Hanna Ala-Sulkava and Manisha Thapa

Non-Pharmacological Methods to Treat Insomnia in Elderly Care Nursing: A Descriptive Literature Review

Bachelor's Thesis

Metropolia University of Applied Sciences

Bachelor of Health Care

Degree Programme in Nursing

20th March 2023

Authors	Hanna Ala-Sulkava and Manisha Thapa
Title	Non-Pharmacological Methods for Insomnia in Elderly Care
Number of Pages	42 pages + 3 appendices
Date	20 March 2023
Degree	Bachelor of Health Care
Degree Programme	Nursing and Health Care
Instructor	Anna-Kaisa Partanen MNsc, PhD-student (UEF), RN, Senior Lecturer

Insomnia is a condition characterized by insufficient quantity and/or quality of sleep over an extended period of time. Insomnia affects 5% of the elderly annually. Insomnia can be treated using pharmacological methods, non-pharmacological means, or a combination of the two; however, pharmacological approaches can have severe side effects, thus non-pharmacological treatment should always be prioritized.

Therefore, the purpose of this bachelor's thesis was to describe the non-pharmacological methods used to treat insomnia in elderly care nursing as well as how these methods affected the quality of sleep in elderly. The aim of this thesis was to gather knowledge that could help health care workers and students to develop their clinical practices and improve their competence in insomnia among elderly with non-pharmacological methods and help the elderly to improve their quality of sleep.

Descriptive literature review was used as the research method for this bachelor's thesis. The articles were retrieved from the reliable databases CINAHL and PubMed. The initial search generated 757 articles collected through database keyword searches. The titles and abstracts of these publications were reviewed, and two hundred and one (n=201) of them were chosen for further consideration. Using predefined inclusion and exclusion criteria, one hundred twenty-one (n=121) were excluded and sixteen (n=16) were included in this descriptive literature review that were analysed by utilizing inductive content analysis.

The data collected and analysed showed that there are various non-pharmacological methods that can be used for insomnia in elderly care as well as how these approaches impact the elderly population's ability to sleep, across different countries and continents. It was discovered that most of the methods were effective at lengthening night-time sleep, enhancing sleep initiation, and lessening daytime sleepiness, all of which contributed to better sleep quality. Nonetheless, there is still need for further research in this topic because there have been relatively few studies that have focused on the elderly.

The results of this thesis may be utilized by nursing students and health care professionals to increase their knowledge, enhance their clinical skills they currently possess, and promote the utilization of non-pharmacological approaches for the treatment of insomnia in elderly care.

Key words	sleep, insomnia, elderly, non-pharmacological treatments

Tekijät	Hanna Ala-Sulkava ja Manisha Thapa
Otsikko	Unettomuuden lääkkeetön hoito vanhustenhoidossa
Sivumäärä	42 sivua + 3 liitettä
Aika	20 maaliskuu 2023
Tutkinto	Sairaanhoitaja (AMK)
Tutkinto-ohjelma	Sairaanhoitaja
Ohjaaja	Anna-Kaisa Partanen TtM, TtT-opiskelija (UEF), SH (amk), Hoitotyön lehtori

Unettomuus on tila, josta puhutaan silloin, kun unen määrä ja/tai laatu on ollut riittämätöntä pitkällä aikavälillä. Vuosittain 5 % ikääntyneistä kärsii unettomuudesta. Unettomuutta voidaan hoitaa lääkkeillä, lääkkeettömästi tai näiden kahden yhdistelmällä. Lääkehoidolla voi olla vakavia haittavaikutuksia, jonka vuoksi lääkkeettömän hoidon tulisi olla ensisijainen hoitomuoto.

Tästä syystä tämän opinnäytetyön tarkoituksena oli kuvailla lääkkeettömiä keinoja unettomuuden hoitoon vanhustenhoidossa ja kuinka nämä keinot vaikuttavat unen laatuun vanhuksilla. Tämän opinnäytetyön tavoitteena oli kerätä tietoa, joka voisi hyödyttää hoitoalan työntekijöitä ja opiskelijoita heidän käytännön työssään sekä kehittää heidän osaamistaan vanhusten unettomuuden lääkkeettömässä hoidossa ja auttaa vanhuksia parantamaan unenlaatuaan.

Tutkimusmetodina tässä opinnäytetyössä käytettiin kuvailevaa kirjallisuuskatsausta. Artikkeleita etsittiin luotettavista lähteistä; CINAHL ja PubMed -tietokannoista. Aluksi avainsanahaku tuotti 757 artikkelia. Otsikoiden ja tiivistelmien lukemisen jälkeen kaksisataayksi (n=201) artikkelia valittiin tarkempaan lukemiseen. Käyttämällä luotua sisäänotto- ja poissulkukriteereitä satakaksikymmentäyksi (n=121) artikkelia suljettiin pois ja kuusitoista (16) valittiin tähän kuvailevaan kirjallisuuskatsaukseen analysoitavaksi induktiivisella sisällönanalyysillä.

Kerätty ja analysoitu data kertoi, että on useita lääkkeettömiä keinoja, joita voidaan käyttää unettomuuden hoidossa vanhuksilla ja kuinka nämä keinot vaikuttavat vanhusten kykyyn nukkua eri maissa ja mantereilla. Lähes kaikki keinot olivat tehokkaita pidentämään yöunta, parantamaan unen päästä kiinni saamista ja vähentämään päiväaikaista uneliaisuutta, jotka kaikki vaikuttavat parempaan unenlaatuun. Kuitenkin tämän aiheen lisätutkimuksille on tarvetta, koska suhteellisen harva tutkimus kohdistui vanhuksiin.

Tämän opinnäytetyön tuloksia voidaan käyttää niin hoitoalan opiskelijoiden kuin ammattilaisten tiedon ja olemassa olevien taitojen lisäämiseen, sekä edistää unettomuuden lääkkeettömien keinojen käyttöä vanhustenhoidossa.

Avainsanat	uni, unettomuus, vanhuus, lääkkeetön hoito

Contents

1 Introduction

The disruption of a person's daily sleep-wake cycle is one of the most fundamental changes associated with ageing according to Mattis & Sehgal (2016), and Morgan (2000: 18). Numerous epidemiological studies have demonstrated that the prevalence of insomnia increases with age (Morgan 2000: 12; Ohayon 2002: 102). Approximately 40% of the elderly complain of sleep problems, such as "light" or interrupted sleep, frequent awakenings, early morning awakenings, and excessive daytime sleepiness. Such irregularities may result in impaired daytime performance and a substantial decline in life quality. (Morgan, 2000: 29.) The incidence of sleep disorders increases with age, has a negative impact on the quality of life of individuals and their families states Darchia et al. (2018: 1588) and may increase healthcare expenses according to Montgomery & Dennis (2004). For their health difficulties, older individuals are frequently prescribed a variety of medications, many of which have undesirable side effects so one factor for using non-drug treatments in clinical settings is that they don't have side effects (Montgomery & Dennis 2004).

The management of insomnia symptoms appears to be amenable to several different behavioural and pharmaceutical treatments (McCrae, Dzierzewski & Kay 2009; National institute of health (NIH) 2005: 1049.) However, because there are not enough randomised clinical studies for many of the medications that are often used, (NIH 2005: 1049; Sateia, Buysse, Krystal, Neubauer & Heald 2017: 342) there has been little information provided for doctors regarding how to select the most effective treatment for insomnia according to Hassinger, Bletnisky, Dudekula & El-Solh (2020). The available treatments include a wide variety of behavioural or non-pharmacologic approaches; hypnotic drugs; and antidepressant, antipsychotic, or antihistamine medications (NIH 2005: 1049; Riemann et al. 2017: 676). However, Hulisz & Duff (2009) says that the side effects of these medications are significantly higher, with adverse effects such as daytime drowsiness, falls, and sedation being commonly observed in the elderly who use these treatments.

Non-pharmacological therapies have proven some degree of efficacy in helping the elderly who suffer from insomnia, although this is only in certain cases. Two of the therapeutic modalities that have demonstrated the most potential for success are cognitive behavioural therapy and short-term behavioural therapy states McMillan, Aitken & Holroyd-Leduc (2013).

The purpose of this thesis is to describe the non-pharmacological methods to treat insomnia in elderly care nursing, as well as the effectiveness of various non-pharmacological measures on the improvement of sleep quality in elderly. There have been several studies in the past that have demonstrated that non-pharmacological treatments for insomnia are successful in several different scenarios, and these non-pharmacological treatments have also been demonstrated to be useful for the treatment of insomnia according to Siebern, Suh & Nowakowski (2012: 719).

Thus, the aim of this research is to produce a descriptive literature review of the data that is already available, to assist nursing students and professionals in the health care field in expanding their knowledge as well as enhancing the skills they already possess and promoting the use of non-pharmacological methods for insomnia in elderly care.

2 Background

2.1 Key terms

The Merriam-Webster dictionary (2022) defines key terms as an important term taken from the title of a document or article that is utilized for the purpose of indexing the content of the article. The key terms of this thesis work are sleep, sleep quality, insomnia, elderly, non-pharmacological treatment.

Sleep is defined by Siegel (2008: 210) as a rapidly reversible condition of immobility and significantly diminished sensory response, and an essential additional criterion is that sleep is homeostatically regulated, meaning that lost sleep is compensated for by an increased drive for sleep and a subsequent increase in the amount of time spent sleeping. Sleep quality is described as an individual 's overall satisfaction with their sleep experience, and it is comprised of four characteristics: sleep efficiency, sleep latency, sleep length, and waking after sleep onset (Nelson, Davis & Corbett 2022: 145).

Insomnia is defined as a continuous or recurrent difficulty beginning or maintaining sleep that results in daytime impairment and is supported by polysomnographic symptoms of disrupted sleep. A variety of reasons, including stress, despair, and worry, can induce insomnia. Therefore, a long sleep latency, frequent nocturnal arousals, or prolonged sleep disruption throughout the sleep phase, as well as repeated transient awakenings, are all regarded to be symptoms of insomnia. (Miller 2022: 512, Roth 2007.)

The term "elderly" refers to those who have reached a chronological age of 65 years old or older, those who are aged 65 to 74 are considered to be “early elderly” whereas those who are aged 75 and more are considered to be "late elderly" according to Orimo et al. (2006: 149).

According to Boutron & Ravaud (2012: xi) the term "non-pharmacological treatments" refers to all interventions that do not include the use of pharmaceuticals. Non-pharmacological treatment covers both technical (such as surgery, ultrasonic, and laser treatments) and participative (such as behavioural therapy, psychotherapy, etc.) approaches.

2.2 Sleep

Sleep is an essential requirement for humans and is required for good health, a high quality of life, and effective daily performance, according to WHO (2004: 2). In relation to the day-night cycle of the sun, the majority of humans acquire a 24-hour sleep-wake cycle, known as circadian or diurnal rhythm. Individuals create their own distinct pattern for waking and sleeping within this rhythm (Williams 2020: 337; Wold 2004: 278). Sleep accounts for one-third of a person's life, during which metabolic processes decrease, growth hormone production increases, tissue repair and protein synthesis accelerate, and cognitive and emotional information is processed, explains Miller (2019: 508). For decades, scientists have been baffled by the complexity of sleep as a behavioural state. Modern sleep was considered syncope, narcosis, or coma. Sleep’s easy reversibility — waking up — distinguishes it. Many hypotheses and theories explain this physiologic phenomenon. Most of these were outdated, pushing academics and clinicians to find additional reasons. (Raphael & Pedwmonte, 2021: 15.)

The central nervous system regulates sleep, norepinephrine controls wakefulness and brainstem serotonin controls sleep. Cortisol and growth hormone both influence sleep. Before sleeping, most people experience 10 to 30 minutes of relaxation and exhaustion, followed by four to six full sleep cycles lasting one to two hours each. There are four non-rapid eye movements (NREM) and one rapid eye movement (REM) stage in each cycle. Throughout the night, REM and NREM cycles extend and shorten respectively. When NREM sleep is interrupted, the individual goes back to stage one and begins a new cycle. (Wold 2004: 278; Williams 2016 :332). The stages are shown in table 1 below.

Table 1. Stage of sleep cycle (Williams 2016: 332).

STAGE 1: NREM
• Includes lightest level of sleep • Lasts a few minutes • Decreased physiological activity begins with gradual fall in vital signs and metabolism • Person is easily aroused by sensory stimuli as noise • Awakened, person feels as though daydreaming has occurred
STAGE 2: NREM
• Period of sound sleep • Relaxation progresses • Arousal is still relatively easy • Lasts 10 to 20 minutes • Body functions continue to slow
STAGE 3: NREM
• Involves initial stages of deep sleep • Sleepers are difficult to arouse and rarely move • Muscles are completely relaxed • Vital signs decline but remain regular • Lasts 15 to 30 minutes
STAGE 4: NREM
• Deepest stage of sleep • Very difficult to arouse sleepers • If sleep loss has occurred, sleeper will spend considerable portion of night in this stage • Vital signs are significantly lower than during waking hours • Lasts approximately 15 to 30 minutes • Sleepwalking and enuresis may occur
REM SLEEP
• Vivid, full-color dreaming may occur (less vivid dreaming may occur in other stages) • Usually begins about 90 minutes after sleep has begun • Typified by autonomic response of rapidly moving eyes, fluctuating heart and respiratory rates, and increased or fluctuating blood pressure • Loss of skeletal muscle tone occurs • Gastric secretions increase • Very difficult to arouse sleeper. • Duration of REM sleep increases with each cycle and average 20 minutes.

An individual's sleep schedule, quantity, and quality of sleep can all be affected by a variety of factors. Cultural, social, psychological, behavioural, pathophysiological, and environmental factors may be included. Society and societal trends can also have an impact on sleep habits. (Miller, Ahuja & Cappuccio 2012.)

2.3 Sleep and aging

The amount of sleep needed varies among the individual states Abad & Guilleminault (2018: 793). Some individual function normally with the less than six hours of sleep, whereas other require nine hours or more to feel rested. The average amount of sleep

required for people aged 20 to 60 is 7.5 hours per day whereas seven hours in the elderly. (Wold 2004: 278; Williams 2016: 332.)

Elderly people have earlier bedtimes, longer sleep onset delay, and problems falling asleep. Slow wave sleep (stage three NREM), REM sleep, and NREM/REM cycles all decrease sleep, while stages one and stage two increase sleep. Transient awakenings, arousals, and shifts in sleep stages to lighter slumber are brought on by environmental cues which results time in bed, wake after sleep onset, sleep efficiency, and total sleep time to decline. (Abad & Guilleminault 2018: 795- 802.)

Aging causes a loss in sleep efficiency, which is the proportion of time spent asleep when in bed. As a result, there is a delay in the commencement of sleep and an increase in awakenings during the night (Miller 2019: 508) and also, it impacts the sleep quality of the elderly according to Sun et al. (2020: 2). In the table 2 below are the changes in sleep related to age.

Table 2. Age related change in sleep (Miller 2019: 510).

Sleep characteristics	**Healthy older adults (vs healthy younger adults)**
Non-REM	Gradual increase in length of light sleep stages with less time in deep sleep. More frequent shifts in and out of light sleep.
REM (Dream stage)	Shorter episodes. Begins earlier in the night. Less intense.
Sleep initiation	Longer time to fall asleep.
Sleep maintenance	More frequent arousals.
Sleep efficiency	Reduced amount of sleep during time in bed, more time in napping to compensate.
Sleep schedule	Shift in nocturnal sleep phase to earlier bedtime and wakening.

Sleep is an essential physiological process that is crucial for the healing and maintenance of the body. As individuals grow older, sleep undergoes both qualitative and quantitative changes. Numerous sleep disorders are becoming more common among the elderly population. (Wolkove, Elkholy, Baltzan & Palayew 2007a: 1299.)

2.4 Sleep disorders in elderly

The term "sleep disorders" refers to issues with sleep quantity, quality, and timing that lead to daily distress and functional impairment according to American Psychiatric Association (2022). Sleep disorders are not a natural consequence of ageing according to Miner & Kryger (2017), they frequently co-occur with medical disorders or other mental health conditions, like cognitive abnormalities, anxiety, and depression, American Psychiatric Association (2022) explains. Sleep disorders are widespread in the elderly, and the prevalence of sleep disorders is expected to rise as this demographic segment of the population grows states Miner & Kryger (2017: 33). The International Classification of Sleep Disorders (ICSD-3) classifies sleep disorders into six major categories (Zucconi & Ferri 2014: 96), which are shown in the next table.

Table 3. ICSD-3 sleep disorder classification's major categories (Zucconi & Ferri 2014: 96).

Major sleep disorder categories
1. Insomnia
2. Sleep-related breathing disorders
3. Central disorders of hypersomnolence
4. Circadian rhytm sleep-wake disorders
5. Parasomnias
6. Sleep-related movement disorders

With age, more people develop various sleep disorders. Insomnia is the most common sleep disorder among the elderly, whether it is a primary symptom or a secondary effect of another condition or medicine according to Wolkove, Elkholy, Baltzan & Palayew (2007b: 1449). It has been estimated than over 35% of people annually has difficulties with sleep, including falling asleep, remaining asleep, waking up early, or having nonrestorative sleep; while 10% suffer chronic insomnia that impairs daytime performance (Partinen 2015; Chokroverty 2010: 132). An approach to a patient with sleep problems must begin with a full knowledge of the disorder specified in the newest edition of the International Classification of Sleep Disorders (ICSD-2) so that the patient may be properly examined, paying particular attention to the history and physical findings before ordering laboratory testing (Chokroverty 2010: 132).

2.4.1 Insomnia

World health organization (WHO) international classification of diseases (WHO-ICD) defines insomnia as a condition of unsatisfactory quantity and/or quality of sleep that persists for an extended length of time, characterized by trouble getting asleep, difficulty staying asleep, and/or early final awakening (WHO 1992: 182). Established Populations for Epidemiologic Studies of the Elderly (EPESE), a major observational community study comprising over 9000 participants and undertaken by the National Institute on Aging (NIA), revealed a higher prevalence of insomnia. Over 50% of elderly had chronic sleep difficulties, notably difficulty initiating or maintaining sleep. (Foley, Monjan, Brown, Simonsick, Wallace & Blazer 1995: 425.) Insomnia is frequently caused by depression and anxiety, which are common among the elderly Wolkove et al. (2007a: 1299) explains. In individuals with insomnia, 25% of individuals are in good health, 62% have a mental health problem, and 12% have a sleep disorder according to Finnish institute for health welfare (2020).

2.4.2 Insomnia and aging

Insomnia gets more prevalent with age: the frequency of long-term insomnia in men and women aged 65 and older is approximately five percent every year (Käypä hoito -suositus 2023). Insomnia in the elderly is different from that in the general population for three reasons: first, ageing and a number of medications taken by the elderly can make them more susceptible to developing insomnia; second, there is growing evidence connecting insomnia to cognitive impairment, dementia, depression, cardiovascular events, and other health problems; and third, pharmacological treatments for insomnia may have significant adverse effects in the elderly (Kwon, Lee, Cheong, Kim, Jang, Chung & Kim 2021). Thus, Foley et al. (1995: 428) states that age is not a cause of insomnia by itself, but it is associated with different health problems. Insomnia can be categorised in three different stages based on symptoms (i.e., sleep onset or sleep maintenance) or its duration (NIH 2005: 1049; Käypä hoito -suositus 2023) as shown in the table 4.

Table 4. Insomnia stages (Käypä hoito -suositus 2023).

Stages of insomnia
1. Temporary insomnia
2. Short-term (1-3 months) insomnia
3. Long-lasting (>3 months) insomnia

Clinically, insomnia disorder is diagnosed by a complaint of unhappiness with sleep quality and/or quantity, trouble initiating or staying asleep, waking up too early, and/or characteristics affecting or unsatisfactory sleep that adversely affects ability to function normally and occurs at least three nights a week for more than three months (Miner & Kryger 2017 :37). The ICSD-3 criteria to diagnose insomnia is shown in the table 5, all four main categories are required (Maness & Khan 2015: 1059).

Table 5. Criteria diagnosing insomnia (Maness & Khan 2015: 1059).

ICSD-3 criteria for diagnosing insomnia
1. Difficulty falling asleep
2. Difficulty staying asleep
3. Early awakening
4. Daytime impairment manifested by at least one of the following: • Fatigue or malaise • Poor attention or concentration • Social or vocational/educational dysfunction • Mood disturbance or irritability • Daytime sleepiness • Reduced motivation or energy • Increased errors or accidents • Behavioural problems such as hyperactivity, impylsivity, or aggression • Ongoing worry about sleep • Occurs at least three times per week for at least one month • Not related to inadequate opportunity, an inappropriate sleep environment, or another sleep disorder

Insomnia should be assessed using a clinical evaluation, self-report questionnaires, and daily sleep diaries. The gold standard for diagnosing insomnia is clinical assessment. Several patient-reported questionnaires evaluate insomnia symptoms, severity, correlates, and cause. The Insomnia Severity Index (ISI), Pittsburgh Sleep Quality Index (PSQI), Insomnia Symptom Questionnaire, and Athens Insomnia Scale are popular tools for diagnosing insomnia. (Morin, Bellevilla, Bélanger & Ivers 2011: 601.) Different methods are used to make the insomnia diagnostics (Käypä hoito -suositus 2023).

These methods include sleep history, sleep diary, or sleep log, possible prescription drug use, sleep and psychological rating scale, focused physical examination, blood tests, night polygraphy, polysomnography, and summary of investigations inter alia (Käypä hoito -suositus 2023; Saddichha 2010: 95-96). In terms of majority of European nations relevant diagnostic categories for insomnia are "non-organic insomnia" (F51.0) and "disorders of beginning and maintaining sleep (insomnia)" (G47.0) (Riemann 2017: 677).

2.5 Treatment of insomnia in elderly

Insomnia in adults, including the elderly, can be treated with psychotherapy, pharmacotherapy, or both. Treatment perceptions of individuals should be measured before, during, and after treatment. (Abad & Guilleminault 2018: 814) Liu (2020) have mentioned that the treatment method for insomnia generally follows a general approach, while specific pharmacological treatment guidelines may be recommended differently. Their general approaches are listed next in table 6.

Table 6. Treatment methods for insomnia according to Liu (2020).

General approaches for treatment methods for insomnia
Assess the characteristics of insomnia, identify the sleep deficit, and improve therapy for any associated disorders.
Cognitive behavioural therapy (CBT) with or without relaxation therapy should be used to commence treatment
Additional nonpharmacologic methods may be considered if no effect is shown
If still no improvement, rethink diagnosis and re-evaluate, especially for undetected underlying conditions
If cognitive-behavioural therapy (CBT) is ineffective, pharmacotherapy supported by evidence should be added
If there is still no improvement, try alternate treatments (e.g., valerian, melatonin)

The purpose of these treatments according to Kamel & Gammack (2006: 466) is to reduce morbidity and improve the patient and family’s quality of life. Insomnia-related morbidities, such as sadness, disability, and diminished quality of life, may be restored by treatment whereas effective therapy for insomnia may also enhance patient productivity, cognition, medical needs, and accident risk.

2.5.1 Pharmacological treatment of insomnia in elderly

Numerous individuals with insomnia may benefit from non-pharmacologic therapy, but many may need pharmaceutical treatments to overcome insomnia, though up to 40% of patients withdraw from cognitive behavioural therapy for insomnia (CBT-I) before to the midpoint of treatment (Matthews, Arnedt, McCarthy, Cuddihy & Aloia 2013: 462). The selection of prescription medication should be done with consideration given to the treatment goals as well as the individual qualities of the patient (Liu 2020). The choice of medication should be determined by the presence and intensity of daytime symptoms, as well as their consequence on the patient's daytime functioning and overall quality of life. Improved sleep start, uninterrupted sleep maintenance, and better functioning the following day are all anticipated pharmacologic results. (McCall 2004.)

Rational medication for insomnia, especially persistent insomnia, in adults and elderly people follows five principles according to Kupfer & Reynolds (1997: 342) utilise the lowest effective dose, intermittent dosing (two to four times weekly), short-term use (three to four weeks), gradual withdrawal, and watch for rebound insomnia.

Cooke & Ancoli-Israel (2011: 662) states that sedative-hypnotic drugs are sometimes appropriate for the treatment of insomnia; however, studies have indicated that for the most successful treatment, pharmacologic treatment should be combined with behavioural therapy. Sedative-hypnotics, particularly benzodiazepines, have serious side effects that must be considered while prescribing them. Long-acting hypnotics can produce daytime sleepiness and impaired motor coordination, which can lead to injury.

According to Ancoli-Israel et al. (2005: 109-110) and Scharf et al. (2005: 722-723) the more selective short-acting type-1 GABA benzodiazepines receptor agonists (BzRAs) including zolpidem, zaleplon, and eszopiclone have been proven to be efficacious with little clinical residual effects, withdrawal, dependency, and tolerance. Zolpidem, zaleplon, and eszopiclone are excellent short-term insomnia treatments for elderly.

Krystal et al. (2003: 798-799) states that eszopiclone has been shown to be both safe and effective in treating insomnia, but these studies only involved younger adults, so according to Roth, Stubbs & Walsh (2005: 306) these more recent sleep medications (zolpidem, zaleplon) need to be regarded as first-line medications for the treatment of insomnia. Table 7 presents The American Academy of Sleep Medicine (AASM) recommendations for pharmacotherapies (Sateia, Buysse, Krystal, Neubauer & Heald 2017: 316).

Table 7. Pharmacotherapy recommendations according to AASM (Sateia, Buysse, Krystal, Neubauer & Heald 2017: 316).

For sleep maintenance insomnia: suvorexant, eszopiclone, zolpidem, temazepam, doxepin
For sleep onset insomnia: eszopiclone, zaleplon, zolpidem, triazolam, temazepam, ramelteon
Recommendation against using trazodone, tiagabine, diphenhydramine, melatonin, tryptophan, or valerian for either sleep-onset or sleep-maintenance insomnia.

Pharmacological treatments have several adverse effects, also with other medications, which needs to be considered when prescribing them (Käypä hoito -suositus 2023). Though, the advantages of the medications may not outweigh the higher risk in elderly people (Glass, Lanctôt, Herrmann, Sproule & Busto 2005). The table 8 below displays some of the prescription medications for insomnia according to Finnish Current Care Guidelines (Käypä hoito -suositus 2023).

Table 8. Medications to treat insomnia (Käypä hoito -suositus 2023).

Classification	Active substance	Notes
Benzodiazepines	Temazepam Oxazepam	The disadvantages are minor in occasional use. With regular use, the drug efficacy decreases.
	Diazepam	Not recommend for elderly (elimination time has reduced)
Nonbenzodiazepines (Benzodiazepine-like medicines)	Zolpidem	Reduced elimination time in elderly. May cause incoherence.
	Zopiclone	Psychomotoric disadvantages may occur for over 12 hours.
	Zaleplon	For occasional use. With regular use, the drug efficacy decreases.
Sedative antidepressants	Mirtazapine	Best effect on low doses. May decrease blood pressure especially in elderly.
Other medicines	Melatonin	Available as short- and long-acting. Should be taken at the same time every day. May increase INR-value if using warfarin. Cimetidine and oestrogen increase the concentration.

Elderly people should be made aware of the risks associated with medications usage by physicians, who should also provide tapering protocols to assist with a comfortable and safe withdrawal of these drugs (Markota, Rummans, Bostwick & Lapid 2016: 1638) as these medications can induce amnesia, physical dependence, rebound anxiety, memory impairment, and withdrawal syndrome along with increases in chance of falling among the elderly resulting in various physical injuries, according to Uzun, Kozumplik,

Jakovljević & Sedić (2010: 92,) as a result, older patients who use these medications also need to be closely monitored states Lam & Macina (2017: 621).

2.5.2 Non-pharmacological treatment of insomnia in elderly

In the treatment of sleep problems, particularly insomnia, non-pharmacological treatment should always receive priority, states Seppälä (2016), and it should be used as a first line of treatment of insomnia states Soong, Burry, Greco & Tannenbaum (2021). It has been established through research that non-pharmacological treatments can induce reliable and long-lasting improvements in the sleep patterns of patients with insomnia (Harsora & Kessmann 2009: 128-129). The treatment of patients who complain of sleeplessness must be customized and based on the formulation of their conditions. As there are numerous processes that may impact the likelihood of insomnia, and as many of these processes may operate concurrently, there are numerous factors that may influence the probability of insomnia. (Siebern, Suh & Nowakowski 2012: 719.) Initial approaches to treatment of insomnia should include at least one behavioural intervention such as stimulus control therapy or relaxation therapy, or the combination of cognitive therapy, stimulus control therapy, sleep restriction therapy with or without relaxation therapy - otherwise known as cognitive behavioural therapy for insomnia (CBT-I) (Schutte-Rodin et al. 2008: 487; Siebern, Suh & Nowakowski 2012: 719). As a result, multiple therapy alternatives may be recommended for each individual, according to Neubauer & McHugh (2003: 168). Next listing includes some non-pharmacological methods for treating insomnia in the elderly:

Sleep hygiene education

Sleep hygiene is the foundation of treating any sleep disorder, although it is rarely effective on its own; therefore, it is frequently combined with other therapies (Frohnhofen & Hermann 2021: 297). It recommends individual to set a routine wake time, stay active, reduce troublesome noise, regulate room temperature, consume a light snack before bed, avoid prolonged use of psychotropic drugs, avoid caffeine in the evening, avoid drinking before bed, and not fight insomnia (Pigeon, Bishop & Marcus 2013: 156).

Stimulus control

Based on learning theory, stimulus control is an effective insomnia treatment that restores positive cognitions and eliminates negative associations with the sleep, evening

routine, and bed by following several principles to reduce sleep-related stimuli and negative cognitions (Pigeon, Bishop & Marcus 2013: 156). These principles include maintaining a regular waking time, reserving the bedroom only for sleep and intimacy, lying down only when sleepy, and leaving the bed if unable to fall asleep and avoiding naps (Pigeon, Bishop & Marcus 2013: 156; Morin et al 1999: 1136).

Relaxation

Insomnia can also be treated through relaxation training, which reduces basal arousal and teaches patients to decrease physiological and cognitive stimulation. Important components of relaxation include diaphragmatic breathing methods, guided imagery, meditation, gradual muscular relaxation, and biofeedback. (Pigeon, Bishop & Marcus 2013: 157.) Alexandru, Róbert, Viorel & Vasile (2009: 78) states that muscle relaxation improves sleep start time, resulting in high-quality sleep, and so benefits in the treatment of insomnia. Muscle relaxation also aids in falling asleep by minimising alertness, as part of the integrate hypothesis of insomnia.

Cognitive Therapy for Insomnia (CBT-I)

Cognitive-behavioural treatment (CBT) which is considered the initial treatment for insomnia, according to Soong, Burry, Greco & Tannenbaum (2021), is one of the most widely used and well re-searched forms of psychotherapy the application of which depends on the sickness or condition being addressed. However, cognitive-behavioural treatment in insomnia's (CBT-I) fundamental premise is that our thoughts, feelings, and actions are interconnected and affect our well-being (Institute for Quality and Efficiency in Health Care 2016). The most predominant treatment for chronic insomnia is CBT-I with many elements, which often includes instruction on sleep hygiene, stimuli management, sleep restriction, and cognitive therapy (Baron, Perlis, Nowakowski, Smith, Jungquist & Orff 2017: 80). Cognitive behaviour therapy for insomnia has multiple components, including cognitive psychotherapy, sleep hygiene, stimulus control, sleep restriction, paradoxical intention, and relaxation therapy (Harsora & Kessmann 2009: 129) and it identifies beliefs, behaviours, and external factors that interfere with establishing and maintaining sleep while allocating time for sleep that is balanced with respect to the body's circadian and homeostatic rhythms (Pigeon, Bishop & Marcus 2013: 158).

Studies have shown that CBT-I was effective at reducing insomnia in the elderly and given its effectiveness and safety, cognitive behavioural therapy for insomnia in the elderly should be the first-line treatment (Sadler, McLaren, Klein, Harvey & Jenkins 2018; Ebben 2021; Chao et al. 2021.) According to Harvey et al. (2014), cognitive behavioural therapy places a strong emphasis on fostering nocturnal sleep as well as intervention for daytime symptoms and also mindfulness-based cognitive therapy (MBCT) is a potential treatment for chronic insomnia, according to Wong et al. (2017), who evaluated the efficacy of MBCT for insomnia (MBCT-I) by comparing it to a sleep psycho-education with exercise control (PEEC) group. Long-term benefits were not observed in MBCT for insomnia, but short-term benefits were observed.

Alternative therapy

Aromatherapy, passionflower, and chamomile were also sometimes used to treat insomnia, but their effectiveness hasn't been proven by scientific research yet because there have been so few studies on these topics (NIH 2022a, b, c). Acupuncture, acupressure, and Tai Chi are some of the other therapies that have showed success in small studies (Gooneratne 2008: 136; Alexandru et al. 2009: 78). Evening rituals and a peaceful, tranquil night make sleep possible. It has been discovered that fluffing a pillow, covering the individuals, and soothing them is equally as effective as prescribing sleep aids. Additionally, morning bright light therapy and midday activity have been linked to favourable outcomes. (Seppälä 2016.)

According to Manjunath & Telles (2005: 688), yoga and meditation are non-pharmacological methods to treat insomnia that helps to reduce physiological arousal in normal individuals based on autonomic and respiratory variables and oxygen consumption, which could have reduced the time to fall asleep and increased total sleep time in institutionalised, older people. Acupuncture, according to Yin et al. (2017:198), is an effective and safe treatment for improving insomnia patients' sleep quality and promoting psychological wellbeing. Düzgün & Durmaz Akyol (2017: 298) and Pigeon, Bishop & Marcus (2013: 159) state that circadian rhythms are influenced by light-dark cycles, which affect 24-hour physiological, psychological, and behavioural characteristics including sleep quality and light exposure reset individuals' circadian rhythms, making falling asleep simpler and earlier.

In Europe, it is a concern that there are not as many non-pharmacological treatments that are supported by scientific evidence. This is emphasized in health centres, where patients have frequently suffered from insomnia for five to ten years while receiving

several medications but no psychosocial treatment according to Partonen, Tuisku, Nikolakaros & Partinen (2020: 2475).

3 Purpose of the thesis, aims and research questions

Purpose of this literature review is to describe the non-pharmacological methods used to treat insomnia in elderly care nursing as well as how these methods affect sleep quality in elderly. Aim of this descriptive literature review is to produce knowledge that could help health care workers and students to develop their working methods and improve their competence in insomnia among elderly with non-pharmacological methods and help the elderly to improve their quality of sleep.

Research questions:

1. What are non-pharmacological methods used to treat insomnia in elderly care nursing?

2. How non-pharmacological methods used to treat insomnia affect sleep quality in elderly?

4 Methodology and methods

4.1 Descriptive literature review as research method

Methodological approach used in this thesis was qualitative and a method selected was descriptive literature review. Literature review is the thorough study and explanation of literature that relates to a specific question, Aveyard (2019: 2) explains. Successful literature review should be critical and organized assessment of existing studies and it also should contain recognizing patterns and themes, as well as evaluation of the quality of the material (Williamson & Whittaker 2020: 182; Wang & Park 2016: 67). According to Aveyard (2019: 3), a literature review usually includes sections for research questions, methods, results, and discussion. Aveyard (2019: 4) points out importance of literature reviews for the health care professionals as summarizations as there are increasing amount of literature available, which cannot be read, and all the information absorbed on any one topic. In the other hand the evidence bases of nurses' professional practices, which are used every day, is contributed by literature reviews (Aveyard 2019: 9).

Qualitative research, as explained by Parahoo (2014: 56), is an approach that attempt to understand human experience, beliefs, perception, motivation, intention, and behaviour by exploring them, which are based on the idea that interpretation is the key to studying and understanding social phenomena. Qualitative research uses rich conceptual material and a flexible research method to examine phenomena in depth (Polit & Beck 2004: 729). It also explores participants' perspectives and actions utilizing inductive, interactive, comprehensive, adaptable, and reflexive data collection and processing methodologies (Parahoo 2014: 56). The emphasis of qualitative research methodology is more on the quality of the data than it is on the quantity of the data, which is the focus of quantitative research methodology (Maltby, Williams, McGarry & Day 2010: 22-48).

4.2 Data search and selection

The data for this thesis was obtained by searching, reviewing, and analysing research articles and studies that have already been done on the non-pharmacological treatments used for elderly, and adults were included as well. PICO tool (table 9) was used to form the search sentences for database searches. The data was searched using Boolean technique from CINAHL complete and PubMed databases, which are some of the main databases used to find studies in the field of nursing and health care science.

Table 9. PICo used to help to create the search sentences.

P	**Patient group**	**Elderly**
I	Interest	Non-pharmacologic treatment for insomnia
Co	Context	Elderly care

Table 10 shows the conducted include and exclude criteria for the articles, based on the research questions.

Table 10. Include – exclude criteria.

Inclusion	Exclusion
Primary scientific sources	Secondary sources
Articles published in year 2012-2022	Articles published before 2012
Peer-reviewed articles	Articles that are not peer reviewed
Articles written in English or Finnish language	Articles written in any other language
Articles that focus on the non-pharmacological treatment in insomnia	Articles that focus on the pharmacological treatment in insomnia
Adults and Elderly	Children and Adolescents

It is important that thesis provides valid information, so the authors made a choice to use only peer reviewed articles in primary scientific sources. There were several articles published before 2012, but the authors wanted to use relevant knowledge and decided to draw a line in a decade. There were also several interesting studies, which did not have proper age group or too few participants, therefore those were then excluded. English and Finnish languages were used because of the authors' language skills.

Review findings' methods and results should be reported in sufficient detail to allow readers to evaluate the trustworthiness and applicability of systematic reviews. The Preferred Reporting Items for Systematic reviews and Meta-Analyses, or shortly, PRISMA, statement was made to make systematic reviews' reporting transparent and complete. (Page et all (2021.) Therefore, a Prisma flow diagram was conducted in figure 1.

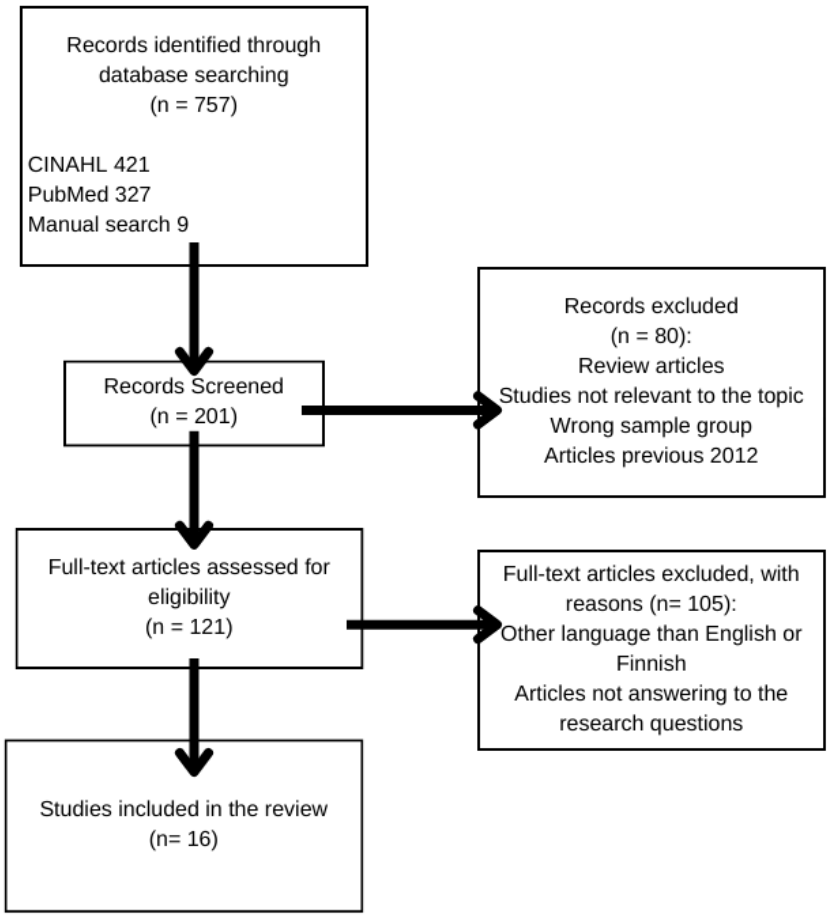

Figure 1. PRISMA of the database search.

Articles selected to this descriptive literature review can be found in Appendix 1, table of selected articles in Appendix 2 and data search table in Appendix 3.

4.3 Data analysis

Qualitative data analysis is complicated, challenging, non-linear process, it is also described to be iterative activity, meaning that researchers go back and forth with their data collection and analysing and refining research questions along the way. Analysing qualitative data is time consuming and requires lot of work. (Holloway & Galvin 2017: 287; Polit & Beck 2022: 257.) Qualitative data analysis is also described to be commonly inductive because it is used to visualize and build a new theory according to Wang & Park (2016: 211). Kyngäs (2020) explains that inductive content analysis is used when data collection approach is open and following loosely defined themes. Therefore, inductive content analysis is used for data analysis method in the thesis.

For analysing qualitative data there are no universal or accurate rules, but content analysis can be considered as a conversation between the researcher and their data. (Kyngäs 2020; Polit & Beck 2022: 257.) In the table 11 below is an example of the data analysis, results can be found in the chapter 5.

Table 11. Example of the data analysis.

Meaning unit (authors, page numbers)	**Reduction / Coding**	**Subcategory**	**General category**	**Main category**
"…after the intervention, sleep quality in the treatment group was significantly better than the control group (P < 0.05)." "…the trend of PSQI score variations in the treatment group was downward and significant." (Adib-Hajbaghery & Mousavi, 109&111)	Significantly better sleep quality. Better PSQI scores.	Chamomile extract Better sleep quality	Alternative methods Improved effects	Non-pharmacological methods for insomnia Effects on sleep quality
"Findings showed that depression and sleep improved in the treatment group compared to the comparison group..." "In the sub-categories of sleep, subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency and daytime dysfunction were significantly improved with laughter therapy, but sleep disturbance and medication use were not." (Han, Park & Park, 560&566)	Sleep improved. Improved subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency and daytime dysfunction. Sleep disturbance didn't improve.	Laughter therapy Better sleep quality Longer sleep Falling asleep faster No improve in sleep disturbance	Group programs Improved effects Contradictive effects	Non-pharmacological methods for insomnia Effects on sleep quality

5 Results

Findings of this descriptive literature review's data, which included sixteen articles, are presented in this chapter. The articles selected were all peer-reviewed and chosen from elderly care or sleeping related journals emphasising nursing aspect. Diverse and dispersed throughout twelve nations, the research were conducted between 2012 and 2022, participants were all elderly and the study group sizes varied from 20 to 165 individuals. The following outlines the studies:

From Asia; China: Cai, Lin, Wang, Yan, & Li (2022), and Wang, Xu, Li, Fu, Li, Wang, Chen, Liu, & Chen (2021). From the Islamic Republic of Iran: Adib-Hajbaghery & Mousavi (2017). From Korea: Han, Park, & Park (2017). Huang, Chang & Lai (2016), and Chen, Huang, Cheng, Li & Chang (2015) from Taiwan. From Turkey: Örsal, Alparslan, Özkaraman & Sönmez (2014) and Akyar & Akdemir (2013). Hariprasad, Sivakumar, Koparde, Varambally, Thirthalli, Varghese, Basavaraddi & Gangadhar (2013) from India.

From Europe; Norway: Jøranson, Olsen, Calogiuri, Ihlebæk & Pedersen (2020). Sweden: Sandlund, Hetta, Nilsson, Ekstedt & Westman (2017) and Bothelius, Kyhle, Espie & Broman (2013). Kuck, Pantke & Flick (2014) from Germany.

From North America and Australia: Canada: Constantinescu, Warness, Virk, Perez, Shankel & Holroyd-Ledu (2019). The United States: Harris, Richard & Grando (2012). And from Australia: Naismith, Pye, Terpening, Lewis & Bartlett (2019).

Eleven studies were quantitative (Cai et al. 2022; Wang et al. 2021; Constantinescu et al. 2019; Naismith et al. 2019; Han et al. 2017; Huang et al. 2016; Kuck et al. 2014; Örsal et al. 2014; Bothelius et al. 2013; Hariprasad et al. 2013; Harris et al. 2012) and five were using mixed methods (Jøranson et al. 2020; Adib-Hajbaghery & Mousavi 2017; Sandlund et al. 2017; Chen et al. 2015; Akyar & Akdemir 2013).

Inductive content analysis answering the research question “what are non-pharmacological methods used to treat insomnia in elderly care nursing” resulted in six main categories, for example physical activity, and 19 subcategories within those main categories, like yoga. The results are also visible in figure 2 and explained more thoroughly in subtopic 5.1. Findings for the research question “how non-pharmacological methods used to treat insomnia affect the sleep quality in elderly?” had two generic categories: improved and contradictive effects on sleep quality, them including ten subcategories, for instance better sleep quality. The results of this review are shown in figure 3 and explained more in detail in subtopic 5.2.

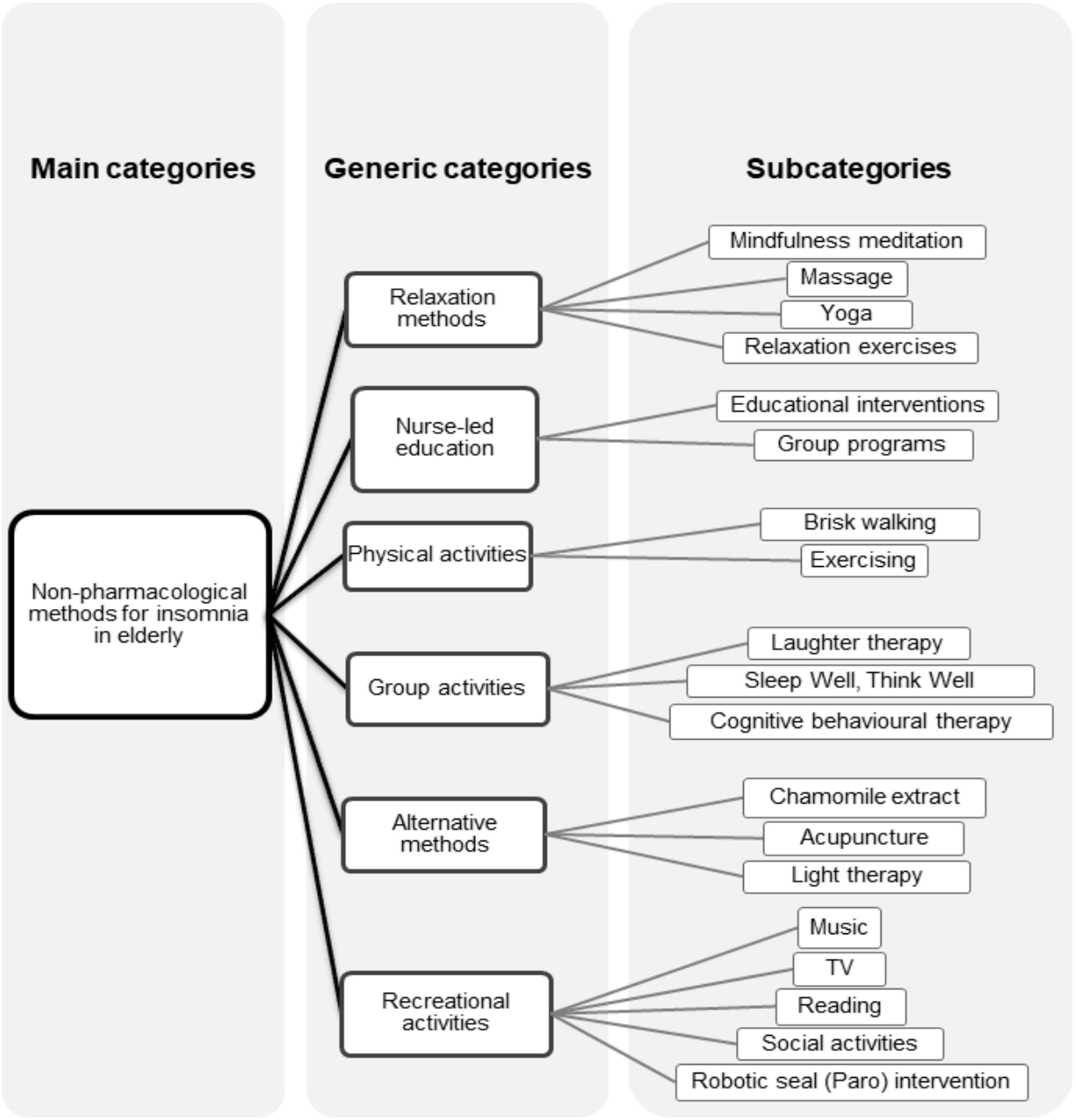

Figure 2. Inductive content analysis of non-pharmacological methods for insomnia.

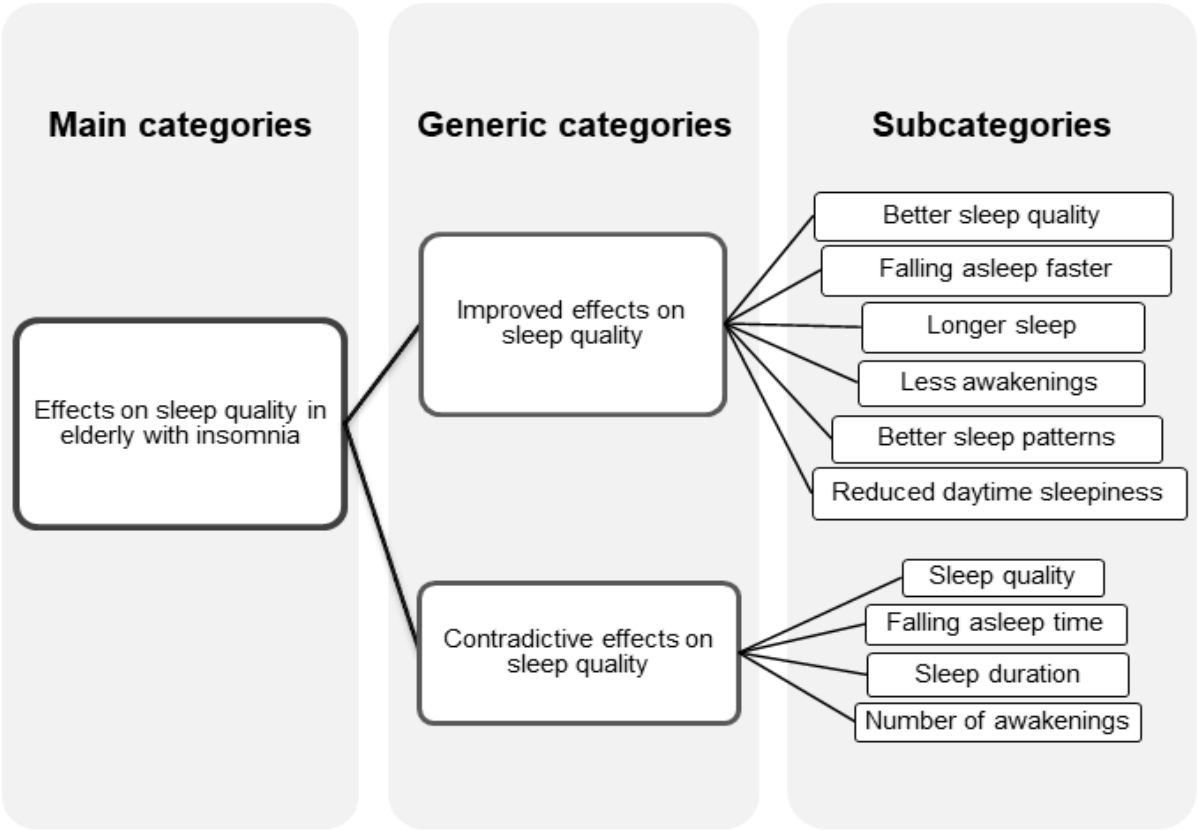

Figure 3. The effects of non-pharmacological methods to sleep quality.

The list of the articles included this descriptive literature review can be found from Appendix 1.

5.1 Non-pharmacological methods for insomnia in elderly

Based on the chosen articles to this review and using inductive content analysis, six generic categories were obtained to answer the research question “what are non-pharmacological methods used to treat insomnia in elderly care nursing?”. Relaxation methods were obtained from four articles (Cai et al. 2022; Örsal et al. 2014; Hariprasad et al. 2013; and Harris et al. 2012). Nurse-led education were identified from four articles (Cai et al. 2022; Constantinescu et al. 2019; Sandlund et al. 2017; and Bothelius et al. 2013). Also, three articles (Huang et al. 2016; Chen et al. 2015; and Kuck et al. 2014) obtained physical activities. Group activities were identified from three articles (Naismith et al. 2019; Han et al. 2017; Sandlund et al. 2017). Furthermore, three articles (Wang et al. 2021; Adib-Hajbaghery & Mousavi 2017; Akyar & Akdemir 2013) resulted alternative methods. Lastly, recreational activities were obtained from four articles (Jøranson et al. 2020; Huang et al. 2016; Kuck et al. 2014; Örsal et al. 2014).

5.1.1 Relaxation methods

The results of this descriptive literature review resulted different relaxation methods for treating insomnia non-pharmacologically in elderly care. One of the methods was mindfulness meditation (Cai et al. 2022), where different kind of mindfulness practices were done with a teacher, including mindfulness breathing, body scanning, stretching, compassion and mindfulness practices. Relaxation exercises (Örsal et al (2014), meaning tensing and relaxing specific muscles from the hands to the feet with technique called PMR (progressive muscle relaxation), were another method recognized. Also, one-hour daily yoga (Hariprasad et al. 2013) and three-minute slow stroke back massages before sleeping (Harris et al. 2012) were identified from the selected articles.

5.1.2 Nurse-led education

Another generic category based on the selected articles was nurse-led education. First, nurses got more specific education of insomnia and how to treat it non-pharmacologically. After these different educations they were able to have either group treatment sessions in primary care or more individual treatment in long-term care, depending on the education. Nursing staff were also empowered to conduct non-pharmacological methods to evaluate and treat insomnia. (Cai et al. 2022; Constantinescu et al. 2019; Sandlund et al. 2017; Bothelius et al. 2013.)

5.1.3 Physical activities

The results of this descriptive literature review showed that different physical activities are beneficial when treating insomnia in elderly people. One of the activities was brisk walking combined with music (Huang et al. 2016). Exercising included also warm-ups, aerobic motions, harmonic stretching in wheelchair-bound senior elastic band exercise program (Chen et al. 2013). Also, strength, balance, and endurance promoting, using for example ankle weights and tennis rings (Kuck et al. 2014) were included to exercising category.

5.1.4 Group programs

Based on this review, different group programs could be used when treating insomnia in elderly. The Sleep Well, Think Well group intervention included education and treatment program, where patients got handouts and had face-to-face meetings. The handouts contained information about good sleeping habits, possible changes in sleep

regarding aging, and methods for improving sleep. There were also different booklets provided, focusing on mindfulness, relaxation, anxiety and worries, good sleep hygiene, and thoughts related with initiation and upkeeping of sleep. In the meetings were discussed about psychoeducation and treatment plans for better sleep based on the handouts. (Naismith et al. 2019.)

Another group program was laughter therapy, which consisted of sessions with singing amusing songs, stretching, laughing for diversion, lectures, engaging in hand games, dancing, laughing exercises, and laughing out loud. (Han et al. 2017.) The nurse-led insomnia group treatment (Sandlund et al. 2017) was based on cognitive behavioural therapy, where sessions focused on helping patients recognize and alter present maladaptive habits and unhelpful thinking that might sustain sleeplessness. Patients got information about sleep and different kinds of methods to improve sleep, and, also, managing sleeplessness, for example relaxation, worry time and sleep restrictions.

5.1.5 Alternative methods

This review resulted different alternative methods for treating insomnia. These methods were acupuncture (Wang et al. 2021); the treatments lasted twenty minutes at the time for ten sessions. In chamomile extract capsule intervention (Adib-Hajbaghery & Mousavi 2017) the capsules were taken daily for 28 days. Light therapy treatment (Akyar & Akdemir 2013) was daily, 30 minutes at a time for 30 days.

5.1.6 Recreational activities

The selected articles showed also different recreational activities as non-pharmacological methods used in treating insomnia in elderly care. Paro, the robotic seal intervention (Jøranson et al. 2020) was a group program for elderly with dementia. The robotic seal was interactive with authentic baby seal sounds, artificial intelligence, fur and moving body parts. Soothing music (Huang et al. 2016) included peaceful Buddhist songs for 30 minutes before sleeping. Memory promoting exercises, fine motor skill games, group activities and conversations (Kuck et al. 2014) were combined as social activities. Watching TV, listening to music and reading a book (Örsal et al. 2014) were listed to help getting to sleep.

5.2 Effects of non-pharmacological methods on sleep quality

The selected research articles shows that the non-pharmacological methods used for insomnia in elderly, which were listed in 5.1, also affect the sleep quality in the elderly (Cai et al. 2022; Wang et al. 2021; Jøranson et al. 2020; Constantinescu et al. 2019; Naismith et al. 2019; Adib-Hajbaghery & Mousavi 2017; Han et al. 2017; Sandlund et al. 2017; Huang et al. 2016; Chen et al. 2015; Kuck et al. 2014; Örsal et al. 2014; Akyar & Akdemir 2013; Bothelius et al. 2013; Hariprasad et al. 2013; Harris et al. 2012). Effects were divided in two generic categories: improved and contradictive effects. All research had improvement in effects, but in some cases, there were differences in subjective and objective results, and that is how the contradictive effects was chosen as another generic category.

5.2.1 Improved effects on sleep quality

This descriptive literature review showed that all of the selected articles resulted better sleep quality (Cai et al. 2022; Wang et al. 2021; Jøranson et al. 2020; Naismith et al. 2019; Adib-Hajbaghery & Mousavi 2017; Han et al. 2017; Sandlund et al. 2017; Huang et al. 2016; Chen et al. 2015; Kuck et al. 2014; Örsal et al. 2014; Akyar & Akdemir 2013; Bothelius et al. 2013; Hariprasad et al. 2013; Harris et al. 2012). Furthermore, falling asleep faster (Wang et al. 2021; Jøranson et al. 2020; Han et al. 2017; Sandlund et al. 2017; Huang et al. 2016; Akyar & Akdemir 2013; Bothelius et al. 2013) and longer sleep (Wang et al. 2021; Jøranson et al. 2020; Constantinescu et al. 2019; Han et al. 2017; Sandlund et al. 2017; Chen et al. 2015; Harris et al. 2012) were commonly resulted. Less awakenings (Jøranson et al. 2020; Sandlund et al. 2017), better sleep patterns (Constantinescu et al. 2019) and reduced daytime sleepiness (Naismith et al. 2019) also were identified from the research articles.

5.2.2 Contradictive effects on sleep quality

Few studies (Han et al. 2017; Bothelius et al. 2013; Harris et al. 2012) showed some incoherent results related to the improved effects identified. The studies resulted with no effects in sleep quality (Bothelius et al. 2013; Harris et al. 2012), falling asleep time (Bothelius et al. 2013), sleep duration (Bothelius et al. 2013; Harris et al. 2012) and number of awakenings (Han et al. 2017).

6 Discussion

6.1 Discussion of findings

The purpose of this thesis was to describe the non-pharmacological methods used to treat insomnia in elderly care nursing as well as how these methods improve sleep quality in elderly and the aim of this descriptive literature review was to gather knowledge that could help health care workers and students to develop their working methods and improve their competence in insomnia among elderly with non-pharmacological methods and help the elderly to improve their quality of sleep. The collected and analysed data for this bachelor's thesis revealed 19 different non-pharmacological method with the effects of these methods in the sleep quality of elderly (Cai et al. 2022; Wang et al. 2021; Jøranson et al. 2020; Constantinescu et al. 2019; Naismith et al. 2019; Adib-Hajbaghery & Mousavi 2017; Han et al. 2017; Sandlund et al. 2017; Huang et al. 2016; Chen et al. 2015; Kuck et al. 2014; Örsal et al. 2014; Akyar & Akdemir 2013; Bothelius et al. 2013; Hariprasad et al. 2013; Harris et al. 2012).

According to Soong, Burry, Greco & Tannenbaum (2021), non-pharmacological methods should be used as the first line of treatment for insomnia. There are several non-pharmacological methods to treat insomnia (Siebern, Suh & Nowakowski 2012: 719) relaxation technique on the elderly has been found to be one of the treatments for elderly insomnia, which is in line with the findings of this descriptive review. Massage, mindfulness through meditation, yoga, or relaxation exercises are examples of relaxation methods (Cai et al. 2022, Akyar & Akdemir 2013, Harris et al. 2012), which were found from this review. It was discovered that mindfulness has a better effect that directly enhances the elderly's sleep quality, and it caused significant relaxation in the brain, which resulted in less anxiety and perceived tension, resulting in fewer nightly awakenings among the elderly (Cai et al. 2022), which is in line with a study by Wong et al. (2017: 250), who found that mindfulness was more effective at reducing nocturnal arousals. In elderly, using a relaxation method before sleeping increased subjective sleep quality, sleep latency, sleep disorder, and daytime functioning (Akyar & Akdemir 2013), furthermore Alexandru et al. (2009: 78) found that relaxation aids in decreasing attentiveness prior to sleep. Yoga is yet another non-pharmacological treatment for insomnia that improved total sleep quality score. This review resulted that the yoga program for the elderly incorporates physical postures, relaxation techniques, and intentionally regulated breathing, which increased sleep latency, sleep duration, and the feeling of being rested upon waking. Yoga intervention improved the total sleep quality

of elderly nursing home residents, resulting in a higher quality of life. (Harris et al. 2012.) According to Manjunath & Telles (2005: 688), yoga may have reduced the time necessary to fall asleep and enhanced total sleep time in this group of institutionalized older persons by lowering physiological arousal, anxiety symptoms, and boosting physiological adaptability.

A nurse-led educational program, which may involve educational intervention, group programs, or cognitive behavioural therapy, is another non-pharmacological technique that is used to treat insomnia in elderly patients (Constantinescu et al. 2019, Hariprasad et al. 2013 & Sandlund et al. 2017). The use of pharmacological treatments in elderly, such as the administration of sedatives, is linked to a higher risk of adverse side effects (Constantinescu et al. 2019); hence, educational interventions led by nurses, such as requesting that elderly patients keep sleep diaries as a means of establishing and auditing tailored sleep strategies (Constantinescu et al. 2019; Hariprasad et al. 2013) and cognitive behavioural therapy, are two non-pharmacological methods are more beneficial in the treatment of insomnia in elderly (Hariprasad et al. 2013 & Sandlund et al. 2017). According to Harvey et al. (2014), cognitive techniques may be essential for maintaining improvement in sleep quality over time; nevertheless, cognitive behavioural therapy show contradictive effect on sleep quality, the sleep time, or quality; awakenings; or daytime drowsiness were not significantly improved (Hariprasad et al. 2013). Nonetheless, it is evident that nurse-led group therapy is a great alternative for treating insomnia given the additional benefit of reducing the need for sedatives (Sandlund et al. 2017).

Physical activities such as exercises, aerobics, stretching, warmups, or energetic movements are another non-pharmacological technique for treating insomnia in the elderly (Huang et al. 2016; Chen et al. 2015; Kuck et al. 2014). Active exercise, such as a brisk walk supplemented with music therapy, improves objective and subjective sleep in the elderly (Huang et al. 2016). In elderly, the combination of music therapy with active exercise, such as a brisk walk, results in an improvement in both the objective and subjective measures of sleep (Huang et al. 2016). Sleep disturbance can be caused by sedentary lifestyles, especially in the elderly who spend too much time in bed and sleep during the day, therefore the WSEB program not only got the elderly moving but also provided an excellent venue for social interaction (Chen et al. 2015). The amount of time residents spends sleeping can be enhanced by a combination of physical activity and social engagement, according to Richards et al. (2011), which improve the elderly's sleep quality (Kuck et al. 2014).

Acupuncture, chamomile extract, and light therapy are three complementary and alternative treatments for insomnia (Wang et al. 2021; Adib-Hajbaghery & Mousavi 2017; Bothelius et al. 2013). It has been demonstrated that acupuncture is an effective treatment for enhancing both subjective and objective sleep markers, in addition to sleep architecture, in elderly (Constantinescu et al. 2019). According to the findings of a study conducted by Yin et al. (2017: 198), acupuncture may increase the overall amount of time spent sleeping as well as the quality of sleep achieved, so the results were similar than in this descriptive review. The chamomile extract does not reveal a statistically significant difference; nonetheless, the treatment group had considerably better sleep quality after the intervention than the control group did (Adib-Hajbaghery & Mousavi 2017). The use of light therapy for thirty to sixty minutes a day leads to improvements in the subjective sleep quality, length, efficiency, and latency of sleep, as well as improvements in daytime functioning (Bothelius et al. 2013.) Düzgün & Durmaz Akyol (2017: 918) had similar results; natural sunlight therapy has the potential to considerably improve the overall quality of elderly people's sleep as well as its individual components.

Recreational activities, such as Paro intervention, listening to music, watching television, and reading books, can also be used as non-pharmacological methods to treat insomnia in the elderly (Jøranson et al. 2020; Huang et al. 2016; Akyar & Akdemir 2013; Kuck et al. 2014). The Paro intervention had a major impact on all important criteria describing the sleep quality of the target group. During the Paro intervention, both sleep efficiency and total sleep time increase. (Jøranson et al. 2020.) According to Jøranson, Pedersen, Rokstad, and Ihlebaek (2016: 3032), Paro can improve the quality of life for the elderly with the improvement in the sleep quality of the elderly. Both a relaxing music intervention and brisk walking while listening to music improved both objective and subjective sleep, according to one study (Huang et al. 2016). Massage, watching television, listening to music, and reading have all demonstrated some improvement in sleep quality (Akyar & Akdemir 2013).

6.2 Ethical considerations and validity

Ethic in research is a moral standard values that concern the degree to which research process adheres to professional, legal, and social obligation to study participant whereas validity refers to a quality criterion that refers to the degree to which inferences made in the study are accurate and well founded; in measurement, it refers to the degree to which an instrument measures what it is intendent to measure according

to Polit and Beck (2022: 383-403). Elo et al. (2014) states that qualitative research is regarded difficult due to its complexities in terms of validity and ethics.

6.2.1 Ethical consideration

Ethics is the study of an individual's decisions and motivations based on their ideas of right and wrong. It is not established by specific laws or tight norms, and despite being reasonably stable, it is subject to change through time. (Clement 2013.) The principles of research include proper research behaviour, maximizing research quality and resilience, and responding to threats or violations of research integrity. The research code describes professional, legal, and ethical duties and the necessity of institutional environments. This Code of Conduct applies to publicly sponsored and private research, while considering implementation limits. (ALLEA 2017: 3.) According to Ethical recommendations for thesis writing at universities of applied sciences (2019), researchers have ethical and moral responsibility, among others, to the society, the research community, the professional field, the research's funder, and the people who are the subjects of the study.

The WHO Research Ethics Review Committee (ERC) is responsible for ensuring that research is conducted ethically. The work of the ERC is guided by the World Medical Association (WMA) Declaration of Helsinki (1964), which was updated in 2013. (WHO 2022.) The WMA Declaration balances human interests with clinical trial participants. Its fundamental principles include respect for individuals, the right to make informed decisions, recognition of vulnerable groups, protection of life, health, dignity, integrity, self-determination, privacy, and confidentiality of research subjects' personal information, and minimization of environmental harm (WMA 2022). It is necessary to adhere to ethical principles to protect the dignity, rights, and wellbeing of study participants. The norms of conduct for scientific researchers are defined by research ethics, and research ethics sets the standards for how researchers should conduct themselves. (WHO 2022.)

Finland uses a framework that is based on the national rules put out by the Finnish National Board on Research Integrity TENK for trying to find and investigating Responsible Conduct of Research (RCR) violations (Finnish National Board on Research Integrity TENK 2008). The National Committee on Medical Research Ethics (Tukija) oversees making sure that clinical trials in Finland are done in an ethical way. Tukija provides opinion on a plan to build a dataset before it's registered in the national biobank registration run by Finnish Medicines Agency Fimea. (Tukija 2022.)

Good research practice follows the contexts of research environment, training, supervision and mentoring, research procedures, safeguards, data practices and management, collaborative working, publication, and dissemination, reviewing, evaluating and editing. All these contexts are produced, designed, and structured to encourage research integrity. (ALLEA 2017: 5.) Research misconduct includes making up, lying about, or copying someone else's work in research, as well as manipulating authorship, self-plagiarism, misrepresenting research results, ignoring possible violations of research integrity, and many other things (ALLEA 2017: 8-9).

The most prevalent kind of misconduct in the academic data is considered as plagiarism states Juyal, Thawani & Thaledi (2015: 77). Within the focus of this research, research misconduct constitutes the majority of the most important ethical considerations.; plagiarism, falsification, and fabrication of gathered data were the three most important ethical considerations kept in mind given that the aim was to produce a descriptive literature review. The obtained material was referred to throughout the whole of the method to ensure that there were no instances of plagiarism at any stage of the research process. In addition, Metropolia itself gives explicit guidelines for proper scientific practice that students are expected to adhere to during their studies. Therefore, the study was conducted with respect and in accordance with the guidelines. Furthermore, the aspects related to the responsible conduct of research and research misconduct that were specified by TENK (2012) were adhered to in a rigorous manner in order to ensure that the findings of the study were correct and can be relied upon. The thesis work did not include any personal opinions or thoughts. All findings were stated honestly and truthfully to prevent any biases. This thesis has been checked by using Turnitin program to avoid plagiarism.

6.2.2 Validity

Validity describes the extent to which a quantitative study accurately measures a concept (Heale & Twycross 2015: 66). The validity of a research study is how well its results reflect those of similar people outside the study. This concept of validity applies to all sorts of clinical studies, including prevalence, associations, therapies, and diagnosis. A research's validity includes internal and external validity. (Patino & Ferreira 2018: 183.) For example, a survey that was meant to find out about depression but instead found out about anxiety would not be considered valid (Heale 2015: 66). For a research study to be judged valid, all aspects of validity, including content validity, criterion validity, and construct validity, must be examined (Polit & Beck, 2022: 230-231).

Internal validity refers to the extent to which it is reasonable to conclude that the independent variable is the driving force behind the outcome. However, the challenges to study validity posed by risks to internal validity such as temporal ambiguity, selection, history, maturation, and mortality might be difficult to overcome. (Holloway & Galvin 2017: 305-306.) The term "external validity" refers to the extent to which the findings of clinical trials provide a reliable basis for projecting those findings to other types of clinical settings. To put it another way, external validity refers to the extent to which the findings of an experiment can be extrapolated to apply to the population of the "real world." If the outcomes of an experiment are not internally valid, then the question of whether they have external validity is meaningless. Internal validity is a requirement for external validity. (Akobeng 2008: 281.)

Qualitative researchers agree that high-quality research is important, but its definition is contested. Some researchers believe validity is a quality requirement in both qualitative and quantitative studies. A “gold standard” for qualitative research was developed back in 1985 that includes credibility, dependability, confirmability, transferability, and authenticity to promote reliability and validity. There are techniques to increase the validity of research, and these methods should be implemented at every stage, including data collection, coding, analysis, and reporting. (Polit & Beck 2022: 276–278.)

To ensure the validity, prior to data collection, validity must be addressed. Researchers must be as accurate as possible when utilizing rating scales or scores to characterize physiological or psychological features, employing high-quality, targeted data measurement. The technique of data collecting should be well-researched, and it is more reliable to collect personality characteristics through a standardized questionnaire. Appropriate sampling techniques are the second component. Thirdly, the evaluation subjects or elements, such as age, location, or occupation, should be given. And lastly the sample size must be adequate and representative of the population, the method, or the parameter. (Ahmed & Ishtiaq 2021: 2403–2404.)

As validity implied research methodology rightness and sufficiency (Association for Qualitative Research 2022) by reviewing the transferability, dependability, credibility, and conformability, which are the four primary parts of evaluating qualitative research (Elo et al. 2014) in the literature review process, all of these qualitative research criteria for each data collection, selection, and analysis technique were used. The data for this research were taken from reliable databases such as CINAHL and PubMed. The methodologies for gathering data and doing analysis are detailed in the appendix, where they are also explained and presented in the form of several tables. The articles utilized

were chosen from academic journals and subjected to inclusion and exclusion criteria and those articles were scrutinized for reliability. Relevant articles written in languages other than English may have been overlooked since only English-language articles were considered.

6.3 Conclusions and Recommendations

The following conclusions were drawn based on the findings of this descriptive literature review:

- Insomnia in the elderly can be treated using a wide variety of non-pharmacological ways.
- All methods, for example yoga, improved sleep quality.
- Some methods, for example laughter therapy, had contradictive results in sleep quality, i.e., sleep duration and sleep latency were improved, but there was no effect with sleep disturbance.
- Non-pharmacological methods to treat insomnia in elderly care is safe and effective.

More research on this topic is necessary, as it became clear during the thesis process that there isn't much research in this field. It was challenging to locate latest and academically accepted research articles on various non-pharmacological approaches used to treat insomnia in elderly care. Academic studies were mostly conducted in early adults (22-34 years old) or middle adults (35-44 years old) or in community settings, thus there is still potential for more research on non-pharmacological treatments used to treat insomnia in elderly care. Finding research on non-pharmacological methods for treating insomnia in the elderly in the context of Finland was difficult, and there wasn't much on the topic from a nursing perspective. Finnish nursing-related research on the topic was scarce and largely concerned with occupational health care. Further research of the topic from a nursing perspective would be beneficial in the future because nurses are always in frontline while provide the health care and service to the peoples.

Both the topic of this thesis and the method used to do the research were considered essential and educational. When contemplating a future career as nurses, the information gathered about the issue through research is comprehensive and crucial. During the phase of analysis, it was discovered that this bachelor’s thesis has the potential to increase the knowledge of nurses and student nurses by expanding their knowledge, enhancing their existing skills, and promoting the use of non-pharmacological methods for the treatment of insomnia in elderly care settings. The authors not only improved their knowledge of non-pharmacological approaches to treat insomnia in elderly care,

but they also acquired a better comprehension of various research methods, methodologies, and the literature review process. During the course of this bachelor's thesis, the authors acquired both the knowledge and abilities necessary to locate academically credible studies. This information is vital for working as a healthcare practitioner because it allows one to provide patients and clients with appropriate and updated non-pharmacological treatments for insomnia in elderly care. These non-pharmacological treatments are safer for elderly population than pharmacological treatments. Therefore, the treatments are also more cost-effective, when there are less for example fallings as side effects of drugs and less hospital visits.

References

Abad, V. C. & Guilleminault, C. 2018. Insomnia in Elderly Patients: Recommendations for Pharmacological Management. Drugs & aging 35(9), 791–817.

Ahmed, I. & Ishtiaq, S. 2021. Reliability and validity: Importance in Medical Research. JPMA. The Journal of the Pakistan Medical Association 71(10), 2401–2406.

Akobeng, A. K. 2008. Assessing the validity of clinical trials. Journal of Pediatric Gastroenterology and Nutrition 47(3), 277–282.

Alexandru, B. V., Róbert, B., Viorel, L. & Vasile, B. 2009. Treating primary insomnia: a comparative study of self-help methods and progressive muscle relaxation. Journal of Evidence-Based Psychotherapies 9(1), 67-82.

ALLEA - All European Academies. 2017. The European Code of Conduct for Research Integrity. <https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf>. Accessed 17 November 2022.

American Psychiatric Association. 2022. What are sleep disorders? <https://www.psychiatry.org/patients-families/sleep-disorders/what-are-sleep-disorders>. Accessed 2 December 2022.

Ancoli-Israel, S., Richardson, G. S., Mangano, R. M., Jenkins, L., Hall, P. & Jones, W. S. 2005. Long-term use of sedative hypnotics in older patients with insomnia. Sleep medicine 6(2), 107–113.

Association for Qualitative Research. 2022. Validity. <https://www.aqr.org.uk/glossary/validity>. Accessed on 18 November 2022.

Aveyard, H. 2019. Doing a Literature Review in Health and Social Care – A Practical Guide. London: McGraw-Hill Education, 2-9.

Baron, K. G., Perlis, M. L., Nowakowski, S., Smith, M. T. Jr., Jungquist, C. R. & Orff, H. J. 2017. Cognitive behavioural therapy for insomnia. In P. H. Attarian (Ed.). Clinical handbook of insomnia. New York: Springer. 75-96.

Boutron, I. & Ravaud, P. 2012. Introduction. Boutron, I., Ravaud, P. & Moher, D. (Eds.). Randomized clinical trials of nonpharmacological treatments. Boca Raton: CRC Press. xi–xii.

Chao, L. L., Kanady, J. C., Crocker, N., Straus, L. D., Hlavin, J., Metzler, T. J., Maguen, S. & Neylan, T. C. 2021. Cognitive behavioural therapy for insomnia in veterans with gulf war illness: Results from a randomized controlled trial. Life sciences 2015(279).

Chokroverty, S. 2010. Overview of sleep & sleep disorders. The Indian journal of medical research 2010(131), 126–140.

Clement, N. 2013. Nursing ethics. E-book. Chennai: Pearson. Chapter 1.

Cooke, J.R. & Ancoli-Israel, S. 2011. Normal and abnormal sleep in the elderly. Handbook of Clinical Neurology 2011(98), 653-65.

Darchia, N., Oniani, N., Sakhelashvili, I., Supatashvili, M., Basishvili, T., Eliozishvili, M., Maisuradze, L. & Cervena, K. 2018. Relationship between Sleep Disorders and Health Related Quality of Life-Results from the Georgia SOMNUS Study. International Journal of Environmental Research and Public Health 15(8), 1588.

Düzgün, G. & Durmaz Akyol, A. 2017. Effect of Natural Sunlight on Sleep Problems and Sleep Quality of the Elderly Staying in the Nursing Home. Holistic nursing practice 31(5), 295–302.

Ebben M. R. 2021. Insomnia: Behavioural Treatment in the Elderly. Clinics in geriatric medicine 37(3), 387–399.

Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K. & Kyngäs, H. 2014. Qualitative content analysis: A focus on trustworthiness. SAGE Open 4(1).

Ethical recommendations for thesis writing at universities of applied sciences. 2019. The Rectors' Conference of Finnish Universities of Applied Sciences Arene. <https://www.arene.fi/wp-content/uploads/Raportit/2020/ETHICAL%20RECOMMENDATIONS%20FOR%20THESIS%20WRITING%20AT%20UNIVERSITIES%20OF%20APPLIED%20SCIENCES_2020.pdf?_t=1578480382>. Accessed 21 January 2023.

Finnish institute for health welfare. 2020. Sleep and sleep disorders. <https://thl.fi/fi/web/elintavat-ja-ravitsemus/uni>. Accessed 2 December 2022.

Finnish National Board on Research Integrity TENK. 2008. Research Misconduct. <https://tenk.fi/en/research-misconduct>. Accessed 18 November 2022.

Foley, D. J., Monjan, A. A., Brown, S. L., Simonsick, E. M., Wallace, R. B. & Blazer, D. G. 1995. Sleep complaints among elderly persons: an epidemiologic study of three communities. Sleep 18(6), 425–432.

Frohnhofen, H. & Hermann, M.D. 2021. Sleep in Elderly Adults and in Subjects with Dementia. In DelRosso M. L. & Ferri R. (Eds). Sleep Neurology. E-book. Cham: Springer. Chapter 18.

Glass, J., Lanctôt, K. L., Herrmann, N., Sproule, B. A. & Busto, U. E. 2005. Sedative hypnotics in older people with insomnia: meta-analysis of risks and benefits. British medical journal 2005(331).

Gooneratne, N. S. 2008. Complementary and alternative medicine for sleep disturbances in older adults. Clinics in Geriatric Medicine 24(1), 121–38.

Harsora, P. & Kessmann, J. 2009. Nonpharmacologic Management of Chronic Insomnia. American Family Physician 79(2), 125–130.

Harvey, A. G, Bélanger, L., Talbot, L., Eidelman, P., Beaulieu-Bonneau, S., Fortier-Brochu, É., Ivers, H., Lamy, M., Hein, K., Soehner, A. M., Mérette, C. & Morin C. M. 2014. Comparative efficacy of behaviour therapy, cognitive therapy, and cognitive behaviour therapy for chronic insomnia: a randomized controlled trial. Journal of Consulting and Clinical Psychology 82(4), 670-683.

Hassinger, A. B., Bletnisky, N., Dudekula, R. & El-Solh, A. A. 2020. Selecting a pharmacotherapy regimen for patients with chronic insomnia. Expert Opinion on Pharmacotherapy 21(9), 1035-1043.

Heale, R. & Twycross, A. 2015. Validity and reliability in quantitative studies. Evidence Based Nursing 18(3), 66-67.

Holloway, I. & Galvin, K. 2017. Qualitative Research in Nursing and Healthcare. Chichester: John Wiley & Sons, Ltd. 287-306.

Hulisz, D. & Duff, C. 2009. Assisting Seniors With Insomnia: A Comprehensive Approach. U.S. Pharmacist 34(6), 38-43.

Institute for Quality and Efficiency in Health Care (IQWiG). 2016. Cognitive Behavioural Therapy. <https://www.ncbi.nlm.nih.gov/books/NBK279297/#i2136.whatiscognitivethera>. Accessed 10 November 2022.

Juyal, D., Thawani, V., & Thaledi, S. 2015. Plagiarism: an egregious form of misconduct. North American journal of medical sciences 7(2), 77–80.

Jøranson, N., Pedersen, I., Rokstad, A. M. & Ihlebaek, C. 2016. Change in quality of life in older people with dementia participating in Paro-activity: a cluster-randomized controlled trial. Journal of Advanced Nursing 72(12), 3020-3033.

Kamel, N. S. & Gammack, J. K. 2006. Insomnia in the elderly: cause, approach, and treatment. The American journal of medicine 119(6), 463–469.

Krystal, A. D., Walsh, J. K., Laska, E., Caron, J., Amato, D. A., Wessel, T. C. & Roth, T. 2003. Sustained efficacy of eszopiclone over 6 months of nightly treatment: results of a randomized, double-blind, placebo-controlled study in adults with chronic insomnia. Sleep 26(7), 793–799.

Kupfer, D. J., & Reynolds, C. F. 1997. Management of insomnia. The New England journal of medicine 336(5), 341–346.

Kwon, C. Y., Lee, B., Cheong, M. J., Kim, T. H., Jang, B. H., Chung, S. Y., & Kim, J. W. 2021. Non-pharmacological Treatment for Elderly Individuals With Insomnia: A Systematic Review and Network Meta-Analysis. Frontiers in Psychiatry 2020(11).

Kyngäs, H. 2020. Inductive Content Analysis. In Kyngäs, H., Mikkonen, K. & Kääriäinen, M. (Eds.). The Application of Content Analysis in Nursing Science Research. E-book. Cham: Springer. Chapter 2.

Käypä hoito -suositus. 2023. Unettomuus. Suomalaisen Lääkäriseuran Duodecimin ja Suomen Unitutkimusseura ry:n asettama työryhmä. Helsinki: Suomalainen Lääkäriseura Duodecim, 2023. <https://www.kaypahoito.fi/hoi50067>. Accessed 9 March 2023.

Lam, S. & Macina, L. O. 2017. Therapy Update for Insomnia in the Elderly. The Consultant pharmacist: The Journal of the American Society of Consultant Pharmacists, 32(10), 610–622.

Liu, M. T. 2020. Current and emerging therapies for insomnia. The American journal of managed care 26(4), 85–90.

Maltby, J., Williams, G., McGarry, J. & Day, L. 2010. Research Methods for Nursing and Healthcare. London: Routledge. 22-48.

Maness, D. L., & Khan, M. 2015. Nonpharmacologic Management of Chronic Insomnia. American family physician 92(12), 1058–1064.

Manjunath, N. K. & Telles, S. 2005. Influence of Yoga and Ayurveda on self-rated sleep in a geriatric population. Indian Journal of Medical Research 121(5), 683-690.

Markota, M., Rummans, T. A., Bostwick, J. M. & Lapid, M. I. 2016. Benzodiazepine Use in Older Adults: Dangers, Management, and Alternative Therapies. Mayo Clinic Proceedings 91(11), 1632–1639

Matthews, E. E., Arnedt, J. T., McCarthy, M. S., Cuddihy, L. J. & Aloia, M. S. 2013. Adherence to cognitive behavioral therapy for insomnia: a systematic review. Sleep medicine reviews 17(6), 453–464.

Mattis, J. & Sehgal, A. 2016. Circadian Rhythms, Sleep, and Disorders of Aging. Trends in Endocrinology & Metabolism 27(4), 192-203.

McCall, W. V. 2004. Sleep in the Elderly: Burden, Diagnosis, and Treatment. Primary care companion to the Journal of clinical psychiatry 6(1), 9–20.

McCrae, C. S., Dzierzewski, J. M. & Kay, D. 2009. Treatment of Late-life Insomnia. Sleep Medicine Clinics 4(4), 593-604.

McMillan, J. M., Aitken, E. & Holroyd-Leduc J. M. 2013. Management of insomnia and long-term use of sedative-hypnotic drugs in older patients. Canadian Medical Association Journal 185(17), 1499–1505.

Merriam-Webster dictionary. 2022. Key word. <https://www.merriam-webster.com/dictionary/key%20word>. Accessed 14 December 2022.

Miller, A. C. 2022. Nursing for Wellness in Older Adults. Philadelphia: Wolters Kluwer. 512.

Miller, A. M., Ahuja, M. & Cappuccio, F. 2012. Sleep and Pregnancy: Sleep Deprivation, Sleep Disturbed Breathing and Sleep Disorders in Pregnancy. <https://www.researchgate.net/publication/221928530_Sleep_and_Pregnancy_Sleep_Deprivation_Sleep_Disturbed_Breathing_and_Sleep_Disorders_in_Pregnancy>. Accessed 17 November 2022.

Miller, C. A. 2019. Nursing for Wellness in Older Adults. Philadelphia: Wolters Kluwer. 508-523.

Miner, B. & Kryger, M. H. 2017. Sleep in the Aging Population. Sleep medicine clinics 12(1), 31-38.

Montgomery, P. & Dennis, J. 2004. A systematic review of non-pharmacological therapies for sleep problems in later life. Sleep medicine reviews 8(1), 47–62.

Morgan, K. 2000. Sleep and Aging. In Lichstein, L. K. & Morin, M. C. (Eds.). Treatment of Late-Life Insomnia. California: Sage Publication, Inc. 1.

Morin, C. M., Belleville, G., Bélanger, L. & Ivers, H. 2011. The Insomnia Severity Index: psychometric indicators to detect insomnia cases and evaluate treatment response. Sleep 34(5), 601–608.

Nelson, K. L., Davis, J. E. & Corbett, C. F. 2022. Sleep quality: An evolutionary concept analysis. Nursing forum 57(1), 144–151.

Neubauer, N. D. & McHugh, R. P. 2003. Understanding Sleeplessness: Perspectives on Insomnia. Baltimore: Johns Hopkins University Press. 168.

NIH = National Institutes of Health

NIH. 2005. National Institute of Health State of the Science Conference statement on Manifestations and Management of Chronic Insomnia in Adults, June 13–15, 2005. Sleep 28(9), 1049–1057.

NIH. 2022a. Aromatherapy. <https://www.nccih.nih.gov/health/aromatherapy>. Accessed 10 November 2022.

NIH. 2022b. Chamomile. <https://www.nccih.nih.gov/health/chamomile>. Accessed 10 November 2022.

NIH. 2022c. Passionflower. <https://www.nccih.nih.gov/health/passionflower>. Accessed 10 November 2022.

Ohayon, M. M. 2002. Epidemiology of insomnia: what we know and what we still need to learn. Sleep Medicine Reviews 6(2), 97-111.

Orimo, H., Ito, H., Suzuki, T., Araki, A., Hosoi, T. & Sawabe, M. 2006. Reviewing the definition of “elderly”. Geriatrics & Gerontology International 6(3), 149-158.

Page, M. J., Moher, D., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., McGuinness, L. A., Stewart, L. A., Thomas, J., Tricco, A. C., Welch, V. A., Whitina, P. & McKenzie, J. E. 2021. PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. <https://www.bmj.com/content/372/bmj.n160>. Accessed 22 January 2023.

Parahoo, K. 2014. Nursing Research: Principles, Process and Issues. Basingstoke: Palgrave Macmillan. 56.

Partinen, M. 2015. Unettomuuden ilmaantuvuus, unettomuudesta toipuminen sekä niihin yhteydessä olevat tekijät ikääntyneillä. <https://www.kaypahoito.fi/nix02229>. Accessed 17 March 2023.

Partonen, T., Tuisku, K., Nikolakaros, G., & Partinen, M. 2020. Mistä unettomuushäiriössä on kyse? Duodecim 2020(136), 2470–2477.

Patino, C. M. & Ferreira, J. C. 2018. Internal and external validity: can you apply research study results to your patients? Jornal Brasileiro de Pneumologia 44(3), 183.

Pigeon, R. W., Bishop, M. T. & Marcus, A. J. 2013. Current Pharmacological and Non-pharmacological Options for the Management of Insomnia. Clinical Medicine Insights: Therapeutics 2013(5), 151–162.

Polit, D. F., & Beck, C. T. 2004. Nursing research: Principles and Methods. Philadelphia: Lippincott Williams & Wilkins. 729.

Polit, D. F. & Beck, C. T. 2022. Essentials of nursing research: appraising evidence for nursing practice. Philadelphia: Wolters Kluwer. 230-403.

Raphael, I. J. & Pedemonte, M. 2021. Neurobiology of sleep. In DelRosso, M. L. & Ferri, R. (Eds.). Sleep Neurology. E-book. Cham: Springer. 15.

Richards, K. C., Lambert, C., Beck, C.K, Bliwise, D. L., Evans, W. J., Kalra, G. K., Kleban, M. H., Lorenz, R., Rose, K., Gooneratne, N. S. & Sullivan, D. H. 2011. Strength training, walking, and social activity improve sleep in nursing home and assisted living residents: randomized controlled trial. Journal of the American Geriatrics Society 59(2), 214-223.

Riemann, D., Baglioni, C., Bassetti, C., Bjorvatn, B., Dolenc Groselj, L., Ellis, J. G., Espie, C. A., Garcia-Borreguero, D., Gjerstad, M., Gonçalves, M., Hertenstein, E., Jansson-Fröjmark, M., Jennum, P. J., Leger, D., Nissen, C., Parrino, L., Paunio, T., Pevernagie, D., Verbraecken, J., Weeb, H. G. & Spiegelhalder, K. 2017. European guideline for the diagnosis and treatment of insomnia. Journal of sleep research 26(6), 675–700.

Roth, T. 2007. Insomnia: Definition, Prevalence, Etiology, and Consequences. Journal of Clinical Sleep Medicine: JCSM: Official Publication of the American Academy of Sleep Medicine 3(5), 7–10.

Roth, T., Stubbs, C., & Walsh, J. K. 2005. Ramelteon (TAK-375), a selective MT1/MT2-receptor agonist, reduces latency to persistent sleep in a model of transient insomnia related to a novel sleep environment. Sleep 28(3), 303–307.

Saddichha, S. 2010. Diagnosis and treatment of chronic insomnia. Annal of Indian Academy Neurology 13(2), 94-102.

Sadler, P., McLaren, S., Klein, B., Harvey, J. & Jenkins, M. 2018. Cognitive behaviour therapy for older adults with insomnia and depression: a randomized controlled trial in community mental health services. Sleep Research Society 41(8).

Sateia, M. J., Buysse, D. J., Krystal, A. D., Neubauer, D. N. & Heald, J. L. 2017. Clinical Practice Guideline for the Pharmacologic Treatment of Chronic Insomnia in Adults: An American Academy of Sleep Medicine Clinical Practice Guideline. Journal of clinical sleep medicine 13(2), 307–349.

Scharf, M., Erman, M., Rosenberg, R., Seiden, D., McCall, W. V., Amato, D., & Wessel, T. C. 2005. A 2-week efficacy and safety study of eszopiclone in elderly patients with primary insomnia. Sleep 28(6), 720–727.

Schutte-Rodin, S., Broch, L., Buysse, D., Dorsey, C. & Sateia, M. 2008. Clinical guideline for the evaluation and management of chronic insomnia in adults. Journal of Clinical Sleep Medicine 4(5), 487–504.

Seppälä, M. 2016. Vanhusten unihäiriöiden hoito. <https://www.oppiportti.fi/op/ger02903/do>. Accessed 12 November 2022.

Siebern, A. T., Suh, S. & Nowakowski, S. 2012. Non-pharmacological treatment of insomnia. Neurotherapeutics: The journal of the American Society for Experimental NeuroTherapeutics 9(4), 717–727.

Siegel J. M. (2008). Do all animals sleep? Trends in neurosciences 31(4), 208–213.

Soong, C., Burry, L., Greco, M. & Tannenbaum, C. 2021. Advise non-pharmacological therapy as first line treatment for chronic insomnia. British Medical Journal 2021(372).

Sun, X. H., Ma, T., Yao, S., Chen, Z., Xu, W., Jiang, X. & Wang, X. 2020. Associations of sleep quality and sleep duration with frailty and pre-frailty in an elderly population Rugao longevity and ageing study. BioMed Central Geriatrics 20(1), 1-9.

Tukija. 2022. National Committee on Medical Research Ethics (Tukija). <https://www.tukija.fi/web/tukija-englanti>. Accessed 18 November 2022.

Uzun, S., Kozumplik, O., Jakovljević, M., & Sedić, B. 2010. Side effects of treatment with benzodiazepines. Psychiatria Danubina 22(1), 90–93.

Wang, G. T. & Park, K. 2016. Student Research and Report Writing – From Topic Selection to the Complete Paper. Chichester: Wiley Blackwell. 67-211.

WHO = World Health Organization

WHO. 1992. The ICD-10 Classification of Mental and Behavioural Disorders: clinical descriptions and diagnostic guidelines. Geneva: World Health Organization.

WHO. 2004. WHO technical meeting on sleep and health. Presentation on 22-24 January. World Health Organization Regional Office for Europe European Centre for Environment and Health Bonn Office.

WHO. 2022. Ensuring ethical standards and procedures for research with human beings. <https://www.who.int/activities/ensuring-ethical-standards-and-procedures-for-research-with-human-beings#:~:text=Research%20ethics%20govern%20the%20standards,and%20welfare%20of%20research%20participants>. Accessed 17 November 2022.

Williams, P. 2016. Basic Geriatric Nursing. Missouri: Elsevier. 332.

Williams, P. 2020. Basic Geriatric Nursing. Missouri: Elsevier. 337-342.

Williamson, G. R. & Whittaker, A. 2020. Succeeding in Literature Reviews & Research Project Plans for Nursing Students. London: Sage Publications Ltd. 36-182.

Wold, G. H. 2004. Basic Geriatric Nursing. Philadelphia: Mosby. 278- 281.

Wolkove, N., Elkholy, O., Baltzan, M. & Palayew, M. 2007a. Sleep and aging: 1. Sleep disorders commonly found in older people. Canadian Medical Association Journal 176(9), 1299-1304.

Wolkove, N., Elkholy, O., Baltzan, M. & Palayew, M. 2007b. Sleep and aging: 2. Management of sleep disorders in older people. Canadian Medical Association Journal 176(10), 1449-1454.

Wong, S. Y., Zhang, D. X., Li, C. C, Yip, B. H., Chan, D. C., Ling, Y. M., Lo, C. S., Woo, D. M., Sun, Y. Y, Ma, H., Mak, W. W., Gao, T., Lee, T. M. & Wing, Y. K. 2017. Comparing the Effects of Mindfulness-Based Cognitive Therapy and Sleep Psychoeducation with Exercise on Chronic Insomnia: A Randomised Controlled Trial. Psychotherapy and Psychosomatics 86(4), 241-253.

WMA Declaration of Helsinki - Ethical Principles for Medical Research Involving Human Subjects. <https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/>. Accessed 17 November 2022.

Yin, X., Gou, M., Xu, J., Dong, B., Yin, P., Masquelin, F., Wu, J., Lao, L. & Xu, S. 2017. Efficacy and safety of acupuncture treatment on primary insomnia: a randomized controlled trial. Sleep medicine 2017(37), 193–200.

Zucconi, M. & Ferri R. 2014. Classification of sleep disorders. In Bassetti, C. L., Đogaš, Z. & Peigneux, P. (Eds.) ESRS Sleep Medicine Textbook. Regensburg: European Sleep Research Society. 95–109.

List of selected articles

Below is a listing of the articles used in this descriptive literature review.

1 Cai, Z. Z., Lin, R., Wang, X. X., Yan, Y. J. & Li, H. 2022. Effects of mindfulness in patients with mild cognitive impairment with insomnia: A double-blind randomized controlled trial. Geriatric Nursing 47(5), 239-246.

2 Wang, C., Xu, W.L., Li, G.W., Fu, C., Li, J.J., Wang, J., Chen, X.Y, Liu, Z. & Chen, Y.F. 2021. Impact of Acupuncture on Sleep and Comorbid Symptoms for Chronic Insomnia: A Randomized Clinical Trial. Nature of Science of Sleep 2021(13), 1807-1822.

3 Jøranson, N., Olsen, C., Calogiuri, G., Ihlebæk, C. & Pedersen, I. 2020. Effects on sleep from group activity with a robotic seal for nursing home residents with dementia: a cluster randomized controlled trial. International Psychogeriatrics 33(10), 1045–1056.

4 Constantinescu, A. M., Warness, J. R., Virk, N., Perez, G., Shankel, M. & Holroyd-Leduc, J. 2019. Optimizing Sleep for Residents in Long-Term Care Without Sedatives. Annals of Long-Term Care 27(12), 1–6.

5 Naismith, L.S., Pye, J., Terpening, Z. & Lewis, S. 2019. “Sleep Well, Think Well” Group Program for Mild Cognitive Impairment: A Randomized Controlled Pilot Study. Behavioral Sleep Medicine 17(6), 778-789.

6 Adib-Hajbaghery, M. & Mousavi, S.N. 2017. The effects of chamomile extract on sleep quality among elderly people: A clinical trial. Complement Therapies in Medicine 35(2017), 109-114.

7 Han, J. H., Park, K. M. & Park, H. 2017. Effects of Laughter Therapy on Depression and Sleep Among Patients at Long-term Care Hospitals. Korean Journal of Adult Nursing 29(5), 560-568.

8 Sandlund, C., Hetta, J., Nilsson, G. H., Ekstedt, M. & Westman, J. 2017. Improving insomnia in primary care patients: A randomized controlled trial of nurse-led group treatment. International Journal of Nursing Studies 72(2017), 30-41.

9 Huang, C.-Y., Chang, E.-T. & Lai, H.-L. 2016. Comparing the effects of music and exercise with music for older adults with insomnia. Applied Nursing Research 32(2016), 104-110.

10 Chen, K. M., Huang, H. T., Cheng, Y. Y., Li, C. H. & Chang, Y. H. 2015. Sleep quality and depression of nursing home older adults in wheelchairs after exercises. Nursing outlook 63(3), 357–365.

11 Kuck, J., Pantke, M. & Flick, U. 2014. Effects of social activation and physical mobilization on sleep in nursing home residents. Geriatric Nursing 35(6), 455–461.

12 Örsal, Ö., Alparslan, G. B., Özkaraman, A. & Sönmez, N. 2014. The effect of relaxation exercises on quality of sleep among the elderly: Holistic nursing practice review copy. Holistic nursing practice 28(4), 265–274.

13 Akyar, I. & Akdemir, N. 2013. The effect of light therapy on the sleep quality of the elderly: An intervention study. Australian Journal of Advanced Nursing 31(2), 31–38.

14 Bothelius, K., Kyhle, K. Espie, C. A. & Broman, J.-E. 2013. Manual-guided cognitive–behavioural therapy for insomnia delivered by ordinary primary care personnel in general medical practice: a randomized controlled effectiveness trial. Journal of Sleep Research 22(2013), 688-696.

15 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. Indian Journal of Psychiatry 55(3), 364-368.

16 Harris, M., Richards, K. C., & Grando, V. T. 2012. The effects of slow-stroke back massage on minutes of nighttime sleep in persons with dementia and sleep disturbances in the nursing home: a pilot study. Journal of Holistic Nursing 30(4), 255–263.

Table of selected articles

Study Author(s), Year, country	Aim	Sample/Participants	Research design / methods	Major findings/outcomes	Limitations
1. Cai, Lin, Wang, Yan & Li. 2022 China	To improve the sleep quality, cognition, and mental state of patients with mild cognitive impairment (MCI) with insomnia.	n=75	A double-blind randomized controlled trial. Quantitative study.	Mindfulness improved sleep quality, cognitive function, and mentality of patients.	This program's promotion scope and applicable population were restricted to nursing institutions and this research was hindered by the COVID-19 epidemic.
2. Wang, Xu, Li, Fu, Li, Wang, Chen, Liu & Chen 2021 China	To evaluate the efficacy and safety of acupuncture at HT 7 (Shenmen) and KI 7 (Fuliu) on sleep and comorbid symptoms for chronic insomnia.	n = 82 41 (acupuncture group) 41 (sham acupuncture group)	Randomized, single-blind, parallel and shamcontrolled trial. Quantitative study.	HT 7 and KI 7 can be an effective, safe, and well-tolerated nonpharmacological intervention for insomnia but acupuncture at HT 7 and KI 7 can only provide a short-term effect, and a better combination of acupuncture points needs further exploration	Measure of treatment fidelity was not established due to limited time and insufficient equipment, only some of the subjects were selected for PSG monitoring
3. Jøranson, Olsen, Calogiuri, Ihlebæk & Pedersen 2020 Norway	To investigate effects from robot-assisted (Paro) group activity on sleep patterns in nursing home (NH) residents with dementia	n = 60	A cluster randomized controlled trial, questionnaire, sleep patterns assessment. Mixed method study.	In robot-assisted activity group total sleep time increased, number of wake ups during night reduced	Dementia, nursing homes declined participation, small sample size
4. Constantinescu, Warness, Virk, Perez, Shankel & Holroyd-Ledu 2019 Canada	To empower nursing staff involved in direct resident care to chart resident sleeping patterns, brainstorm possible reasons for poor sleep, and record nonpharmacological interventions used.	n= 20	randomized stepped-wedge controlled trial. Quantitative study.	A simple resident-centered educational intervention was effective at improving sleep patterns among long term care residents.	The study was done in single long-term care facility so the result might not be applicable to other facilities with differing resident populations, personnel ratios, or workplace cultures. The trial began with a limited number of residents on sedative medications, which may have reduced statistical power.
5. Naismith, Pye, Terpening, Lewis & Bartlett 2019 Australia	To evaluate the efficacy of a four-session multicomponent group intervention for participants with mild cognitive impairment (MCI).	n = 35	Parallel-group single-blind randomized controlled trial. Quantitative study.	SWTW group intervention helps MCI patients sleep better.	Not measured treatment expectations and satisfaction, didn't test blinding, or do an intention-to-treat analysis.

6. Adib-Hajbaghery & Mousavi 2017 Islamic Republic of Iran	To evaluate the effects of chamomile extract on sleep quality among elderly people.	n = 60	Single-blind randomized controlled trial. Mixed method study.	The use of chamomile extract can significantly improve sleep quality among elderly people.	Study was single-blinded, individual difference in sleep habits and usual pattern of rest and activity were not investigated.
7. Han, Park & Park 2017 Korea	To investigate the effects of laughter therapy on depression and sleep among patients at two long-term care (LTC) hospitals.	n = 42	Quantitative study.	laughter therapy with more intense physical activities reduced depression and improved sleep among the participants.	This study was conducted at two LTC hospitals the two groups of participants were drawn from separate hospitals and there may be differences in the two groups that may account for the findings.
8. Sandlund, Hetta, Nilsson, Ekstedt & Westman 2017 Sweden	To evaluate the effects of a group treatment program for insomnia led by nurses in primary care.	n = 165	Randomized controlled trial. Mixed method study.	The treatment program led to decreased insomnia severity, improved sleep, and improvements in clinically important insomnia outcomes.	No objective measures of sleep. The intervention group was larger than control group. The sessions in the treatment program were not observed or recorded.
9. Huang, Chang & Lai. 2016 Taiwan	To examine the effects of a soothing music intervention before bedtime and a treadmill brisk walking exercise combined with music in the evening on sleep quality of sedentary older adults with chronic insomnia.	n = 38	Crossover controlled trial. Quantitative study.	A combination of treadmill jogging at a brisk pace and music is another option for health care practitioners seeking to improve sleep onset in sedentary persons with insomnia.	The participants were healthy, elderly, sedentary, and mostly female, which made it difficult to generalise results. The mechanisms of the two genres of music utilised may be different, and the short duration of music and brisk walking interventions may not have been enough to detect any significant effects of music and exercise on other sleep metrics.
10. Chen, Huang, Cheng, Li & Chang 2015 Taiwan	to test the effectiveness of 6 months of elastic band exercises on sleep quality and depression of wheelchair-bound older adults in nursing homes.	n = 27	Cluster randomized controlled trial. Mixed method study.	Regular practice of WSEB exercises significantly improved the sleep quality and decreased depression of wheelchair-bound older adults in nursing homes.	A convenience sampling, rather than a probability sampling, was used the demographics of the participants across study sites and in the two groups had no significant differences.
11. Kuck, Pantke & Flick 2014 Germany	To promote nursing home residents' sleep by improving their social activation and physical mobilization.	n= 85	Cluster randomized intervention. Quantitative study.	Nursing home residents, especially those without cognitive impairment, had significantly better subjective sleep quality after eight weeks of social activity and physical mobilisation.	The analyses were only adjusted for sedative drugs detected at baseline, cognitive ability varied significantly between study groups at baseline, and intervention individuals dropped out more frequently

					than control group participants.
12. Örsal, Alparslan, Özkaraman & Sönmez 2014 Turkey	to determine the effect of relaxation exercises on quality of sleep of the elderly people staying in a nursing home	n = 44	Cross-sectional intervention study. Quantitative study.	Important to start relaxation training for all older people in a nursing home every day before going to the bed to increase sleep quality.	The PSQI scores in neither the intervention group nor the control group were not correlated with chronic disease history, the number of medicines taken, or the prevalence of obesity.
13. Akyar & Akdemir 2013 Turkey	To determines the effect of light therapy on the elderly living in nursing homes.	n = 24	General questionnaire, interventional study. Mixed method.	Light therapy has been shown to be effective non-pharmacological therapy for improving sleep quality among healthy elders.	The small sample size, institutionalised elderly, and the implementation period (summer).
14. Bothelius, Kyhle, Espie and Broman 2013 Sweden	to investigate the clinical effectiveness of manual-guided CBT for insomnia delivered by ordinary primary care personnel in general medical practice with unselected patients	n = 66	A randomized controlled parallel group design. Quantitative study.	Manual guided CBT could thus be effective for patients with insomnia in primary care.	The training of the personnel in how to use the manual was limited to a 2-day course without additional scheduled supervision. The present study only attracted personnel with some formal training in CBT, which in most countries might not resemble clinical reality. Therapist adherence to the manual was not assessed.
15. Hariprasad, Sivakumar, Koparde, Varambally, Thirthalli, Varghese, Basavaraddi & Gangadhar 2013 India	to examine the effects of yoga intervention on quality-of-life (QOL) and sleep quality in the elderly living in old age homes	n = 120	Single blind controlled study. Quantitative study.	Yoga intervention appears to improve the QOL and sleep quality of elderly living in old age homes.	the elderly population in this study belonged to residential care, generalization of the results may be limited.
16. Harris, Richard & Grando 2012 USA	To test the effects of a 3-minute slow-stroke back massage (SSBM) on total minutes of nighttime sleep on persons with dementia with sleep disturbances aged 65 years or older in the nursing home	n = 40	Randomized controlled pilot study. Quantitative study.	SSBM may be an effective intervention to facilitate sleep among cognitively impaired older adults with dementia.	The short duration of data collection may have influenced results on nighttime sleep and exploratory sleep variables. There was no control over nighttime routines.

Data search table

Database	Search terms	Limiters	Number of hits	Selected based on title	Selected based on abstract	Selected based on whole text
CINAHL	(insomnia AND nursing)	2012-2022 Peer-reviewed Language - English	355	43	25	3
CINAHL	(non-pharmacological OR nonmedical) AND (insomnia OR sleep disorders OR sleep disturbance) AND (elderly OR aged OR older OR elder OR geriatric)	2012-2022 Peer-reviewed Language-English	44	24	14	0
CINAHL	(non-pharmacological treatment OR music therapy OR music intervention OR musical therapy) AND (insomnia OR sleep disorders OR sleep disturbance OR sleeplessness) AND (elderly OR aged OR older OR elder OR geriatric)	2012-2022 Peer-reviewed Language-English	22	15	7	1
PubMed	alternative therapy AND insomnia AND elderly*	Language: English	75	19	11	2
PubMed	elderly care AND insomnia	2012-2022	19	5	5	3
PubMed	(insomnia OR "sleep disorder" or "sleeplessness" or "sleep disturbance" OR "sleep quality") AND (non-pharmacological OR nonmedical OR nonpharmacological OR nonmedical)	Published 2012-2022, including articles about clinical trials, meta-analysis, randomized controlled trials	185	73	45	3
PubMed	aromatherapy AND sleep quality AND elderly	2012-2022 Language-English	38	8	6	1
PubMed	cognitive behaviour therapy AND insomnia AND sleep quality AND elderly care	-	10	5	2	1
Manual search			9	9	6	2
			Total 757	Total 201	Total 121	Total 16