

Sleep disturbance among elderly people in Nursing home: A nonpharmacological approach

Literature Review study

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Abstract: Sleep disturbance is a common complaint among elderly people living in nursing home. This phenomenon is usually as a result of a series of related factors including medical, environmental, and behavioral and age related factors.

Aims: The purpose of the study is to bring to lime line what needs to be done in promoting health through empowerment strategies among elderly people suffering from sleep disturbance. To research on common sleep assessment tools available to diagnose sleep disturbance in nursing home and also to investigate potential non-pharmacological interventions that can resolve sleep problem among elderly people. The study was guided by Derek Chambers & Susan Thompson (2008) theory of Empowerment to enable the author achieves the objectives.

Method: Qualitative method was used in this study and deductive content analysis was employed to analyze selected articles for the study and later the findings were organized under four categories.

Results: Results shows two main sleep assessment tools Objective and subjective sleep assessment tools. Objective includes; Pittsburgh sleep quality Index (PSQI), wrist actigraphy, polysomnography. While nonpharmacological intervention approaches yielded great significance to promote sleep in elderly people. They include; sleep restriction, stimulus control, relaxation therapy, scheduled bright light, incontinence management, aromatherapy, bed massage, music, acupressure, Tai Chi program and aerobic exercises.

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Tiivistelmä: Uni ongelmat ovat yleinen vaiva hoitokodeissa asuvilla vanhuksilla. Vaivan vaikuttavat useat eri lääketieteelliset, käyttäytymis, ikä ja ympäristö sidonnaiset tekijät. Tämän tutkimuksen tarkoituksena on selvittää miten tietoa uni vaikeuksista kärsivien vanhusten auttamisesta voitaisiin levittää ja miten univaikeuksista kärsiviä auttaa. Tutkimus selvittää tavallisesti hoivakodeissa tarjolla olevia diagnostisia menetelmiä uniongelmien selvittämiseen, sekä selvittää mahdollisia ei lääkinnällisiä tapoja uni ongelmien parantamiseen vanhus potilailla. Tutkimus tehtiin terveyden edistämisen näkökulmasta ja kontekstissaan sen lähteitä hyödyntäen. Tutkimus menetelmänä on käytetty kvalitatiivistä kirjallisuus analyysiä jonka tulokset on analysoitu deductiivisellä sisältö analyysillä ja löydökset esitetty ryhmiteltyä neljään katagoriaan.

Yleisesti hoitokodeissa käytetyt objektiiviset unen analyysi menetelmät ovat Pittsburgh unen laatu analyysi indexi (PSQI), ranne actigraphy ja polysomnography. Ei lääkinnälliset interventio menetelmät uni häiriöiden hoitoon ovat stimulaation kontrollointi ennen nukkumaan menoaa, nukkumis ajan rutinoittaminen, rentoutumisterapia, säännöllinen valoterapia, inkontinenssin hoito, aromiterapia, hieronta, musiikki, acupressure terapia, ohjattu Tai Chi voimistelu ja aerobic harjoittelu.

Avainsanat:	unihäiriöt, vanhukset, ei Farmakologiset, sairaskoti, terveys , Terveyden edistäminen
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FOREWARD

This work is dedicated to God almighty that inspired and instills in me the zeal to go through the entire process. He let me through all the difficulties to finish my degree. I will live to praise him forever.

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1 INTRODUCTION

Sleep disturbances is a common problem in the society at large with disastrous health implications. However, it is common among elderly people in nursing home. (Reza et al. 2010) Suen and Wong (2002) found that about 70% of elderly people in long term care suffer from sleep disturbances. In another study by Ancoli –Isreal et al (2006), the aging process itself is not the main cause of sleep disturbance per se, but the possibility to sleep progressively decreases with age coupled with attributed health conditions and the medications previously used to treat sleep disturbances. (Ancoli- Isreal et al 2008) However, several factors contribute to the problem; including geriatric syndromes for example urinary incontinence, psychiatric disorders like dementia and depression, (Alessi et al. 2005) environmental and behavioral. (Alessi and Schnelle 2000) Other contributive factors include changes in sleep mechanism due to change in the circadian rhythm which changes as one grows older as well as the prevalence of primary sleep disorder. (Alessi et al 2005)

It has been noticed that elderly people suffering from sleep disturbance are most likely to possess symptoms like difficulty falling and maintaining sleep, sleep fragmentation, get up too early in the morning and sleep more during the day. (Reza et al 2010) Other symptoms include; tiredness, tension, anxiety, headache, poor memory performance, upset stomach, anger and lack of energy (The American Academy of Sleep Medicine 2008). Sleep disturbance has been found to be responsible for most fall cases in nursing home and has been proclaimed to lead to death in the long run if proper management is lacking. (Chan et al 2010)

In a nutshell, it is not wise to conclude if noticed one or more of the above symptom(s) as basis for treatment because effective treatment depend on a clear diagnosis. (Sandberg et al 2001) Therefore, a more concrete assessment procedure is necessary before any treatment is being considered.

Considering the consequences of this problem as discussed above. The author chose non-pharmacological interventions as an alternative approach to resolve the problem. Some standard nonpharmacological interventions to resolve the problem according to Philip and Ancoli- Isreal (2001) consists of a regular scheduled sleep circle, exercises, total absent or reduce daytime naps and outdoor exposure to bright light in the late afternoon, avoidance of alcohol, Caffeine and stimulating medications near bed time. (Philip and Ancoli-Isreal 2001)

Some research scientists suggest that sleep medications itself can provoke sleep disturbance especially when discontinued. (Alessi and Schnelle 2000) Medications noted to cause sleep disturbance include decongestants medicine, bronchodilators, cardiovascular medications, stimulating antidepressants like beta-blockers and alpha-blockers, phenytoin, H2-blockers, levo-dopa, diuretics and caffeine given at night. (Alessi and Schnelle 2000)

Nevertheless, the implementation of nonpharmacological interventions to resolve sleep difficulties came into existence in accordance with the principles of clinical governance that promote organizational responsibility which stipulates that if any ongoing strategies to improve effectiveness in health services is successful then more attention must be given to it. (Collier et al 2003)

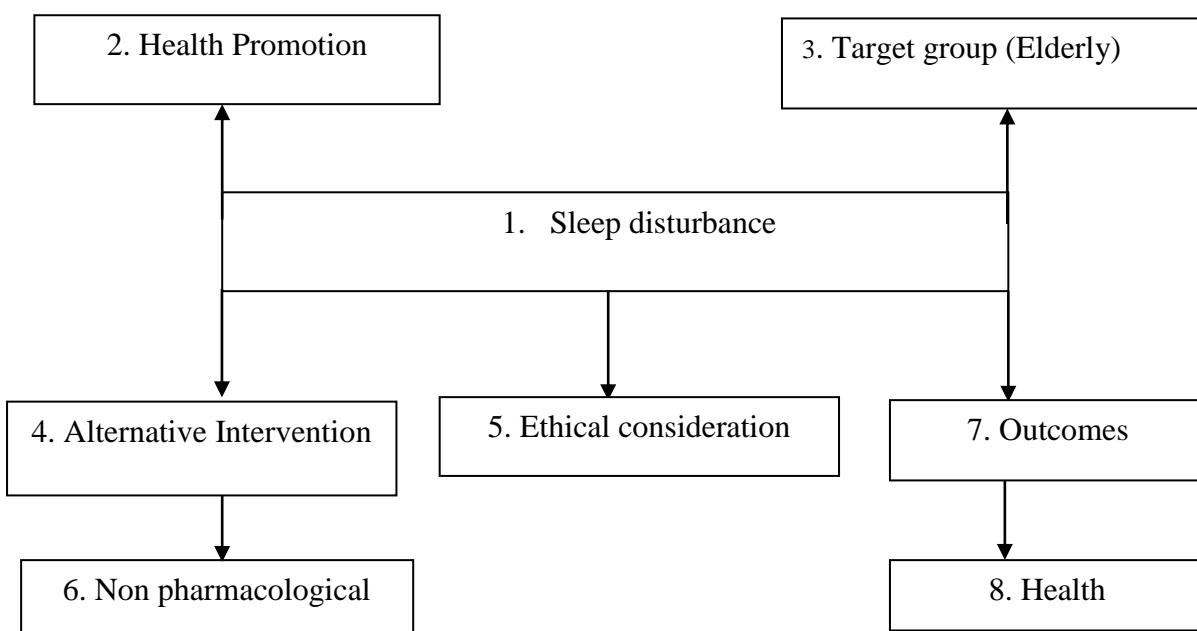
Derek Chambers & Susan Thompson (2008) theory of empowerment guided the study and is the major theoretical framework. Their theory is linked to health promotion to form a platform on how to go about promoting health in elderly people. Through this theory, the author is able see clearly the impact of using nonpharmacological approach to resolve sleep difficulties among elderly people in nursing home. While some research scientists pointed out that health promotion is a complex concept that means different things to different people, therefore, there should be a need for researchers in the healthcare sector to specify a particular trend to go about especially when dealing with cases of treatment (Green and Tones 2004). In this case, the author's trend to go about it is by reviewing previous articles of non-pharmacological approaches that can be used as alternative approach to resolve sleep problems.

1.1 Motivation for choice of research topic

The author of this study developed interest in the topic while in the course of a practical training program in a Nursing home. As one of the condition, each student is obliged to consider a case study. Unfortunately, the author's case study had difficulties in sleeping. The client possessed symptoms of dementia for instance difficulty to fall asleep, fatigue, tension, agitation and aggression. While pondering on how to assist the client sleep well, the author read through the medical file and discovered a long history of prescribed anti-depressant medicines like serotonin reuptake inhibitors to induce sleep. Even with the intake of these drugs, the client still had problem and could still not sleep well. This brought to the author's knowledge the zeal to investigate alternative means that could enable improve sleep quality of the client.

The author embarked on evidence based literature to support the practice. This was to appropriately make sure the practice is safe and generally accepted. Evidence based practice according to Aveyard (2007 p 6) is an appropriate application of research knowledge to practice. It is the "*conscientious, explicit, and judicious use of current best evidence in making decision about the care of individual patients*" (Sackett et al. 1996 p 71). Figure 1 below is a mind map sketch on how the research topic came into existence.

(Figure 1) Mind Map sketch



The sketch above depicts the interconnections and relations that exist between the various elements and concept of the topic. The purpose of this sketch is to expose a visual structure and classification on how the research topic came about with the intention to assist the reader grapple with the work as it unfolds. The element in the boxes is arranged according to the importance of the concept from 1 to 8, with the aim of representing other connections between portions of ideas.

Aveyard (2007) described the sketch as a mind map which guides researchers to make notes about an idea for a literature review topic in order to generate further ideas to formulate a concrete topic (Aveyard 2007 p 45). The initial idea that came up was sleep disturbance numbered above as 1, it gradually developed to form other ideas and further developed through stages 2 to 8.

Another motivating factor is to uphold the objective of the entire program. Being a student of human Ageing and Elderly service program, the author's interest is to contribute to knowledge through research work and to promote health in elderly people.

1.2 Objectives and Research Questions

With regards to the complexity of sleep disturbances that is often influence by a series of factors, the author's interest is to address the issues underlining the problem, why it is so prevalent amongst elderly people in nursing home. To examine sleep assessment tools, diagnosis and management strategies of sleep disturbance cases. Furthermore, to establish standard approaches to promote quality sleep through non-pharmacological interventions. Within the context of the objectives, two research questions were derived at;

1. What are the common sleep assessment tools to diagnose sleep disturbance among elderly people in nursing home?
2. How to improve sleep quality through non-pharmacological interventions among elderly people in nursing home?

1.3 Previous Research

Previous literatures were reviewed in an attempt for the author to grasp a pre-knowledge of the study. In the course of reviewing these literatures, it was noted that effective diagnosis is necessary before any sort of interventions is administered. Non-pharmacological approaches are an effective alternative to resolve sleep problems among elderly people in nursing home due to its low or no side effects.

To elaborate on previous researches, Krishnan P & Hawranik P (2007) in their study "*Diagnosis and management of geriatric insomnia: A guide for nurse practitioners*". They discuss assessment methods used to diagnose and manage sleep disturbance among elderly. Several point sleep assessment form was noted and were categorized under eight main heading; Sleep history, sleep log or diary, Rest, Sleep/Psychological assessment scales, social factors, medications, medical /psychological factors and general factors.

Sleep history was further subcategorized under three heading Bedtime, sleep and daytime functioning.

Under bedtime, they focused on if the light is off at the time when clients are sleeping. If the bedroom environment is convenient to sleep (room temperature, room quietness), legs symptoms, pain, partner snoring, how many minutes it takes for clients to fall asleep.

Under sleep, they took note of the number of awakenings, the reason why the client is awake, how long it takes for clients to get back to sleep after any sleep disruption. Does the client wake up too early? Is the client suffering from incontinence, pain, palpitations, difficulty in breathing, heartburn, nightmares, movement of clients, restless legs and also if the client snores while sleeping.

Daytime function assesses client's driving ability, attention and concentration, cataplexy. If the client fall asleep while watching TV or reading after dinner.

Sleep log or dairy keeps and record information of clients for a period of 1 to 2 weeks taking in considerations when client goes to bed, actual sleeping time, number of awakenings, why the client is awake and when they get back to sleep. Daytime functioning of clients, how often clients takes a nap, social factors. This information is always completed in the following morning the previous day and not during the day or night.

Under the heading *Rest*. They considered if client had restorative sleep the previous night, if client sleep excessively and is tired during the day.

Sleep/Psychological assessment Scales consists of Pittsburgh sleep quality index, Epworth sleepiness scale and Beck depression inventory.

Social factors were grouped under three subheadings; Occupational, Exercise, Habits.

Occupational consists of the impact of shift work, weekend's schedules.

Exercise such as relaxation exercises, yoga, meditational. Habit assesses if clients consumes high level of caffeine, tobacco, alcohol and cocaine.

Medications suspected to cause sleep disruption among elderly according to their study are adrenergic agonists, amphetamines, some antibiotics especially quinolones, anticonvulsants, antidepressants, antihypertensive, cancer agents decongestants, diuretics, glucocorticoids, hypnotics, levodopa, niacin, oral contraceptives, stimulants, sympathomimetic, theophylline, thyroid replacements.

Medical/Psychological factors that cause sleep disturbance includes asthma, Rheumatoid diseases, angina-coronary artery disease, cystic fibrosis, menopausal symptoms, thyroid problems, gastroesophageal reflux disease, irritable bowel syndrome, chronic renal or liver failure, anxiety, depression.

Though the study mentioned some pharmacological interventions to resolve sleep disturbance, the author of this study is interested in nonpharmacological intervention. Nonpharmacological interventions according to their study should be aim at correcting behaviors that are not conducive to healthy sleeping. In a nutshell, cognitive behavioral

interventions according to their study seem to be very important and are widely used in most nursing homes.

Krishnan P & Hawranik P (2007) found in their study that complaints of sleep disturbance among elderly people are often not taking into account and is considered a normal ageing process by those caring for elderly people. They noted that quality of life can be improved if those caring for elderly people are conscious and knows how to manage their problem. On the other hand, if sleep disturbance is not diagnosed at an earlier stage, it exposes elderly people at high risk of falls, motor vehicle accidents, depression, stroke, cancer and even suicide.

A similar study conducted by Elizabeth Collier and Gill Skitt (2003). They described a handful of evidence based practice of nonpharmacological approaches for instance; sleep restriction, sleep hygiene, break old habits, cognitive restructuring, sleep promoting food, bright light therapy, exercise, cognitive behavioural therapy, thought jamming, visual imagery, forward control exercises, general relaxation, articulatory suppression. Overall results show great improvement in resolving sleep disturbance among elderly.

Another research by Vaughn w McCall (2005). *Diagnosis and Management of Insomnia in Older People*. They listed five basic steps that can assist nurses caring for elderly people to identify and treat sleep disturbance. The first is to ask question about sleep at every new patient at the time of visit. The second step is to perform an initial evaluation of the problem, taking in considerations symptoms, contributing factors, and the effects on daytime function. Third step is to determine whether the patient is in crisis. Fourth step focuses on a thorough sleep history, blood test and polysomnography and finally the need for treatment. However, they suggest that nonpharmacological strategies are a mainstay of treatment for chronic sleep disturbance.

Holbrook et al (2000). *The diagnosis and management of insomnia in clinical practice: a practical evidence-based approach*. In their study, Nonpharmacological interventions recommended to resolve sleep disturbance among elderly people includes sleep hygiene manoeuvres and exercise

Alessi et al (2005). *Randomized, Controlled Trial of Nonpharmacological Intervention to Improve Abnormal Sleep/Wake Patterns in Nursing Home Residents*. They presented a total of 492 participants at the initial stage and after the screening process, 339 had night time sleep disruption and 120 completed a baseline assessment. Five nonpharmacological interventions were used to promote quality sleep among the subjects. They include reduce day time nap, sunlight exposure, decrease night time noise and light, increase physical activity, structured bedtime routine.

Montgomery & Jane Dennis (2004). *A systematic review of non-pharmacological therapies for sleep problems in later life*. In this systematic review study, 3 nonpharmacological interventions were considered to resolve sleep problem in older adults. These interventions include; bright light therapy, physical exercise, cognitive behavioral therapy.

1.4 Definitions of Core concepts

Consideration to define key terms in this study was taken into account. These terms however is to throw more light and proper understanding of the problem in question and to avoid ambiguous meaning on the reader's part. They include;

1.4.1 Sleep disturbance

Disturbed sleep can mean different things to different people. Generally, one thing that is certain is that it is often equated with Insomnia. Clinically it is defined as “persistent difficulty in initiating sleep, or non-restorative sleep that leads to significant daytime distress and impaired social or occupational functioning. (Ancoli-Isreal et al 2010)

1.4.2 Elderly

The World health Organization and the sport recreational bodies in Ireland define elderly person as someone who is above 50 years. (Michael Cooke et al 2007) Nevertheless, the British heart foundation argues that chronological age should not be a reliable source to decide whether a person is an elderly or not because there exist ‘old’ 50 years and ‘young’ 70 years. Hence, a more objective definition should rely on self-identification. (Active for later life 2003)

1.4.3 Nursing homes

Most nursing home looks more like a hospital; in other word it takes a medicalized setting. Residents are most likely to share room with another. Some of the rooms are very small and there exist little or no interaction within them and out of the premise. The main feature embodies large number of nurses who perform greater part of care. Accepted to stay in nursing home is base on varying conditions that depends on what the subject is suffering from. Those admitted in a nursing home are either in need of short or long term rehabilitative care. (Alessi and Schnelle 2000)

1.4.4 Health

Health is famously described as an essentially contested concept meaning different thing to different people. (Jackie and Tones 2010) It can be attributed to one of those abstract words like ‘love’ and ‘beauty’ which depends on the eyes of the beholder. Maggie D and Wendy MacDowall (2005) defined it using two approaches (absolute and relative definitions). Absolute definition is inline with the World Health Organization’s (1946) opinion which emphasized on “*a state of complete physical, mental and social wellbeing and not the absent of disease or infirmity*”. On the other hand, relative definition takes in considerations the social and cultural context since different societies and cultures consider state of health differently. However, the World Health Organization (1986) summarizes it as the “*resource for everyday life and not the objective of living*”.

Generally speaking, it seems difficult to figure out a standard definition for health; therefore, it should be base on the context under which it is used and not focusing on either the absolute or relative definitions. (Maggie D & Wendy MacDowall 2005)

2 BACKGROUND STUDY

This section enables the reader to understand the conceptual basics of the study in detail. It determines the structure on how to answer the research questions. Peterson et al (2001) recommends a theoretical background for any scientific writing because it guides the author to develop and answer the research questions.

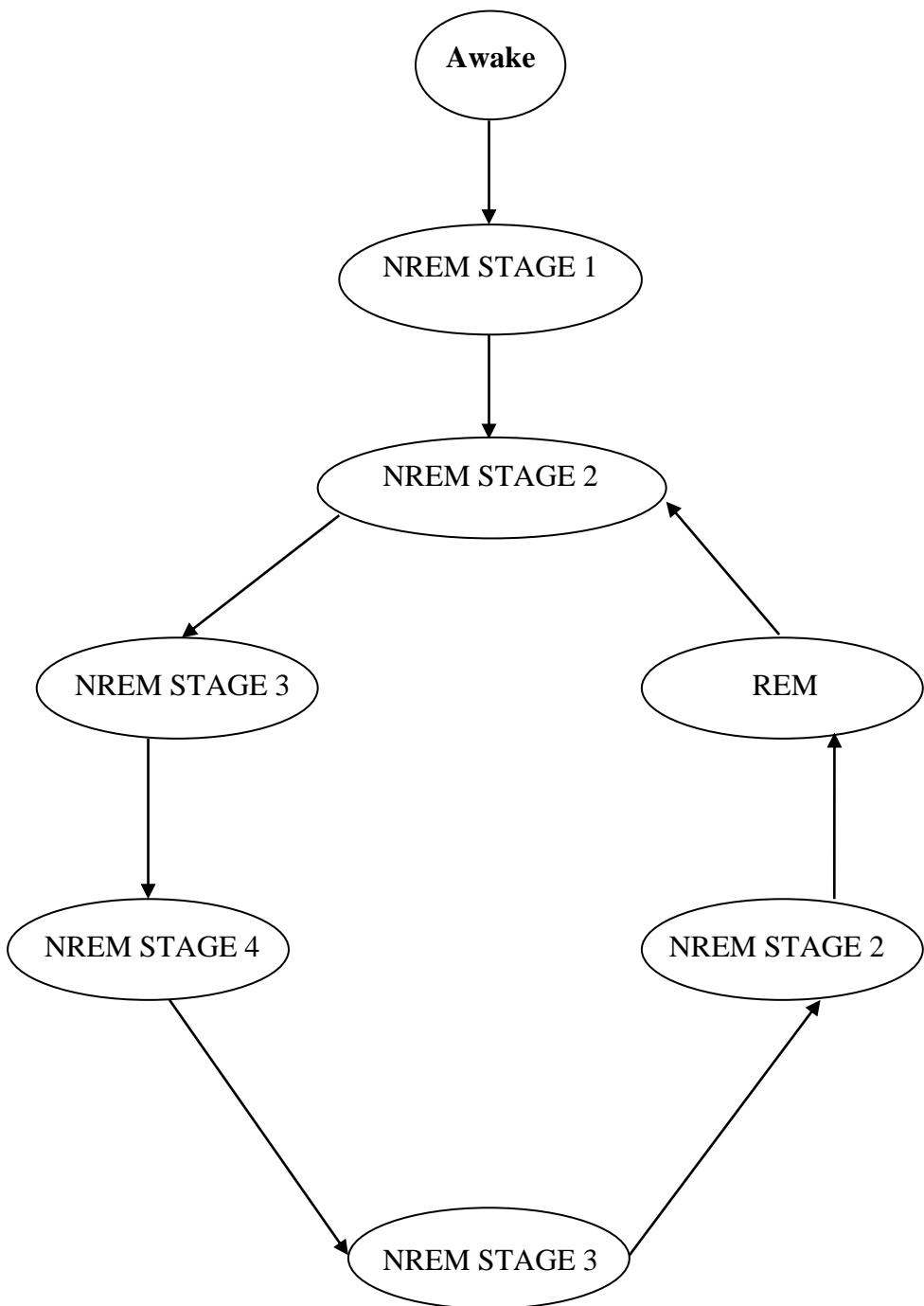
2.1 What is sleep

Sleep is generally divided into two physiological phases known as rapid eye movement (REM) and Non-Rapid eye movement (NREM) sleep. (Corey L. Nagel et al 2003) Non-Rapid eye movement phase according to Iber et al (2007) occurs in four phases throughout a normal sleep circle known as N1, N2, N3 and N4. It consists of about 70% to 75% of total sleep circle (Carskadon & Dement 2000). Phase N3 and N4 plays great role in the healing process. During phases (N3 and N4), the body and brain are being restored for adequate biological functioning. The brain and body tissues are also repaired and chemicals necessary for proper functioning are replenished during N3 and N4 phases.

While Rapid Eye movement sleeps (REM) is characterized by brain activation and muscle paralysis. It is known as the phase where procession of the memory occurs. Therefore, less amount of REM may results to poor recalling memory or recently learned information. (Siegel 2005; Walker & Stickgold 2006) Reason why those who suffers from sleep disturbance are likely can't recall or remember so fast.

Figure 2 below throw more light the different phases. The figure is a normal sleep cycle with sleep initiation beginning with 1NREM phase. It continues through each phases of NREM and a brief period of REM. The cycle is repeatable and REM sleep becomes more progressive in the long run until the individual is awaking. (Corey L. Nagel et al 2003)

(Figure 2) Normal Sleep Cycle



Corey L. Nagel et al (2003). *Sleep Promotion in Hospitalized Elders*

During the awake stage, the brain is alert and the muscles start getting tense. The NREM phase experiences a reduction in brain wave activity, slow eye movement and is known as the transitional phase. While during N2, the muscle becomes relaxed, body temperature decreases, there is reduction in heartbeat. (McKibbin et al 2005) Stage N3

and N4 of NREM phase is the deep sleep phase or the restorative sleep stage where secretion of growth hormones that stimulates protein synthesis and tissue repair takes place. (Carskadon and Dement 2000)

REM phase is where deep dreaming occurs, respiration rate increases and active inhibition of voluntary muscle. (McKibbin et al. 2005)

2.2 Sleep disturbance common in elderly people

This section presents an overview of some specific types of sleep disturbance common among elderly people in nursing home. They include;

2.2.1 Insomnia

Insomnia is generally classified under two headings, primary and comorbid insomnia. Primary insomnia is as a result that no other type of sleep problem has been diagnosed, while comorbid insomnia is as a result of other diagnosis alongside with insomnia that is behind the cause. Comorbid types of insomnia are characterized by psychiatric symptoms (anxiety, depression). Other attributed comorbid factors include medical disorder (cardiopulmonary disorder, chronic somatic complaints and neurological disorders. (Bloom et al 2009)

2.2.2 REM Sleep Behaviour disorder

Rapid Eye Movement sleep behavior disorder symptoms include the incapability to stay calm during the dream stage. This is so because at this stage the voluntary muscles are actively under suppression. It is characterize by “*intermittent loss of REM sleep, electromyography atonia and by the appearance of elaborate motor activity associated with dream mentation*”. (Paparrigopoulos 2005) Elderly people with this type according to Olson et al (2000) are likely to display varieties of movement which at times is harmful to them or those they share bed with. In some cases they get out of bed and walk about, swing their arms and legs assuming to hit something.

2.2.3 Restless Leg Syndrome

Elderly with this type complains of very painful sensation, tingling and crampy feelings in the extreme part of their body. Most often they describe the feeling as crawling feeling under the skin which provokes them to move or massage the legs to offer them with some relief. (Bloom et al 2009; Hickey 2000)

2.2.4 Narcolepsy

Narcolepsy is a neurological type cause by the inability of the human brain to correctly regulate sleep and wake circles. It occurs due to daytime somnolence and fatigue. According to Bloom et al (2009), it is characterize by hypnagogic hallucination, disturb nocturnal sleep, and sleep paralysis. During a narcolepsy attack sudden temporal muscle weakness occurs. (Bloom et al 2009) In more severe cases it causes the individual to fall asleep for an hour or even more. (National Disorder and stroke 2009)

2.2.5 Sleep Disordered Breathing

It involves snoring as a result of collapse of the airways that plays a role in breathing cessation during the respiration process. (Collop and Cassel 2002) In addition, elderly people with this type often experience reduce respiration while sleeping. It is often diagnose when it persist or exceed 10 seconds per event while sleeping at night leading to repeated arousal from sleep (Roepke & Ancoli-Isreal 2010). Other contributive cause of this type occurs when the tongue blocks the air from moving freely in and out of the throat due to fat in the neck region cause by overweight. (Roepke & Ancoli-Isreal 2010) It is associated with cognitive deficit and reduced vigilance. (Ancoli-Isreal and Ayalon 2006) Another contributive cause is when the brain fails to instruct the chest muscles or diaphragm to initiate breathing. (Sleep apnea: Keeping up the positive pressure 2010)

2.2.6 Advanced Sleep Phase disorder

Elderly people with advance sleep phase disorder often go to bed earlier and wake up early than expected. Their sleep onset period may be as early between 6pm and 9pm and getting up as early between 2am and 5am. (Bloom et al 2009) They find it difficult to change sleep patterns even when they try not to sleep earlier. Lack & Wright (2007) suggests they get up early than desired consequently causing sleep debt.

2.2.7 Circadian Rhythm Sleep Disorders

Circadian rhythm sleep disorders result due to the alterations of the central circadian clock responsible for human biological rhythm that control and work on a daily time scale. How elderly people feels to fall sleepy will all depends on the length of time when they get up from an adequate sleep determine by their internal circadian rhythms. It is described in two phases known as delayed sleep phase common in adolescent and advance sleep phase common among elderly people. (Martinez and Sfreddo Lenz M. C. 2010)

Common symptoms includes; early bedtime and wake time habits, inability to maintain sleep throughout the night, undesired early morning awakening, frequent daytime sleepiness resulted from changes of the circadian timing system (Bloom et al 2009)

2.3 Causes of Sleep disturbance

It is imperative to understand the cause(s) of a particular sleep problem before any sort of intervention is ensue. People caring for elderly people in nursing home should consider this aspect as a significant part during the screening and treatment process of sleep disturbance, because treatments are base on the causes. However, several factors account for it as follows.

2.3.1 Age related contributions

As one grows older, he or she is bound to undergo a variety of developmental and physiological changes. Phillips and Ancoli-Isreal (2001) suggests some of these changes as sleep fragmentation, increases in both arousals and awakenings and reduce REM or non-REM cycles that ultimately reduces sleep efficiency. Other age related changes includes early morning awakening, decrease in deep sleep stages with frequent night time arousal and the prevalence of certain sleep problems e.g. sleep disordered breathing, periodic limb movements of sleep (Alessi and Schnelle 2000)

Ancoli-Isreal et al (2008) found that changes in circadian rhythm plays a great role in the sleep pattern as one grows older. Because the circadian rhythm serves as a 24 hour biological rhythm responsible to control many physiological functions in humans like the endogenous hormone secretion, core body temperature, and sleep/wake cycle, a change in it will affect the sleep pattern in one way or the other. With age the sleep/wake circadian rhythm becomes weaker and less coordinated, consequently leads to less consistent period of sleep/wake across 24hours day.

2.3.2 Health and comorbid contributions

Health conditions responsible for sleep disturbance among nursing home residents are seen through severe illnesses such as chronic pain, cardiac, vascular, pulmonary, endocrine and renal diseases, gastrointestinal disorders, incontinence and neurological disorders. (Ancoli-Isreal et al 2008; Alessi and Schnelle 2000; Bloom et al 2009)

2.3.3 Environmental and behavioral contributions

Environmental surroundings of most nursing home for example shared rooms; long hallways with hard surface floor that easily transmit noise, numerous alarms, and television contributes to disturb sleep. (Alessi and Schnelle 2000) In an attempt to justify this hypothesis, Alessi et al (2000) conducted a study in three nursing homes to investigate major environmental causes of sleep disturbance. They implemented three nonpharmacological approaches; noise, nursing care routine and lightening. Results of their findings revealed no significant reductions in noise levels until 1am. Nursing care routines were accompanied by light changes. They found that 21% night time noise were due to residents, 22% from staffs and 58% from other equipment, with television often on but not watched throughout the night accounting for 19% of all noises.

In another study by Bloom et al (2009), they suggests most residents in nursing home have no access to bright light exposure which can be responsible to impede coordination of their internal circadian clock.

Behavioral contributions such as inactiveness of nursing home residents due to fear of fall. This habits in a long run leads to less participation in social and physical activities. Most elderly people would rather consider daytime napping to replace interaction and participation in day time activities. (Alessi and Schnelle 2000)

3 THEORETICAL FRAMEWORK

Chapter three present Derek Chambers & Susan Thompson (2008) theory of empowerment, which serves as the foundation for this study to answer the research questions. It is an explanatory base why this study was conducted. Through the framework, the reader will view clearly what it takes to improve sleep quality among elderly people, why and how to implement chosen interventions. Before commencing on this theory, it is wise to talk about health promotion first since empowerment has long been the point of interest within health promotion definition.

3.1 Health promotion

Having digested all the symptoms and the negative effects of sleep disturbance, the author moves forward to seek for solutions on how to resolve the problem. The solutions under which this problem can be resolve properly are through an effective, ethical and sustainable health promotion strategies. (Maggie and MacDowall 2005) Generally, health promotion programs are designed to enhance and maintain functional ability for all to enable individual live independently for a longer period of time and to enhance quality of life by assisting them to self-manage chronic disease which are disastrous to their health. (Nunez et al 2003) In addition, health promotion programs should have regular scheduled interventions through group education, on-site exercises, individual counseling with respect to the advantages and disadvantages of health promotion activities. (Barbara Resnick 2001)

The World health organization (1986) defines health promotion as “*the process of enabling individuals and community to increase control over the determinants of health and thereby improve their health*”. (Maggie & MacDowall 2005) Because the outcome of health promotion is good health suggesting that health is the “*state of a complete physical, mental and social wellbeing and not merely the absence of disease or infirmity*”. (<http://www.who.int/aboutwho/en/definition.html>). However, O'Donnell (1989) opposes the idea of ‘complete’ absence of physical, mental and social wellbeing as not to be realistic in present day society. This is for sure because many people today are living longer with increasing chronic diseases. It would rather be wise to omit the

word ‘*complete*’ from the definition in order to produce a broader definition as suggests by O’Donnell’s (1989) that health promotion is “*the science and art of helping people change their life style to move towards a state of optimal health ... it can be facilitated through a combination of efforts to enhance awareness, change, behavior, and create environments that support good health practices.*” (Loeb et al 2001)

3.2 Derek Chambers & Susan Thompson (2008) theory of Empowerment

Within the definition of health promotion, the concept of empowerment is of increasing interest to most researchers dealing with health practices. (Chambers and Thompson 2008) Empowerment according to them is to enhance equality in health as well as public participation regarding decisions affecting lives of the people. It is the process by which “*individual people are encouraged to assert their own autonomy and self-esteem sufficiently to be able to identify their own health agendas, rather than being told what to do*”. (Chambers and Thompson 2008)

The theory emphasizes the ability of healthcare providers to see the need to involve individuals, group or community through means of active participation by taking in considerations their social, cultural, psychological and political needs to influence decisions concerning their health. (Lis et al 2008) The theory entails gaining increasing control or influence in daily activities at the individual level. At a small level perspective, it entails shared experiences and influence of a group about decision making that concerns their lives. At the community level it is about making good use of the available resources as well as strategies to enhance community control over certain aspects of life. (Lord & Hutchison 1993)

With respect to health promotion concept, empowerment theory incorporates collaboration and encouragement between the empowerers and the individual or target group over decision making. (Haber 2007) In some cases there may be situation where the target group may rely on healthcare providers to make decisions on their behalf

about certain health related issues. This at time is to simplify an uncertain decision process. (Kennelly 2001)

What is very interesting and important here is that healthcare providers should persistently contact and create a forum of discussion with the target group in question. For instance, in situation where an individual finds it difficult to comply with his or her medication regimen to treat a certain illness, healthcare providers should assist them with medication schedule and also monitors possible interactive effects. (David Haber 2007)

Chambers and Thompson (2008) reveals that the term ‘Empower’ carries a dual meaning; as an act of gaining power and an act where healthcare providers have upper hand regarding decision making on behalf of the target group. However, the latter is more dangerous because it puts healthcare providers in total control and allows them to decide on behalf of their patients without consulting them. This aspect might go a long way leading to conflict between them and their patients because s/he ends up playing a passive role throughout the process. In more exaggerated cases it may create non-cooperative atmosphere from the target group against healthcare providers. (Chambers and Thompson 2008)

Due to the dual meaning attached to the concept ‘empowerment’ an option evolves to resolve the issue. The solution emphasizes that healthcare providers should liberate themselves from biomedicine which according to previous knowledge was assumed to be the main dependent source of knowledge. They should adopt a more refined habit that goes beyond biomedicine in order to embrace a holistical approach by taking into consideration patient’s experience, cultural and social background before commencing proper treatment.

Therefore, health promotion should be viewed in two perspectives. Holistic and biomedical approach. (Chambers and Thompson 2008)

3.2.1 Holistic Approach to Health Promotion

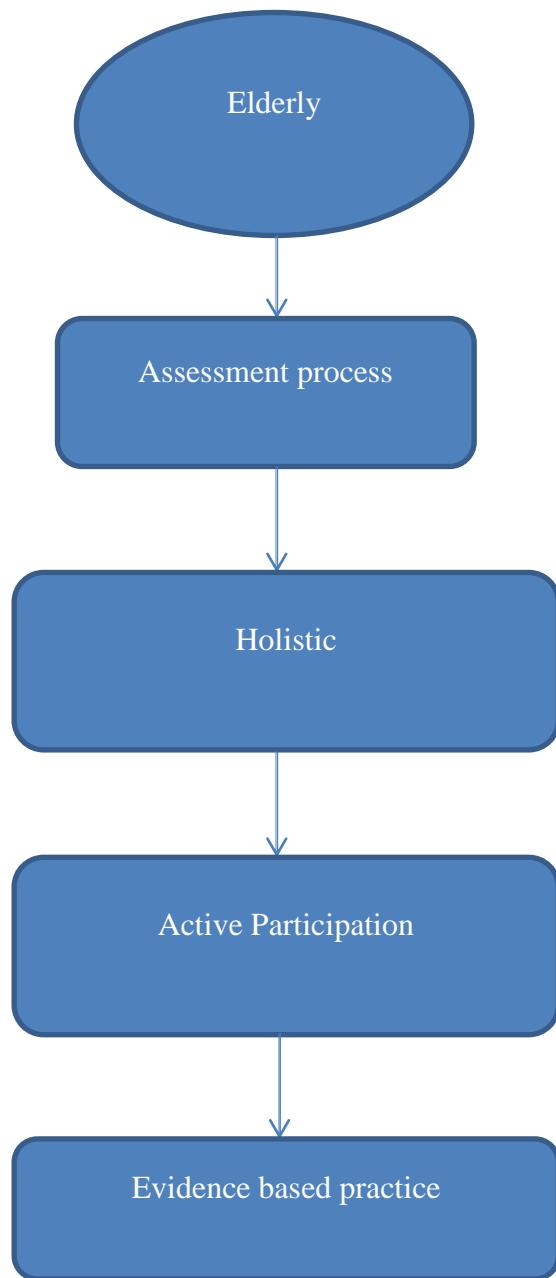
This approach understands health “*as an intrinsic part of a social context, outside of which it is not possible to isolate individual pathology*”. (Chambers and Thompson 2008) Through this approach, healthcare providers consider a wide range of contributive chain of a certain illness as well as other factors that contributed to that illness in question as well as environmental and societal impact of health to the individual. For instance, physical, mental, social, spiritual, sexual and emotional aspects. (Lis et al 2008) The idea behind this approach is that people’s health situation can be influenced by family, cultural and social conditions. Therefore, considerations regarding these aspects will go a long way to achieve a satisfactory goal of health promotion.

3.2.2 Biomedical Approach to Health promotion

The biomedical approach “*emphasizes on individual behaviour change by patients, controlled by the nurse, as pathology is thought to be isolated largely within the individual body*”. (Chambers and Thompson 2008) Through this approach, healthcare providers run a test to check sections of the body suspected to have a breakdown for an intervention to follow so that the individual should move from an unhealthy state to a healthy state.

However, successful health promotion strategies to promote health among elderly people should consist of proper evaluation procedure, implementation of a holistic approach, active involvement (empowerment) and to compare the practice to evidence based source (Lis et al 2008). Figure 3 below shows the different steps to consider when promoting health among elderly people.

(Figure 3) Health Promotion model



Lis et al (2008). *Evidence-Based Guidelines on Health Promotion for Older People*.

4 METHODOLOGY

Qualitative method was used for the study (systematic literature review). The search was conducted using the following databases CINAHL, EBSCO, ScienceDirect for the years 2000 – 2011. Basic search criteria were limited to published literature written in English. Primary search terms were; *Sleep assessment tools* AND *nursing home*. *Sleep* AND *Nursing home*, *Sleep disturbance* AND *Older Adults*, *Sleep* AND *Nursing home*, *Sleep treatment* AND *older adults*, *Cognitive behavioral therapy for insomnia*, *Sleep disturbance in nursing home*, *Systematic review of non-pharmacological interventions of sleep*, other synonyms like *sleep disorder*, *Older adult* was used in the place of sleep disturbance and elderly respectively.

4.1 Inclusion and exclusion criteria

An extensive inclusion and exclusion criteria was established to identify literature that could help answer the research questions. Inclusion and exclusion criteria were meant to articulate the focus of the study. Inclusion and exclusion criteria are “*a combinations of limit that are necessary to focus a research work and pragmatic limitations that are required due to the resources available*” (Aveyard 2007 p 60)

Inclusion criteria include;

- Published articles on sleep disturbance diagnosis, assessment measures among elderly people.
- Studies to determine the impact of non-pharmacological interventions that could resolve sleep problem among elderly people in nursing home.
- Sleep disturbance and possible consequences to health.
- Published articles between the years 2000 - 2011.
- Published literature in English.

Articles that did not meet the inclusion criteria were excluded. For example those articles having similar title that were unable to answer the research questions were excluded. Unpublished literatures and articles not written in English were also left out.

4.2 Sampling Process

A search from three electronic databases was performed with the following key search terms as seen in table 1 below;

Database	Search terms	Year range	Results	Selected articles
Academic Search Elite (EBSCO)	*Sleep disturbance* AND *Older Adults*	2000 - 2011	26	2
CINAHL (EBSCO)	*Sleep* AND *Nursing home*	2000 - 2011	114	4
CINAHL	*Sleep treatment* AND *older adults*	2000 – 2011	7	1
CINAHL	*Sleep assessment tool* AND *Nursing home*	2000 - 2010	1	1
ScienceDirect	*Cognitive behavioral therapy for insomnia*	2000 – present	4421	1
ScienceDirect	*Sleep disturbance in nursing home*	2000 – present	5979	3
ScienceDirect	*Systematic review of non-pharmacological interventions of sleep*	2000- present	5051	2

Considering that the core of this study is to improve sleep quality through non-pharmacological interventions among elderly people in nursing home, Priority was given to articles that had used Randomized control Trial research type (RCTs). The reason being this selection criteria is that, RCTs research type has been tested and found to yield reliable results in most cases where the objective is to compare one

treatment with another or none (Aveyard 2007 p 26). Another reason is that most at times the enthusiasms of researchers in RCTs design study are always in an inverse proportion (Montgomery and Dennis 2004). In most cases it consists of two or more sample groups, where one group is consider as the experimental or intervention group that receives standard intervention and the other group is seen as the placebo group that receives little or no intervention. At the end of the Trial, the different outcomes of the various groups are compared to know the differences between the various groups in terms of treatment approaches.

Selecting articles for this study began with reading of abstracts of related articles and later full text was read to grasp detail if the abstract of the article in question provides evidence base facts to answer the research questions of this study. An electronic and a paper base back-up space was created throughout the sampling process to store or write all records, procedure, search terms, search engines and a list of references. This was to avoid cases of losing important information and to demonstrate a systematic approach that could yield important result and is repeatable. Aside from electronic search sources, the author found some important books at the school library that actually helped to realize the study for instance the book ‘Doing a literature review in health and social care: A practical guide’ by Helen Aveyard 2007, and ‘Health promotion: planning and strategies’ by Jackie Green and Keith Tones 2010. Just to mention a few.

4.3 Literature Analysis

Since the development of the study relies so much on previous researches, theories, deductive content analysis was chosen as the best analyzing tools to analyze selected articles. According to Elo & Kyngäs (2007) deductive content analysis is good for studies where the main findings relies more on previous theories, model, mind maps. The analysis process of articles that met the inclusion criteria exposes and develops replicable and valid inference of facts. (Krippendorff 2004) However, a deductive content analysis approach begins with development of facts, categorization and later code the data according to similar ideas. After the categorization process the author proceeds with reviewing each selected articles for correspondence. Several non-pharmacological interventions were noted and were grouped into similar headings. (Elo & Kyngäs, 2007)

4.4. Ethical Considerations

The topic proposal was approved by the institutional review board of Arcada University of applied science in charge of scientific writing and a competent supervisor was assigned to guide the author realize the study. Irrespective that the author had a pre-knowledge about the topic, a realistic approach was considered and not an idealistic approach. Information regarding the institution where the author had inspiration to write on the topic was treated anonymously. Direct information from articles or books was properly quoted with a quotation mark and was in italic format to differentiate it from normal text.

The author read through the rules as outline in the ‘Helsinki declarations’ which serves as a statements of ethical principles necessary for healthcare professionals doing research in health and social fields involving human subjects (World Medical Association declaration of Helsinki, 2000). This is to make sure the entire research process is relevant and up to date according to current demand .All body text references were well cited and put in bracket to differentiate it from normal texts.

5 RESULTS

Through the outlined search engines and procedure as in the method section, 14 articles were included in the study to answer the research questions. Out of these, 6 were Randomized Controlled Trials (RCTs) research type, 3 systematic literature review research type, 2 discussion articles, 1 mixed design research type, 1 controlled Trial research type and 1 parallel-group study design. These papers present varieties of sleep assessment tools as well as nonpharmacological intervention approaches.

Sleep assessment tools are observed under two categories; subjective and objective sleep assessment measures. While nonpharmacological interventions is group under four categories as follows, Cognitive Behavioral interventions, environmental modification and care giver role, sensory, Physical and social interventions. Table 2 below outlines articles chosen for the study with their respective objectives, sleep assessment tools and interventions.

Table 2: Selected articles for the study

Author/ date	Title	Objectives	Assessment tools/ Interventions
J. Sarris & G.J. Byrne/2011 Systematic Review study design	A systematic review of insomnia and complementary medicine.	To investigate the effect of hypnotic complementary and alternatives interventions like herbal and nutritional medicine, acupuncture, acupressure, yoga, tai chi, massage, aromatherapy and homoeopathy	<ul style="list-style-type: none"> - Sleep Assessment tools: Insomnia severity Index (ISI), Pittsburgh quality Index (PSQI), Leeds sleep evaluation questionnaire (LSEQ), Purpose designed self-report sleep questionnaire - Herbal and nutritional medicine, acupuncture, acupressure, yoga, tai chi, massage, aromatherapy and homoeopathy therapies
Bélanger et al. 2011 Discussion paper	Cognitive Behavioral therapy (CBT) for Insomnia in older adult.	Discussion on the different components of Cognitive behavioral therapy in community-dwelling older adults.	<ul style="list-style-type: none"> - Cognitive behavioural therapy including stimulus control, sleep restriction, relaxation, cognitive restructuring and educational component (sleep hygiene)
K.J. Reid et al / 2010 RCTs Study	Aerobic exercise improves self-reported sleep and quality of life in older adults with Insomnia	To investigate the efficacy of moderate aerobic physical exercise with sleep hygiene education to improve sleep, mood and quality of life in older adults with chronic insomnia	<ul style="list-style-type: none"> - Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale [ESS] - Sleep log - Aerobic physical exercise plus sleep hygiene education
H. Reza et al. 2010 RCTs study design	The effect of acupressure on quality of sleep in Iranian elderly nursing home residents	To evaluate potential beneficial effects of acupressure on a group of institutionalized elders experiencing sleep disturbance	<ul style="list-style-type: none"> - Pittsburgh Sleep Quality index (PSQI) questionnaire - Stimulation of acupoint was noted to increase and release of serotonin and melatonin which helps to relax the body and thus promote sleep.

R. Nelson & C. Coyle/2010 Mixed design study	Effects of a Bedtime Massage on Relaxation in Nursing Home Residents With Sleep Disorders	To evaluate the effectiveness of an activity-based intervention (massage) in producing a relaxation response and sleep in nursing home residents	- physiological and self-report measures was used (Wrist blood pressure monitor to collect physiological measures of heart rate and blood pressure, Visual Analog Scale for Anxiety , Environmental measures - Bedtime massage therapy
Friedman et al./2009 A parallel-group study design	Scheduled Bright Light for Treatment of Insomnia in Older Adults	To determine whether bright light can improve sleep in older individuals with insomnia	- Subjective sleep assessment tools: Sleep logs, questionnaires and Objective sleep assessment tools include actigraphy, polysomnography - Scheduled bright light therapy
Norma G. Cuellar et al./2007 Discussion paper	Assessment and Treatment of Sleep Disorders in the Older Adult	To discuss best available assessment tools and treatment option of sleep disorder in the Older adult	- Sleep assessment tools should begin with a thorough physical examination that includes a sleep history. Questions about sleep hygiene sleep habits sleep environment. - Sleep hygiene, behavioural , exercise and dietary therapies
Ouslander et al. 2006 Controlled Trial study design	Non-pharmacological intervention to improve sleep in nursing home patients: Results of a controlled Trial	To improve night time sleep in nursing home patients incorporating exercise, attempt to keep elderly out of bed during the day, consistent bedtime routine, modified nighttime continence care and noise abatement program	- Sleep assessment tools : Wrist actigraphy and polysomnography Secondary sleep assessment tools: assessment of mood, behavioral using the neuropsychiatric inventory, the geriatric depression scale and behavioral observations. - Exercise, consistent bed time routine, modified night-time incontinence care and noise reduction interventions
Alessi et al./2005 RCTs study	Randomized Controlled Trial of non-pharmacological intervention to improve Abnormal Sleep/wake Patterns in Nursing home residents	To test a multidimensional, non-pharmacological intervention to improve abnormal sleep/wake patterns in Nursing home residents.	- Sleep assessment tools: Wrist actigraphy and structured behavioral observations - Daily Sunlight exposure, increased physical activity, structured bedtime routine, decrease night-time noise and light interventions

S Koch et al. 2005 Systematic Review Study	Effectiveness of sleep management strategies for residents of aged care facilities: findings of a systematic review	To determine the most effective tools for the assessment and diagnosis of sleep problems, as well as identify the most effective strategies for the promotion of sleep within this population.	<ul style="list-style-type: none"> - Reduction in environmental noise, - reduction of night time nursing care - promotions of daytime activity are likely to be most effective for promoting sleep in elderly people. - Sleep assessment tools: Wrist actigraphy
Paul Montgomery and Jane Dennis / 2004 Systematic review study design	A systematic review of non-pharmacological therapies for sleep problems in later life	The paper considers the effectiveness of three non-pharmacological interventions , Cognitive behavioural therapy, bright light therapy and physical exercise	<ul style="list-style-type: none"> - Sleep assessment tools: Pittsburgh Sleep Quality Index (PSQI), the sleep impairment Index, daytime functioning as measured by attentional task tests, self-report using standardised measure like the standford sleepiness Scale, the Epworth Sleepiness Scales and quality of life as measured by validated scales. - Cognitive behavioural therapy - Bright light therapy - Physical exercise
Hui-Ling Lai and Marion Good /2004 RCTs study design	Music improves sleep quality in older adults	To investigate amongst Taiwanese older adults who use music as a therapy at bed time each night for 3 weeks would have better global sleep quality and better components of sleep quality over time than those who did not use music	<ul style="list-style-type: none"> - Sleep assessment tools used: Pittsburgh Sleep Quality Index (PSQI) and Epworth Sleepiness Scale. - Sedative music such as Chinese Orchestra, synthesizer, harp piano, orchestra and jazz music

Li et al. 2004 RCTs Study design	Tai Chi and self-Rated Quality of sleep and daytime sleepiness in Older adults: A Randomized Controlled trial	To assess the effectiveness of Tai Chi on self-rated sleep quality and day time sleepiness in older adults reporting moderate sleep complaints.	<ul style="list-style-type: none"> - Two assessment tools were used; Pittsburgh Sleep Quality Index (PSQI) and Epworth Sleepiness Scale (ESS). - Older adults with moderate sleep complaints benefited from the Tai Chi exercise. It indicated that a 16 weeks exercise intervention is able to reduce sleep-onset latency by 12 minutes, increase sleep duration by 42 minutes per night. It was recommended that the Tai Chi movements be performed slowly and gently, with deep diaphragmatic breathing and relaxation coupled with smooth, flowing movement.
L.K.P. Suen et al. 2002 RCTs study design	Effectiveness of auricular Therapy on sleep promotion in the Elderly	To adopt a scientific approach to examine the effectiveness of auricular therapy using magnetic pearls on sleep improvement in the elderly.	<ul style="list-style-type: none"> - Sleep questionnaire, wrist actigraphy and sleep diary was used as assessment tools in the study. - Auricular therapy

5.1 Critical Review of results

This is an overall evaluation and summary of the results for this study. Sleep assessment measures is seen in two heading, objective and subjective sleep assessment measures. While Nonpharmacological is seen under four broad heading.

5.1.1 Sleep Assessment measures for sleep disturbance

Subjective sleep assessment measures according to Norma G. Cuellar (2007) are always the first step to begin with if an individual is suspected of suffering from sleep disturbance. It involves a face to face interview or questionnaire regarding sleep habits, sleep hygiene, sleep environment by a nurse to the elderly in question during time of admission. Nurses should conduct an initial evaluation test with considerations in mind about sleep disturbance symptoms, their ability to function during the day by taking note of their sleep-wake schedules (Norma G. Cuellar 2007). Request the elderly to keep and maintain a sleep log book for a continuous duration of about two weeks that will be used in the future to assess their sleep patterns for instance actual sleep time and time in bed, time asleep, the number of awakenings throughout the night, daytime activities (Friedman et al. 2009)

Specific subjective assessment questionnaire form found include the Pittsburgh Sleep Quality Index (Reza et al. 2010), the Epworth Sleepiness scale (Lai and M. Good, 2004), Insomnia severity Index (ISI) and Leeds evaluation questionnaires (LSEQ) design for self-report assessment (Sarris and Byrne 2011).

Pittsburgh sleep quality index (PSQI) is a self-rated questionnaire which assesses sleep quality and disturbance (Lai and M. Good 2004). It assesses seven components of sleep as follows, sleep latency, sleep duration, perceived sleep quality, sleep efficiency, sleep disturbance, use of medications and daytime dysfunction. Each of the component ranges from 0 (no difficulty) to 3 (severe difficulty). The components scores are sum to produce a global score ranging from 0 to 21. Higher scores indicate worse sleep (Lai and Good 2004). A complete paper based copy can be seen on the appendix page.

The Epworth Sleepiness Scale (ESS) (Lai and Good 2004), is used to determine the level of daytime sleepiness. Scoring 10 points or more indicates a sleepy score. 18 points indicates very sleepy. The scores range from 0 to 3 with the following meaning; 0 (would never doze or sleep), 1 (Slight chance of dozing or sleeping), 2(moderate chance of dozing or sleeping), 3(high chance of dozing or sleeping). See a complete sample in the appendix page.

Insomnia Severity Index is a paper base questionnaires comprises of seven questions used to assess severity of insomnia. At the end of the process, the seven questions are summed up to get a total score. The scores can be interpreted as follows. Score between 0 -7 indicates no clinical significant insomnia, 8-14 signifies sub threshold insomnia, 15-21 indicates clinical insomnia (moderate case) and 22 – 28 indicate insomnia (severe case), (Sarris & Byrne 2011).

Objective sleep assessment measures include actigraphy and polysomnography. (Friedman et al. 2009) Wrist actigraphy is a device typically worn on the wrist and also on the ankle or trunk that record body movement and stores the information for days, weeks or months along with the time it was measured for later analysis. A computer programs are being used to derive levels of activity or inactivity, rhythm parameters as well as total sleep time, percentage of time spent asleep, total wake time, percentage of time spent awake as well as the number of awakenings (Suen et al. 2002). Figure 4 below is a picture of a wrist actigraph device.



(Figure 4) Suen and Wong (2002). *The American Journal of Chinese Medicine*, Vol. 30 p 435

Another objective sleep assessment tools is the Polysomnography test. During this process, various physiologic variables are recorded throughout the sleep period with the aim of diagnosing sleep disturbance. Individual are require to be in bed for hours while the nurse place physiologic leads sensor on the individual to record brain electrical activity, airflow, respiration in the chest and the abdomen, eye and jaw muscle movement, leg movement, oxygen saturation and the heart electrical activity also known as Electrocardiogram or EKG (Friedman et al. 2009)

5.1.2 Non-pharmacological approaches to treat sleep disturbance

Non-pharmacological interventions were examined in different perspective according to the different articles selected.

One controlled Trial study included five nonpharmacological approaches including daytime physical activity and attempts to keep subjects in bed, evening bright light exposure, consistent bedtime routine, nighttime care routines designed to minimize sleep disruption and strategies to reduce nighttime noise. The results found did not actually improve quality nighttime sleep for most of the participants involves in the

study. Rather, they recommend enhanced non-pharmacological interventions combine with environmental interventions to reduce noise for best result in future finding. (Ouslander et al. 2006)

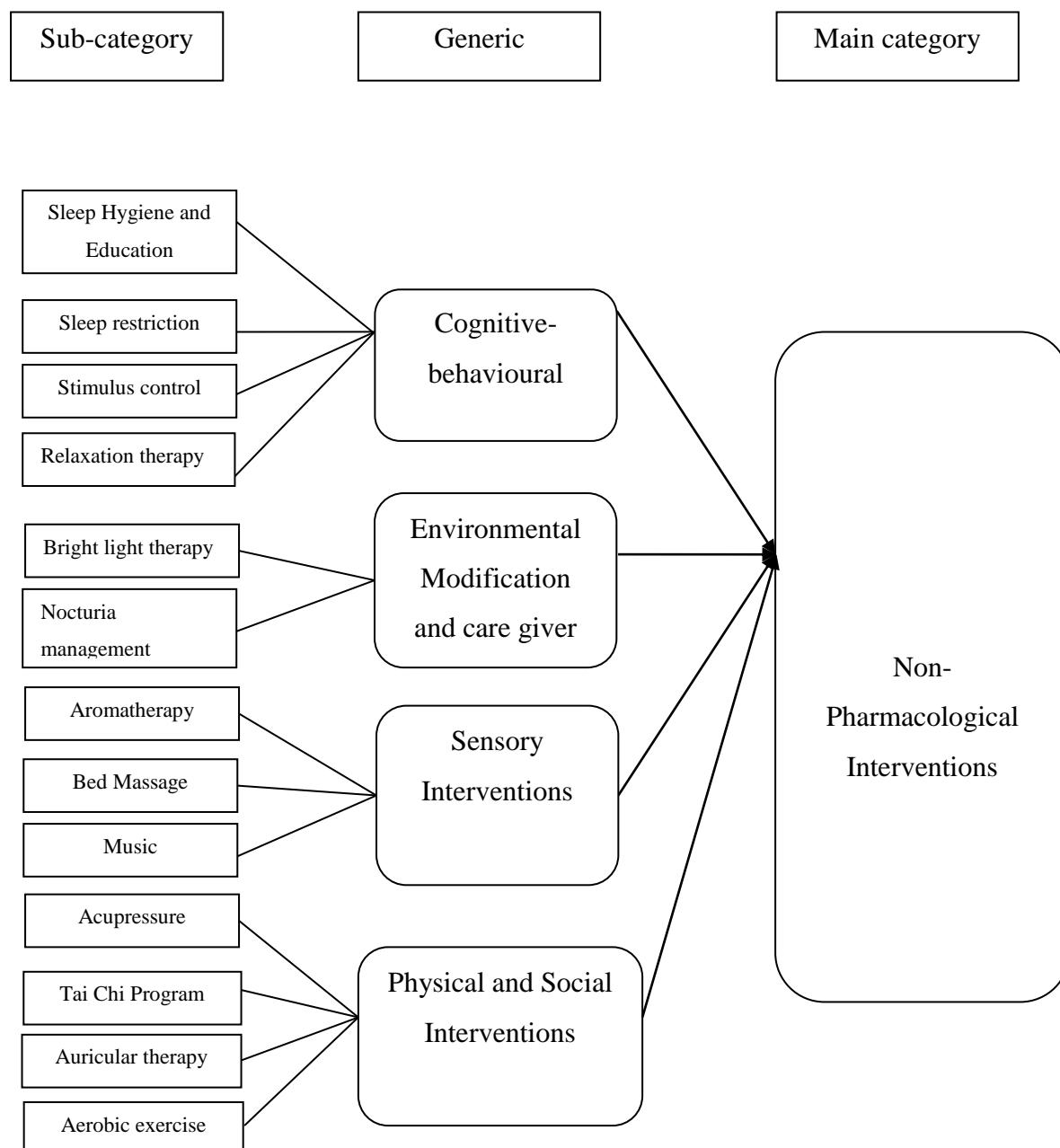
Another randomized controlled Trial study conducted by Alessi et al. (2005) consisted of an experimental group and a controlled group. They investigated several nonpharmacological approaches as follows; ways to encourage participants suffering from sleep disturbance to remain out of bed if unable to sleep. Thirty minutes of sunlight exposure in a comfortable outdoor location preferably in the morning. Participation of lower level exercise program three times per day. A bedtime routine between 10:00p.m and 6:00am that consists of personal care, lights out, reduced sources of noise and light in hall way areas and in participants' room as well as the usual night-time nursing personal care like toileting or diaper changing provided by the research staffs. Research staffs in the study made tour on hourly basis to identify whether participants were in need of care. Cases where participant were asleep on three consecutive tours, they were awakened and care was being provided on the fourth tour. Details were recorded about the whole study and there was no major adverse event as a result of the intervention. However, there was a significant reduction in percentage of day time naps in the experimental group and no change in the control group. Moreover, day time mean light level and minutes of exposure to bright light were higher during treatment than during baseline in the experimental group, with no change in the control group. Research staffs found participants awake on 17% of night-time hourly tours. 24% of night-time personal care was provided during awake rounds. 71% of the time research staff were able to make efforts to eliminate or reduce the noise or light. Despite all these efforts, there was no significant less nighttime noise and light levels in the intervention group than the control group. Following the outcome of the study, the combined non-pharmacological interventions contribute to decrease daytime sleeping and an increase in participation in social and physical activities as in nursing home. Reduced duration of night-time awakenings in the experimental group was noted unlike the controlled group.

In a systematic review research case by Montgomery and Dennis (2004), the efficacy of three non-pharmacological interventions; cognitive behavioural therapy, bright light

therapy and physical exercise was noted. Total sleep duration at the end of the study shows a modest improvement.

More than half of articles selected for this study present specific non-pharmacological approaches for instance, scheduled bright light therapy, acupressure, music, bed massage, physical exercises (Tai Chi program, Aerobic exercise), auricular therapy and cognitive behavioral therapy. Deductively, the author organized and collapsed interventions that are similar or dissimilar under four categories (Elo & Kyngäs 2007), as in figure 5 below.

5.2 Categorization of nonpharmacological Interventions



5.2.1 Cognitive Behavioural Interventions

This approach strive to inform healthcare providers or nurses caring for elderly people diagnosed with sleep disturbance to educate them to switch from their old ways of thinking, feeling and behavior to a more refined one about the consequences of sleep disturbance. (Bélanger et al. 2011) Cognitive and behavioral therapy always take a complementary approach because the way we behave sometimes often reflects how we think about certain things. Treatment components within this intervention involve sleep hygiene and education, Sleep restriction, stimulus control and Relaxation therapy and cognitive therapy.

Sleep hygiene and education requires the nurse to continuously educate those diagnosed with sleep disturbance to be conscious with their sleep environment and behavior that may affect their sleep pattern negatively and to seek new strategies to avoid them. To educate them to be aware of certain health practices for example diet, exercise, substance use and environmental factors such as light, noise, temperature. (Bélanger et al. 2011) Elderly people diagnosed with sleep disturbance through this approach should be educated to maintain a regular sleep schedule, involve in a regular exercise program but not too close to bed time. They should avoid taking stimulant substances such as caffeine or nicotine closely before bedtime. Education on a convenient sleep environment like a quiet room environment, decrease light, and maintain a comfortable sleep temperature are all example of this approach. (Alessi et al. 2005)

Sleep restriction instructions consisted of cautioning elderly people to reduce the amount of time in bed to make sure it correlates with their actual sleeping time. For instance an elderly who spend 9 hours in bed and end up sleeping for 6 hours would be advice to limit their time in bed to 6 hours (Bélanger et al. 2011).

Stimulus control intervention as suggested by Bélanger et al. (2011) should focus on the following instructions; postponement of bedtime until when the elderly feels sleepy. They should get out of bed if unable to fall back to sleep at night, avoid all non-sleep activities such as reading, watching TV from the bedroom or while in bed, maintain a regular arising time in the morning and avoid daytime or evening naps. Contrarily, this

this approach might not be the best for elderly people with ambulatory difficulties especially regarding the instruction to leave the bed when unable to sleep be eliminated, this is to avoid the risk of falls and according to Bélanger et al. (2011) such individual be rather instructed not to go out of bed. They should rather plan a quiet and relaxing activity like crosswords that may end up put to them to sleep (Bélanger et al. 2011)

The purpose of relaxation therapy especially progressive muscle control is to help reduce muscle tension. Elderly people with sleep disturbance should alternatively tense and relax their muscle. Closely before bedtime, they should direct their thoughts and imaginations towards a relaxed, focused state (guided imagery). This in a long run will enable them control certain bodily processes that normally happens involuntarily such as heart rate, blood pressure, muscle tension and skin temperature (Bélanger et al. 2011; Bloom et al. 2009). This approach to an extend is difficult to implement especially for physically impaired elderly because it demands a lot of physical input. It Relaxation requires training and daily practices for 2 to 4 weeks with professional guidance at the initial stages (Bélanger et al. 2011)

Cognitive therapy according to Bélanger et al (2011) is to guide elderly people through a question and answer session with the aim to know their thoughts and belief about the consequences of sleep disturbance. Nurses caring for elderly people with sleep disturbance should strive hard to alternate these beliefs so as to trigger negative emotion that are incompatible with sleep. (Bélanger et al. 2011)

In addition to Cognitive behavioural therapy one study (Norma G Cuellar 2007) combined relaxation therapy, sleep restriction, stimulus control and cognitive behavioural therapy and it yielded good result but lack rigorous research trials that use objective measures of sleep to determine their effectiveness.

5.2.2 Environmental modification and care giver role

Environmental sleep interruptions such as staff member's conversation, night time noise from doors slams, lightening and care giver role such as residents care routines especially nighttime incontinence care activities can affect sleep negatively. (Alessi et al. 2005) As a solution to these problems, nurses should assist the resident when he or she is observed to be awake. Resident noticed to be at low risk of skin problems should be allow to sleep for four hours continuously and should be awaken in the fifth hour. (Annan. Rahman and John F. Schnelle 2002)

Environmental light exposure in the morning and in the evening plays great role to promote sleep in the elderly. Friedman et al. (2009) found that scheduled bright light therapy in the morning and in the evening induces changes in the hypothalamic functions related to sleep by altering circadian rhythm and mood. (Friedman et al. 2009) It was able to shift the circadian phase though did not moderate the effects of light on sleep per se.

Nevertheless, Alessi and Schnelle (2000) pointed out that noise, light reduction and modified incontinence care cannot total resolve sleep problems when used alone. Rather a more comprehensible intervention comprising of the three at once is preferable.

5.2.3 Sensory intervention

Sensory interventions go beyond to explains how the human system response to objects or something pleasing. In other words, it is the study of sensory emotional values. Common sensory approaches included in the study include; Music, (Lai et al. 2004) and aromatherapy (Sarris & Byrne 2011), bed massage (Rhonda Nelson & Catherine Coyle 2010). According to the theory of psychophysiology, sedative music was proven to be a sensory intervention to induce relaxation and distraction responses. (Good et al. 2001) Music helps to reduce activity in the neuroendocrine and sympathetic nervous systems resulting in reducing anxiety, heart rate, respiratory rate, blood pressure, reduction of noradrenaline circulation which is associated with sleep onset (Lai and Good 2004).

Lai et al (2004) research conducted in Taiwan to test if elderly who use music as a therapy during bedtime each night for three consecutive weeks would have a better quality sleep than those who did not. The music intervention consists of six types of audiotape sedative music played for 45 minutes at bedtime. The choices of the music are five western music as follows; new age, Harp (electric), piano (popular oldies), orchestra tape, one Chinese music for those who preferred it. The speed of the sedative music was 60-80 beats per minute. Participants in the study were given the opportunity to select one among the six music and after which they were asked to sit back in a relax manner, unfold their legs, not to think about anything, to let their lips go soft as they listen to the music to make sure the music relax their body from head to toe. The music were replayed for 2 minutes at a comfortable volume and those who participated were asked for the second time to select the music that was most preferable and relaxing to them. This time the researchers took note of their facial looks. To verify mastery of the use of music, the researchers rated participants on four criteria as follows; relaxed face, no tension around the mouth, slow and even respirations, no tension when the investigator raised an alarm.

Assumptions was recorded after the second play that if participants were able to effectively relax to the two minute period of music, they might also relax to the music at bedtime.

There were great changes noted at the end of the study and all those who actually took part achieved satisfactory outcomes. The following outcome was noted;

- mean heart rates beat before the study were 75.5 beats per minute and after the music it lowered to 74.7 beats per minute.
- Respiratory rates were 15.2 breaths per minute before the music and significantly fall to 14.7 breaths per minute after the music. These observations suggested that music intervention at bedtime improved sleep quality, improved the components of sleep quality such as, shorter sleep latency, less day time dysfunction, longer sleep duration (Lai and Good 2004).

Another sensory intervention is aromatherapy. It is the practice of using volatile plant oils for example valerian plant designed to treat or prevent a particular disease. It

consist of tiny aromatic molecules that are readily absorbed through the skin, whilst breathing they enter the lungs and next it enters the blood stream and later carried around the body where they can deliver their beneficial healing power. For example (Sarris and Byme 2011). Valerian herbs are flowering plant with very sweet smell pink or white flowers. It produces volatile oil and is mostly prepared in tea form. Valerian herbs are known to cause a reduction in REM sleep during the first part of the night and an increase in NREM sleep during the latter part of the night (Norma G. Cuellar et al. 2007).

R. Nelson and C. Coyle (2010) suggests bed massage of 15 minutes sequences administered to the shoulder, head, and back by a certified therapeutic recreational specialist was recommended can induce relaxation which in the long run promotes quality sleep. Participants in their research got a bed massage therapy while in their bed and they were assigned to lie in a prone position (position where the face is up) with their head turned to the side. In the course of the process, they were all dressed in a hospital gown that could permit direct free access to their skin and around their back. While in the treatment there was elimination of noise, lights were lowered in the room. At the end of the process, participants experienced a relaxation feeling which is responsible to induces sleep.

5.2.4 Physical and social interventions

A common physical exercise suitable for elderly to promote sleep includes Aerobic exercise (Reid et al. 2010), Tai Chi program. (Li et al. 2004)

Tai Chi program is a Chinese health promoting exercise suitable for elderly people due to its low moderate intensity, whole body activity that incorporates a meditational component accompanying the rhythmical movements. It consisted of stretching or controlled breathing. (Li et al 2004)

In trying to examine the efficacy of physical exercise to promote sleep in elderly people who had reported to experience sleep disturbance through the Tai Chi Program, Li et al (2004) used a RCTs study design. A total sample size of 118 elderly people met their research inclusion criteria and the mean age participant was 75 years. They considered

two groups; an experimental group which comprised of 62 elderly people and a control group of 56 elderly people. The researchers emphasized on tai chi movement coordination and regulated breathing 3 times an hour per week for 24 weeks in the experimental group. While they emphasized on low impact exercise (seated exercise with controlled breathing, stretching, and relaxation) 3 times per hour, per week for 24 weeks in the control group. The reason for this was to provide the controlled group with a structured, low intensity exercise program that would contain comparable social interaction and enjoyment components with less physical demands than the Tai Chi program. (Li et al. 2004)

Results after the study recorded significant positive effects in the experimental group compare to the controlled group. The experimental group experienced high sleep quality, sleep onset latency reduced by 18 minutes per night compared to the controlled group. Sleep duration in the experimental group increased by 48 minutes per night compared to the controlled group. Also, the experimental group experience high sleep efficiency and less sleep disturbance. (Li et al. 2004)

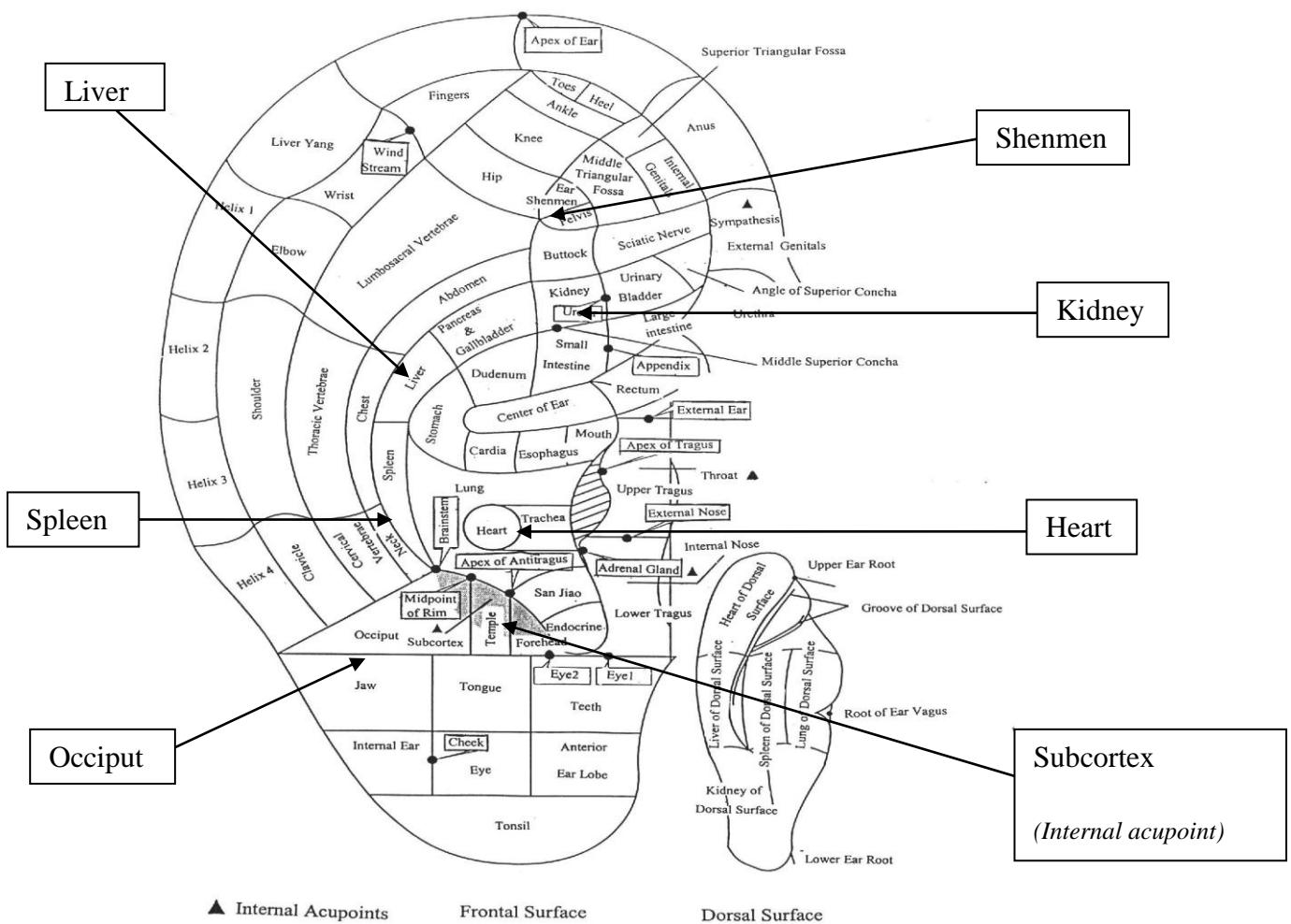
Reid et al (2010) suggests moderate intensify aerobic physical activity and sleep hygiene education to promote quality sleep among elderly people. They found that physical exercise could improve sleep, mood and quality of life in elderly people suffering from chronic sleep disturbance. Participants in their study took part in physical exercise 4 times per week with some specifications such as (week 1) 10 to 15 minutes per day, (week 2) 15 to 20 minutes per day and (week 3) 20 – 25 minutes per day, (week 4) 25 -30 minutes per day, (week 5-6) 30 -40 per day. After completion of the specific conditions, participants exercised for either two 20 minutes sessions or one 30-40 minutes session,

4 times per week for the duration of the study. Exercised session were conducted in the afternoon or evening (1-7 pm). Exercises program included at least two or three aerobic activities like walking, stationary bicycle, or treadmill.

The study recommended the importance of a structured physical and social activity programs to improve the effectiveness of standard behavioural approaches for the treatment of sleep disturbance especially insomnia in sedentary elderly population (Reid et al. 2010).

Another physical intervention to promote quality sleep is auricular therapy. This approach is a traditional Chinese approach where by specific points on the auricles are stimulated to treat various part of the human body. According to Chinese traditional medicine, the ear contains acupuncture points which are linked to various parts of the body (Suen et al 2002).

Seven auricular points were selected including, the shenmen, heart, Kidney, Liver, Spleen, Occiput and sub cortex as seen in figure 6 below.



Suen et al (2002). *Effectiveness of Auricular Therapy on sleep promotion in the elderly.*

The points were selected based on the assumptions corresponding with the principles of traditional Chinese medicine which believes the mind resides in the heart and if treated can calm the mind and may improve relaxation which is necessary before sleep. Moreover, that the kidney is believed to restore essence, by treating the kidney, it can tonify the essence. The acupoint Liver is said to soothe the liver and regulate the flow of energy especially when sleep disturbance is caused by stagnation of the liver energy flow. Lastly, it is believed stimulating the spleen can enhance digestion and fluid drainage. While the sub cortex is known to harmonize excitement and inhibition of the cortex. (Suen et al 2002)

Three groups were considered in their study; Group A used Junci Medulla (A dried stem of perennial plant). Very soft in texture and likely not induces any physical pressure of the ear. It is assumed to have no therapeutic effect when using it as an auricular therapy for sleep promotion. See picture below;



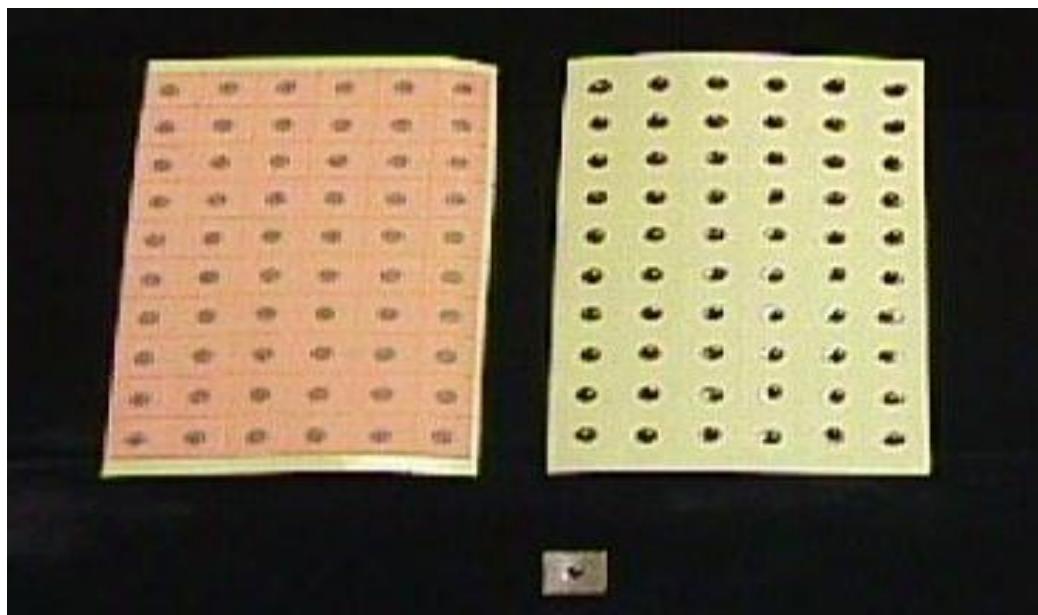
(Figure 7)

The second group, group B (control group) used semen vaccariae. Semen Vaccariae is a small round seed which is commonly used for auricular taping see picture below.



(Figure 8)

The third, group C (the experimental group) used a magnetic pearl which was randomly checked. See picture below.



(Figure 9)

Participants in the three groups were compared across and the results demonstrated significant sleep improvement, sleep efficiency in the experimental group unlike the controlled groups. Also the therapeutic effect seen in the experimental group was due to magnetic effects rather than the physical pressure induced by the pearls on the acupoint. In a nutshell, auricular therapy using magnetic pearls was recommended to be cost effective and hygienic with fewer side effects and is easily accepted by most clients than many complementary therapies for insomnia for instance acupuncture (Suen et al. 2002)

Next physical nonpharmacological intervention to promote sleep quality in elderly people is acupressure therapy. (Reza et al. 2010) It involves finger pressure on specific part of the body. It is a typical Chinese approach of treating several illnesses including sleep problem. According to Chinese medicine, if the internal body organs are not functioning well with each other, abnormalities in consciousness may occur, including mental illness, insomnia or even results to illness. (Sun et al. 2010)

The after effect of acupressure is that it helps to release endorphins in the brain to facilitate relaxation of the muscles, reduces pain and enhances comfort which is important for a good sleep. (Yang and Lin 2007) This approach is a non-invasive intervention and is generally considered safe for elderly people and very easier to administer by nursing staffs. (Sun et al 2010)

6 VALIDITY AND RELIABILITY OF THE STUDY

As already explained in the methodological section of this study, the method deductive content analysis is based on analyzing previous research articles. However, this method has been recommended for those doing literature review study because “*inductively built models or concept system can be complemented, tested and developed further with the aid of deductive analysis*”. (Elo and Kyngäs 2007)

The book “Doing a Literature review in health and social care: A practical guide’ by Helen Aveyard (2007) provided a larger portion of the methodological portion of this study. This book is valid and is recommended for undergraduates’ student writing their thesis in social and health care. Other articles used are recent and updated and are scientifically established.

7 LIMITATIONS OF THE STUDY

Free access to articles that were assumed by the author to be directly related to the topic could not be accessed. Yet the author was requested to enter password of which the author was not in possession of any password. This hindrance let the author to review only those articles which requested no password.

The method used is time consuming. Publication year ranges are too broad. Published articles from 2000 and 2011 were incorporated; nevertheless it contributed a lot to get a deeper meaning of the entire study.

Moreover, the nature of the method which is analyzing of secondary data or previous research articles has limited the study for if the author was to include every piece of information from selected articles, it would have influence the result of the study as well.

Considering the fact that this study has been based on a single methodology, in-depth research comprising of observation, interview could have influence the results may be to a more concrete view. This shortcoming has so far limited the study to investigate in details the negative side effects of nonpharmacological interventions as there may be some draw backs regarding this approach.

Considering that 6 articles selected for this study involves randomized controlled Trial approach , it may have allow the author to make casual conclusion especially as the author had no active role in the actual process of secondary findings.

The fact that articles selected for this study consists of almost the same interventions, made critical analysis almost impossible.

8 DISCUSSION AND CONCLUSIONS

Irrespective of the fact that sleep remains an important aspect in human existence, necessary for normal functioning, yet nurses caring for elderly people living in nursing home still encounters problem to manage it. However, Nonpharmacological interventions should be tested in situation where pharmacotherapy has failed. The reason being that sedative hypnotic drugs are likely to place elderly people at risk of falls or reduce their functional ability. Thoughtful nonpharmacological interventions comprises of Cognitive behavioral interventions consisting of sleep restriction therapy, stimulus control, relaxation therapy. Proper sleep environmental management conducive to sleep should involves noise reduction, light adjustment, reduce interruptions of sleep among elderly people during the caring process especially at night and a meaningful daytime activity design in collaboration with elderly people. Nonpharmacological interventions to promote relaxation such as music, bed massage, progressive muscle relaxation, scheduled bright light therapy, a define aerobic exercise (brisk walking, stretching, yoga) can improves sleep quality and also reduces duration of time it takes for an elderly person to fall asleep. Acupressure therapy is also a vital approach and is very helpful in resolving sleep disturbance among elderly people.

Several sleep assessment procedure according should begin with a critical physical examination as the first step when screening an elderly person suspected of suffering from sleep disturbance. Basic physical assessment approaches should include examining the sleep history of the individual, information from relatives, friends about sleep hygiene, sleep habits as well as environmental factors that could disturb sleep.

The method (deductive content analysis) used to analyze articles for the study seems very complex. It involves a vast amount of materials from different writers to be reviewed. This process is likely to make things difficult especially at the categorization stage. It was a difficult task to decide which articles to include and which not to include in the study.

Another challenging stage came up when categorizing data for results. At this stage, it was difficulties to group similar nonpharmacological interventions under particular heading as many of them were interrelated.

The fact that selected article for this study possesses common or uncommon information; it was chaotic to make decision on where to place certain interventions. The author was tempted to formulate several categories. Presenting each article and analyzing their respective result wasn't easy due to lack of a unique methodology used in these articles.

Sleep management and treatment among nursing home residents should be included in the daily role of the caring process just like incontinence care. This is to make sure all those caring for elderly people know how to promote quality sleep. On a general note, cognitive behavioral therapy produced the most reliable results to treat sleep disturbance among elderly people though very slow to create an impact.

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