persons feel more relaxed and sleep more deeply. However, they may hear voices and may release sighs occasionally. There is not an eye movement and must be strongly stimulated to wake at this stage. The NREM stage 2 does not change at old age.

NREM stage 3, the stage of deep sleep. The body has decreased responses to external stimuli in this stage. A person usually enters this stage in 30 – 45

minutes after sleep onset. The shortest duration this stage is 15 – 30 minutes. It is more difficult to wake the persons up. Body muscles are all relaxed and the vital signs remain normal. This stage accounts for 10 – 20 % of the total sleep time.

NREM stage 4, the stage of the deepest sleep in total sleep time thus it is difficult to wake. Persons with sleep deprivation will be able to sleep longer in this stage. During the NREM stage 4, various body systems function less than usual and the vital signs are lower than the awakening period. It occurs at 40 minutes after the onset of NREM stage 1 and may take 15 – 30 minutes to complete. The NREM stage 4 accounts for 10 – 20 % of the total sleep time. A person may perform some behavior in this stage, e.g. sleep talking, sleep walking, or incontinent.

2. Rapid eye movement (REM). The REM stage of sleep occurs every 50 – 90 minutes. After sleep onset, human body changes in certain ways i.e. having rapid eye movement, fluctuation of respiratory rate and heart rate, rising or dropping blood pressure, loose muscle tones and increased release of peptic enzymes. Suppressed feelings are relieved in this stage and the persons may have dreams in association with facial expressions such as smiling or crying. Waking up a person in this stage is more difficult than in other stages. The REM stage enhances one's learning, thinking, memorizing and adjusting. In the elderly, the REM stage reduces to 20 – 25 % of the total sleep time. Deprivation of REM sleep have effects on one's emotion and driving force for performing basic activities (Miller, 1999).

1.2.2 Sleep cycles. Generally, there are 4 – 5 sleep cycles. Each cycle takes about 90 – 110 minutes. The first cycle has long NREM stage 3, 4 and short REM sleep; then NREM stage 3 and 4 will be shorter and REM sleep is progressively longer. Basic sleep cycle starts from wakefulness, entering NREM stage 1, 2, 3 and 4, returning to NREM stage 3, 2 and 1, entering REM sleep, and returning to NREM stage 2 but skipping the stage 1. The sleep cycle continually follows this pattern through the total sleep time, as summarized in figure 1.

In a complete sleep cycle, NREM stage 3 and 4 are short and REM stage is long, probably about 30 – 60 minutes. If the sleeping person is woken up in any stage of sleep, he or she will enter sleep by starting from NREM stage 1 again. The time of each stage of sleep varies, depending on the person's activities in that day and on the entering to NREM stage 1 and 2. A rapid onset of NREM stage 1 and 2 leads to early

start of subsequent stage 3 and 4. In the elderly, the time of this stage decreases to 15 – 20 % of the total sleep time.

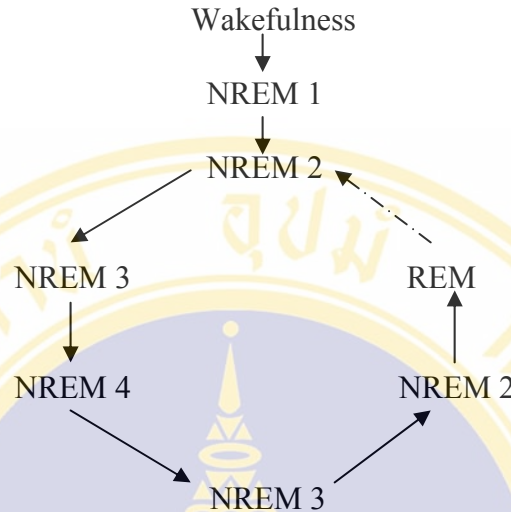


Figure 1. The Sleep Cycle) (Richards, 1996: 411)

1.2.3 Sleep requirement. It is found that sleep requirement varies in each individual and in persons with different ages. Neonates require 20 hours for the total sleep time and the requirement gradually decreases to 10 – 12 hours per night at the age of four. Children at 10 years of age require 9 – 10 hours sleep and adolescents require 8.5 hours. At the age of 25 – 45 years old, a person needs to sleep 7.5 hours per night and the old age requirement decreases to 6.5 hours. (Miller, 1999). When the body is deprived of sleep, it will seek compensation by having more sleep in the following day. Generally, daily sleep requirement decreases as one ages. The appropriate sleep time is the total sleep time that one awakes with refreshed feeling and alertness, and their work effectively during the daytime (Ramsiri, 2000).

1.3 Sleep assessment

Sleep quality can be assessed in two ways: objective sleep measurement and subjective sleep report.

1.3.1 Objective sleep measurement

1. Polysomnography (PSG)

Polysomnography is a scientific instrument for measuring sleep in laboratories. It can record sleep circle continuously according to biological

characteristics of sleep and wakefulness, of which the result will be shown on the electroencephalogram (EEG). This is used for quantitative assessment such as duration of wakefulness or duration of actual sleep. It is used with various groups of patients with sleep disorders. However, PSG cannot assess a person's perception of sleep, feeling after awakening, and satisfaction with sleep. Moreover, the cost of measurement is fairly high. The operation of this device is complicated and a specialist is needed for the interpretation of results.

The study conducted by Fontaine (Fontaine, 1989 cited in Subongkosh, 2003: 27) has shown the subjective sleep measurements and the questionnaire gained more reliability and validity than polysomnography. Thus subjective sleep report is widely accepted and it can assess sleep quality appropriately.

2. Body movement measurement

- Night cap is a small sleep measurement device using body movements to identify wakefulness, REM sleep and NREM sleep. This device can measure actual sleep but it cannot identify different stages of NREM.

- Wrist actigraphy is a small electronic device that could be worn around the wrist. It can measure duration of sleep and of complete wakefulness (Schwab, 1994). Wrist actigraphy is found to be well associated with the PSG but is not much associated with wakefulness (Sadeh, 1995).

1.3.2 Subjective sleep report

Subjective sleep report assesses sleep from the perception and feeling toward sleep of each individual. It can obtain both qualitative and quantitative data and is mostly used due to its simplicity and low cost. Moreover, sleep assessment with this tool does not much disturb the subjects. A number of studies show that sleep assessment with self-report tools yield similar results to the EEG from the PSG in adult patients (Beck, 1992; Closs, 1988). Subjective sleep report is also found to have validity and reliability in the studies of most sleep variables in various populations. Subjective sleep report is available in many forms, as reviewed below.

- 1. Sleep Diary or sleep log**, a self-report sleep record that the subject fills data in every morning. Data recorded in this report comprise bedtime, time of sleep onset, night-time awakenings, number of awakenings, including stress and emotion, feelings after morning awakening, daytime nap, alcoholic drink, and use of

sleep medications (National Center on Sleep Disorder Research, National Heart Lung and Blood Institutes of Health, 1999; Beck, 1992). This tool is widely used in clinical practice and research. It is found to be associated with the PSG regarding quantitative measurement and is well accepted for its reliability (Roger, Caruso and Aldich, 1993).

2. Verran Snyder Halpern Sleep Scale, an instrument designed for hospitalized adult patients. This instrument is composed of 8 question items with responses given in a form of visual analog scale (VAS), which is a 100 mm straight line. The respondents report their sleep by making a mark on a spot on the VAS that reflects their feelings in response to each statement. The possible scores range from 0 – 800 and high scores reflect good sleep quality. This instrument can assess sleep disturbances and sleep efficiency (Snyder Halpern and Verran, 1987).

3. St. Mary's Hospital Sleep Questionnaire, designed for hospitalized adult patients. The questionnaire is composed of 14 questions, brief, and multiple answers. This questionnaire can obtain information for the diagnosis of all types of insomnia (Ellis et al, 1981). The trials of this questionnaire show that it can clearly measure sleep disturbances, sleep latency, sleep time, satisfaction with sleep and sleep quality (Richardson, 1977). The subjects provide similar information even at different time of assessment thus the result is consistent at anytime of the day. This questionnaire is reliable in comparison with the EEG from PSG. Thus it is widely accepted and has been used in a large number of studies (Ellis et al., 1981). However, the questionnaire has shortcomings in its length. It is also difficult to read and to mark the answer. There are difficult to interpret the results and to classify the obtained information (Richardson, 1977).

4. Pittsburgh Sleep Quality Index (PSQI), developed by Bussy and associates (1989) to assess sleep quality in healthy population in the past month. The PSQI is composed of 9 question items divided into 7 components, sleep quality, sleep latency, sleep duration, habitual sleep effectiveness, sleep disturbances, use of sleep medication and impacts on day time dysfunction. The scores are categorized into good sleep quality and poor sleep quality. The trial with 52 healthy subjects for 18 months found that the PSQI has high reliability value with the Cronbach's alpha coefficient 0.83 (Montgomery and Dennis, 2004; The Joanna Briggs Institute, 2004; Buysse et al., 1989). A study with 80 patients with sleep disorders shows that the PSQI is well valid

and the test-retest reliability was 0.87 (Riemann and Hohagen, 2002). In Thailand, Chirapramukpithak and Tanchaisawasdi (1997) translated the PSQI and developed it for using with Thai people. The translated questionnaire was tried out with 30 staff nurses at Songkhlanagarindra Hospital and the subsequent Cronbach's alpha coefficient was 0.82. Ramsiri (2002) used this instrument in a study with 20 elderly people in Loei Province and found that the Cronbach's alpha coefficient was 0.83. The review of research on sleep promotion in the elderly reveals that this assessment tool is appropriate for the elderly because the questionnaire contains small number of brief and simple questions and it can assess sleep quality appropriately (Montgomery and Dennis, 2004).

1.4 Sleep Quality in the elderly

Sleep quality in the elderly depends on sleep patterns and several factors.

1.4.1. Sleep patterns. The elderly have two major stages of sleep, like general people, but there are different changes in each stage, as reviewed below.

1. Non-rapid eye movement (NREM). The duration of NREM stage 1 is longer thus it is more difficult to fall asleep. In NREM stage 2, the duration is also longer thus the elderly tend to wake up easily. The brainwaves in this stage still show sleep spindles. The duration of NREM stage 3 in the elderly may decrease or may not change at all. The elderly women tend to be in this stage longer than elderly men. And, the duration of NREM stage 4 is notably shorter (Khahawong, 1995). A quarter of the elderly have 50 % decrease in this stage of sleep or may not have this stage at all (Morgan and Closs, 1999).

2. Rapid eye movement (NREM), the decrease in time of the REM stage of sleep until a person is at very old age. However, the shortening duration of NREM sleep leads to early onset of REM and the duration of this stage decreases to 20 – 25 % of total sleep time (Ramsiri, 2000).

Insomnia and sleep disturbances are common problems in the elderly. Almost 50 % of people aged 65 years or older have insomnia (Ring, 2001). This is consistent with a study conducted by Kumtaweeporn and associates (1995) who found that among 126 elderly people, 31.1 % of them reported fitful sleep and frequent nocturnal awakenings, 23 % reported inadequate sleep due to early morning

awakenings, and 12.7 % felt sleepy all day. Ramsiri (2000) investigated 336 elderly people in Loei Province and found that 55.65 of the sample had poor sleep quality. A foreign study reported that among 1,516 elderly people in Brazil, 38.9 % reported having sleep problems (Rocha et al., 2002). Another study in Taiwan found that among 2,045 elderly people living in Taipei, 6 % reported having insomnia for one month, 17.7 % had perpetual insomnia and 80 % started having insomnia (Su et al., 2004). Sleep disorders associated with aging process are due to changes in the central nervous system that controls sleep (Haesler, 2004; Miller, 1999; Miaskowski, 1998). Such changes affect circadian rhythm, temperature rhythm and the releases of cortisone and growth hormone. In addition, the changes may also reduce the release of melatonin, which is a sleep promoting hormone from pineal gland and is associated with circadian rhythm and good environment. (Zanocchi et al, 1999). which goes through the retina to the hypothalamic suprachiasmatic nuclei (SCN). Retinal impairments from aging result in changes of melatonin release. Moreover, there is a decrease in level of serotonin, which is a neurotransmitter that enables a person to enter sleep easily and continuously (Neil, 2005).

As the aforementioned changes, the elderly have shorter sleep time and cannot maintain continuous sleep. They experience difficulties in falling asleep, have fragmented sleep, are easily woken up when disturbed and have early morning awakenings. These problems contribute to sleepiness and increased needs for daytime napping (Miller, 1999; Morgan and Jose closs, 1999; Richads, 1996). The sleep requirement of the elderly does not change from the requirement in adult age, which is about 6 – 8½ hours per day. But, the elderly have shorter duration of nocturnal sleep and longer duration of daytime sleep. With sleep disorders, the elderly are more likely to use sleep medications. It is found that 25.1 % of 1,516 elderly people in Brazil used hypnotic drugs (Rocha et al, 2002) and 43 % of 88 elderly people in Taiwan bought hypnotic drugs for self-treatment (Su et al, 2004).

1.4.2. Factors related to sleep quality in the elderly

Sleep quality of the elderly depends on several factors. The factors are classified into intrinsic and extrinsic factors, as detailed below.

1. Intrinsic factors. The following intrinsic factors have effects on sleep quality in the elderly:

- **Gender.** Sleep efficiency and duration of REM sleep in women are much decreased after 49 years of age. Nevertheless, women still have longer duration of sleep and more amounts of sleep than men until old age. Elderly women tend to have insomnia and sleep disturbances more than elderly men (Li et al., 2002, Chiu et al., 1999). The elderly women have longer period of sleep latency, more fragmented sleep, longer awakenings, and slightly longer total bed time more than elderly men. However, the total nocturnal sleep time of men and women do not differ. Elderly women have more deep sleep whereas elderly men have more light sleep.

- **Age.** Sleep problems increase with ages due to physiological changes from the aging process that affect the circadian rhythm (Haesler, 2004; Miller, 1999; Miaskowski, 1998). The changes in sleep patterns include increased amount of NREM stage 1, decreased amount of NREM stage 3 - 4 and REM, causing more sleep disturbances (Chieu et al., 1999). A study on sleep by Raimer (2000) has shown that people at later old age, i.e. those who are older than 75 years, have longer period of sleep latency than people at early old age.

2. Extrinsic factors. Extrinsic factors could be classified into three domains, as follows:

2.1. Physical factors

- **Physical illness.** Elderly people usually have physical impairments from aging and other chronic illness, leading to poor sleep quality. According to a study conducted by Foley and associates (2004), 40 % of the elderly with sleep disorders in the U.SA also had other chronic illness such as hypertension, joint diseases, heart disease and diabetes mellitus. A study conducted by Zancocchi and associates (1999) has shown that nocturnal urination is the most common cause of sleep disturbance in the elderly (51.4%). In addition, perceived poor health condition and coexistence of physical illnesses or chronic illnesses are also associated with insomnia in the elderly (Foley et al., 2004; Chiu et al., 1999).

- **Behavior-related sleep quality** that co-exist with insomnia in the elderly, including periodic leg movement and restless leg syndrome, have effects on sleep quality. Periodic leg movement cause insomnia and day time sleepiness. Restless leg syndrome causes difficulties falling asleep. The disorders in REM sleep and sleep

apnea syndrome are usually present with loud snoring and severe day time sleepiness, leading to poor sleep quality (Beullens, 1999).

- **Pain.** Pain is one of the most common factors disturbing sleep in the elderly. (Laempetch, 2001; Ramsiri, 2000; Zanocchi et al., 1999; Pothiros, 1995). The elderly usually suffer pain from chronic illness such as gout arthritis or knee osteoporosis, which induces discomfort. If the pain is very severe, the sleep pattern will be affected.

- **Physical discomfort** as it causes difficulties falling asleep and fragmented sleep (Chiu et al., 2002). The causes include sleeping postures, cough, itchiness, void, difficult breathing. (Laempetch, 2001). Zanocchi and associates (1999) found cough is a cause of sleep disturbances in 38.6 % of the elderly.

- **Medications.** Some prescribed medications affect sleep and circadian rhythm. Hypnotic drugs and sedative drugs, including antidepressant and antihypertensive drugs, reduce REM stage of sleep. Benzodiazepine hypnotic drugs inhibit the proceeding to NREM stage 2 and 3 and REM stage. Even though the drugs in this group can induce deep sleep, sudden withdrawal will cause difficulties in having REM sleep and it may cause nightmares, insomnia and tiredness (Miaskowski, 1998). Long-term effects of benzodiazepines include cognitive and memory impairments and increased risk of accidents (Haesler, 2004; Backhaus et al, 2001).

- **Foods and drinks.**

Decreased food intake and lack of appetite affect sleep patterns as they may cause light sleep and occasional nocturnal awakenings. Consumption of heavy meal or spicy foods before bedtime may cause stomach discomfort, resulting in difficulties falling asleep. (Morgan and Jose Closs, 1999).

Tea, coffee, soft drinks have caffeine stimulant effect thus stimulating nervous system function, causing delayed sleep onset and decreased sleep time. (Miaskowski, 1998). It is found that 5.4 % of the elderly taking caffeine- had insomnia, 20.7 % reported difficulties falling asleep after having the medications for 2 weeks and 12.9 % reported constant difficulties falling asleep (Brown et al., 1995).

Alcoholic drinks may help accelerating sleep onset but the REM stage of sleep will be disturbed, causing interrupted sleep. Alcohol may also cause sleep

apnea (Miller, 1999). A study has shown that 13 % of the elderly drink alcohol to manage sleep problems (Sproul et al, 1999).

Cigarettes had nicotine stimulates the sympathetic nervous system, causing increased release of catecholamine. Consequently, heart rate and blood pressure increase, leading to difficulties falling asleep, frequent awakenings, decreased amount of sleep and, finally, poor sleep quality (Morgan and Jose Closs, 1999).

- **Exercise.** The elderly who have inadequate exercise tend to have sleep problems more than those who have regular exercise. Moreover, exercise helps the elderly falling asleep more easily and having better sleep quality. (Li et al., 2004; Tanaka and Shirakawa, 2004; Tonhuathoy, 2003; Tanaka et al, 2002; Tanaka et al, 2001; Driver and Tayler, 2000; Resnick, 2000; King et al., 1997; Bazargan, 1996). Evening exercise or exercise at three hours before bed time stimulates the autonomic nervous system to increasingly function during sleep latency. However, vigorous or prolonged exercise causes excessive tiredness and may result in difficulties falling asleep (Miaskowshi, 1998).

2.2. Psychological factors

- **Stress.** Stress is a non-specific body response to disturbing events. In response to stress, the body releases corticosteroids and adrenaline, which stimulate the parasympathetic nervous system. As a result, the affected persons will have difficulties falling asleep and have frequent awakenings. They may have inadequate sleep or excessive and demonstrate decreases in perceived sleep quality (Neil, 2005). This is consistent with a study conducted by Chirapramukpithak and Tanchaisawasdi (1997), who found that stress is a factor related to a person's sleep quality and it is the most common cause of sleep disturbance. It is found that people with difficulties falling asleep tend to have daily stress or experience stressful life event and perceive they unable to cope with stress and expected events more than people who can sleep well (Chiu et al., 1999).

- **Anxiety.** Anxiety occurs when people feel threatened or insecure and do not know what will happen to them. They respond to the threat with physical and psychological reactions. Anxiety stimulates the RAS, leading to difficulties falling asleep. The body is alert from stimuli on the sympathetic nervous system, causing

increased release of adrenalin and corticosteroids. Consequently, respiratory rate, blood pressure and muscular tension increase and these changes lead to restlessness and insomnia (Miller, 1999; Miaskowski, 1998). A study of physiological changes and brainwaves in people with insomnia has shown that psychological problems induce high level of cortisone thus disturbing sleep. Moreover, the delta waves function more than the alpha waves in the NREM stage 1 of sleep thus it is difficult to enter the NREM stage 2 (Neil, 2005). It is found that the elderly who have anxiety and depression have difficulties falling asleep and fragmented sleep with frequent nocturnal awakenings, inability to resume sleep and early morning awakenings. They also have decreased amount of deep sleep and poor sleep quality (Miller, 1999; Morgan and Jose closs, 1999; Zanocchi et al., 1999; Richards, 1996). Studies have shown that anxiety is the psychological factor that disturbs sleep in elderly people mostly (Ramsiri, 2000; Khumtaweepon and Panittarat, 1995). It is also related to satisfaction with sleep (Anusasananan, 1993). People with anxiety have insomnia and insomnia leads to increased anxiety (Boonchan, 1995).

- **Depression.** Depression is an emotional response to loss, disappointment, or failure. It is a significant symptom that causes lack of self-interest and enthusiasm, including decreased sense of self-worth. Prolonged or severe depression may lead to depressive neurotic disorder. Depression is found associated with sleep disturbance and insomnia in the elderly (Chiu et al., 1999). It causes difficulties falling asleep. (Zanocchi et al., 1999), fragmented sleep and decreased sleep quality. The incidence of depression in the elderly is high due to the loss of physical capacity for daily activities, loss of career and social status, and loss of spouse or significant others. These problems contribute to sleep disorder (Boonchan, 1995). Depression is highly associated with insomnia and it is found in 8.9 % of the elderly with insomnia (Su, Huang and Chou, 2004).

2.3. Environmental factors

- **Noise.** General people can sleep well at the noise level lower than 35 decibels and will feel discomfort with the noise level is higher than 80 decibels (Phipps, Sands and Marck, 1999). Awakening from noise disturbance is dependent on the stage of sleep. The NREM stage 1 is the stage of light sleep thus a person can be awake from noise disturbance more easily in this stage than in the NREM stage 3 and

4, which are the stages of deep sleep. Noise is the factor that disturbs sleep in the elderly mostly (Ramsiri, 2000). It has negative relation to satisfaction with sleep (Unnapirak and Khumtaweepon, 1995; Anusasnanan, 1993). It causes frequent awakenings in the elderly (Khumtaweepon et al., 1995). This is because the elderly are prone to light sleep (Miaskowshi, 1998).

- **Light.** Bright light can affect circadian rhythm and sleep cycles. Darkness stimulates the release of melatonin, which regulates normal function of circadian rhythm and induces sleep. The light intensity higher than 2,000 Lux inhibits the release of melatonin. Light is a sensory stimulus thus it can cause insomnia. This is consistent with a study conducted by Unnapirak and Khumtaweepon (1997), which shows that light, has negative correlation with sleep quality of elderly patients in hospitals.

- **Temperature.** Too high or too low temperature affects sleep because circadian rhythm is associated with temperature. A slight change in temperature may disturb sleep cycles (Morgan and Jose Closs, 1999). An increase temperature during sleep causes rising body temperature, leading to decreased amounts of sleep in the NREM stage 3 and the REM stage, resulting in early awakening.

Other environmental factors, such as bedroom condition, roommate, unpleasant smell, and insects, can also disturb sleep and affect sleep quality.

In summary, sleep quality depends on health condition of the elderly and environmental factors. Poor sleep quality has effects on both physical and mental health thus sleep promotion for the elderly is essential.

2. Sleep Promotion for the Elderly

There are several sleep promotion techniques for the elderly, either with pharmacological or non-pharmacological management, as reviewed below.

2.1 Pharmacological management

The use of hypnotic drugs is a short-term sleep promotion and these drugs are mostly used with people with sleep disorder (Petit et al., 2003; Miller, 1999). Nowadays, hypnotic drugs are widely used for the management of sleep problems in the elderly (Bootzin and Oerlis, 1992). A study of the efficacy of antidepressants, benzodiazepines and neuroleptics in 176 patients with severe incontinence found no

difference in the relations of the medications, sleep quality and nocturnal movements in bed between the patients who received medications and those who did not receive medication either in night time or daytime (Alessi, Schenell, Traub and Ouslander, 1995). It is also found that increased use of psychoactive medications does not reduce sleep problems (Haesler, 2004; Miller, 1999). Long-term use of hypnotic drugs may have adverse effects, as the body has more tolerance to the drugs. Moreover, hypnotic drugs disturb the REM stage of sleep and long-term effects of hypnotic drugs cause cognitive and memory impairments and increased risk of accident (Haesler, 2004; Backhaus et al, 2001).

2.2 Non-pharmacological management

2.2.1 Sleep hygiene education

Health education is the provision of knowledge, encouragement and support to promote one's knowledge and understanding about certain subject, including appropriate self practice, so that the person will have basic knowledge to use as guidelines for the modification to appropriate lifestyle. To provide education for the elderly, the educators need to understand the nature of the elderly. The sleep hygiene education may be given individually or in groups.

The elderly may receive the sleep hygiene education, as listed below (Petit et al., 2003):

1. Avoid the use of all products containing caffeine, nicotine and alcohol in the evening and before bedtime.
2. Avoid heavy meals within two hours before bedtime.
3. Avoid drinking large amount of water after dinner to prevent night-time urination.
4. Avoid environments that will disturb evening rest (from 5.00 p.m. onward) such as noisy environments; and avoid noise that disturbs sleep to the extent of awakening as it will cause interrupted sleep.
5. Use the bed for sleep only. Avoid watching television and do not use the bedroom as the study or living room. If not being able to sleep, get up to do light activities such as reading or listening to music in another room and return to bed only when you are sleepy.

6. Relax before bedtime to help falling asleep more easily e.g. reading or meditating, including using relaxation techniques such as breathing exercise or progressive muscle relaxation.

7. Create an atmosphere to induce sleep e.g. clean bed sheets and pillows, good ventilation, no noise or bright light and comfortable temperature.

8. Control possible stress or cumulative stress by avoiding conversations that induce stress or anxiety before bedtime.

9. Get up and go to bed at the same time every day; irregular bedtime may cause insomnia.

10. Avoid taking daytime naps. However, those who feel tired and sleepy may take a short nap for 10 – 20 minutes as a refresher. Nevertheless, the total time of napping should not exceed one hour and the nap should be taken before 3.00 p.m. because napping later in the day may cause insomnia at night.

11. Maintain regular physical activity such as walking or gardening and have light exercise in the afternoon or in the evening, self-massaging, saying a prayer to help falling asleep.

12. Avoid vigorous exercise after 6.00 p.m. or within three hours of bedtime as it is found to increase the autonomic nervous system function during sleep latency thus possibly causing difficulties falling asleep. However, it has no effects on the NREM stage 3 and 4.

A study on the effects of sleep hygiene education via radio and television found that the education can reduce amounts of sleep latency and increase total sleep time at night. It could also modify sleep behavior and reduce the use of hypnotic drugs in persons using sleep medications (Oosterhuis and Klip, 1997). It is also found that the provision of short-course sleep hygiene education to people with non-organic insomnia for two weeks could manage sleep problems in a long term, as it increases total night-time sleep, improves sleep efficiency, and decreases sleep disturbances (Bruno et al., 2005). Sleep hygiene education is commonly used in sleep promotion with non-pharmacological management, as it can reduce sleep problems, leading to decreased use of hypnotic drugs in a long term (Bruno, Denis, et al., 2005; Oosterhuis and Klip, 1997). Explanations about varied sleep requirements in each

individual so that the elderly can understand and apply various techniques to use in their daily lives appropriately (Miller 1999).

2.2.2 Stimulus control

Stimulus control helps the elderly to maintain regular wake-sleep pattern and it reduces the factors that disturb sleep. The instructions to be followed in stimulus control are listed below (Petit et al., 2003).

1. Go to bed only when you are sleepy.
2. Use the bed for sleep only; do not read, watch television or eat.
3. Leave the bedroom if you do not fall asleep after 10 minutes and return to bed only when you feel sleepy again.
4. Avoid daytime napping.
5. Get up at the same time every morning regardless of how much sleep you have during the night; this is to set regular sleep rhythm for the body.
6. Repeat the action in step 1-5 everyday until you feel that entering the bedroom makes you feel sleepy.

Palleson and associates (2003) found that stimulus control is very effective in helping the elderly with frequent awakenings to maintain all-night sleep. Alessi and associates (2005) conducted a study in a nursing home for the elderly with a program consisting of reducing daytime napping, daily 30-minute exposure to light, increasing exercise, modifying sleep pattern and reducing disturbing factors – both light and sound. They found that the intervention can reduce nocturnal awakenings and daytime napping. Stimulus control is mostly used in institutions or organizations where subjects' behavior could be controlled, e.g. nursing homes for the elderly or hospitals.

2.2.3 Sleep restriction.

The purposes of sleep restriction are to limit the time spent in bed by extending actual sleep time and to increase sleep efficiency. The instructions for sleep restriction are the following (Petit et al., 2003):

1. Estimate total sleep time. The data for estimation could be obtained from the record in a sleep diary for at least two weeks.
2. Restrict the time in bed to the average estimated time.
3. Determine weekly sleep efficiency (Total sleep/time in bed X 100)

every week, using the data in sleep diary.

4. Maintain sleep efficiency within the range of 80 – 90 %.
5. Get up at the same time every morning regardless of the amount of previous night sleep; this is to set regular circadian rhythm for the body.
6. Do not reduce time in bed to below five hours.
7. Reduce daytime napping.

Sleep restriction is more appropriate for hospitalized elderly patients or those who are 24-hour (Morin et al., 1999).

2.2.4 Bright light therapy.

An appropriate period of exposure to bright light for 2 – 3 days can alter the circadian rhythm. The intensity of light in bedroom is generally about 500 Lux (lumen/ m²). The light brighter than 2,000 Lux inhibits the release of melatonin, which regulates circadian function and induces sleep. Sleep depends on the time of light exposure. The exposure in the morning advances the circadian clock whereas the exposure in the evening delays the circadian clock. Bright light therapy is beneficial for the treatment of persons with circadian rhythm sleep disorder. It helps people working night shift having good sleep in daytime (Bootzin and Oerlis, 1992). Environmental noises can be reduced by avoiding disturbing sound, using ear plugs or using headphones, and reduced level of noise from alarms.

A study has shown that sleep hygiene education, bright light control and environmental noise control in combination with 2 minute exercise before bedtime could improve sleep quality in the elderly living in nursing homes (Schnelle et al., 1998). Moreover, the reduction of disturbing light and sound can also reduce the use of hypnotic drugs in the elderly (Montgomery and Dennis, 2005a).

2.2.5 Cognitive therapy

Cognitive therapy emphasizes the modification of dysfunctional attitude and beliefs to change one's perception toward insomnia and replace it with the belief that the problem could be managed. It is recommended as a therapy in combination with other sleep promotion techniques (Morin, Blais and Savard, 2002).

2.2.6 Cognitive behavior therapy

Cognitive behavior therapy is the development of one's cognitive and behavior skills for more effective modification from undesired behavior (Eamsuparsit,

2000). Several researchers use cognitive behavior therapy for sleep promotion in combination with other sleep promotion techniques.

Mimeault and Morin (1999) investigated the effects of sleep promotion program, sleep hygiene education, stimulus control, cognitive therapy and bibliotherapy, and found that these approaches could reduce rate of insomnia from 35 to 26 %. Moreover, they also found improvements in sleep efficiency, nocturnal sleep time and awakening time among subjects in the experimental group. Espire and associates (2001) studied the utilization of sleep hygiene education, sleep plan, cognitive therapy and relaxation technique in adults with sleep disorders and they found that the interventions could change sleep pattern and sleep quality and could significantly reduce anxiety ($P < .05$). Morin (2002) and Eding and Sampson (2003) conducted studies in the elderly who had sleep disorders with the intervention similar to that of Mimeault and Morin (1999) with an exception of bibliotherapy and found increased sleep efficiency. According to Montgomery and Dennis (2005b), cognitive behavior therapy is an effective technique for promoting sleep in the elderly.

2.2.7 Relaxation therapy

There are many relaxation techniques e.g. progressive muscle relaxation, imagery training, deep breathing and meditation (Bootzin and Oerlis, 1992). Relaxation helps reducing stress and anxiety, thus inducing sleep because the limbic system decrease stimulus arousal on the brain, leading to increased release of serotonin. As a result, a stimulus on reticular formation is inhibited and the person can fall asleep easily.

Johnson (1999) studied the effects of progressive muscle relaxation on sleep in the elderly by assessing their sleep for eight consecutive days. The study was conducted in a laboratory on the night of day 1 – 3 and of day 6 – 8 and the subjects practice muscle relaxation at home on the night of day 4 – 5. After the training, the results showed increases in total sleep time, decreases in awakening stimuli, increased satisfaction with sleep and refreshed feeling in the morning. The record with the PSG showed that body muscles progressively relaxed over the period of training, and the subjects had decreased nocturnal awakenings and increased amount of sleep in the NREM stage 3 and 4. Rosen and associates (2000) studied the effects of relaxation therapy on sleep quality and found that can increase sleep time and sleep efficiency.

2.2.8 Music therapy

Music therapy is a kind of relaxation therapy. Slow music with gentle and smooth rhythm playing at low or medium volume can induce relaxation and relieve stress, leading to peacefulness, decreased pulse rate and improved sleep. This is because the relaxation feeling inhibits reticular activating system function and the bulbar synchronizing region function becomes dominant. As a result, the sympathetic nervous function will be decreased and the neurotransmissions to the nervous system reduce thus decreasing level of catecholamine, leading to reduction of stress. In addition, endorphins and serotonin, which are neurotransmitters inducing sleep, will be released, resulting in relaxation feeling and the person will fall asleep more easily.

Mornhinweg and Voignier (1995) studied music therapy in the elderly in community and found that the elderly who received music therapy had improved sleep and had rapid sleep onset. Moreover, they could resume sleep quickly when waking up at night and could maintain sleep to the morning. It is found that the utilization of music therapy at 45 minutes before bedtime in combination with progressive muscle relaxation for three weeks can improve sleep quality (Li and Good, 2005). This finding agrees with studies conducted by Johnson (2003) and Choothueng, W. (2004), which show that music therapy could help shortening sleep onset latency and reducing nocturnal awakenings in the elderly, as well as increasing their satisfaction with sleep.

2.2.9 Exercise

Regular exercise helps improving night-time sleep as it induces deeper sleep and increases total sleep time. Light exercise in the afternoon or in the evening is recommended within 4 – 6 hours after exercise thus improving sleep. However, vigorous exercise after 6.00 p.m. or within three hours of bedtime should be avoided. It is found that evening exercise or bedtime exercise increases stimulation on the autonomic nervous system during sleep latency thus it may cause difficulties falling asleep. Nevertheless, evening exercise does not have effects on the NREM stage 3 and 4 of sleep.

A study conducted by Kosol, (1995) has shown positive correlation between exercise and sleep quality, as persons with regular exercise tend to have better sleep than those who do not exercise. Namazi and associates (1995) investigated the

effects of exercise in elderly people with brain impairments by giving the elderly a 40-minute exercise program for 4 weeks. They found that the experimental group demonstrated improved sleep than the control group. King and associates (1997) studied the effects of aerobic exercise at moderate level of intensity 30 – 40 minutes for 16 weeks on sleep in the elderly. They found that the experiment group demonstrated improvements in sleep quality sleep efficiency, sleep onset latency and total sleep time more than the control group. Another study conducted by Tanaka and associates (2001) investigated the effects of 4-week program comprising 30-minute daily daytime napping in combination with 30-minute evening physical exercise and the results shows decreases in nocturnal awakenings and evening napping, improved sleep efficiency and increased scores of mental health after the intervention. In the following year, Tanaka and associates (2002) conducted a study in the elderly with the same intervention and the findings show increased sleep efficiency, decreased evening napping and improved mental health. Tinhuathoy (2003) investigated the effects of qigong exercise in the elderly by organizing an exercise program consisting of qigong exercise three times a week for 6 consecutive weeks. She found that the sample had increased total sleep time in week 3 – 6 and sleep efficiency increased to the higher level than the efficiency in the 1-2 weeks of the program. These findings are consistent with a study conducted by Li and associates (2004), who investigated the effects of tai chi three times a week and found improvements in sleep quality, sleep onset latency, total sleep time at night, and sleep efficiency, including decreases in sleep disturbances.

Exercise is an effective sleep promotion technique and is appropriate for the elderly in community (Montgomery and Dennis, 2005c; King et al, 1997). Moderate intensity exercises include brisk walking, jogging, stationary running or physical exercise, etc. It is found that four weeks practice of 30 minute evening exercise at least three times a week can improve sleep efficiency, decrease evening naps, mental health, leading to improved sleep quality (Li et al, 2004; Tinhuathoy, 2003; Tanaka et al, 2002; Tanaka et al, 2001). A number of studies have shown that psychophysical exercise such as tai chi or qigong can reduce stress, anxiety and depression, which major factors are contributing to insomnia in the elderly (Li et al., 2004; Driver and Taylor, 2000; Beng-Yeong, 1999).

There are several sleep promotion techniques. The techniques are appropriate, effective, and feasible for the elderly in community. Sleep hygiene education and exercise, which will promote knowledge and understanding about sleep nature and will induce self-practice and exercise skills that are practical for daily living.

The Sleep Promotion Program in this study, therefore, was composed of sleep hygiene education that is relevant to the lifestyle of elderly people, and qigong psychophysical exercise. The education was aimed to encourage and support the elderly to develop knowledge and understanding about the nature of that subject and about self-practice so that they would have fundamental knowledge as guidelines for modification of lifestyle, as reviewed above. Qigong psychophysical exercise is an exercise with moderate level of intensity which could be practiced in a short time. This exercise is simple and easy to remember and it is appropriate for the elderly.

3. Concepts of qigong psychophysical exercise

3.1 Qigong psychophysical exercise

3.1.1 Meaning of qigong

Qigong is the exercise of body and mind which has been passed down from ancient China. It is integration of isometric and isotonic aerobic exercise, and of meditation and relaxation (Guo, 1995).

Qi or Chi means breath and vital energy that keeps a human alive. It is the energy used in human's body.

Gong means exercise, practice, or training.

Qigong means the practice of breathing or exercise to achieve liveliness (Guo, 1995) or the practice to increase vital energy (Dejkong, 2004).

3.1.2 Components of qigong psychophysical exercise.

Qigong is an exercise with specific characteristics. It is performed to maintain healthy condition, regular breathing, relaxation and blood circulation, leading to improved metabolism. Qigong is composed of three major components, as follows (Chunhasawasdikul, 1996):

1. Physical training, in standing, sitting, lying-down and striding positions. The principles of movement are that the body must be in the most

comfortable posture and body movements should be in coordination with one's imagination and natural breathing.

2. Breathing exercise, regulating the breath in the rhythm of inhaled and exhaled breath flow.

3. Mental refinement, focusing the mind on one area of the body such as the spot under the belly button, on the palm of the hand, or under feet, etc.

3.1.3 Types of qigong psychophysical exercise

The qigong exercise applied to this study is the exercise that Doctor Dejkong had studied and tried out with a number of patients and the outcomes of the trial were satisfactory. He then developed the qigong exercise consisting of four exercise postures, comprising: adjusting breath flow, expanding chest, flying eagle and letting the breath flow all over the body. The exercise is composed of only four postures because excessive postures will require a long time to learn, probably years. Moreover, if the practitioners lack concentration, many postures could be confusing. Moreover, qigong practice emphasizes meditation and each posture in this exercise helps the practitioners maintaining their concentration better than having various postures to remember. These four postures are simple and could be easily followed for people who do not have any background in qigong before. The first three postures focus on breathing exercise of the diaphragm, upper and lateral chests, respectively. The fourth posture is the extraction of energy from the earth, which is cool energy, to integrate with warm energy, which is appropriate for the elderly.

Qigong exercise is classified into two types, as follows:

1. Therapeutic exercise. People who have practiced qigong exercise for a long time have much vital energy. This exercise can be used for treatment of allergic disease, tiredness, dizziness, stress, infectious disease and cancer but it requires long-term practice. Illness and disorders that could be relieved with self-practice include tiredness, lack of appetites, lethargy, joint pain, and stress-induced disorders such as palpitation, insomnia, anxiety, hypertension, and migraine and non-severe infectious diseases such as a cold or sore throat.

2. Health promotion exercise. It is a kind of self-treatment exercise, as it is the use of breathing exercise to prevent illness and to improve physical and mental health. There are two types of qigong exercise for health maintenance, as listed below.

2.1. Static qigong or internal qigong is the exercise that combines breathing with mental exercise without having body movements.

2.2. Dynamic qigong or external qigong is the integration of breathing exercise, mental exercise and body movements. It is widely practiced nowadays in Thailand, as well as in foreign countries.

3.1.4 Qigong psychophysical exercise

1. Warm-up exercises

It is necessary to prepare the body before practicing qigong exercise to strengthen the body parts, especially muscles and tendons. The following exercises for the elderly are simple and do not require much memorizing.

1.1. Meditation practice during exercise

Practitioners may enter meditation and touch qigong energy by sitting in a comfortable position, raising both hands to chest level with the palms turning toward each other, moving the hands to and from each other slowly (about 5 – 10 inches apart) without touching and observing the feelings on the palms of both hands while moving. After concentrating on the palms for a while, the practitioners should sense electrical impulses on finger tips, the pulling and pushing forces of the palms and occasional heat flashing from the palms. They should continue concentrating on these feelings. The senses of electrical impulses and heat are samples of vital energy or qi that the practitioners could touch.

The beginners of qigong exercise should practice moving hands as described above for 5 – 10 minutes one or twice daily. This practice will help simplifying qigong exercise for them. People who are weak and cannot stand can perform this hand movement in sitting position to increase their energy and may practice for 15 – 20 minutes daily.

1.2. Abdominal breathing exercise

Breathing exercise is essential for successful qigong. Correct breathing can induce relaxation and maintain balance of the autonomic nervous system. The main principle of abdominal breathing exercise is that at the beginning one should practice breathing inhaling with the abdomen swelling up and exhaling with the abdomen subsiding. In normal breathing, both chest and abdomen will be raised. Abdominal breathing exercise can be practiced, as follows:

For lying position -down position, the practitioners lie down in supine position or may rest their head on a pillow as usual; put a hand or a small box on the belly button. The hand or the small box will be an observation mark as it will rise while inhaling and will lower while exhaling whereas the chest hardly moves and the neck muscles are not tensed up.

For sitting position, the practitioners sit on a chair, put hands on the belly button and imagine that the inhaled air entering the nostrils has pushed the abdomen to swell up like blowing into a balloon. The abdomen then subsides to normal size while exhaling. Some practitioners may bend or stretch their neck in sitting position to induce the swelling and subsiding of the abdomen.

1.3. Warm-up

Exercise 1: Stand with feet 4-inch apart; raise both hands above the head while inhaling; slowly bend forward to touch both toes while exhaling; stretch up and slightly push the body forward while inhaling; repeat this exercise 5 – 10 times.

Exercise 2: Stand with feet 4 – 12 inch apart; put hands on the waist and turn the body to the left side while turning the neck backward to look at the right heel; turn the body to the right side while turning the neck to look at the left heel; repeat turning alternatively like this for 5 – 10 sets.

2. Four postures of qigong psychophysical exercise

Posture 1: Adjusting breath flow. Stand with feet shoulder-width apart, toes pointing straight to the right hand side and both arms hanging by the body sides; slowly turn both palms up and raise the hands passing chest level to chin level while inhaling slowly; turn both palms upside down and press the hands to knee level while bending knees slightly and exhaling.

Posture 2: Expanding the chest. Continue from the first posture, while the knees are still bending; gradually raise both hands forward to chest level while the palms are still upside down; separate the hands wide apart at arm length or at considerable width while inhaling; when the hands are furthest apart, bring them back in the same direction and lower them down while bending knee and exhaling; do this alternatively in rhythm with inhaling and exhaling.

Posture 3: Flying eagle. From the second posture, stretch the knees to stand straight; spread both arms sideway to reach above the head while inhaling; lower

both arms until the hands are back at both side while bending the knee slightly and exhaling; repeat the exercise.

Posture 4: Letting the breath flow all over the body. From the third posture, quickly turn the hand up sideways like scooping up natural energy from the earth into the body; turn the palms over and stretch the knees; raise the hands to just under chin level then turn the palms upside down while inhaling; stretch both arms sideways and exhale; repeat alternatively.

Store the energy. After having the exercise, there will be a tingling sensation, especially in both palms, like having electrical impulses and the hands will feel warmer. The practitioners should then put their hands on the belly button or lower abdomen for a while or about 10 – 15 minutes to store the energy; then massaging the body with both hands.

For practitioners who are weak and cannot exercise in standing position, they can perform qigong exercise in sitting position by practicing Posture 1 and 2 as the key exercise and moving in slow and regular pace while inhaling and exhaling along with the movements in the same way as qigong practice in standing position.

3.2 Effects of Qigong psychophysical exercise on sleep quality

Stress or depression in the elderly which are causes of insomnia. The outcomes of qigong exercise increase body tolerance to physical stimuli because they function through the autonomic nervous system, which controls various involuntary body functions such as body temperature regulation, blood pressure, digestion, including cardiac function. The autonomic nervous system consists of two systems: sympathetic and parasympathetic nervous system, as detailed below.

The sympathetic nervous system functions in response to emergency situation. It is ready to work when the body requires urgent reaction to stress e.g. increased respiratory rate or heart rate. During qigong exercise, the mind is relaxed and the body is in meditative state thus increasing the level of serotonin neurotransmitter, As a result, the elderly can sleep better.

The parasympathetic nervous system involves in body relaxation to regain and produce energy and to slow down the functioning of various body systems. Qigong exercise induces body changes and promotes body balance by modifying the

functioning of the two nervous systems of the autonomic nervous system, especially the parasympathetic nervous system which involves in muscular relaxation, vascular dilatation, improved blood circulation and stress reduction.

Previous studies on qigong psychophysical exercise and other exercises based on similar principle in the elderly have shown that four weeks practice of 30 minute evening exercise for at least three times a week can increase sleep efficiency, decrease afternoon napping and improve mental health (Li et al, 2004; Tinhuathoy, 2003; Tanaka et al., 2002; Tanaka et al., 2001). It is also found that the sleep time increases in week 3 – 6 of the practice, resulting in improvements in sleep latency, nocturnal sleep time and sleep efficiency, and decreased sleep disturbances (Tinhuathoy, 2003). Continuous practice of qigong exercise, therefore, leads to improved sleep quality.

In addition to sleep improvement, qigong also has physical and psychological. During qigong exercise, the EEG presents more alpha and theta waves. The practitioners also have slower and deeper breathing thus the amount of airflow increases, leading to increases in carbon dioxide elimination from the body and decreases in oxygen elimination. Studies on patients with hypertension found that qigong could reduce level of stress and blood pressure, as well as reducing the use of anti-hypertensive drugs (Raknui, 2002; Pirasorn, 1999). It is also found that blood pressure was lower after two week practice of qigong for 30 – 45 minutes daily (Taweerat, 2000). Qigong exercise leads to decreased heart rate, slower respiration, decreased use of oxygen, reduced body metabolism and increased skin temperature (Tang, 1994). It also increases the digestive rhythm of gastrointestinal tracts and improves enzyme releases because qigong stimulates peripheral nerve functioning and the nervous system that controls the visceral organs. Moreover, the breathing exercise with movement of diaphragm and abdominal muscles helps moving foods in the stomach and intestines. For the musculoskeletal system, qigong improves joints flexibility and body balance (Ross et al., 1999) because it is a repetitive exercise involving the stretching of muscles and tendons thus improving flexibility of various joints, leading to improvements in body movement and balance, including the coordination of body organs.

Qigong can reduce stress, anxiety and depression (Li et al, 2004; Driver and Taylor, 2000; Beng-Yeong, 1999). Qigong can reduce blood cortisol, which is found

at high level in stressed persons. It also reduces white blood cell functioning and improves short-term memory functioning of the brain (Donpaew, 2003; Nituthorn, 2001; Dejkong, 1999). Moreover, during the exercise the mind is relaxed and in meditative state thus the body releases more catecholamine neurotransmitters such as norepinephrine, dopamine and serotonin. The body also has increased level of endorphins, which induce the sense of happiness and comfort. Qigong also leads to decreased release of adrenocorticotrophic hormone (ACTH), which is found at high level in persons with depression. This is consistent with studies conducted by Schaller (1999) and Pantharak (2002), which show that 10-week practice of qigong exercise can reduce depression.

Therefore, the elderly can apply qigong psychophysical exercise to promote sleep and to prevent sleep problems because this exercise can reduce stress, anxiety and depression, which is psychological factor affecting sleep quality. Qigong exercise stimuli environments such as light and sound, as well as the reactions to internal stimuli that cause insomnia.

Conclusion

Referring to the above review of literature, it is evident that the elderly experience changes in sleep more than people in other age groups. Moreover, several factors disturb and affect their sleep quality. Thus it is important to promote sleep or to prevent and delay sleep problems in the elderly in order to maintain or improve their health condition. The researcher of this study, therefore, provided them with A Sleep Promotion Program consisting of sleep hygiene education and qigong psychophysical exercise, which is an effective and appropriate technique for the elderly in community. The program was designed with consideration of and emphasis on the feasibility for using in community. It was expected that when the elderly had received correct information about sleep promotion and had developed skills for qigong psychophysical exercise, they would be able to apply the knowledge to appropriately practice in their daily life. As a result, they would have quality sleep, which will promote their mental health and prevent mental health problem, leading to physical and mental well-being.

CHAPTER III

METHODOLOGY

Research Design

This research was a randomized controlled trial study with pre-post test control group design. It examined effects of a sleep promotion program on sleep quality in older adults living in community at Sanamchai Subdistrict, Muang District, Supanburi Province, Thailand. The research methodology is discussed in detail below.

Population and Sample

Population

The population of this study was older adults' age 60 years and above, who living in community at Sanamchai Subdistrict, Muang District, Supanburi Province

Sample

The sample was selected with sampling method on the basic of the following inclusion criteria:

1. No clinically diagnosed significant sleep disorder.
2. No physical illness significant sleep disorder such as cardiovascular disease or stroke.
3. No musculoskeletal problem that might be affected by qigong exercise such as severe joint pain.
4. No psychiatric condition such as depression and anxiety.
5. Not currently taking sleep medications.
6. Having ability to communicate in Thai.
7. Willing to join in the study.

Sample with the following characteristics were excluded form the study:

1. Feel chilly or feel cheap.
2. Severe pain.

3. Currently loss and grief condition such as loss of significant other.

The sample size required was derived from power analysis according to Cohen (1988) at significance level (α) of .05, power of statistic test ($1-\beta$) of .80, and effect size of .70 for one tail. The sample required was 26 participants. Total sample was 52 participants. The appropriate sample size of this study was 62, divided into 31 participants for the control and the experimental group.

Setting

This study was conducted at Phochareon temple, Sanamchai Subdistrict, Muang District, Supanburi Province. The participants were the older adults age 60 years and above. A total 504 older adults have been living in this community. There had the elderly clubs but they were not participating in community activities and live their life as usual. Most of them stay at home; some might take care of their grandchildren.

The researcher met the chief of Sanamchai Public Health Centre and explained the details of the study. Purpose and process of the research program requested for their cooperation. The Participants were induced to participate in the sleep promotion program. The sample was recruited by inclusion criteria. Eighty – two subjects entered the participants agreed to participate but only 62 met the criteria. Any subjects, who took sleep medications at stage of the program and/or did not practice qigong psychophysical exercise according to the program, were not participate in the study. So, at the completion of the study the number of subjects for each group was 31 participants.

Instruments

The instruments in this study were classified into two categories as follows:

Part I Research instrument

The instrument for collecting data was an interview questionnaire consisting of two main parts, as detailed below.

1. Personal data consisted of sex, age, marital status, education level, personal health history, income and sufficiency of income.

2. The Pittsburgh Sleep Quality Index (PSQI) was used to evaluate rated sleep quality. The original questionnaire was developed by Buysse and associates (1989). It had been translated into Thai by Jirapramukpitak and Tanchaiswad (1997). The translated questionnaire was tried out with 30 staff nurses at Songkhlanagarindra Hospital and subsequent Cronbach's alpha coefficient was 0.82. Ramsiri, K. (2002) used this instrument in a study with 20 elderly people in Loei Province and found that the Cronbach's alpha coefficient was 0.83.

This questionnaire assesses sleep quality predicting 1 month period. The PSQI is consisted for 9 items, which represent the sum of 7 component and criteria of each component was detailed, as follow:

Component 1 Subjective sleep quality (Item 5)

Very good subjective sleep quality	=	0	point
Fairly good	=	1	point
Fairly bad	=	2	points
Very bad	=	3	points

The score of item 5 is the score of component 1.

Component 2 Sleep latency (Item 2, 9.1)

1. Duration of time in bed until falling asleep (Item 2)

Less than 15 minutes	=	0	point
Within 16 – 30 minutes	=	1	point
Within 31 – 60 minutes	=	2	points
More than 60 minutes	=	3	points

2. Problem of inability to get to sleep within 30 minutes (Item 9.1)

None	=	0	point
Less than once a week	=	1	point
Once or twice a week	=	2	points
Three or more times a week	=	3	points

If sum of scores item 2 and 9.1 is equal

0 point	=	0	point
1 – 2 points	=	1	point
3 – 4 points	=	2	points
5 – 6 points	=	3	points

This result is the score of component 2.

Component 3 Sleep duration (Item 4)

More than 7 hours	=	0	point
More than 6 - 7 hours	=	1	point
More than 5 - 6 hours	=	2	points
Less than 5 hours	=	3	points

The score of item 4 is the score of component 3.

Component 4 Habitual sleep efficiency (Item 1, 3, 4)

Normal sleep effectiveness was calculated from the total hours asleep (item 4) divided by the total hours in bed calculated from time of getting up in the morning (item 3) minus time of going in bed (item 1)

More than 85 percents	=	0	point
75 - 84 percents	=	1	point
65 - 74 percents	=	2	points
Less than 65 percents	=	3	points

This result is the score of component 4.

Component 5 Sleep disturbances (Item 9.2-9.10)

None	=	0	point
Less than once a week	=	1	point
Once or twice a week	=	2	points
Three or more times a week	=	3	points

If sum of scores item 9.2 to 9.10 is equal

0 point	=	0	point
1 – 9 points	=	1	point
10 – 18 points	=	2	points
19 – 27 points	=	3	points

This result is the score of component 5.

Component 6 Use of Sleep medication (Item 6)

None	=	0	point
Less than once a week	=	1	point
Once or twice a week	=	2	points
Three or more times a week	=	3	points

The score of item 6 is the score of component 6.

Component 7 Daytime dysfunction (Item 7, 8)

1. Taking daytime naps or sleepiness (Item 7)

None	=	0	point
Less than once a week	=	1	point
Once or twice a week	=	2	points
Three or more times a week	=	3	points

2. Problem of keeping up enthusiasm to get things done completely (Item 8)

None	=	0	point
Less than once a week	=	1	point
Once or twice a week	=	2	points
Three or more times a week	=	3	points

If sum of scores item 7 and 8 is equal

0 point	=	0	point
1 – 2 points	=	1	point
3 – 4 points	=	2	points
5 – 6 points	=	3	points

This result is the score of component 7.

Interpretation: The sum of the component scores yields a global score (range 0-21). The global sum of “5” or less than 5 points indicates good sleep quality, whereby the global sum more than 5 points indicates poor sleep quality.

Part II Intervention instrument

A **sleep promotion program** was an experimental instrument in this study. Its results were obtained by applying the sleep promotion by sleep education and the training of qigong psychophysical exercise. As well as an extensive review of relevant research literatures about sleep, sleep in older adults, sleep promotion. The researcher developed the qigong psychophysical exercise based on booklet from Department of Mental Health, Ministry of Public Health (Datkhong, T, 2004), and engaged in qigong psychophysical exercise training.

The program was continuously delivered three times a week on Monday, Wednesday and Friday for four weeks thus it was given 12 sessions. Which about 60 minutes with sleep education and qigong psychophysical exercise, each as follows:

- 1st Session Orientation and Qigong psychophysical exercise.
- 2nd Session Sleep in older adults and Qigong psychophysical exercise.
- 3rd Session Sleep quality and Qigong psychophysical exercise.
- 4th Session Factors related to sleep quality and Qigong psychophysical exercise.
- 5th Session Sleep hygiene practice and Qigong psychophysical exercise.
- 6th Session Exercise and sleep and Qigong psychophysical exercise.
- 7th Session Relaxation to sleep and Qigong psychophysical exercise.
- 8th Session Diet for sleep and Qigong psychophysical exercise.
- 9th Session Environments for good sleep and Qigong psychophysical exercise.
- 10th Session Sleep promotion (1) and Qigong psychophysical exercise.
- 11th Session Sleep promotion (2) and Qigong psychophysical exercise.
- 12th Session Evaluate the outcome of groups

Validity and Reliability

Validity

A sleep promotion program was reviewed for the content validity by panel of three experts comprising one physician specialist in qigong exercise and two nurse instructor specialist in sleep and aging. The program was subsequently revised as suggested by the expert and was practically trailed with nurse instructor specializing in order to ensure the accuracy of language, procedure and duration of the sleep promotion session. The researcher then revised the program again before the actual utilization with the sample.

Reliability

The Pittsburgh Sleep Quality Index was tried with 30 participants in Phophaya Subdistrict, Muang District, Supanburi Province, who had similar characteristics to the population in this research. The obtain data were than calculated for reliability with Conbach's Alpha Coefficient. The reliability coefficient of this instrument was 0.84.

This instrument was tried 62 participants in this research. The reliability coefficient was 0.80.

Data Collection

Preparation phase

1. Related knowledge

The researcher reviewed the literature about sleep in older adults, sleep promotion, qigong exercise and group process.

2. Related experience

2.1 The researcher practiced as a leader in the community.

2.2 The researcher practiced qigong psychophysical exercise following CD guidance and training with Datkhong, who expert in qigong psychophysical exercise at Department of Mental Health, Ministry of Public Health, twice attaining a quality standard of practice before data collecting. The researcher was leader for qigong psychophysical exercise training in this study.

2.3 The researcher trained to leader assistant about interview by PSQI.

Data collection phase

The data were collected by the procedure as follows:

1. The letter of recommendation from the Faculty of Graduate studies was delivered to the committee on Human Rights Related to Human Experimentation Mahidol University.

2. The letter of recommendation from the Faculty of Graduate Studies, Mahidol University to the Director of Supanburi public health requesting permission for data collection from older adults in Sanamchai Subdistrict, Muang District, Supanburi Province.

3. After the permission from the committee on Human Rights was announced, the data collection was started. The researcher met the relevant officers in order to explain the details, purpose and process of the research and requested for their cooperation

4. The population was screened by inclusion criteria were invited to participate in this study.

5. After the participants agreed to participate. The revised 62 participants were randomly divided into the experimental group and the control group, comprising 31 participants in each group. Then participant signed the protection of human participate form. All two groups were assessed for personal data and sleep quality by leader assistant before the intervention phase (pre-test).

Intervention Phase

The research was carried out in each group as detailed follow.

Experimental Group

The researcher met the participant to explain the purpose and fits benefits of the research. The research of a sleep promotion program was carried out every week at the frequency of three times a weeks on Monday, Wednesday and Friday thus it was given 12 sessions about 60 minute for 4 weeks. The participants were assessed for sleep quality at end of session 12 (post-test).

Control Group

The participants in the control group lived their life as usual during the intervention period. The researcher met the control group in order to explain the details of the research and cooperation was requested from the group. The researcher made an appointment to meet with the participant in the control group again for the assessment of sleep quality, which was set in the next 4th week (post-test).

In each session, the researcher assessed characteristics from exclusion criteria were excluded from the study; the participants in each group were completion of the study. After intervention phases, the researcher were checked for the completeness of the instrument for collecting data. Data were analyzed the results by using statistic methods.

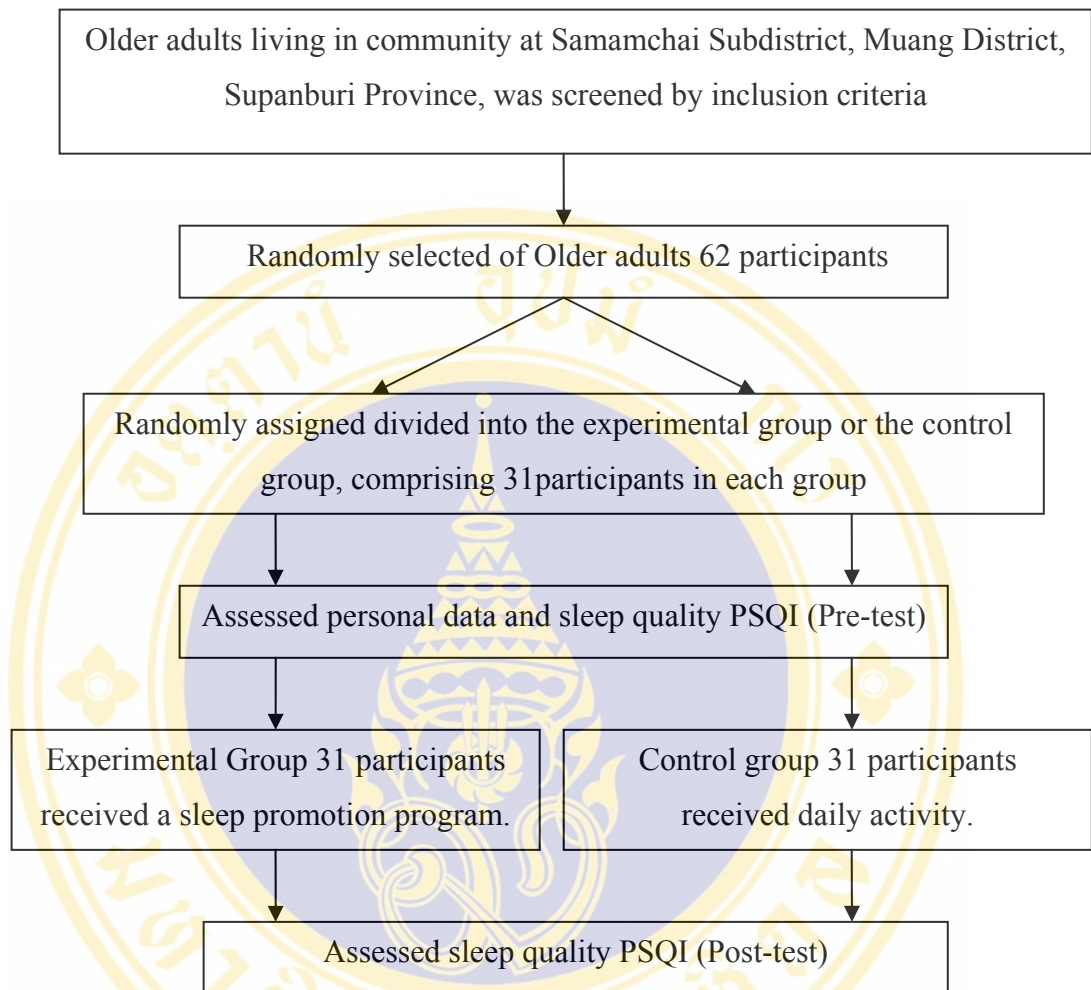


Figure 2: Design of the study

Protection of human Participant

In this study, the researcher has considered the rights and honed of the sampling group. The explanation on research detail and affects of the study were therefore provided, using the following steps:

1. The researcher requested permission form the older adults who participant in research before the data collection.
2. The participant volunteered to participant in sleep promotion program. They could withdraw. In addition, they were informed that their decision to withdraw from the study would have no negative effect on them.

3. Should this program to be effective, the researcher would later apply in a sleep promotion program with control group in the same member as had been applied to be experimental group.

Data Analysis

The data obtain were analyzed as follows:

1. The percentage and frequency were used for analysis of the personal data.
2. Compare the personal data and sleep quality score (pre-test) in the participant by using chi-square and t-test.
3. Compare the sleep quality score between before and after the intervention in the experimental group by using paired t-test.
4. Compare the sleep quality score between the experimental group and the control group by using independent t-test.

CHAPTER IV

RESULTS

This research study examined the effects of a sleep promotion program on sleep quality in older adults living in the community of Sanarmchai Subdistrict, Muang District, Suphanburi Province, Thailand. Sixty-two participants met the inclusion criteria divided into experimental group or control group. Each group consisted of 31 participants. The experimental group participated in sleep promotion program three times a weeks for 4 weeks (12 sessions), whereas the control group received daily regular activities. The participants were complete of a sleep promotion program. The program started on 15 March to 10 April 2006. The results of this study are presented in 2 parts with tables and relative description in following order.

Part 1 Personal data of the sample.

Part 2 Comparison of the sleep quality score.

Part 1 Personal data of the sample.**Table 1** Numbers, percentage and chi square of the samples.

Personal data	Experimental group (n=31)		Control group (n=31)		x ²	p
	n	%	n	%		
Sex					.000	ns
Male	10	32.30	10	32.30		
Female	21	67.70	21	67.70		
Age (years)					-.032	ns
60 - 69	14	45.20	15	48.40		
70 - 79	17	54.80	16	51.60		
Mean (SD)	69.39	(5.66)	69.97	(5.35)		
Marital status					.081	ns
Single	2	6.40	1	3.20		
Married	23	74.20	23	74.20		
Divorce	6	19.40	7	22.60		
Education level					.000	ns
Primary school	31	100.00	31	100.00		
Income (Bath/month)					.132	ns
None	3	9.70	3	9.70		
< 5,000	27	87.10	25	80.60		
≥ 5,000	1	3.20	3	9.70		
Mean (SD)	2,580	(1727)	2,451	(1609)		
Sufficiency of income					.375	.001
Enough, to keep	12	38.70	3	9.70		
Enough	15	48.40	22	71.00		
Not enough	3	9.70	6	19.40		
Not enough, get into debt	1	3.20	0	0.00		

ns = non significant

Table 1 Numbers, percentage and chi square of the samples.

Personal data	Experimental group (n=31)		Control group (n=31)		x ²	p
	n	%	n	%		
Physical health					-0.033	ns
No comorbidity	14	45.20	13	41.90		
Comorbidity	17	54.80	18	58.10		
- Hypertension (HT)	2	6.50	9	29.00		
- Diabetes (DM)	2	6.50	0	0.00		
- Osteoarthritis (OA)	3	9.70	5	16.10		
- Allergy	1	3.20	0	0.00		
- High Cholesterol	3	9.70	0	0.00		
- HT & DM	3	9.70	0	0.00		
- HT & OA	2	6.50	1	3.20		
- DM & OA	0	0.00	1	3.20		
- DM & Allergy	1	3.20	0	0.00		
- HT, DM & Allergy	0	0.00	1	3.20		
- HT, DM & Cholesterol	0	0.00	1	3.20		
Regular medication					-0.035	ns
None	22	71.00	21	67.70		
Use	9	29.00	10	32.30		

ns = non significant

Table 1, Personal data of the experimental group was as follows. The majority were female (67.70 %), and mean age was 69.39 years old. The majority of older adults were married (74.20 %). All older adults were educated at primary level (100 %). The average of income in the experimental group was 2,580 Bath/month; income were enough but were not left to keep (48.40 %). More than half of participants in the experimental group report some physical illness (54.80 %). Finally, more than half of participants in the experimental group (71.00 %) did not use any type of medication

In the control group, the majority were female (67.70 %), mean age was 69.97 years old. The majority of older adults were married (74.20 %). All older adults were educated at primary level (100 %). The average of income in the control group was 2,450 Bath/month; income were enough but not left to keep (71.00 %). More than half reported criteria physical illness (58.10 %), and reported no use of any type of medication (67.70 %).

The comparative analysis of personal data between the experimental group and the control group regarding gender, age, marital status, educational level, income, physical health and regular medication showed no significance differences ($p < .05$). However, sufficiency of income was significance differences ($p < .05$).

Part 2 Comparison of the sleep quality score.

Table 2 Comparison of the sleep quality score between before and after the intervention in the experimental group (n = 31).

Sleep quality	Before the intervention		After the intervention		t
	M	SD	M	SD	
Experimental group	8.29	2.969	5.77	1.944	6.954 *

* $p < .05$

Table 2, the sleep quality score after the intervention (M=5.77, SD=1.94) were lower than sleep quality score before the intervention (M=8.29, SD=2.96) at a statistically significant level of .05 ($t = 6.95$).

Table 3 Comparison of the sleep quality scores between the experimental group and the control group (n = 31 participants in each group).

Sleep quality	Experimental group		Control group		t
	M	SD	M	SD	
Before the intervention	8.29	2.969	8.68	2.495	.556
After the intervention	5.77	1.944	8.74	2.708	4.957*

* $p < .05$

Table 3, the sleep quality score between the experimental group (M=8.29, SD=2.96) and the control group (M=8.68, SD=2.49) before the intervention showed no difference at a statistically significant level .05 ($t = .556$).

However, after the intervention, the sleep quality score of the experimental group (M=5.77, SD=1.94) was lower than the sleep quality score of the control group (M=8.74, SD=2.70) at a statistically significant level of .05 ($t = 4.957$).

Figure 3 Comparison of sleep quality score in the experimental group and the control group.

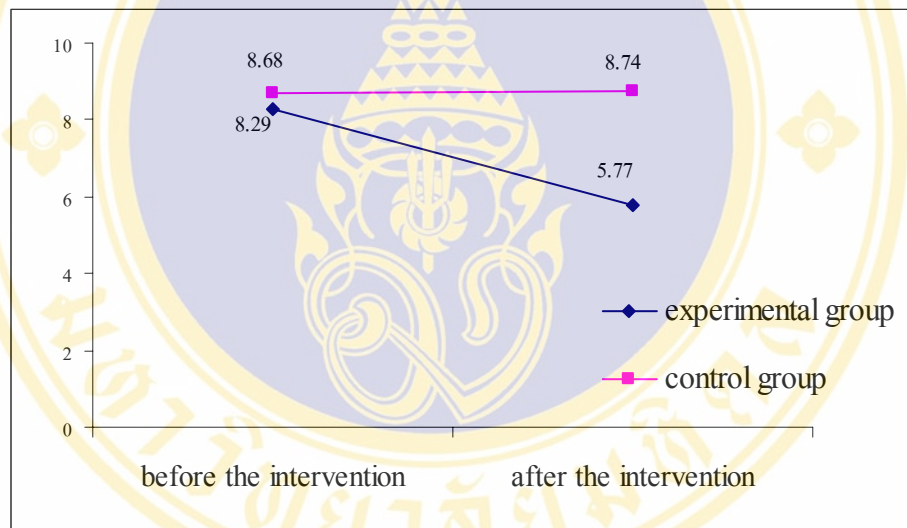


Figure 3, Sleep quality scores before the intervention in the experimental and the control group were closed. After the intervention, sleep quality score in the experimental was decreased. Wherever that of the control group was increased, meaning that the sleep quality in the experimental group improved.

Table 4 Numbers and percentage of opinions and suggestions about “A Sleep Promotion Program” in the experimental group (n = 31 participants).

Information	n	%
Participants' opinions*		
1. Know more about sleep promotion techniques.	26	83.87
2. Were able to apply the knowledge to their daily life.	24	77.41
3. Were able to exercise and do activities together.	19	61.29
4. Felt relaxed and had better sleep/sleep easier.	14	45.16
Suggestion		
1. Would like continuous group activities.	19	61.29
2. Would like everybody to interesting in exercise.	9	29.03
3. Would like to learn more about other exercise methods, such as Mea-Boon-Me club dance, Tai-chi.	4	12.90

*Note: The subject could give opinions more than one answer to question.

Table 4, the experimental group stated the opinions about a Sleep Promotion Program in older adults as know more about sleep promotion techniques, 83.87 %. They could applied the knowledge to their daily life, 77.41 %; were able to exercise and do activities together, 61.29 % and felt relaxed and had better sleep, 45.16 %. The suggestion from the older adults in the experimental group would like continuous group activities as 61.29 %; prefer to everybody to interesting in exercise as 29.03 %; and would like to learn more about other exercises medthods, such as. Mea-Boon-Me club dance, Tai-chi as 12.90 %.

CHAPTER V

DISCUSSION

This research aimed to study the effects of a sleep promotion program on sleep quality in older adults. The results are discussed below with reference to the following research hypotheses:

1. After the intervention, sleep quality in the experimental group better than sleep quality before the intervention.
2. After the intervention, sleep quality in the experimental group better than sleep quality in the control group.

Hypothesis 1 After the intervention, sleep quality in the experimental group better than sleep quality before the intervention.

The results of this study showed that after the intervention the experimental group achieved sleep quality more than before the intervention at a statistically significance level of .05 (Table1 and Figure 3). This finding supported the hypothesis 1 of this study, indicating that a sleep promotion program had effects on sleep quality in older adults. This is because the elderly who participated in a sleep promotion program had learned the techniques and skills to manage sleep problems more appropriately. The activities concerning sleep education enabled the elderly to understand the nature of sleep, factors affecting sleep and sleep promotion techniques such as sleep hygiene education, appropriate diet, environmental setting, relaxation techniques, exercise, etc. These techniques could be applied to practical use and to manage sleep problems with relevance to the cause of problems in each individual. Moreover, the practice of qigong psychophysical exercise, which is an exercise with moderate level of intensity in addition to breathing exercise, meditation practice and movement of all body parts, leads to natural muscular and mental relaxation. The gentle movements of body parts induce muscular relaxation, vascular dilatation, improved blood circulation and decreased heart rate and respiratory rate whilst

releases induce relaxation. In addition, increased release of serotonin leads to an increase in the functioning of bulbar synchronizing region and a decrease in the functioning of reticular activating system; thus the elderly could enter sleep more easily. This is consistent with a study conducted by Ryu (1996), which found that exercise could increase the level of endorphins, which induce the sense of happiness and promote sleeping (Culebras, 2002). The moderate exercise that involves gentle movements and meditation could induce the sense of relaxation and could reduce anxiety and depression (Li et al., 2002). Moreover, the group process allowed the elderly to meet other people and exchange their knowledge and experience. As a result, they gained a variety of guidelines for sleep promotion and prevention of sleep problems. In addition, such interaction could reduce psychological problems such as stress, anxiety and depression, which have effects on sleep quality.

The experimental group who participated in a sleep promotion program, most of them reported that they gained benefits from the program as it enhanced their knowledge and understanding about sleep. They learned various sleep promotion techniques from the program and also learned how to perform qigong psychophysical exercise. The exercise is simple because it does not have many postures and the movements are not too quick thus the elderly could remember the postures of this exercise in a short period of time. Some participants reported that it was like learning meditation, making them feel relaxed. Some participants commented that they used to stay at home alone without doing anything but having daytime naps thus they could not sleep at night. Therefore, they would like to have this kind of activities again so that they could have some activities and could meet other people. These comments are relevant with the researcher's observation, as it was notable that every participant appeared interested in the program and was well cooperative. Some participants applied the obtained knowledge to use at home such as not having day time naps, arranging the environment to promote sleep and avoid taking alcoholic drinks. However, not all participants practice qigong exercise at home. Those who did not perform qigong exercise at home reported that "I don't dare doing it at home because I am afraid the children and grand children would laugh at me" "I'd rather do it in group." It is evident that the education, exercise and group process used in a sleep

promotion program contributed to the participants' reception of knowledge, guidelines and mental support, which are factors that could promote sleep quality.

This study, therefore, showed that a sleep promotion program had effects on sleep quality in older adults. The program improved sleep quality among older adults in the experimental group after the intervention. This result is consistent with a study on 2-week sleep education program in persons with non-organic insomnia, conducted by Bruno and associates (2005) which found that the education program could solve sleep problems as it prolonged nighttime sleep, improved sleep quality and reduced sleep disturbances. The result of this study regarding exercise is in accordance with the study conducted by Kosol (1995), which found positive correlation between exercises and sleep quality, as persons who had regular exercise could sleep better than those who did not exercise. Namazi, Zadorosny and Gwinup (1995) investigated exercise in the elderly with senile dementia by providing 40-minute exercise for four weeks. They found that the elderly in the experimental group demonstrated improved sleep whereas the control group did not have any change in sleep quality. King and associates (1997) provided the elderly with a 30 – 40 minute aerobic exercise at moderate level of intensity in the late afternoon for 16 weeks. They found that the elderly in the experimental group demonstrated better sleep quality, sleep efficacy, duration of sleep latency and duration of nighttime sleep, in comparison with the elderly in the control group. Tanaka and associates (2002) studied the effects of 30-minute day time nap in combination with 30 minutes evening exercise for four weeks in the elderly and found that this program could significantly improve sleep efficacy, reduce late afternoon naps and improve mental health. Thinhuatoey (2003) investigated the effects of tai-chi qigong exercise on sleep quality in the elderly who lived in a nursing home and found different effects on the sample's sleep quality after two weeks, four weeks and six weeks of the exercise: as the duration of exercise program was extended, the total sleep time was prolonged accordingly. Nevertheless, the study is a pretest-posttest research in one group with no comparative group. Li and associates (2004) who studied effects of exercise in the elderly also found significant difference between the experimental group and the control group.

Hypothesis 2 After the intervention, sleep quality in the experimental group better than sleep quality in the control group.

The results of this study showed that the sleep quality of the experimental group before participating in a sleep promotion program was not different from that of the control group at a statistically significance level of .05. After the intervention, however, the elderly participated in a sleep promotion program achieved better of sleep quality at a statistically significance level of .05 (Table 3 and Figure 3). This finding supports hypothesis 2 of the study. The comparative analysis of personal data and pre-test scores of sleep quality between sample in the experimental group and the control group found no differences regarding gender, age, marital status, educational level, personal health history, income and regular medication at a statistically significance level of .05 (Table 1, 3). Thus the difference in sleep quality of the two groups was certainly related to the participation in a sleep promotion program, not because of differences in the sample's characteristics. This could be explained from the fact that the elderly in the control group did not participate in a sleep promotion program and lived their life as usual. Most of them stayed at home; some might take care of their grandchildren; some had daytime naps thus they could not sleep at night. When they had sleep disturbances, the elderly in this group did not seriously solve the problems thus their sleep quality did not change. In contrast, the elderly in the experimental group continually participated in a sleep promotion program, having group activities in learning sleep promotion techniques and skills that could be applied to practical use. In response to the interview about changes in their sleep, the elderly reported that they had shorter period of sleep latency and had prolonged sleep time. For the application of sleep promotion techniques, some of them used relaxation techniques when they felt stressed or worried and some used environmental control to improve their sleep. Moreover, every elderly person in the experimental group performed qigong psychophysical exercise together. It is evident that sleep hygiene education in combination with qigong psychophysical exercise could directly and indirectly reduce the physical, psychological and environmental factors that affect sleep quality. Thus the sleep quality of sample in the experimental group was increase after the intervention. This result is consistent with a number of previous studies as mentioned in the discussion of hypothesis 1.

In conclusion, a sleep promotion program, this is a combination of sleep hygiene education and qigong psychophysical exercise indicating the improvement in sleep quality. Continuous performance of appropriate self-practice and qigong psychophysical exercise may help improving sleep quality in the elderly to a good level.



CHAPTER VI

CONCLUSION

This study is a randomized controlled trial research design to examine the effects of a sleep promotion program on sleep quality in older adults. The sample was composed of 62 adults older age 60 years and above, who lived in the community of Sanamchai Subdistrict, Muang District, Suphanburi Province, Thailand, divided into a control and an experimental group, with 31 participants in each group.

Data were collected with interview method using a questionnaire for personal information and the Thai version of Pittsburgh Sleep Quality Index. The older adults in both groups were interviewed before and after the intervention on the same day. The intervention provided for the older adults in the experimental group was the sleep promotion program comprising of sleep hygiene education and qigong psychophysical exercise. The program was composed of 60-minute group sessions provided three times a week for four consecutive weeks, thus sample in the experimental group attended 12 sessions in the whole program. The older adults in the control group lived their life as usual during the intervention period.

The obtained data were analyzed by comparing sleep quality with paired t-test and independent t-test. The findings are summarized below.

Sleep quality after the intervention of the experimental group was better than the sleep quality before the intervention at a significance level of .05.

Sleep quality after the intervention of the experimental group was better than the sleep quality of the control group at the significance level of .05.

The findings indicated that the sleep promotion program, which combined sleep hygiene education with qigong psychophysical exercise, could significantly improve sleep quality in the older adults.

Limitations of the study

As the study was conducted during March – April 2006, a number of factors might affect sleep quality of the sample, e.g. very warm weather and political situations.

Recommendations

The findings of this study showed that a sleep promotion program had effects on sleep quality in the older adults. Therefore, the program could be applied as a mean to reduce sleep disturbances in the older adults. The following actions were recommended for the application to nursing practice and for future research.

1. For nursing practice

Independent nursing roles could be developed by applying a sleep promotion program, sleep hygiene education with qigong psychophysical exercise, to populations in different age groups who have similar problems. This program may be applied as a part of community activities by encouraging the community to participate in activities and to improve sleep quality.

2. For future research

2.1 There should be a long-term study of the effects of a sleep promotion program, which Sleep quality may be assessed periodically and continually. The results could lead to more notable support of the sleep promotion program.

2.2 There should be a study that extends to cover other populations, e.g. populations in different age groups. A research may also be conducted as a comparative study, comparing between people who use hypnotic drugs and those who do not use the drugs.

2.3 There should be a comparative study of sleep promotion with other type of exercises or other techniques and their effects on sleep quality.

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มหาบัณฑิต สาขาการพยาบาลผู้ใหญ่ บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.





APPENDIX A

รายนามผู้ทรงคุณวุฒิ

1. นายแพทย์เทอดศักดิ์ เดชคง
กลุ่มที่ปรึกษากรมสุขภาพจิต กรมสุขภาพจิต
กระทรวงสาธารณสุข
2. รองศาสตราจารย์ ประคอง อินทรสมบัติ
ภาควิชาพยาบาลศาสตร์ คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี
มหาวิทยาลัยมหิดล
3. รองศาสตราจารย์ ถิวรรณ อุณาภิรักษ์
ภาควิชาการพยาบาลรากฐาน คณะพยาบาลศาสตร์
มหาวิทยาลัยมหิดล

APPENDIX B

เอกสารชี้แจงผู้เข้าร่วมการวิจัย

เรียน ผู้ตอบแบบสอบถามทุกท่าน

เนื่องด้วยดิฉัน นางสาวศศิวิมล วรรณทอง นักศึกษาหลักสูตรพยาบาลศาสตรมหาบัณฑิต สาขาการพยาบาลสุขภาพจิตและจิตเวช คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล กำลังทำวิทยานิพนธ์ เรื่อง “ผลของโปรแกรมส่งเสริมการนอนต่อคุณภาพการนอนหลับในผู้สูงอายุ” ซึ่งวัตถุประสงค์ของการวิจัยครั้งนี้เพื่อศึกษา การให้ความรู้ร่วมกับการออกกำลังกายแบบซึ่งสามารถเพิ่มคุณภาพการนอนหลับได้หรือไม่ โดยจะมีผู้เข้าร่วมวิจัยทั้งสิ้น 62 คน ใช้เวลาทั้งหมด 6 สัปดาห์

การนอนหลับเป็นความต้องการพื้นฐานที่สำคัญของทุกคน ในผู้สูงอายุมีรูปแบบการนอนหลับที่แตกต่างจากวัยอื่น ส่งผลให้นอนไม่หลับหรือถูกรบกวนหรือกระตุ้นให้ตื่นง่ายกว่าวัยอื่น แต่เราสามารถลดหรือป้องกันการเกิดปัญหาการนอนได้ ก็จะเป็นประโยชน์กับตัวเราเอง และผู้สูงอายุหรือคนที่มีปัญหาการนอนต่อไปได้ ท่านจึงเป็นบุคคลสำคัญอย่างยิ่ง ที่สามารถให้ข้อมูลที่เป็นประโยชน์ต่อการศึกษาค้นคว้าครั้งนี้

ท่านได้รับเชิญให้เข้าร่วมการวิจัยนี้เพราะ ท่านเป็นผู้สูงอายุที่ไม่มีโรคหรืออาการที่อาจส่งผลต่อการนอน และไม่อยู่ในช่วงที่ใช้ยานอนหลับ มีสภาพร่างกายไม่เป็นอุปสรรคต่อการออกกำลังกาย รวมทั้งไม่มีประวัติการเจ็บป่วยทางจิตหรือความผิดปกติของระบบประสาท

เมื่อท่านยินยอมเข้าร่วมการวิจัยแล้ว ผู้วิจัยจะคัดเลือกผู้เข้าร่วมการวิจัยโดยจับฉลากจำนวน 62 คน จากนั้นจึงใคร่ขอความร่วมมือจากท่าน ในการตอบแบบสัมภาษณ์ ซึ่งประกอบด้วย 2 ส่วน ได้แก่ แบบบันทึกข้อมูลส่วนบุคคล และแบบประเมินคุณภาพการนอนหลับ โดยใช้เวลาในการตอบแบบสัมภาษณ์ทั้งหมดประมาณ 20 นาที ในการตอบจะไม่มีคำตอบที่ถูกหรือผิด จึงไม่มีผลกระทบบใด ๆ โดยจะสัมภาษณ์ท่านทั้งหมด 2 ครั้ง คือ วันนี้และสุดท้ายของโปรแกรม (สัปดาห์ที่ 4 ของโปรแกรม) จึงใคร่ขอความร่วมมือจากท่านให้ตอบตรงตามความรู้สึกของท่านมากที่สุด เพื่อนำผลการสัมภาษณ์ที่ได้ไปศึกษา และดำเนินการในการแบ่งกลุ่มควบคุมและกลุ่มทดลอง กลุ่มละ 30 คน

กลุ่มควบคุม คือ กลุ่มผู้สูงอายุที่ดำเนินชีวิตตามปกติ

กลุ่มทดลอง คือ กลุ่มผู้สูงอายุที่ได้เข้าร่วมโปรแกรมการส่งเสริมการนอน เป็นระยะเวลา 4 สัปดาห์ ๆ ละ 3 ครั้ง วันจันทร์ พุธ และศุกร์ เวลา 16.00 -17.00 น. รวม 12 ครั้ง

ผลของการวิจัยที่ได้จะแปลผลออกมาและเก็บเป็นความลับ โดยไม่มีการเปิดเผยชื่อให้คนอื่นทราบ ข้อมูลจะวิเคราะห์เป็นภาพรวมเพื่อประโยชน์ในการวิจัยและการพยาบาลเท่านั้น

ในการวิจัยครั้งนี้ผู้วิจัยรับรองว่าจะไม่เกิดความเลื่อมหรือเป็นอันตรายต่อตัวท่าน ถ้าหากพบว่ามีความผิดปกติใดๆเกิดขึ้นท่านจะได้รับการดูแลเบื้องต้นและส่งต่อที่เหมาะสมต่อไป

ในการเข้าร่วมวิจัยนี้ ผู้เข้าร่วมการวิจัยไม่ต้องรับผิดชอบค่าใช้จ่ายใดๆทั้งสิ้น

ท่านสามารถติดต่อผู้วิจัยได้ตลอดเวลาตามที่อยู่ที่แนบมา

การตัดสินใจเข้าร่วมการวิจัยครั้งนี้เป็นไปตามความสมัครใจของท่าน และไม่ว่าท่านจะเข้าร่วมการวิจัยหรือไม่ก็ตาม จะไม่มีผลกระทบใด ๆ ต่อตัวท่าน ถึงแม้ว่าท่านจะยินยอมเข้าร่วมการวิจัยแล้ว ท่านก็มีสิทธิ์ที่จะยกเลิกการเข้าร่วมการวิจัยได้ตลอดเวลาตามที่ท่านต้องการ โดยไม่มีข้อแม้ใด ๆ

ผู้วิจัยขอขอบคุณท่านที่ได้เสียสละเวลาให้ความร่วมมือในการตอบแบบสอบถามครั้งนี้

ศศิวิมล วรรณทอง

ผู้วิจัย

ติดต่อผู้วิจัย

ศศิวิมล วรรณทอง

วิทยาลัยพยาบาลบรมราชชนนี สุพรรณบุรี

118 หมู่ 1 ต. สนามชัย

อ. เมือง จ. สุพรรณบุรี

72000

เบอร์โทรศัพท์ 06-6216896

APPENDIX C

ใบยินยอมให้ทำการวิจัยโดยได้รับการบอกกล่าวและเต็มใจ

การวิจัยเรื่อง ผลของโปรแกรมส่งเสริมการนอนต่อคุณภาพการนอนหลับในผู้สูงอายุ
วันที่ให้คำยินยอม วันที่.....เดือน.....พ.ศ.....

ก่อนที่จะลงนามในใบยินยอมให้ทำการวิจัยในครั้งนี้ ข้าพเจ้าได้รับการอธิบายจากผู้วิจัยถึงวัตถุประสงค์ของการวิจัย วิธีการวิจัย อันตราย หรืออาการที่อาจเกิดขึ้นจากการวิจัย รวมทั้งประโยชน์ที่จะเกิดขึ้นจากการวิจัยอย่างละเอียด และมีความเข้าใจดีแล้ว

ผู้วิจัยรับรองว่าจะตอบคำถามต่าง ๆ ที่ข้าพเจ้าสงสัยด้วยความเต็มใจ ไม่ปิดบังซ่อนเร้นจนข้าพเจ้าพอใจ

ข้าพเจ้ามีสิทธิที่จะบอกเลิกการเข้าร่วมโครงการวิจัยนี้เมื่อใดก็ได้ และเข้าร่วมโครงการวิจัยนี้ด้วยความสมัครใจ และการบอกเลิกการเข้าร่วมการวิจัยนี้ จะไม่มีผลกระทบต่อประโยชน์ต่าง ๆ ที่ข้าพเจ้าจะพึงได้รับต่อไป

ผู้วิจัยรับรองว่าจะเก็บข้อมูลเฉพาะที่เกี่ยวกับตัวข้าพเจ้าเป็นความลับ และจะเปิดเผยเฉพาะในลักษณะของการสรุปผลการวิจัย การเปิดเผยข้อมูลของข้าพเจ้าต่อหน่วยงานต่าง ๆ ที่เกี่ยวข้องจะทำได้เฉพาะด้วยเหตุผลด้านเป็นทางวิชาการเท่านั้น

ผู้วิจัยรับรองว่าหากเกิดอันตรายใด ๆ จากการวิจัยดังกล่าว ข้าพเจ้าจะได้รับการรักษาพยาบาลโดยไม่คิดมูลค่าตามมาตรฐานวิชาชีพ และจะได้รับการชดเชยรายได้ที่สูญเสียไประหว่างการรักษาพยาบาลดังกล่าว ตลอดจนเงินทดแทนความพิการที่อาจเกิดขึ้น

ผู้วิจัยรับรองว่า หากมีข้อมูลเพิ่มเติมที่ส่งผลกระทบต่อการศึกษา ข้าพเจ้าจะได้รับการแจ้งให้ทราบโดยไม่ปิดบังซ่อนเร้น

ข้าพเจ้าได้อ่านข้อความข้างต้นแล้ว และมีความเข้าใจดีทุกประการ และได้ลงนามในใบยินยอมด้วยความเต็มใจ

(ข้าพเจ้าไม่สามารถอ่านหนังสือได้ แต่ผู้วิจัยได้อ่านข้อความในใบยินยอมนี้ให้แก่ข้าพเจ้า ฟังจนเข้าใจดีแล้ว ข้าพเจ้าจึงลงนามหรือประทับรอยนิ้วมือขวาของข้าพเจ้า ในใบยินยอมด้วยความเต็มใจ)

ลงนาม ผู้ยินยอม

ลงนาม พยาน

ลงนาม พยาน

APPENDIX D

เลขที่แบบสัมภาษณ์.....

แบบสัมภาษณ์คุณภาพการนอนหลับ

เรื่อง “ผลของโปรแกรมส่งเสริมการนอนต่อคุณภาพการนอนหลับในผู้สูงอายุ”

คำชี้แจง แบบสัมภาษณ์นี้ประกอบด้วย 2 ส่วน คือ

1. แบบบันทึกข้อมูลส่วนบุคคล
2. แบบประเมินคุณภาพการนอนหลับ

ส่วนที่ 1 แบบบันทึกข้อมูลทั่วไป

คำชี้แจง ผู้สัมภาษณ์ทำการสัมภาษณ์ข้อมูลทั่วไป ตามข้อคำถามที่กำหนดให้ดังต่อไปนี้

ชื่อ.....นามสกุล.....

1. เพศ ชาย หญิง
2. อายุ ปี
3. สถานภาพสมรส
 โสด คู่
 หม้าย/หย่า/แยก อื่นๆ ระบุ.....
4.
5.
6.
7.
8. ยาหรือสมุนไพรที่รับประทานเป็นประจำ.....

ส่วนที่ 2 แบบประเมินคุณภาพการนอนหลับ (The Pittsburgh Sleep Quality Index: PSQI)

คำชี้แจง ผู้สัมภาษณ์ทำการสัมภาษณ์แบบประเมินตามข้อคำถามที่กำหนด โดยทำเครื่องหมาย ✓ หรือเติมข้อความในช่องว่างลงในแต่ละข้อที่ตรงกับ การนอนหลับส่วนใหญ่ของท่าน ในระยะ 1 เดือนที่ผ่านมา (กรุณาตอบทุกข้อ)

1. ท่านมักเข้านอนเวลาประมาณ.....น.
2. ท่านมักจะหลับหลังจากเข้านอนแล้ว.....นาที
3.
4.
5.
6.
7.
8.

9 ท่านมีปัญหาเกี่ยวกับการนอนหลับเนื่องจากสาเหตุเหล่านี้บ่อยเพียงใด	ไม่มีปัญหาเลย	มีปัญหา < 1 ครั้ง ต่อ สัปดาห์	มีปัญหา 1-2 ครั้ง ต่อ สัปดาห์	มีปัญหา ≥3 ครั้ง ต่อ สัปดาห์
9.1 นอนไม่หลับ หลังจากเข้านอนไปแล้วนานกว่า 30 นาที				
9.2				
9.3				
9.4				
9.5				
9.6				
9.7				
9.8				
9.9				
9.10 สาเหตุอื่น ๆ ถ้ามี (ระบุ)				

APPENDIX E

โปรแกรมส่งเสริมการนอน ต่อคุณภาพการนอนหลับในผู้สูงอายุ

เป็นเครื่องมือที่ใช้ดำเนิน โปรแกรมส่งเสริมการนอน เพื่อส่งเสริมคุณภาพการนอนหลับในผู้สูงอายุ ผู้วิจัยสร้างขึ้นจากการทบทวนตำรา วารสาร งานวิจัยและบทความต่าง ๆ ที่เกี่ยวข้องกับ การนอนในผู้สูงอายุ การให้การให้ความรู้การนอน และการออกกำลังกายแบบซิงก์

เมื่อผู้สูงอายุที่มีคุณภาพการนอนหลับไม่ดี ส่วนใหญ่เกิดจากถูกรบกวนทั้งด้านร่างกายและจิตใจ เช่น ความไม่สบาย การถ่ายปัสสาวะบ่อย ความเครียด อารมณ์เศร้า ความวิตกกังวล เสียงดัง แสงสว่างมาก เป็นต้น ทำให้การเข้าสู่การนอนหลับยาก นอนหลับไม่สนิท การนอนหลับไม่ต่อเนื่อง โดยมีอาการตื่นบ่อย ตื่นง่ายเมื่อถูกรบกวน และตื่นเร็ว ส่งผลให้ระยะเวลาการนอนหลับ กลางคืนน้อยลง หรือมีอาการง่วงนอนในกลางวัน และความพึงพอใจต่อการนอนหลับลดลง ดังนั้น ควรมีการส่งเสริมให้สามารถปรับตัวและเผชิญกับปัญหาการนอนหลับ ซึ่งรูปแบบการส่งเสริมการนอนหลับโดยไม่ใช้ยามีหลายรูปแบบ ทั้งการปรับพฤติกรรมทางการรู้คิด การออกกำลังกาย การผ่อนคลาย ดนตรีบำบัด การให้ความรู้ การสร้างสุขนิสัยการนอน การจำกัดการนอน การปรับความคิด ซึ่งพบว่าการใช้หลายวิธีร่วมกันมีประสิทธิภาพมากกว่าใช้วิธีเดียว การส่งเสริมการนอนหลับโดยไม่ใช้ยา เป็นรูปแบบที่น่าสนใจต่าง ๆ มาใช้ร่วมกัน สามารถนำมาใช้ได้อย่างปลอดภัยและมีประสิทธิภาพเพียงพอในการส่งเสริมคุณภาพการนอนหลับในผู้สูงอายุ

การให้ความรู้เกี่ยวกับการนอนสามารถให้ได้หลายวิธี เช่น การอบรม การสอน การสาธิต การฝึกปฏิบัติ เป็นต้น จากการศึกษาการให้ความรู้โดยวิธีการสอน การอภิปรายหรือการสาธิต ทำให้ผู้เรียนรู้มีความรู้ สามารถปฏิบัติตัวได้เหมาะสมมากขึ้น ส่วนการบริหารกายจิตแบบซิงก์ เป็นการออกกำลังกายที่มีการเคลื่อนไหวร่างกาย ประกอบกับการควบคุมจังหวะการหายใจเข้าออกอย่างมีสมาธิ เป็นการฝึกฝนจิตใจควบคู่ไปกับการเคลื่อนไหวทุกส่วนของร่างกาย ทำให้มีการผ่อนคลายกล้ามเนื้อและจิตใจ ช่วงที่ฝึกเมื่อจิตใจสงบและมีสมาธิ ส่งผลทำให้ร่างกายมีการเพิ่มปริมาณของสารสื่อประสาทแคททีโคลามีน ได้แก่ นอร์อิพิเนฟริน โดปามีน ซีโรโทนิน และส่งผลทำให้ร่างกายมีการหลั่งสารเอนโดรฟิน ซึ่งเป็นสารที่ทำให้เกิดความรู้สึกสบาย ในช่วงที่ฝึกจะมีการเปลี่ยนแปลงคลื่นสมองทำให้คลื่นสมองแอลฟาและบีตาเพิ่มมากขึ้น คลื่นสมองแอลฟาพบได้ในผู้ที่มีความรู้สึกผ่อนคลาย มีสมาธิ ส่วนคลื่นสมองบีตาพบได้ในคนที่เริ่มนอนหลับ การบริหารกายจิตแบบซิงก์สามารถลดความเครียด และมีผลต่อการควบคุมฮอร์โมนในร่างกาย และช่วยให้ผู้สูงอายุนอนหลับได้ ในการส่งเสริมการนอนในครั้งนี้ ผู้วิจัยให้ความรู้โดยการสอน บรรยาย และสาธิต ประกอบกับสื่อเกี่ยวกับ การส่งเสริมการนอนในรูปแบบต่าง ๆ ร่วมกับการฝึกการบริหารกายจิตแบบซิงก์ เพื่อ

เป็นสิ่งเร้าแก่ผู้สูงอายุให้เกิดการเรียนรู้ ตอบสนองพฤติกรรมตามการเรียนรู้ของตน เป็นการส่งเสริมผู้สูงอายุมิมีบทบาทสำคัญในการดูแลสุขภาพตนเอง สามารถส่งเสริมการนอนได้อย่างเหมาะสม ป้องกันการเกิดปัญหาสุขภาพจิตที่จะเกิดตามมา

เมื่อพิจารณาถึงอุบัติการณ์การเกิดปัญหาการนอนหลับในผู้สูงอายุที่ค่อนข้างสูง และผลกระทบต่อร่างกายและจิตใจที่อาจเกิดตามมา การส่งเสริมการนอนโดยไม่ใช้ยามีความสำคัญอย่างยิ่ง และมีการส่งเสริมการนอนหลายรูปแบบที่สามารถนำมาใช้ได้อย่างปลอดภัย และมีประสิทธิภาพ นอกจากนี้การศึกษาในประเทศไทยพบว่า การส่งเสริมคุณภาพการนอนยังมีค่อนข้างน้อย ดังนั้น ผู้วิจัยจึงสนใจจัดโปรแกรมส่งเสริมการนอน โดยการให้ความรู้เกี่ยวกับการส่งเสริมการนอนร่วมกับการบริหารกายจิตแบบซิงกง ซึ่งเป็นวิธีหนึ่งที่สามารถส่งเสริมคุณภาพการนอนหลับได้และเหมาะสมสำหรับผู้สูงอายุในชุมชน โดยมุ่งเน้นให้มีความเป็นไปได้ในการปฏิบัติจริงในชุมชน เน้นที่การปฏิบัติ เมื่อผู้สูงอายุได้รับข้อมูลที่ถูกต้องเกี่ยวกับการส่งเสริมการนอน รวมถึงมีทักษะการบริหารกายจิตแบบซิงกง ก็สามารถนำไปปรับใช้ในชีวิตประจำวันได้อย่างเหมาะสม ส่งผลให้คุณภาพการนอนหลับดีขึ้น อีกทั้งเป็นการช่วยส่งเสริมและป้องกันปัญหาสุขภาพจิต อันเป็นผลดีต่อสุขภาพทั้งร่างกายและจิตใจ

วัตถุประสงค์

1. เพื่อส่งเสริมความรู้เกี่ยวกับการนอนหลับในผู้สูงอายุ
2. เพื่อส่งเสริมความรู้และทักษะการบริหารกายจิตแบบซิงกง
3. เพื่อส่งเสริมคุณภาพการนอนหลับ

กลุ่มเป้าหมาย

ผู้สูงอายุในชุมชนตำบลสนามชัย อำเภอเมือง จังหวัดสุพรรณบุรี จำนวน 31 คน

สถานที่ดำเนินการ

บริเวณวัดโพธิ์เจริญ ตำบลสนามชัย อำเภอเมือง สุพรรณบุรี

ระยะเวลาและวิธีดำเนินการ

ผู้สูงอายุเข้าร่วมกิจกรรมการส่งเสริมการนอน โดยเข้ารับการให้ความรู้ร่วมกับการบริหารกายจิตแบบซิงกงอย่างต่อเนื่อง ในระหว่างวันที่ 15 มีนาคม – 10 เมษายน พ.ศ. 2549 เป็นระยะเวลา 4 สัปดาห์ สัปดาห์ละ 3 ครั้ง วันจันทร์ พุธ และศุกร์ รวม 12 ครั้ง โดยจัดกิจกรรมตามช่วงเวลา

16.00-16.30 น. กิจกรรมการให้ความรู้เกี่ยวกับการนอนในผู้สูงอายุ

16.31-17.00 น. กิจกรรมการบริหารกายจิตแบบซิงกง

โดยมีกิจกรรม ดังนี้

- | | | |
|----------|----|--|
| ครั้งที่ | 1 | ปฐมนิเทศ และเตรียมร่างกายก่อนฝึกชี้กึ่ง |
| ครั้งที่ | 2 | ผู้สูงอายุกับการนอน และฝึกชี้กึ่ง 4 ท่า |
| ครั้งที่ | 3 | นอนอย่างไร เรียกว่ามีคุณภาพ และการบริหารกายจิตแบบชี้กึ่ง |
| ครั้งที่ | 4 | ปัจจัยที่ทำให้นอนไม่หลับและการบริหารกายจิตแบบชี้กึ่ง |
| ครั้งที่ | 5 | วิธีสร้างสุขนิสัยการนอน และการบริหารกายจิตแบบชี้กึ่ง |
| ครั้งที่ | 6 | การออกกำลังกายกับการนอน และการบริหารกายจิตแบบชี้กึ่ง |
| ครั้งที่ | 7 | หลับสบายยามผ่อนคลาย และการบริหารกายจิตแบบชี้กึ่ง |
| ครั้งที่ | 8 | กินอย่างไรให้นอนหลับ และการบริหารกายจิตแบบชี้กึ่ง |
| ครั้งที่ | 9 | สร้างสิ่งแวดล้อมให้นอนสบาย และการบริหารกายจิตแบบชี้กึ่ง |
| ครั้งที่ | 10 | วิธีง่าย ๆ ให้หลับสบาย (1) และการบริหารกายจิตแบบชี้กึ่ง |
| ครั้งที่ | 11 | วิธีง่าย ๆ ให้หลับสบาย (2) และการบริหารกายจิตแบบชี้กึ่ง |
| ครั้งที่ | 12 | สรุปและประเมินผลโปรแกรม |

สื่อ/อุปกรณ์ประกอบกิจกรรม

คู่มือการบริหารกายจิตแบบชี้กึ่ง ของนายแพทย์เทิดศักดิ์ เดชคง กรมสุขภาพจิต กระทรวงสาธารณสุข เป็นเอกสารที่จัดเป็นเล่มมีการบรรยายพร้อมภาพประกอบเป็นตัวแทนสัญลักษณ์ เพื่อเป็นสื่อประกอบการบรรยายให้ความรู้และสาธิตการออกกำลังกาย

เอกสารแผ่นพับเกี่ยวกับวิธีการส่งเสริมการนอน เป็นเอกสารที่ผู้วิจัยสร้างขึ้น

การประเมินผล

แบบสัมภาษณ์ประเมินคุณภาพการนอนหลับ ซึ่ง The Pittsburgh Sleep Quality Index (PSQI) ที่บุชชี เรย์โนลด์ส์ มองส์ เบอร์แมน และคัพเฟอร์ (Buysse, Reynolds, Monk, Berman & Kupfer, 1989) ได้สร้างขึ้น และแปลเป็นภาษาไทย โดยตะวันชัย จิระประมุขพิทักษ์ และวารัญ ตันชัยสวัสดิ์ (1997)

APPENDIX F



คำสั่ง

บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล

ที่ (ศร) 0575 /2548

เรื่อง แต่งตั้งคณะกรรมการควบคุมวิทยานิพนธ์

บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล อนุมัติให้ นางสาวศศิวิมล วรรณทอง เลขประจำตัว 4737727 NSMH/M นักศึกษาบัณฑิตวิทยาลัย ระดับปริญญาโท สาขาวิชาการพยาบาลสุขภาพจิตและจิตเวช คณะพยาบาลศาสตร์ ศึกษาวิจัยค้นคว้าเขียนวิทยานิพนธ์ ด้วยภาษาอังกฤษ ในหัวข้อเรื่อง “EFFECTS OF SLEEP PROMOTION PROGRAM ON SLEEP QUALITY IN OLDER ADULT.” และขอแต่งตั้งคณะกรรมการควบคุมวิทยานิพนธ์ ดังนี้

- | | |
|------------------------------|---------------|
| 1. ผศ.ดร.วรรณมา คงสุริษนาวิณ | ประธานกรรมการ |
| 2. ผศ.ดร.อดิรัตน์ วัฒนไพสิน | กรรมการ |
| 3. อ.ดร.อหิตยา พรชัยเกตุ | กรรมการ |

ทั้งนี้ตั้งแต่วันที่ 29 ธันวาคม 2548 เป็นต้นไป

สั่ง ณ วันที่ 30 ธันวาคม พ.ศ. 2548

(ศาสตราจารย์ นพ.บรรจงมไหสวริช)

รองคณบดีฝ่ายวิชาการ

ปฏิบัติราชการแทน คณบดีบัณฑิตวิทยาลัย

สำเนาเรียน คณะกรรมการควบคุมวิทยานิพนธ์

BIOGRAPHY

NAME	Miss. Sasiwimon Wanthong.
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INSTITUTIONS ATTENDED	Naresuan University, 2002. Bachelor of Nursing. Mahodol University, 2006. Master of Nursing Science (Mental Health and Psychiatric Nursing)
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