

CONSEQUENCES OF INSOMNIA IN LATER LIFE

The impact of sleep disturbances on functioning in older
adults

Lindo Maliackal Varghese

Degree Thesis

Nursing

2013

DEGREE THESIS	
Arcada	
Degree Programme:	Nursing
Identification number:	17062
Author:	Lindo Maliackal Varghese
Title:	Consequences of insomnia in later life
Supervisor (Arcada):	Pamela Gray
Abstract:	
<p>This thesis explores the consequences of insomnia as a sleep disorder in later life with the aim of collecting available information on the topic. The three research questions that guided the objective of the study sought to examine how elderly people experience sleep, insomnia and its consequences as well as what nursing intervention tools could assist in insomnia management to improve the quality of life of elderly. Sleep disturbances effect daytime routines and functioning of older adults thereby impacting on their quality of life. Poor sleep hygiene has been mentioned as one the main contributing factor for sleep disorders. Behavior therapy has been considered as effective and recommended on its own or in combination with pharmacology. The trans-theoretical model (TTM) theory as a health promotion approach used in this study focuses on intentional change to acquiring a positive behavior. Qualitative literature review methodology was used to analyze 13 scientific articles through the inductive content analysis process to produce results. The findings of this research agree with the previous studies and the theoretical frame. Cognitive malfunctioning, social dysfunction, associated medical comorbidities as well as increased economic burden have been outlined as some of insomnia consequences. Nurses role in timely assessment, diagnosis and treatment is termed as crucial. Thus the need for Insomnia management resources, proper communication structures, team work, and education.</p>	
Keywords:	Elderly people, Insomnia, Sleep disorders, Consequences of insomnia, Insomnia management, Coping with Insomnia
Number of pages:	44
Language:	English
Date of acceptance:	2.5.2014

Contents

1	INTRODUCTION	5
2	BACKGROUND STUDIES	6
2.1.1	<i>AGE-RELATED SLEEP CHANGES</i>	7
2.1.2	<i>SLEEP AND COGNITION</i>	8
2.1.3	<i>SLEEP DISORDERS COMMON IN LATER LIFE</i>	9
2.1.4	<i>SLEEP RELATED RESPIRATORY DISORDERS</i>	11
2.1.5	<i>INSOMNIA</i>	13
2.1.6	<i>INSOMNIA AND COGNITION</i>	15
2.1.7	<i>MANAGEMENT OF INSOMNIA</i>	17
3	THEORETICAL FRAME	19
4	AIM AND RESEARCH QUESTIONS	22
5	METHODOLOGY	22
5.1	LITERATURE REVIEW	22
5.2	QUALITATIVE CONTENT ANALYSIS	24
5.3	ETHICAL CONSIDERATIONS	26
6	RESULTS	26
6.1	DISCUSSION AND CONCLUSION	32
6.2	VALIDITY AND RELIABILITY	33
6.3	STRENGTHS AND LIMITATIONS	33
6.4	RECOMMENDATIONS	34
7	REFERENCES	35
8	APPENDICES	38

FIGURES

<i>Figure 1: Summary of TTM stages of change. Elder et al (1999)</i>	<i>20</i>
<i>Figure 2: Summary of TTM process of change variables and description. Prochaska et al (2008) & Plotnikoff et al (2001).....</i>	Error! Bookmark not defined.
<i>Figure 3: An illustration of the inductive content analysis approach</i>	<i>25</i>
<i>Figure 4: Summary of the inductive approach process</i>	Error! Bookmark not defined.

TABLES

<i>Table 1: Data retrieval process</i>	<i>23</i>
APPENDIX (1) <i>Table 2: Summary of the main factors influencing sleep quality in older persons. Carrier et al (2012) & Roepke & Ancoli-Israel (2010).....</i>	<i>38</i>
APPENDIX (2) <i>Table 3: An outline of behaviour treatments for insomnia. Petit et al (2003).....</i>	<i>39</i>
APPENDIX (3) <i>Table 4: Description of the literature search process.....</i>	<i>40</i>
APPENDIX (4) <i>Table 5 Description of articles used in data analysis</i>	<i>43</i>
APPENDIX (5) <i>Table 6 Description of articles used in data analysis</i>	<i>44</i>

1 INTRODUCTION

A personal experience with a client aged 82 years old with insomnia diagnosis during practical training generated an interest on the topic. He complained numerously about staying awake for the better part of the night and the inability to participate in some of his favorite day time hobbies due to frailty and sleepiness during the day.

According to him, his resolution to take several cups of coffee during the day helps him feel better as well as helps him achieve most of his daily objectives though he feels this may be a contributor to this sleep disturbance. He also explained that as often as two days could go without achieving any rejuvenating sleep.

He had on several occasions suffered falls that were not fatal. He therefore uses a rollator an assistive device for walking and balance. Quite often, he skipped his meals as he took naps now and then regardless of the time of the day. His speech did not make sense most of the time and was often disoriented.

He had a prescription for mirtazapine 15mg every evening before bedtime for treatment of his sleep problems and associated major depression. He strayed around the care facility at night when it was difficult to fall asleep. He suffered aggressive and agitation episodes on several occasions that made it very challenging for the nurses to take care of him.

Despite the major health concerns resulting from insomnia if not treated, the concept as well as risk factors are not quite well understood by the nursing and care professionals. Elderly individuals with sleep problems rely on the nursing assistance. Nursing professionals need to possess the skills and know how to carry out proper assessment of sleep disorders. Their awareness of prescribed sleep medications as well as over-the counter medications often used by the patients could assist in educating on the possible potential side- effects and misuse (Morin 2012).

The 82 year old man's real life experience combined with the insomnia epidemic facts was quite challenging to the author and triggered a lot of interest and determination on the topic. A broad-based investigation and comprehension of this subject could be quite significant in the quality of life of elderly individual as well as enlightening the nursing professionals caring for them as a tool to support better insomnia assessment and management therefore the need for this research (Morin 2012).

This study will explore more into the consequences of insomnia as a sleep disorder in later life with the aim of collecting available information on the topic. Information availability as a tool for increased awareness to individuals and the healthcare professionals could assist in improving comprehension. This could result in better identification, assessment and management of these disorders as well as associated complications.

2 BACKGROUND STUDIES

By the year 2025, it has been predicted that, the elderly population over the age of 60 years will be one third of the population in Europe. This demographic transition is expected to cause influence on individual's well-being, care, social development as well as the management of the available resources. The high life expectancy has been anticipated along with hefty challenges therefore the need for evidence based practice and guidelines as well as policies seeking to promote healthy aging (The Swedish National institute of public health 2006).

The Swedish National institute of public health 2006 reviewing the challenges of healthy aging in Europe suggests that although normal aging is accompanied by physical, cognitive and social decline , the ability to utilize one's available resources to achieve the desired goals is of most significance in achieving healthy aging (Gunnar Ågren & Karin Berensson 2006).

Consequences of insomnia have been associated with impact on the individual's quality of life, health and work. Stress development, decline in concentration, road accidents,

poor performances at work among others, have all been associated with sleep deprivation consequences (Morphy et al 2007).

The WHO defines quality of life in later life as a relation between individual goals and expectations in life to their overall well-being. The authors further argue that overall well-being involves psychological, physical, social aspects and the relationship to the environment (WHO 1997). Decline in the immune and physiological systems due to aging results to numerous medical conditions in later life that is high predictor's low quality of life (Hariprasad et al 2013).

Pace-Schott & Spencer (2011) suggest that cognitive function and performance decline has been associated with poorer sleep quality in older adults. Primary sleep disturbances may have an effect on the daytime routines and functioning of older adults thereby impacting on their quality of life. It has been estimated that more than half of older adults experience some kind of sleeping disturbances. This high statistics call for more awareness on sleep disturbances to the health care providers to facilitate better assessment and treatment of these disorders (Neikrug & Ancoli-Israel 2010).

It has been suggested that cognition and performance in older adults with diminished quality of sleep can be enhanced by improved sleep therapies that could be either behavioral oriented or pharmacological (Pace-Schott & Spencer 2011).

2.1.1 AGE-RELATED SLEEP CHANGES

Age related sleep changes in late adulthood and later years is not limited to specific contributing factors. Research has found that sleep influencing factors at the mentioned stage in life could be due to comorbidities, lifestyle, neuropsychiatric, cardiovascular and sleep disorders (Pace-Schott & Spencer 2011).

The most prominent age related sleep change in later life is however a decline in total sleep time. With aging, increased day time napping is very common as well as waking up in the night for urination. Increased need for urination in the night is common with

aging although it is not considered as an attribute of normal healthy aging . These are common behaviors in later life that highly interfere with night sleep patterns (Pace-Schott & Spencer 2011).

Research has found the existence of potential functioning impairment risks in those individuals that suffer sleep deprivation. Behavior, physical and psychological effects from sleep deviation have been named as the common causes of these impairments. Cognitive malfunctioning due to lack of sleep has been associated with metabolic changes in the front part of the brain that is eventually believed to have dramatic effect over time on functionality (Bruce & Aloia 2006)

The *Appendix (1/5)* outlines the main factors influencing sleep quality in later life. These factors are further elaborated on as the topic develops and in different sections.

2.1.2 SLEEP AND COGNITION

Sleep usually occurs in two main physiological cycle's usually non-rapid eye movement (NREM) and rapid eye movements (REM). NREM includes three phases that are Stage 1, 2 and Slow wave sleep (SWS). Alteration of NREM and REM cycles during sleep support memory consolidation a crucial physiological element (Harand et al 2012).

Sleep has been characterized by psychological state circumstance that provides suitable memory consolidation in this case, episodic memory and procedural memory where lately gathered and unstable memory traces are reinforced. The interactions between Melatonin secretions and circadian rhythms as well as homeostatic regulation are found to be healthy sleep determining factors. Melatonin secretion is associated with memory consolidation in determining sleep and wake up cycles while circadian rhythms like core body temperature, hormone secretion and the sleep and wake cycle are associated mental and behavior patterns determined by day and night cycle (Pace-Schott & Spencer 2011).

Circadian rhythms alterations and melatonin secretions reduction in old age impact sleep dependent memory consolidation. Circadian rhythms and melatonin secretions can

therefore be described as important factors in achieving quality sleep as well as desired duration. With aging, Circadian rhythms become weaker, disharmonized and lose amplitude resulting in their decline (Harand et al 2012).

Bright light has been identified to cause strong adjustment to circadian rhythms. Exposure to bright light for older adults, especially those in institutional care, nursing homes or suffering from memory disorders, is very limited and at times Zero. This is a critical factor influencing circadian rhythm disturbances in sleep- wake cycles. Increased exposure to bright light in the early evening and bright light avoidance in the early morning have been suggested to be helpful solution for sleep- wake cycle problem and artificial bright light therapy for individuals with no chance of exposure to natural light (Neikrug & Ancoli Israel).

Research suggest that negative sleep changes such as sleep quantity reduction may result in reduced memory as well as reduced brain volume, cardiovascular or neurochemical changes. All the above elements point an interrelation between sleep with memory therefore providing valid sleep and cognition affiliation (Pace-Schott & Spencer 2011).

2.1.3 SLEEP DISORDERS COMMON IN LATER LIFE

Narcolepsy

A sleep disorder that is often characterized by interrupted normal sleep/wake cycle and REM (rapid eye movement). Most common symptoms usually involve poor quality of sleep, excessive daytime sleepiness (EDS) and experience of immense tiredness and fatigue during the day. Individuals may as well develop an overwhelming urge to sleep but REM intrusion causes them daytime wakefulness, cataplectic attacks (Lack of reflex or voluntary muscle control from an emotion like surprises, excitement, laughter or anger) as well as sleep paralysis and hypnogogic hallucinations at onset to sleep (Milter et al 1990).

In narcolepsy, REM has been associated with the hypnagogic hallucinations, sleep paralysis and cataplexy. This sleep disorder can be difficult to diagnose as numerous medical conditions result in fatigue but with modern polysomnographic technique it can be diagnosed (Milter et al 1990).

Rapid eye movement (REM) disorder

During the REM stage in sleep, there is a manifestation of intricate movements by individuals with this disorder that may include yelling, kicking or punching which are uncontrolled and sometimes violent or aggressive. Often the individual may not be aware of these actions. Causes of Chronic REM disorders seem to be much associated with principle neurological or neurodegenerative conditions such as Lewy body dementia, multiple system atrophy and Parkinson's disease (Neikrug & Ancoli-Israel 2009).

REM sleep disorder diagnosis is usually done to an individual and more successfully in the presence of bed partner where comprehensive sleep history is quite convenient. A recent advancement into the diagnosis of REM disorder has been the development and validation of a new screening questionnaire and the use of polysomnography video recording to help confirm the condition (Neikrug & Ancoli-Israel 2009).

Restless leg syndrome

This is a sleep disorder affecting the lower extremities where during sleep an individual may complain of 'pins and needles', cramp or painful sensations. This disorder commonly occurs to individuals when they get to bed, and in a relaxed state, resulting to difficulties in initiating sleep. A large number of individuals experiencing this disorder may experience Periodic leg movement's disorder and vice versa though the individual may not be aware of the movements. (Wolkove et al 2007).

The cause of the syndrome though not proven has been linked to iron deficiency. On gender statistics, this disorder is most common in females. Sleep history is usually helpful in making a diagnosis (Neikrug & Ancoli-Israel 2009).

Periodic leg movements

This sleep disorder is characterized by unique motor disorder of periodic leg movements that is a major cause of interrupted sleep. These movements occur specifically during sleep. These kinds of movements often awaken the individual from sleep causing sleep interruption and the consequences in older persons are often daytime urge to sleep and fatigue (Wolkove et al 2007).

Overnight polysomnogram is often used in making diagnosis where it helps to calculate periodic limb movement's index and a bed partner is as well useful in accounting for their partner's night limb movements (Neikrug & Ancoli-Israel 2009).

Insomnia

Insomnia is a sleep disorder that involves difficulty in maintaining sleep and may occur in isolation but mostly in later life may occur simultaneously with other medical conditions and psychiatric disorders. Studies have associated insomnia with depression where individuals with persistent insomnia have named as a risk group to insomnia and on the other hand, insomnia is most probable in individuals diagnosed with depression (Neikrug & Ancoli-Israel 2009). More details on insomnia has been presented below in chapter 2.5

2.1.4 SLEEP RELATED RESPIRATORY DISORDERS

Snoring

With aging, muscles of the upper airways weaken and lose elasticity. This may apparently lead to airway obstruction during sleep and hence snoring. This is a sleep disorder that is related to breathing that causes sleep interruption (Wolkove et al 2007).

.

The airway usually collapse causing cessation in breathing during an apneic event (Complete cessation of respiration). Due to the respiration disturbance, this condition is highly associated with increased risk for ischemic heart disease and stroke (Roepke & Ancoli-Israel 2010).

Obstructive Apnea

Obstruction of the upper airway that occurs frequently during sleep may reduce or stop the flow of air leading to sleep interruption. This usually happens due to obstruction of the airways during sleep when the pharyngeal muscles relax and the tongue and palate falls backwards (Wolkove et al 2007).

.

These episodes are most common between 2nd stage of sleep and REM sleep where they may even cause decline or complete absence of REM sleep as well as non-rejuvenating sleep due to poor oxygen saturation during the night. The prevalence of this sleep disorder is higher in older people, male gender and most frequent in obese individuals (Wolkove et al 2007).

Obstructive apnea has been associated with cognitive impairments most likely due to oxygen saturation disturbances. Studies have also suggested association between this condition with hypertension, stroke and ischemic heart conditions as well as atherosclerosis (Wolkove et al 2007).

2.1.5 INSOMNIA

Insomnia precise definition accounts the difficulties in sleep initiation or maintenance and how that amounts to unproductiveness in many areas of an individual's situations. According to World Health Organization (WHO) 1997 report on international classification of sleep disorders, Insomnia can be defined as the ineffectiveness in achieving quality and or sufficient sleep. Insomnia has been rated as the most common sleep disorder (Grewal & Doghramji 2010). It is commonly distinguished by complains on sleep duration and quality (Morin 2012).

Morphy et al (2007) imply that, high prevalence of insomnia has been reported among individuals who are female in sex, mental health problems and physical health problems. He further details that, research done on the prevalence of insomnia with increased age have produced conflicting reports and so far this has not been confirmed although there has been significant records of these instances.

However, according to Carrier et al ((2012), the prevalence of this condition has been reported to rise with age. The effects of insomnia seem to be more damaging in elderly individuals as compared to young adults. Some of the main insomnia symptoms reported are difficulties in initiating sleep at night, sleep maintenance difficulties and waking up too early as well as non- regenerative sleep (Morin 2012).

Morin 2012, further explains that subjects diagnosed with insomnia often report daytime unproductivity in their social, domestic and career activities. This is mainly as a result of daytime fatigue, mood disorders, troubles with cognitive functions mainly related to attention and memory as well as diminished energy.

WHO has characterized insomnia with personal suffering and limitations in activity of daily living which impacts on the quality of life (QOL) of an individual according to their definition quoted below.

'Individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, Social relationships, personal beliefs and their relationship to salient features of their environment (WHO 1997).'

The elderly people are among the highest group experiencing Insomnia (Grewal & Doghramji 2010). According to Ohayon & Partinen 2002, effects of insomnia reported by those suffering from this condition in Finland are among others daytime fatigue, sleepiness, mood changes and cognitive problems.

Ohayon & Partinen carried out a research in 2002, where among other aims sought to identify the existence of seasonal sleep inconsistencies in various regions in Finland as well as compare them with other European countries sleep disorders statistics. The study revealed that Finland in comparison with their southern European counterparts, recorded almost twice higher Insomnia diagnosis. The above statistic has been explained by the fact that, Finland being among the arctic countries, circadian rhythms are highly associated insomnia especially in the middle of the winter when they experience long periods of darkness (Ohayon & Partinen 2000).

On gender statistics related to insomnia, the study by Ohayon & Partinen 2000 revealed that men and women in Finland reported insomnia symptoms equally although women symptoms affiliated with primary insomnia and other mental disorders were higher in women.

Insomnia has been determined as triggered by circumstances, periodic or constant problem that is generally most common in women and individuals with low physical and psychological mental health self-ratings. Chronic insomnia has been highly affiliated altered sleep schedules, challenging life events that cause stress to an individual. If these issues are resolved, for some individuals this problem subsides while for others the problem may still remain (Morin 2012).

2.1.6 INSOMNIA AND COGNITION

Individuals diagnosed with insomnia usually may have accompanying medical condition, medications in use, depression, and substance abuse or sometimes the Insomnia cases could be in isolation (Carrier et al 2012). In older adults, insomnia related to maintaining sleep is the most common. Subjective self-report of patient with insomnia reflects deplored night sleep, cognitive decline especially in relation to daytime performance as well as in comparison with the capability levels of individuals in the same age group (Bruce & Aloia 2006).

Cognition difficulties have been demonstrated by different studies mostly in relation to poor sleep quality and cognition. Difficulties in information retrieval, attention and concentration have been identified especially in older subjects. Task performance declines has also been demonstrated in relation to alertness, problem solving capabilities, speed, decision making accuracy, information retrieval and psychomotor speed (Wolkove et al 2007) & (Bruce & Aloia 2006).

CONTRIBUTING FACTORS

Although factors and variables influencing sleep quality in older later life have been outlined in *Table 2 in Appendix 1*, there is a further consideration and discussion on some of the prime elements in this chapter. The aim is to create a better understanding of the phenomenon in question.

Sleep hygiene

Sleep related behaviors and environmental conditions adjustments have been acknowledged in the promotion of sleep quality. Poor sleep hygiene has been in most cases termed as a primary cause of insomnia. Using caffeine containing products later in the day, taking heavy meals before bedtime, active environments in the evening as well as watching television in bed are some of the maladaptive behaviors that are likely to affect sleep (Petit et al 2003).

Regular physical activity routine is beneficial earlier in the day as well as having an established bed time routine. Drinking fluids after dinner is been associated with frequent night urination that disrupts sleep. Bedroom atmosphere is considered crucial for good sleep that includes, comfortable temperature, noise and light limitation and comfortable mattress (Petit et al 2003).

Menopause

According to Roepke & Ancoli-israel 2010, women experiencing menopause usually report high levels of sleep disturbances in relation to the general population. This has been attributed to progesterone and estrogen hormonal changes in menopause. Decrease in estrogen during menopause has been associated with lower melatonin levels in menopausal women thus the effect on sleep.

Factors experienced as a consequence of menopause could have an effect on sleep patterns in later life. Vasomotor symptoms affect the nervous system part that controls the blood vessels proficiency which has been associated with sleep architecture disruption. These factors may among others include chronic stress, anxiety, mood disturbances, night sweats and hot flashes (Carrier et al 2012).

Although contradictory results have been achieved by studies on vasomotor symptoms in relation to polysomnographic sleep variables, hormonal therapy has been considered helpful especially in minimizing the vasomotor symptoms and improving individual perceived quality of sleep (Carrier et al 2012).

Medication and Drugs

The presence of multiple medical conditions among the elderly contributed to the use of multiple medications. Central nervous system stimulants medications usually prescribed for psychiatric disorders as well as chronic medical conditions have been associated

with leading to insomnia. Administration of diuretics and stimulants early in the day and sedative medications before bedtime could be more beneficial for the elderly practicing pharmacotherapy (Neikrug & Ancoli-Israel 2009).

2.1.7 MANAGEMENT OF INSOMNIA

Neikrug & Ancoli-Israel 2009, suggest that though use of medication in the treatment of sleep problems has been widely practiced, behavior treatments should be given a first priority as they have been found to be effective and the consequences are few. He further suggests combined approach where use of medication is inevitable for more effective results. A further consideration of the two approaches is outlined below to create a better understanding and distinction.

PHARMACOLOGICAL APPROACHES

Use of medication in the treatment of sleep disorders is widely practiced (Neikrug & Ancoli-Israel 2009). Considering the age related changes that occur to the body with aging, pharmacotherapy maybe intricate. Age related pharmacokinetics and pharmacodynamics changes are reflected in the drugs distribution and excretion therefore high possibility of adverse effects in elderly people (Huedo-Medina et al 2012).

Hypnotics drugs especially prescribed for primary treatment of insomnia and they normally include benzodiazepines and non- benzodiazepines. Use of medications in the treatment of insomnia has been embraced with more caution by the professionals owing to the fact that risks outweigh the benefits that are gained from them (Carrier et al 2012).

According to a review on Hypnotics effectiveness in insomnia treatment, Huedo-Medina et al 2012 found that they have been associated with adverse effective especially on cognition, psychomotor effects, daytime fatigue, addiction, tolerance and even mortality. This has been explained by Carrier et al 2012 to be as a result of the drugs pharmacokinetics in elderly persons where it is absorbed and excreted slowly.

Neikrug & Ancoli-Israel 2009 suggests that recent studies have found evidence citing that behavior treatments have been more effective in treating insomnia in comparison with medication option which has been most popular in the past. They however recommend behavior therapy before opting for medication treatment.

NON-PHARMACOLOGICAL APPROACHES

Cognitive behavior therapy (CBT) has been recommended as most effective treatment for insomnia. Individuals with sleep disturbances are orientated with sleep hygiene techniques as well as ways to overcome poor sleep habits as well as non-functional ideologies that affect their sleep culture (Reopke & Ancoli-Israel 2010).

Psychological and behavior therapy especially for insomnia associated with other medical conditions as well as psychiatric disorders has been found effective. The advantages of these therapies have also been found to be more enduring as well as cost effective. Some of the CBT approaches include stimulus control therapy, sleep restriction therapy, relaxation training, and cognitive therapy and sleep hygiene education (Morin et al 2006). The *Appendix (2/5)* provides an outline of behavior treatments for insomnia.

ROLE OF THE NURSES IN INSOMNIA MANAGEMENT

Use of over the counter medication by the elderly people is a common practice. The nurse practitioner has an important role in educating elderly people on the possible side effects as well as alternative sleep hygiene. In elderly care facilities, it is the role of the nurses to assess poor sleep quality among the residents and provide a detailed and appropriate assessment to the physicians for further evaluation and prescription (Carrier et al 2012).

Elderly people with sleep disorders have high expectations from the nurse practitioners to assist in finding a solution. Nurse practitioners responsibility in advocating and implementing non-pharmacological alternatives to treat insomnia has been termed as vital in the quality of life of the elderly people (Petit et al 2003).

3 THEORETICAL FRAME

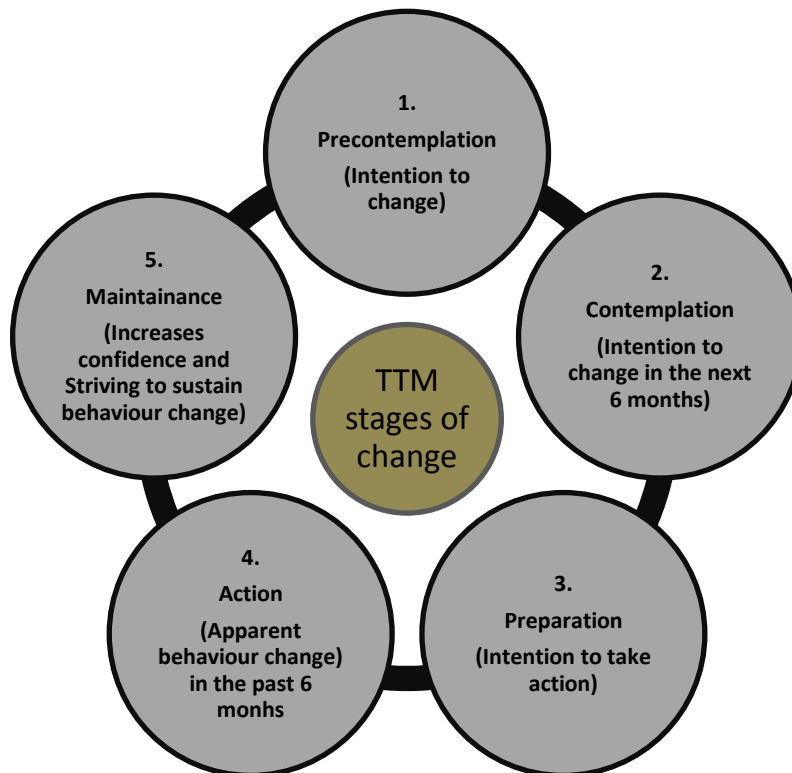
With relation to the study topic in question, motivating healthy choices with the Transtheoretical model (TTM) has been considered to form the frame of reference to guide the analysis of the consequences insomnia in later age. TTM is an integrative model of behavior change developed by the integration of key constructs from other theories. This model of behavior change was developed by Prochaska and DiClemente (1982, 1983) as a framework to define the progression from adoption to maintenance of health behavior change so as to achieve optimal health (Cheung et al 2006). TTM key construct is the stages of change that outline how individuals modify problem behavior (Cheung et al 2006) & (Sarkin et al 2001).

With reference from the pharmacotherapy treatment for insomnia already cited , Neikrug & Ancoli-Israel 2009 suggest that, evidence from recent studies support behavior treatments as more effective in treating insomnia in comparison with pharmacotherapy option which has been most popular in the past. TTM as a health promotion approach focuses on intentional change to acquiring a positive behavior (Sarkin et al 2001).

TTM model defines five discrete stages, processes of change and outcome instruments involving decision balance and self-Efficacy that entails confidence and temptation. The main organizing concept of TTM, that is the Stages of change, denotes a series of 5 stages to change over time towards positive behavior achievement

TTM stages of change

Figure 1: Summary of TTM stages of change. Elder et al (1999)



The precontemplation stage which is the initial stage is characterized by individuals who may have awareness or limited awareness on their lifestyle consequences, behavior change relapse, and demoralization due to inability to achieve desired change and or lack of motivation. The purpose to action in these stage is measured in the next Six months and usually individuals in these category usually don't plan to change within this span of time (Prochaska et al 2008)..

Contemplation stage is characterized by individuals who have more awareness about the consequences of their behavior and therefore have the intent to behavior change in the next six months. Individuals in the preparation stage have the intent to take action in the recent future usually measure in the next one month. They have already made signifi-

cant effort to change in the last one year and are ready for health promotion programs (Prochaska et al 2008).

Successful behavior modification within a period of 6 months is considered as Action stage in this model. After the 6 months transpires the individual is considered to be in the maintenance phase. In these phase although the individual has high confidence there is the risk of relapse though the temptation is less therefore while working on lifestyle modification they as well struggle to avoid relapse. This stage could last within 6 months up to about 5 years (Prochaska et al 2008).

TTM processes of change

The process of change involves 10 stages that can be explained as strategies that an individual has the capability to manipulate. It could be employed to facilitate the progression from one level to the next and therefore beneficial in the behavior change process (Plotnikoff et al 2001).

Decision balance, Self-Efficacy and Temptation

The individual progression from one level to the next is highly facilitated by increased awareness. The individual is therefore more equipped to consider the benefits undertaking change which has been described by the TTM as the decision balance. The confidence to maintain behavior change from an old and challenging unhealthy behavior is referred in the TTM as Self-Efficacy and if the contrary results to Temptation which is in this case, the behavior relapse in challenging situation. Temptations could be facilitated by emotional distress, craving and positive social situation. (Prochaska et al 2008) & (Plotnikoff et al 2001).

4 AIM AND RESEARCH QUESTIONS

This study will explore more into the consequences of insomnia as a sleep disorder in later life with the aim of collecting available information on the topic. Information availability as a tool for increased awareness to individuals and the healthcare professionals. It could assist as a way of improving comprehension that could result in better identification, assessment and management of this disorders as well as associated complications.

The author generated three research questions to guide this study as listed below:

- How is sleep experienced in later life in relation to aging related changes?
- What are the consequences of insomnia on the quality of life of the elderly people?
- What nursing intervention tools could assist nurses in managing insomnia to improve the quality of life of elderly people?

5 METHODOLOGY

The objective of this study is to examine how sleep is experienced in the later years as well as the effects of Insomnia and influences that support coping. This section of this research study describe the selected research methodology, explain how the literature for review were selected and as well as explain the ethical consideration of this research study.

5.1 LITERATURE REVIEW

According to Aveyard (2010 p.6), literature review involves a thorough scrutiny of relevant literature and systematically analyzing them with the aim of answering the defined research questions. A new comprehension is achieved through piecing up information from different sources.

DATA COLLECTION

Using search terms to search for peer reviewed articles from academic databases e.g. EBSCO, PUBMED, GOOGLE SCHOLAR, SAGE Journals online.

Table 1: Data retrieval process

Database	Search terms	Year Range	Search hits	Articles selected	Articles used
Google scholar	*Consequences of insomnia* *Insomnia management* *Coping with Insomnia*	2004-2014	524	6	2
Academic search elite (Ebsco)	*Consequences of insomnia* *Insomnia management* *Coping with Insomnia*	2004-2014	4129	15	13
PubMed	*Consequences of insomnia* *Insomnia management* *Coping with Insomnia*	2004-2014	48	4	4
SAGE Journals online	*Consequences of insomnia* *Insomnia management* *Coping with Insomnia*	2004-2014	18	2	0

Words and phrases related to elderly used in the data search were, *Elderly, Old, Senior citizens, Aging, Later life, Aged, Elderly people, Seniors, Old age*. Words and phrases related to sleep were *Insomnia, Sleep disorders, Sleep disturbances, Lack of sleep*

While Words and phrases related to coping were *Coping, Management, Manage, survive*.

Inclusion criteria were articles in English language, articles relevant to the research study published between 2004 and 2014, articles with abstract from academic databases that are peer reviewed, articles with reliable sample size and available in full text.

Exclusion criteria were articles that are not free, articles published in other languages than English, articles older than 10 years at the time of this study, articles on insomnia or sleep disorders but not related to consequences or management, articles without full text available and nonscientific articles or non-peer reviewed.

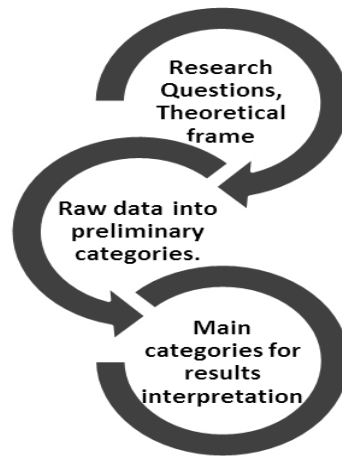
5.2 QUALITATIVE CONTENT ANALYSIS

Qualitative data analysis utilizes a range of processes and procedures to identify the important aspects of raw data and present them clearly and effectively so as build or support an argument that is convincing and meaningful. Using this methodology, information is classified into categories that can be denoted numerically and therefore can be manipulated statistically and translated into information that derives certain conclusions about the information in the text (Aveyard 2010 p. 56-57).

INDUCTIVE CONTENT ANALYSIS APPROACH

Inductive approach to content analysis uses a wide range of related textual data that is concise by producing categorical relationships between the research goals and the results interpretation of the raw data that are legitimate and practical (Elo & kyngäs 2007).

Figure 2: An illustration of the inductive content analysis approach



Specific definitions in this approach are extracted from the theoretical frame and research questions which are crucial for the researcher in determining the supporting literature to review. The researcher reads through the literature obtained and develop preliminary categories from the raw data. These categories are then scrutinized and revised to eventually reduce them to main categories that are for reliability with respect to the research study objectives (Elo & kyngäs 2007).

In Inductive approach, qualitative data is analyzed using a systematic procedure which is influenced by the objectives of the research study. The researcher starts with reading through the text precisely to establish different interpretations of text elements. Significant elements are then identified and labeled into a new category where relevant texts with meanings and perspectives associated to them are assigned. Multiple categories can be deduced from one text element. New themes and subtopics that are fundamental are then selected. Categories are examined for new insights and conflicting opinions. References that support the central theme or category are selected and categories with similar meanings combined together (Elo & kyngäs 2007).

The reliability of the results generated using this methodology can be established by comparing with the finding of earlier studies, feedback from research participants or

users of the research findings, unbiased replication of the research and triangulation within a project where research question is analyzed from multiple perspectives or different sources (Elo & kyngäs 2007).

5.3 ETHICAL CONSIDERATIONS

Good scientific practice in studies at Arcada provides clear guidelines for good scientific practice that the students should conform to in the course of study. The author has carried out this study in high regard and conformation to the guidelines.

Plagiarism is the use of idea of others as if they were your own (Aveyard 2010 p. 157) the works of others people as well as their ideas have been recognized and regarded in this study by proper referencing the ideas of others. Direct quotations have been put in quotations and written in italics in accordance to Arcada's rules on direct quotations.

Use of information collected from earlier studies have handled by the author with high respect to people and avoiding doing harm to others. Misinterpretation, bias or misuse of information from previous studies has been observed by the author in regard to adhering to ethical principles of justice as well as maintaining professional standards and good conduct.

6 RESULTS

Question 1 was answered in the background while the articles collected for the literature review were analyzed to provide answers to research questions 2 and 3. The articles consider the insomnia phenomena at home and care facility settings with the participants considered living alone or with care givers like nurses. An illustration of the articles has been provided in the *appendix (3/5)* with the information on the author(s), title, aim and the conclusions of the study and the description of the articles used in data analysis provided in *appendix 4/5*

Cognitive functioning

Cognitive impairment associated with insomnia is evident by their effect in the waking neurobehavioral function of an individual (5). Elderly people's individual capacity to think, comprehend and make resolutions is highly affected by sleep disturbance. Slowed response and attention problems as a result predicts poor balance problems (7) as well as high risk to falls and fractures (1, 4, 5, and 8). Falls and fractures have been stated (4) as a common cause of institutionalization and mortality especially among the elderly.

The above symptoms coupled with memory disturbances and poor performance could often be misdiagnosed for mild dementia or psychiatric disorders symptoms. If not well treated, elderly with insomnia have been found likely to develop depression fatigue (1,5) (1, 3,4,5,8,10), anxiety (1,3,4,8,9) and irritability (1,5).

Functional impairment is thereafter among the obvious consequences which is detrimental especially on the quality of life (5) of an individual. Impaired thinking, alertness and memory often result to functional impairments and declined productivity (8).

Medical consequences

Insomnia associated comorbidities have been severally mentioned as a contributor to reduced quality of life in later life. Insomnia associated psychiatric conditions risks mostly anxiety and depression have been quite often termed as major threat to health among the elderly (8).

An association between sleep time and glucose regulation has been identified as a major health consequences in individuals suffering from insomnia. Short sleep durations often lead to disturbances in glucose regulation and therefore likelihood in development of diabetes (8).

Day time sleepiness resulting from sleep deprivation, slowed response as well as attention disturbances could influence visual disturbances (2). Ability to performing activi-

ties of daily living could decline as well as individual's vocational functioning resulting from consequences like falls, fractures and pain (4, 8).

As mentioned above on the cognitive impairments sub-section, insomniacs being at a high risk of falls and fractures could lead to more complications as a consequence. Pain, ambulating difficulties that could be associated with movements restrictions, risk for depression, anxiety among others (2, 4, 7, 8).

Sleep deprivation has been associated with an insight to chronic pain (4, 5, 7, 8, and 9). Insomniacs reported pain has been mostly linked with medical conditions like osteoarthritis, cancer or diabetes mellitus (2). As a result, accomplishing activities of daily living is negatively impacted as well as the individuals requiring more health care services which impact their financial status (2, 7).

Chronic obstructive pulmonary disease, congestive heart failure are some of the conditions that play a role in respiratory problems in individuals suffering from insomnia. These conditions could range from shortness of breath to other breathing associated disorders (2, 7, and 8).

Quite often, poor sleep associated attention difficulties and slowed response could be misdiagnosed for dementia symptoms or even mild cognitive disorders (7). Sleep deprivation related day time sleepiness has been termed as a risk factor for Dementia as well as reoccurrence of depression (10, 11).

Though mentioned that insomnia is not an independent factor in the development of medical conditions like cardiovascular disease, stroke and cancer, it has been termed that individuals diagnosed with insomnia have double the risk of developing those chronic medical disorders (3, 4, 8).

Social/Vocational functioning

Dysfunctional habits and poor performance have been severally suggested to relate to poor vocational performance. Usually, attention bias may be experienced by individuals

suffering from insomnia. Regarding their poor ability to focus, slow response as well as diminishing cognitive ability (3) could as well be attributed to the decline in daily productivity.

The ability to enjoying social life and as well as interpersonal life may be compromised by several factors (5, 8). Individuals with insomnia diagnosis have been termed to be vulnerable to inability to handle and manage minor irritations thus poor relations with those close to them (3, 7, 8).

Impaired cognitive performance related to insomnia has been reported to have significant effects on individual's tasks performance and productivity whereby extra effort has to be put in so as to achieve satisfaction. Motor vehicle accidents have often been recorded to be risk for insomniacs thus the impairment of driving skills due to the risk of attention maintenance impairment, drowsiness as well slowed ability to make decisions (3, 4, 5, 7, 8).

Insomnia associated inability to manage activities of daily living and poor coping skills in the long run carry with it the potential risk of institutionalization (4). In this case, the quality of family life enjoyment is therefore affected and institutionalization has been as well associated with the risk of developing chronic insomnia (9). More than half of individuals requiring long term admission in care facilities have been termed to have health complications directly associated with insomnia (4).

Economic consequences

Consumption of over the counter and prescription medications, health consultations and regular visits to the health care facilities has been termed as some of the factors attributing insomnia to increasing costs in health care consumption (8).

Insomnia and its associated comorbidities have been termed to have individuals diagnosed with insomnia consume high healthcare services in comparison with their counterparts who are good sleepers. High health care consumption may be attributed to di-

rect and indirect costs incurred in the treatment of insomnia and associated comorbidities.

Psychiatric and Chronic medical comorbidities usually associated with insomnia attribute to the need and utilization of health care services (8). Institutionalization has not only been attributed to impaired social functioning but increased health care costs as well due the high need for care (4).

Question 3

What nursing intervention tools could assist nurses in managing insomnia to improve the quality of life of elderly people?

The description of the articles used in data analysis is provided in *appendix 5/5*

Attitudes

Nursing systems and especially in elderly care facilities, governed by an established set rules and procedures on how things should run. Usually this ensures routine on nurses and therefore hindering flexibility in innovation and change related to client's personal circumstances or influencing medication administration for non-pharmacological alternatives. Nurses should adopt different approaches in addressing problems when they come along and communicate them to the physician. The state of affairs may not conducive but nurses play a vital role in breaking routines (6, 12).

Nurses are often overburden and therefore may not be able to utilize a more systematic ways of addressing insomnia which often results to opting for medical solutions. Although nurses often achieve more job satisfaction in systematic approach to insomnia that are much beneficial to the elderly, facing resistance to change from fellow colleagues is sometimes a setback to initiation. Innovation, team opinions and more flexible work settings should be encouraged and respected (6, 12).

Poor communication among work teams and interdisciplinary practitioners often lead to misdiagnosis or under reporting of cases that could be helpful in considering effective interventions. Interdisciplinary team meeting to discuss patients circumstances on the need for interventions and the best treatments options are considered worthwhile and effective (6).

Organizational factors

Professional gap between physicians and nurses could often result to the nurses feeling that their opinions are disregarded when they make the diagnosis and follow up and the doctor makes the prescriptions which they cannot challenge. Nurses could lose motivation when they make a diagnosis that is not given much value by the doctor. Nurses should therefore take more professional responsibility work as a team and to delegate and implement protocols that could be more useful in tackling insomnia interventions (6, 12, 13).

Understaffing and bureaucratic systems hinders the nurses from having high expectations in handling insomnia cases and therefore opting for easy solutions by medications. High workload on nurses hinders pro-active promotion of addressing Insomnia. Care facilities opting for medication alternatives to ensure smooth and efficient management of the homes result in logical way of addressing insomnia based on dealing with specific situations rather than dealing with the main cause of the sleep problems (12, 13).

Knowledge

Nurses often lack awareness on insomnia pharmacology and side effects as well as the non- pharmacological approaches to deal with insomnia. Nurse's attitudes and behavior towards dealing with insomnia and anxiety could be highly influenced by training to gain more insight on the topic. Nursing staff could therefore play a major role in suggesting and implementing alternative non- pharmacological techniques that could improve the quality of life of elderly people (6, 12, and 13).

6.1 DISCUSSION AND CONCLUSION

The study above has presented substantial evidence on the detrimental consequences associated with sleep deprivation and insomnia especially in later life. Although different studies have presented controversial evidence on the association between cognitive decline and functional dysfunction levels, the actual effect in functional capacity could be less significant.

Quality sleep has therefore been established to play a crucial role on the Quality of life in elderly people socially, economically and health wise. Dysfunctional behaviors and beliefs were mentioned earlier in this research study as major contributing factors.

Proper and timely diagnosis followed by treatment have been found to be likely effective in handling insomnia not overlooking that the individual has a role to play in achieving positive results. Cognitive behavior therapy which mostly entails proper sleep hygiene has been recommended as both effective and efficient.

This study has established that there is some association between normal aging and changes in sleep architecture. It has further established that maladaptive behaviors management could yield significant results in insomnia treatment to achieve quality sleep. Behavior treatment to achieve optimal results in dealing with insomnia has therefore been recommended as the most effective treatment option that could be prescribed independently or along with pharmacological treatment.

The role of nurses in insomnia assessment, diagnosis and treatment has been termed as quite important and therefore the need for the nurses to take professional responsibility in assisting to determine the most suitable intervention approach. Education for the nurses on issues dealing with insomnia pharmacology and side effects as well non-pharmacological options, influence behavior and attitude therefore the need for nurses to possess it as a tool in alleviating insomnia.

6.2 VALIDITY AND RELIABILITY

The author has established validity, reliability and objectivity as crucial criteria for quality evaluation of this research study using the below defined approach.

Reliability of a research study is established through consistency in the study process by using assessment tools ((Elo & kyngäs 2007). The integrity of this research study has been achieved through the author developing an objective data collection strategy in relation to the study objectives and data representations have been adequately argued out. The author has demonstrated a transparent coding process from which the conclusions have been generated from raw data. Precise coding definitions and clear coding procedures have been provided in this study.

Different researches and research materials that have been used for the purpose of this study seemed to replicate the same results, findings or conclusions at some extent putting into consideration the different research methods employed and research materials. The use of these materials for the purpose of this study establishes reliability of the results generated from their interpretations.

Validity is achieved through audits of the research process where logic and consistency in the data, findings, interpretations and the recommendations and findings are examined (Elo & kyngäs 2007). Peer review of the research results can confirm validity by employing this audit process. The author ensures validity in this study by carefully scrutinizing scientific articles that are peer reviewed and books that are reliable in the literature review process.

6.3 STRENGTHS AND LIMITATIONS

The availability of a wide variety of scientific research studies carried out in relation to this research study provided a broad approach and rich information supply to support the evidence presented above. Different research methods used by different authors of

the articles reviewed in this study assisted in presenting results that have been tested using different research methods, statistics as well as varying demographic regions.

The author's interest and enthusiasm carrying out this research study was an interesting undertaking as well as quite enlightening. This motivation backed up by high professional standards have played a huge role in generating results that seek to increase awareness into the consequences of insomnia on functioning in older adults.

Evidence presented in the above study has been gathered regarding elderly people in different kind of settings including those living independently or in care facilities. Considering the fact that environmental conditions could bear varying consequences, the author wish to point out that the causes and consequences of insomnia could be therefore vary on individual circumstances which has not presented in this study. The reason for that being the author had to focus on general consequences with the aim of generating general results that generates an overview on the topic in question.

6.4 RECOMMENDATIONS

Cognitive impairments have been significantly associated with other consequences especially effecting functionality in the elderly people. As established in this study, conflicting and insufficient evidence emerged on the effects of insomnia on cognition. The actual effects of insomnia on cognition have been poorly presented and the long term effects facts undocumented.

Future research should seek to establish more evidence to support cognition impairment as a consequence of insomnia as well as present cognitive support mechanisms that could be useful especially in functional capacity maintenance.

7 REFERENCES

Ancholi-Israel, Sonia. & Cooke, Jana. R. 2005, Prevalence and comorbidity of insomnia and effects on functioning in elderly populations, in: *American geriatric society*, Vol 53, No. 7, pp. S264-S271.

Anthierens, Sibyl., Grypdonck, Mieke., De pauw, Liesbeth. & Christieans Thierry. 2009, Perceptions of nurses in nursing homes on the usage of benzodiazepines, in: *Journal of clinical nursing*, Vol 18, pp.3098-3106.

Agren, Gunnar. & Berensson, Karin. 2007, Healthy ageing: A challenge for europe, in: *The Swedish national instate of public health*, pp. 1-35.

Aveyard, H. 2007, Doing literature review in health and social care: A practical guide.

Bloom Harrison, G., Ahmed, Irman., Alessi, Cathy A., Ancholi-Israel, Sonia., Buysse Daniel J., Kryger Meir H., Philips Barbara, A., Thorpy Michael, J., Vitiello, Michael., V. & Zee Phyllis, C. 2009, Evidence-based recommendations for the assessment and management of sleep disorders in older persons, in : *The American geriatrics society*, 57:761-789, pp. 761-789.

Bruce, Amanda Schurle. & Aloia, Mark S. 2006, Sleep and cognition in older adults, pp. 207-220.

Carrier, Julie., Lafortune, Marjolaine. & drapeau, Caroline. 2012, Sleep in the elderly-When to reassure, When to intervene, in: *Insomnia Rounds*, Vol. 1, Issue 4, pp. 1-6.

Chen, Pin-Liang., lee, Wei-ju., Oyang, Yen-jen., & Fuh, Jong-Lin. 2012, Risk of dementia in patients with insomnia and long term use of hypnotics: A population based retrospective cohort study, Vol. 7, Issue 11, pp. 1-6.

Elo, Satu. & Kyngas, Helvi. 2007, The qualitative content analysis process, pp. 107-115.

Gilsenan, Irene. 2012, Nursing interventions to alleviate insomnia, Vol 24, No. 4, pp. 14-18.

Grewal, Ritu. & Doghramji, Karl., 2012, Epidemiology of insomnia, pp. 13-22.

Griffiths Maree, F. & Peerson, Anita., 2005, Risk factors for chronic insomnia following hospitalization, in: *Journal of advanced nursing*, pp.245-253

Harand, Caroline., Bertran, Françoise., Doidy, Franck., Guenole, Fabian., Desgranges, Braetrice., Eustache, Francis. & Rauchs, Geraldine. 2012, How ageing affects sleep – dependent memory consolidations?, *Frontiers in neurology*, Vol 3, Article 8, pp. 1-6.

Hariprasad, V. R., Sivakumar, P. T., Koparde, V., Varambally, S., Thirthalli, J., Varghese, M., Basavaraddi, I. V. & Gangadhar, B. N. 2013, Effects of yoga intervention on sleep and quality of life in elderly: A randomized controlled trial, in: *Indian journal of psychiatry*, Vol 55, pp. 57-63.

Krishnan, Preetha. & Hawranik, Pamela. 2008, Diagnosis and management of geriatric insomnia: a guide for nurse practitioners, in: *Journal of the American academy of nurse practitioners*, pp.590-599.

Lieberman III Joseph, A. & Neubauer David, N. 2007, Understanding insomnia: Diagnosis and management of a common sleep disorder, in: *The journal of family practice*, Vol 56, No 10A, pp. 35a-50a.

Mitler, Merrill M., Hajdukovic, Roza., Erman, Milton. & Koziol, James A. 1990, Narcolepsy, pp. 93-118.

Morin, Charles M. 2012, Insomnia: Prevalence, Burden and consequences, in: *Insomnia rounds*, Vol. 1, issue 1, pp. 1-6.

Naganathan, Vasi. & Mudra, Izzuna. 2011, Greater risk of Alzheimer's disease in older adults with insomnia, Vol 59, No. 3, pp.559-562.

Neikrug, Ariel B. & Ancoli-israel, Sonia. 2009, sleep disorders in the older adult-A mini review, *Gerontology* , Vol. 56, pp. 181-189.

Ohayon, Maurice M. & Partinen, Markku. 2002, Insomnia and global dissatisfaction in Finland, *j. sleep res*, Vol. 11, pp. 339-346.

Pace-Schott, EF. & Spencer, RM. 2011, Age related changes in the cognitive function of sleep.

Petit, Lyndal., Azad, Nahid., Byszewski, Anna., Sarazan, Francine F.-A. & Power, Barbara. 2003, Non-pharmacological management of primary and secondary insomnia among older people: review of assessment tools and treatments, Vol. 32, pp. 19-25.

Pigeon Wilfred, R. 2010, Diagnosis, prevalence, pathways, consequences & treatment of insomnia, pp. 321-332.

Plotnikoff, Ronald C., Hotz, Stephen B., Birkett, Nicholas J. & Courneya, Kerry S. 2001, Exercise and the transtheoretical model: A longitudinal test of a population sample, *The American journal of Preventive medicine*, Vol 33, pp. 441-452.

Prochaska, James O., Redding, Colleen A. & Evers, Kerry E. 2008, The transtheoretical model and stages of change, in: *Health behavior and health education: theory, research and practice, 4th edition*, pp. 97-117.

Roepke, Susan K. & Ancoli-Israel, Sonia. 2010, Sleep disorders in the elderly, pp. 302-310.

Rosekind Mark, R. & Gregory Kevin, B. 2010, Insomnia risks and cost: Health, safety, and quality of life, in: *The American journal of managed care*, Vol. 16, No. 8, pp.617-626.

Sarkin, Julie A., Johnson, Sara S., Prochaska, James O. & Prochaska, Janice M. 2001, Applying the \Transtheoretical model to regular moderate exercise in an overweight population: Validation of a stages of change measure, *Preventive medicine*, Vol. 33, pp. 462-469.

Sateia Michael, J. & Nowell Peter, D. 2004, Insomnia, Vol 364, 364:1959-73, pp.1959-1973.

Siriwardena Niroshan, A., Apekey, Tanefa., Tilling, Michelle., Dyas Jane, V., Middleton, Hugh. & Orner, Roderi. 2010, General practitioners' preferences for managing insomnia and opportunities for reducing hypnotic prescribing, in: *Journal of evaluation in clinical practice*, Vol 16, ISSN 1356-1294, pp.731-737.

Wolkove, Norman., Elkholy, Osama., Baltzan, Marc. & Palayew, Mark. 2007, sleep and aging: Sleep disorders commonly found in older people, *Insomnia rounds*, Vol. 176(9), pp. 1299-1304.

World health organization (WHO). 1997, Measuring quality of life, pp. 1-15.

World health organization (WHO) Geneva. 1993, The ICD-10 Classification of Mental and behavior disorders, pp. 1-263.

8 APPENDICES

APPENDIX (1) Table 2: Summary of the main factors influencing sleep quality in older persons. Carrier et al (2012) & Roepke & Ancoli-Israel (2010)

MAIN FACTORS	RISK FACTORS VARIABLES	RECOMMENDATIONS
BEHAVIOURAL AND ENVIRONMENTAL FACTORS	Sleep and hygiene Extreme temperature Noise and light Lack of sunlight exposure Physical inactivity	<ul style="list-style-type: none"> • Sleep and wake times consistency • Regular exercises • Enough Sunlight exposure . • Limit daytime napping • Using Bed for sleep only
PSYCHOSOCIAL FACTORS	Stress Hyper arousal Social isolation Bereavement Change of residence Hospitalization Work status	<ul style="list-style-type: none"> • Comprehensive evaluation and review of sleep history and behaviors, medical conditions, medications, stimulants consumption, psychiatric and mood disorders • Sleep specialist consultation.
PSYCHIATRIC DISORDERS	Depression Anxiety Psychosis Delirium Schizophrenia	<ul style="list-style-type: none"> • Drug interaction evaluation • Medication dependence evaluation. • CBT therapy
PHYSICAL STATUS	Cardiovascular disorders Pulmonary diseases Gastrointestinal disorders Genitourinary disorders Stroke and seizure Chronic pain Thyroid disorder Diabetes Menopause	<ul style="list-style-type: none"> • Drugs interaction evaluation • Hormonal therapy for menopause • CBT therapy
MEDICATION AND DRUGS	Alcohol Caffeine Nicotine (Central nervous system) stimulants Decongestants Bronchodilators Corticosteroids Anticholinergic Antidepressants	<ul style="list-style-type: none"> • Medication schedules adjustments e.g. diuretics earlier in the day and sedatives before bedtime. • Stimulants abstinence e.g. alcohol , nicotine and caffeine

APPENDIX (2) Table 3: An outline of behaviour treatments for insomnia. Petit et al (2003)

THERAPY	DESCRIPTION	OBJECTIVE
Stimulus control	Set of sleep behavior instructions is used to guide the client. Follow up sessions to ensure any concerns are addressed.	This therapy aims at help clients associate the bed and bedroom to rapid sleep onset.
Sleep hygiene education	Educating clients on some habits before bedtime like watching television, eating heavy meals before bedtime, strenuous activity late in the evening, use of caffeine and alcohol late in the day, noisy bedroom environment, warm temperatures.	Optimizing sleep quality through change of sleep habits and ensuring conducive sleep environment. Through Sleep continuity and depth, sleep efficiency could be developed.
Sleep restriction	Addressing spending excessive time in bed with the aim of creating mild sleep deprivation so as to be achieve more solid sleep	Prolonging sleep by restricting time spent in bed to actual sleeping time so as to ensure sleep efficiency.
Cognitive therapy	Ascertainment of attitudes and beliefs that maladaptive and addressing them by supplying the clients with facts on normal and abnormal sleep.	Addressing sleep disturbances and accumulation of emotional distress through recognizing and confronting maladaptive attitudes them and eliminating them by allowing for change.
Relaxation therapy	Applying different relaxation techniques like muscle relaxation, meditation, listening to music etc.	Reducing somatic or cognitive arousal with the overall aim of sleep improvement.
Multicomponent therapy	Combining components from different interventions.	Combined therapy treatment for insomnia
Paradoxical intention	Practicing most feared behavior to overcome anxiety.	Aims to facilitate effective sleep onset.

APPENDIX (3) Table 4: Description of the literature search process

Author and year of publication	Title	Study objective	Study findings
<p>ARTICLE (1) Sataia & Nowell (2004)</p>	<p>Insomnia</p>	<p>Research the insomnia epidemiology, evaluation, diagnosis, characteristics and therapy.</p>	<p>Insomnia recognition and assessment form basis for effective management while sleep habits enquiry should be included in routine health check-ups. Behavior therapy is more effective for long-term sleep improvement.</p>
<p>ARTICLE (2) Bloom et al (2009)</p>	<p>Evidence –Based recommendations for the assessment and management of sleep disorders in older persons.</p>	<p>Review and examine sleep problems in older persons to guide clinicians as well as suggest evidence based recommendations for assessment and treatment.</p>	<p>Study presents expert evidence based recommendations developed by sleep and clinical experts.</p>
<p>ARTICLE (3) Pigeon, Wilfred R. (2008)</p>	<p>Diagnosis, prevalence, pathways, consequences & treatment of insomnia</p>	<p>Review insomnia as a prevalent sleep disorder and types of interventions with empirical support.</p>	<p>A combination of CBT (Cognitive behavior therapy) and hypnotic therapies is an equitable approach in managing insomnia worth practical support. Insomnia that develops as a comorbid condition should be treated in the context of primary treatment.</p>

<p><u>ARTICLE (4)</u> Krishnan Peetha & Hawranik Pamela (2007)</p>	<p>Diagnosis and management of geriatric insomnia: A guide for nurse practitioners.</p>	<p>Analyze the assessment, diagnosis and management of Geriatric insomnia.</p>	<p>Insomnia is often ignored as part of normal ageing, difficult to treat or lack of evidence based clinical guidelines. Effective insomnia management warrants care practitioners attention as it improves quality of life for older adults.</p>
<p><u>ARTICLE (5)</u> Lieberman III & Neubauer (2007)</p>	<p>Understanding Insomnia: Diagnosis and management of a common sleep disorder.</p>	<p>Identify insomnia risk factors and describe how insomnia and psychiatric disorders are related among other objectives.</p>	<p>Insomnia may develop as independent disorder or maybe accompanied by comorbid disorders. Effective diagnosis is essential for effective treatment strategies and patients understanding of sleep hygiene crucial.</p>
<p><u>ARTICLE (6)</u> Anthierens,Grypdonck, De Pauw & Christiaens (2009)</p>	<p>Perceptions of nurses on the usage of benzodiazepines.</p>	<p>Nurses understanding on the use of benzodiazepines and the factors influencing nurses to use them in nursing homes.</p>	<p>Nurses should employ more non-pharmacological interventions in their role to addressing sleep problems.</p>
<p><u>ARTICLE (7)</u> Ancoli-Israel & Cookie 2005</p>	<p>Prevalence and Comorbidity of Insomnia and effects on Functioning in Elderly populations.</p>	<p>Review Insomnia prevalence and comorbidity</p>	<p>Sleep assessments should be included in health routine checks and elderly people self-reported sleep complains needs proper assessment and treatment</p>
<p><u>ARTICLE (8)</u> Rosekind & Gregory (2010)</p>	<p>Insomnia Risks and Costs: Health, Safety and Quality of Life.</p>	<p>Association of Insomnia with costly psychiatric and medical comorbidities leads to huge costs in healthcare.</p>	<p>Proper insomnia management in diagnosis and treatment could save on health cost.</p>

<u>ARTICLE (9)</u> Griffiths & peerson (2005)	Risk factors for chronic insomnia following hospitalization	Establish if there is increased risk of Insomnia with hospitalization.	Impaired sleep and sleep behaviors as well as hyper arousal are major predictors of chronic insomnia.
<u>ARTICLE (10)</u> Naganathan & Mudla (2011)	Greater risk of Alzheimer disease in older adults with insomnia	Assess the relationship between Insomnia and Alzheimer's disease.	Insomnia is a potential risk factor for Alzheimer's disease
<u>ARTICLE (11)</u> Chen et al 2012	Risk of dementia in patients with insomnia and long-term use of hypnotics.	Assess the risk of Dementia in insomnia patients and the effect of hypnotics.	A high risk of dementia for patients especially between 50-65 years and with long term use of hypnotics is double as hypnotics double the risk of Dementia development.
<u>ARTICLE (12)</u> Apekey, Mphil, Tilling, Dyas & Middleton (2010)	General practioners' preferences for managing insomnia and opportunities for reducing hypnotic prescribing.	Assess general practitioners sleep management preferences, knowledge as well as pharmacological alternatives use.	Better assessment and management of sleep disorders using non-pharmacological alternatives need to be developed as well as patients tailored services evaluated.
<u>ARTICLE (13)</u> Gilsenan (2012)	Nursing interventions to alleviate insomnia.	Assess insomnia and consider nurses and startegies role in assessing and promoting quality sleep in care homes residents.	Nurses should play a major role promotion of good sleep hygiene as well as employ interdisciplinary team work in assessing and managing sleep problems.

APPENDIX (4) Table 5 Description of articles used in data analysis

THEME	CATEGORY	SUB-CATEGORY
CONSEQUENCES OF INSOMNIA	PSYCHOLOGICAL/COGNITIVE FUNCTIONING	<ul style="list-style-type: none"> • Reduced concentration (1,4,5,7,8) • Vigilance (1,4,7,8) • Short term memory disturbances (1,4,8) • Depression (1, 3,4,5,8,10) • Anxiety (1,3,4,8,9) • Irritability (1,5,) • Fatigue (1,5,) • Psychomotor performance disturbances (1,8)
	MEDICAL	<ul style="list-style-type: none"> • Musculoskeletal disturbances(1) • Gastrointestinal disturbances (1) • Falls (2,4,7) • Balance difficulties (2) • Respiratory problems (7,8) • Ambulating disturbances (2,8) • Visual disturbances (2) • Risk of hypertension and cardiovascular diseases (3,4,8) • Increased mortality (3,5,7) • Fractures & occupational accidents (4,8) • Reduced pain threshold (4,5,7,8,9) • Insulin resistance (4,8) • Perceived poor health (1,4,7,8) • Alcoholism (8) • Risk of Dementia (10,11)
	SOCIAL/VOCATIONAL FUNCTIONING	<ul style="list-style-type: none"> • Intentional bias (3) • Minor irritations management difficulties (3) • Family interpersonal relationships impairments (3, 4, 5, 7). • Poor tasks performance and productivity (3,4,5,7,8) • Risk of institutionalization(4)
	ECONOMIC	<ul style="list-style-type: none"> • Reduced productivity (3,4,5,7,8) • Motor vehicle accidents (3,5,7) • Increased healthcare resources consumption (3,4,7,8)

APPENDIX (5) Table 6 Description of articles used in data analysis

THEME	CATEGORY	SUB-CATEGORY
Nursing intervention tools	Attitudes	Routines (6, 12) Work pressure (6) Resistant to change (6, 12) Communication (6)
	Organizational factors	Doctor- nurse relationships (6) Organizational routines (6) Organizations efficiency (6) Interdisciplinary team interactions (6, 13) Lack of enough resources (6, 12) Lack of assessment procedures and management systems (12, 13)
	Knowledge	Poor or under- information(6, 12, 13)