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USE OF COGNITIVE BEHAVIOURAL THERAPY TO IMPROVE INSOMNIA IN ELDERLY CARE.

A narrative literature review

AUTHOR/S Agbo Ifeoma Racheal

Bah Alieu

Pokharel Manisha

SAVONIA UNIVERSITY OF APPLIED SCIENCES

THESIS
Abstract

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Abstract

Cognitive Behavioural Therapy for Insomnia (CBT-I) has been recognized as a safe and effective non-pharmacological approach for addressing insomnia in older adults. Several meta-analyses have highlighted the positive impact of CBT-I on various sleep indicators, including reducing the time it takes to fall asleep, decreasing wakefulness after sleep onset, and enhancing overall sleep quality in the elderly.

This review aimed to explore how Cognitive Behavioural Therapy for Insomnia (CBT-I) can be implemented as a non-pharmacological strategy for managing Insomnia in elderly care. A narrative literature review method was employed to explore articles information extracted from three databases: CINAHL Complete, PubMed, and ScienceDirect. 13 articles were scrutinized using content analysis techniques.

The findings revealed that CBT-I on its own is an effective targeted intervention for the elderly who experience Insomnia. The result showed that six core interventions or components of CBT-I, such as stimulus control therapy, sleep restriction therapy, cognitive restructuring therapies, psychoeducation, sleep hygiene practices, and fatigue management stood out in all the literatures analyzed. These components are often tailored to an individual's specific needs and can be adjusted or combined based on the severity and underlying causes of their Insomnia.

The results showed that CBT-I can be implemented as an effective non-pharmacological intervention for managing insomnia by utilizing effectively the six components of CBT-I on the elderly. These components help in reducing behaviours that disrupt sleep, lessening arousal, and changing negative thought patterns associated with sleep.

Keywords
Cognitive Behavioural Therapy, Insomnia, elderly, Care

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1 INTRODUCTION

Sleep is a peaceful state of mind and a basic human need for a healthy and better life (WHO 2004, 2). In clinical terms, sleep is divided into two significant states: Rapid Eye Movement (REM), comprising 75—80 % of the sleep period, and Non-Rapid Eye Movement (NREM), comprising 25—20 % of the sleep period, and alternate cyclically during the night (Martin, Schochat, & Ancoli-Israel, 2000, 784).

Any disturbances to the quality and quantity of sleep, regardless of the causes, are considered a sleep disorder, comprising a wide range of disorders. According to the latest report by the International Classification of Sleep Disorders (ICSD), sleep disorder is divided into seven major categories that include insomnia disorders, sleep-related breathing disorders, central disorders of hypersomnolence, circadian rhythm sleep-wake disorders, sleep-related movement disorders, parasomnias, and other sleep disorders (Sateia 2014, 1389.).

Sleep disorders become more serious with age as physical and physiological changes in humans increase (Foley et al. 1995, 425). For example, a global synthesis reports that the prevalence of Insomnia, a type of sleep disorder, in the elderly is greater, varying from ~9—65% (Ohayon 2002, 99) than the prevalence of Insomnia in the general population (i.e., 8-48%, (Fernandez-Mendoza & Vgontzas 2013, 1) indicating that human's well-being is at risk as they grow older. Moreover, societal and economic impacts of sleep disorder (e.g. Insomnia) associated with the elderly are going to increase because it is estimated that by 2050, the worldwide population of elderly people (> 65 years) is expected to rise by 16% (UN 2019, 1).

It is often that either or combined pharmacological and non-pharmacological methods are used (Abad & Guilleminault 2018, 793; Chigome, Nhira & Meyer 2018, 34) to treat Insomnia in the elderly. However, a study by (Bain 2006, 172) highlights that treating Insomnia using pharmacological methods for longer periods brings more risk to one's health, such as cognitive impairment (anterograde amnesia), sedation during day, deterioration in motor skills, and increased risk of accidents and falls. Therefore, non-pharmacological methods are considered preferable to pharmacological ones (Noriega, Camporro & Rodríguez 2019, 529).

Cognitive Behavioral Therapy- Insomnia (CBT-I) is one of the widely used non-pharmacological methods for treating Insomnia. A comparative study between CBT-I and pharmacological intervention (using zopiclone) for treating Insomnia in the elderly shows that CBT-I outperformed zopiclone treatment and was effective for both short- and long-term. This was confirmed by an increase in sleep duration, from 81.4 % during pretreatment to 90.1 % after CBT-I (Sivertsen et al. 2006, 2854.).

Therefore, this literature review aims to explore different non-pharmacological methods of managing Insomnia in elderly care, with a focus on cognitive behavior therapy insomnia CBT-I. The CBT-I has been considered an important form of treatment for Insomnia mainly because it avoids sleep medication risks and is successful in improving Insomnia caused by diverse comorbidities (Williams, Roth, Vatthauer & McCrae 2013, 554-557.)

2 SLEEPING DISORDERS AND TREATMENTS

2.1 Sleep disorder

Sleep disorder is common among the older populace and causes a lot of negative effects such as reduced quality of life, increased mortality, increased risk of hypertension, obesity, depression, diabetes, heart attack, stroke, among others. However, the latest 2014 published update on International Classification of sleep disorders Third Edition (ICSD-3), conducted by the American Academy of Sleep Medicine's Board of Directors, classified sleep disorder into six major categories namely insomnia disorders, Sleep-Related Breathing disorders, central disorders of hypersomnolence, circadian Rhythm Sleep-Wake Disorders, Parasomnias and Sleep-Related Movement Disorders (American Academy of Sleep Medicine 2023, 1).

In addition, each of the international classification system of sleep disorders has a different symptom, leading to difficulty in comparing studies. (Edinger et al. 1996, 12; Sateia et al. 2000, 22.) As earlier stated, there are many types of sleep disorders but in this review, we are going to focus on Insomnia because other sleep disorders such as REM sleep behaviour disorder and restless legs syndrome are mostly neurological problems, and the interventions are treated medically unlike Insomnia where some lifestyle changes can help the patients.

2.2 Insomnia

Difficulties initiating or maintaining sleep are perceived as a sleep disorder or as Insomnia (Ohayon 2002, 98). Among many, Insomnia as a sleep disorder seems to be a widespread health condition affecting most of the general population. It is estimated that the prevalence of Insomnia in the general population varies from 5—48%, with greater prevalence in women than men and is linked to different factors (Figure 1), varying from one's acts (e.g., lifestyle and substance abuse) to underlying other health conditions, e.g., neurological, psychiatric, and so on. (Fernandez-Mendoza & Vgontzas 2013, 1; Ohayon 2002, 103.)

Although Insomnia is a health problem, studies suggest that elderly people are more vulnerable to Insomnia. A comprehensive study using an enormous number of samples (n>9000) found that ~ 42% of people older than 65 years of age had difficulties initiating and maintaining sleep (Foley et al. 1995, 425.). Figure 1 below shows some of the factors linked to insomnia.

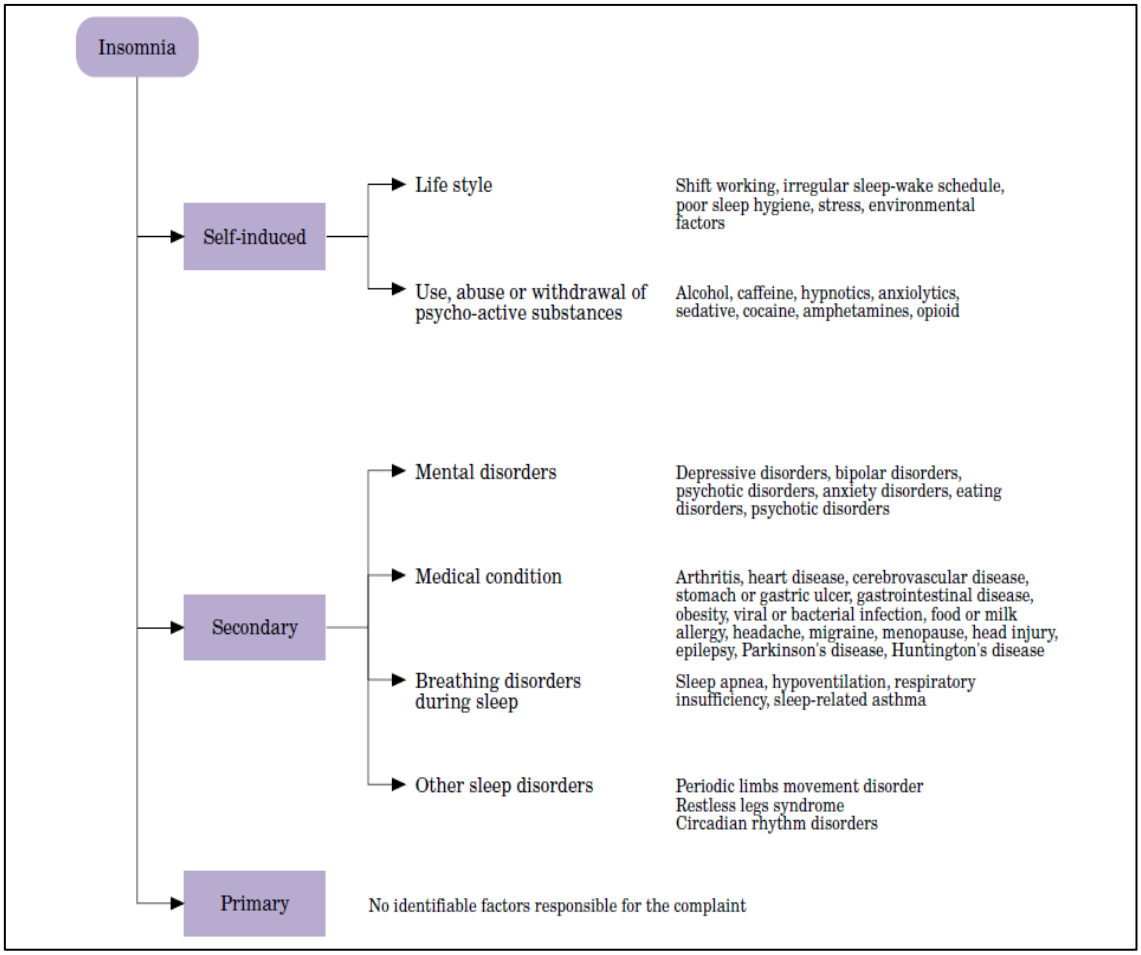

FIGURE 1. Factors linked with Insomnia. This schema was obtained from Ohayon (2002,105).

2.3 Common sleep disorders suffered by the elderly.

Unlike the younger generation, the older people tend to show age-related sleep differences, such as an improved sleep phase and decreased slow-wave sleep, which result in disjointed sleep and early awakening signs. Some of the sleep disorders suffered more among the elderly are Insomnia, sleep apnea, REM sleep behavior disorder, restless leg syndrome, among others. In Figure 2, below we shall briefly present an overview of some common types of sleep disorders amongst the elderly in a table.

TABLE 1. An outline of common sleep disorders (Ramar, K & Olson. E.J, 2013)

Disorder	Symptoms and signs	Treatment
Delayed sleep phase syndrome	Late sleep onset and wakeup time	Use bright treatment in the morning, give low dose melatonin or any other medication
Insomnia	Having difficulty initiating or holding sleep, feeling sleepy in the daytime and unable to take a nap, daytime impairment such as difficulty concentrating, remembering things and focusing.	Cognitive behaviour therapy, benzodiazepine receptor agonists or any other pill from your doctor
Narcolepsy	Heightened daytime drowsiness, occurrences of cataplexy, and hallucinations during wakefulness or sleep	Modafinil, stimulants, sodium oxybate (Xyrem), and selective serotonin reuptake inhibitors

Obstructive sleep apnea	Snoring, observed episodes of apnea, choking, heightened daytime drowsiness.	Clonazepam (Klonopin)or melatonin
Restless legs syndrome	Uneasy sensation on both legs, symptoms can be more in the evening and gets better when the person walks or stretches	Dopaminergic agonists

2.4 Treatment of sleeping disorders

There are several sleep disorders, and the treatment for each may vary depending on the underlying cause. According to Lam and Macina (2017,20). Improving sleep measures and reducing sleep-related distress are the objectives of managing Insomnia. Healthcare providers have two approaches to managing Insomnia in seniors: non-pharmacological and pharmacological management (Parsons et al.2017,10-12).

People with Insomnia are more susceptible to developing depression, especially among seniors (Baglioni et al. 2011, Cole & Dendukuri, 2003, Fiske, Wetherell & Gatz, 2009,45). Insomnia is common and has become more persistent with time, and it affects 25% in older men and almost 40% in women in their 80s (Doi et al. 2000,10).

Insomnia is a costly condition that has been linked to increased risks of cardiovascular disease, obesity, diabetes, depression, anxiety, and suicide (Chan et al. 2018 & Hertenstein et al. 2019, 6-8). A Norwegian study has demonstrated that Insomnia is a significant predictor of sick leave and disability pension and is, in fact, a stronger predictor than depression (Overland et al. 2008 & Sivertsen et al. 2009,16).

2.5 Pharmacological treatment of sleep disorder

The study aims to explore non-pharmacological methods for treating elderly individuals residing in institutionalized care homes. However, the study will briefly highlight some of the pharmacological interventions currently used to support seniors. Pharmacological treatment of Insomnia in older people can be complicated because of age-related changes in the body, as well as the increased likelihood of comorbid medical conditions and polypharmacy. Therefore, medication use for Insomnia should be carefully evaluated and monitored by a healthcare provider.

In the past, benzodiazepines (BDZs) were the primary method of treating sleeping disorders. However, due to their side effects, there were several limitations. Fortunately, the development of selective non-BDZ receptor agonists has provided a safer treatment option for older individuals experiencing sleep problems. Consequently, selective non-BDZ receptor agonists are currently the most frequently prescribed sleep medications (Ancoli-Israel et al. 2005, 198.) Examples of these agents are Zolpidem, zaleplon, and eszopiclone (Ancoli-Israel et al. 2005, 199).

However, the American College of Physicians updated their guidelines in 2016, for evaluating and treating Insomnia in adults and recommended CBT-I as a first line of treatment for individuals who

have Insomnia. Julie et al. (2020, 9) also endorsed cognitive behavioral therapy for Insomnia (CBT-I) as a recommended treatment for long-term insomnia disorder in elderly patients.

However, CBT-I may not be suitable for elderly patients with dementia who cannot participate actively or meaningfully during treatment sessions. Therefore, this treatment option may not be available for many older adults. Evidence-based analyses suggest specific drug therapy options for chronic Insomnia in adult patients, including triazolam, temazepam, eszopiclone, zaleplon, Zolpidem, ramelteon, and suvorexant (Julie A. et al. 2020, 259.) Table 2 below describes the elimination of benzodiazepine in seniors.

TABLE 2. Benzodiazepine elimination half-lives in older people (Woodward 2007, 238)

Long (>20 hours)	Intermediate (10 to 20 hours)
Clonazepam	Alprazolam
Diazepam	Lorazepam
Flunitrazepam	Temazepam
Flurazepam	
Nitrazepam	
Short (5–10 hours)	**Very short (5 hours & below)**
Oxazepam	Triazolam
	Midazolam

2.6 Non-pharmacological treatment of sleep disorder

Selecting the most suitable intervention for Insomnia in older adults poses a challenge for healthcare providers, given the intricacies associated with the condition (Ulmer et al. 2017, 11). Pharmacological interventions should be used only if non-pharmacological approaches are ineffective (Qaseem et al. 2016 & Sateia et al. 2017, 2). Non-drug management strategies for Insomnia in older adults include sleep hygiene, cognitive behavioral therapy for Insomnia (CBT-I), regular exercise, and participation in social activities (Nguyen et al. 2019, 46).

Cognitive Behavioural Therapy for Insomnia (CBT-I) is an essential and safe non-drug intervention for older adults suffering from Insomnia. According to several meta-analyses, CBT-I has shown improvement in various sleep guides, for instance sleep onset latency, wake after sleep onset, and sleep quality among elderly (Van Straten et al. 2018,45- 48.)

CBT-I aims to adjust bad sleep habits and promote healthier sleep hygiene practices and against bad thinking and beliefs about sleep. CBT-I is suggested for older adults due to its superior long-term maintenance in comparison to medication, and there are no side effect in terms of cognitive impairment or risk of falls (Glass et al. 2005, 2311.)

CBT-I is effective not only for enhancing insomnia symptoms but also help to alleviate depressive symptoms (Buysse et al. 2011, 148). This implies that CBT-I may be used as a preventative management strategy for depressive symptoms among elderly. The effects of CBT-I on depressive symptoms have been studied in elderly patients diagnosed with Insomnia (Morin et al. 1993 & Lichstein et al. 2000, 7.)

The American College of Physicians, in their studies, suggests that cognitive behavioral therapy for Insomnia (CBT-I) should be regarded as the primary treatment for adults who are experiencing Insomnia. They recommended that older patients should receive cognitive behavioral therapy for Insomnia (CBT-I) as the top treatment for long-term insomnia disorder (Brasure et al. 2016,154-156.)

The European guidelines for the diagnosis and treatment of Insomnia align with the American College of Physicians that CBT-I should be the first-line treatment for insomnia patients. They further recommended that pharmacological method should only be used if CBT-I treatment is fail or unavailable (Riemann et al.2017, 8.) The British Association for Psychopharmacology (BAP) also recommended CBT-I as the initial treatment for patients with chronic Insomnia (Wilson et al. 2019, 9).

Cognitive behavioral therapy for Insomnia (CBT-I) aims primarily at addressing the factors that could perpetuate Insomnia, such as disrupted sleep drive, behaviours that interrupt sleep, negative thoughts about sleep, attempt to regulate sleep, and anxiety related to sleep. CBT-I is usually composed of stimulus control therapy, sleep restriction therapy, various cognitive therapies, psychoeducation, sleep hygiene practices, and relaxation training (Riemann & Perlis, 2009,12.) Table 3 below summarizes the main interventional strategies included in a CBT-I protocol (Baglioni et al.2019, 7).

TABLE 3. CBT-I ingredients (Baglioni et al., 2019, 7)

CBT-I strategy	**Description**
Sleep restriction	Behavioral strategy: The method enhances the body's natural sleep regulation mechanisms and stabilizes the patient's sleep and wake cycles. This method is obtained by reducing the patient's means for sleep over several nights to increase the stability sleep pressure. Patients are advised to limit the time they spend in bed to the amount of sleep they usually get, as recorded in their sleep diary. The time the

		patient spends in bed gradually increases until they reach their optimal sleep duration. Another approach, known as sleep compression, involves gradually decreasing the amount of time the patient spends in bed and then gradually increasing it until the optimal sleep duration is reached.
	Stimulus control	Behavioral strategy: These are a set of instructions for the patient that are designed to strengthen the patient's association between the bed and sleep and weaken the association between the bed and activities that might affect with sleep. This helps patients with insomnia establish a consistent sleep pattern based on the principles of operant conditioning. These instructions include: (1) The Patient only go to bed when feeling sleepy, (2) The patient use the bed only for sleep and sexual activity, (3) if the patient is unable to fall asleep, get up and go to another room, and the patient only return to bed when feeling sleepy, (4) The patient repeat step 3 as necessary throughout the night, (5) The patient is set an alarm to wake up at the same time every morning regardless of how much sleep was obtained and (6) The patient avoid sleeping during the day.
	Sleep Hygiene education	Behavioral strategy: This method of teaching and modifying a patient's behavior includes general guidance on various internal and external factors that could affect sleep. These include physical exercise, lighting, temperature, and other relevant aspects related to overall health.

Relaxation	Behavioral strategy: This is a collection of techniques intended to decrease the patient's physical or mental hyperactivity. These methods include progressive muscle relaxation, autogenic training, guided imagery, and meditation.
Cognitive Reappraisal	Behavioral strategy: These are techniques developed to lessen the patient's maladaptive beliefs, attitudes, misconceptions, and irrational beliefs about the reasons for Insomnia and the inability to sleep.
Cognitive control/ Worrying time	Behavioral strategy: This involves having the patient sit in a comfortable chair and note down a list of worries and plans for the following day. The goal of this approach is to emotionally charged and unwanted thoughts from occurring during the period when the patient is trying to fall asleep. By processing and addressing worries ahead of time, the patient can enter the sleep period with a calmer and more relaxed mindset.
Paradoxical Intention	Behavioral strategy: This strategy aims to decrease the patient's anxiety that comes with the anticipation of falling asleep. Patients are advised to close their eyes while lie still and stay awake for as long as possible. Doing so decreases the effort to sleep, which can result in falling asleep more quickly.

3 AIMS AND RESEARCH QUESTION

This narrative literature review aims to explore different non-pharmacological methods of managing Insomnia in elderly care, with a focus on Cognitive Behavior Therapy-Insomnia CBT-I. Several studies have suggested the potential of CBT-I in treating Insomnia because of its non-pharmacological nature and success in treating diverse causes of Insomnia. The CBT-I is considered highly relevant in treating Insomnia in the elderly because the elderly are vulnerable to Insomnia because of many diseases and health-related issues such as anxiety, fatigue, depression, osteoarthritis pain, and sleep obstructive apnea (Williams, Roth, Vatthauer & McCrae 2013, 554-563.) Therefore, this literature review will focus on finding solutions to the following research question:

1. How can CBT-I be implemented as an effective non-pharmacological intervention for managing Insomnia in elderly care?

4 METHODOLOGY AND DESIGN

4.1 Research design

Narrative literature review is a crucial part of most empirical articles, theses, and proposals, and many book chapters are designed exclusively to reviewing the literature on a particular topic. (Baumeister & Leary, 1997,1.) Narrative literature review can be defined as a traditional way of reviewing the extant literature and it slants towards a qualitative analysis of earlier knowledge. (Sylvester et al. 2013, 1199–1215.)

A narrative literature review involves a thorough, evaluative, and unbiased examination of the existing information pertaining to a particular subject. (Baker 2016, 265-269.) It is a crucial part in the research process, aiding in the establishment of a theoretical framework and a central focus for research purposes.

In this study, the authors adopted narrative literature method in analysing findings from the articles collected for the study because narrative literature review offers several advantages for this topic. For example, it has been an effective tool used to organize research findings, and may be useful for testing hypotheses, evidence and to discover areas that needs further research. (Snyder 2019, 104). (Rossella 2015, 20) states that narrative literature review is suitable in explaining CBT-I and how it can help people with sleeping disorder. Similarly, research questions are made broader and clearer with the help of narrative literature review. (Suhonen et al. 2016, 7-22.) Cronin et al. (2008, 14) argues that narrative literature review provides a comprehensive detail on a current knowledge to the reader and as well highlighting the importance of new research. Narrative review can as well be used as educational articles to update consultants on certain topics such as CBT-I. (Green et al. 2006, 3.)

Despite the importance of narrative literature reviews, it has equally several limitations that affect its use. One of the limitations is that research method textbooks do not often explain how to write narrative reviews. Narrative literature review is not systematic and follow no specified protocol guide for the review (Ferrari 2015, 8). Furthermore, there are no easy and available way to learn how to write it, assumptions and the planning of an article is unknown, while selection and evaluation biases are not known. (Baker 2016, 103).

The study employed the approach of a narrative literature review, consisting of three phases and nine steps, to address the research question. (Juntunen & Lehenkari 2021, 332.) These phases encompass planning, implementation, and documentation. FIGURE 2 below illustrates an overview of steps of conducting narrative literature review followed in this study.

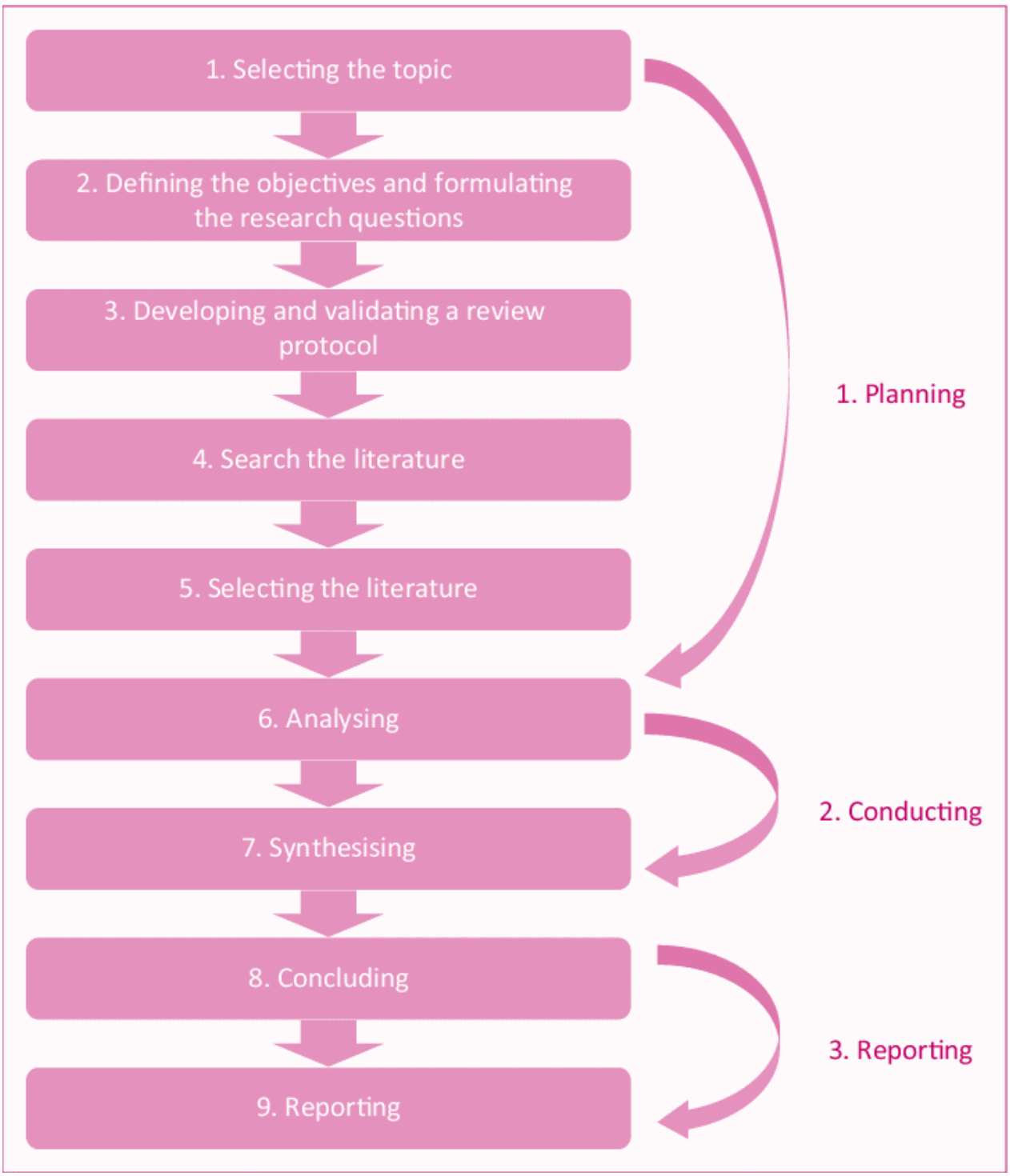

FIGURE 2. Overview of steps of conducting narrative literature Review. (Mokgaola I.O et al. 2021,3)

Conducting a narrative literature review involves a qualitative and interpretive approach to synthesizing research and presenting a coherent narrative on a particular topic. While there is flexibility in the process, the following steps, as suggested by some scholars, provide a general framework for conducting a narrative review:

4.1.1 Selecting the topic

The initiation of the process begins with the topic selection. (Pickering et al. 2015, 10.) The topic selected for this study is the use of cognitive behavioural therapy (CBT-I) to improve Insomnia in elderly care.

4.1.2 Defining the objectives and formulating the research questions

The objective of the study was to explore and describe how to use CBT-I therapy to improve insomnia in the elderly care.

- How can CBT-I be implemented as an effective non-pharmacological intervention for managing Insomnia in elderly care?

4.1.3 Developing and validating a review protocol:

This step is similar to research design in empirical research. (Xiao & Watson 2019, 1.) This step involves establishing a predetermined framework guiding the execution of subsequent research procedures. (Gates 2002, 547-557; Xiao & Watson 2019, 1.) In this thesis, the reviewers conceptualized the study. The process and development of the thesis outline was discussed and decided by all the authors. In chronological order they carefully considered how each point will be conveyed to the readers and they all accepted when to submit to their supervisor. The thesis supervisor, with his great experience, re-conducted the validation of the protocol in this specific context.

4.1.4 Searching the literature

The next step involves searching the relevant literatures and making the right decision on the suitable materials to use in the review (Cooper 1988, 104-126). Articles in scholarly journals usually form the main core for a literature review search. (Rowley & Slack 2004, 6.)

The data for this study was collected from CINAHL, ScienceDirect and PubMed scientific databases. The Savonia UAS library gave access to these databases. Clearly established inclusion and exclusion criteria determined which studies were included in the review. These criteria relate to a combination of search keywords such as Cognitive behavioural therapy insomnia, AND elderly or geriatric, senior, or elder, AND care homes or residential care or nursing homes or long-term care facility.

TABLE 4. Study and article selection process

Database	Results with limiters	Included title and abstract	Included full text
EBSCOhost (CINAHL complete)	2431	255	6
PubMed	982	108	6
ScienceDirect	367	1	1

4.1.5 Selecting the literature

This step indicates deciding which articles are included or excluded from the analysis. (Juntunen & Lehenkari 2021, 333.) The authors agreed on the inclusion and exclusion criteria of this study. The type of data to be retrieved is guided by the research questions. (Okoli & Schabram 2010, 22.) The reviewers read the titles, skimming through the articles and abstracts of the papers selected by the search strategy, analysed the main headings, subheadings and screened non-related topics. The decision on the suitability of each article was separately done; a total of 13 articles were picked.

On the other hand, exclusion criteria were identified according to the pertinence of the search objective, exclusion criteria are removal of duplicated words at the end of the search using a variety of term options such as peer reviewed articles not written in English and published from 2012 downwards were not considered.

4.1.6 Analysing Screening for inclusions

At this step, the authors read and re-read selected articles and made sure they are suitable. The inclusion and exclusion concepts were utilized. A set of predetermined rules provided by the authors form the basis for including and excluding some of the selected literature materials. The authors assessed the chosen articles to ascertain their relevance to the research question. Apply the inclusion and exclusion criteria consistently to select the most appropriate studies for the review.

Establishing clear inclusion and exclusion criteria for selecting literature aided in directing the reviewers to focus on the relevance of the studies to the topic. In this thesis, the inclusion criteria for the review were studies published in English language, studies related to research questions and publications not older than ten years, full article, and free texts. TABLE 5 below shows lists of inclusion and exclusion criteria that helped to achieve the aims and objectives of the thesis.

TABLE 5. Inclusion and exclusion criteria of database search

Inclusion criteria	Exclusion criteria
Articles written in English	Articles in another languages
Articles published from 2010 to 2023	Articles published before 2010
Articles that are free of charge	Articles that require payment
Articles that focused on Cognitive behavioural therapy insomnia in elderly care	Search outside these search phrase
Peer reviewed articles	None peer reviewed articles

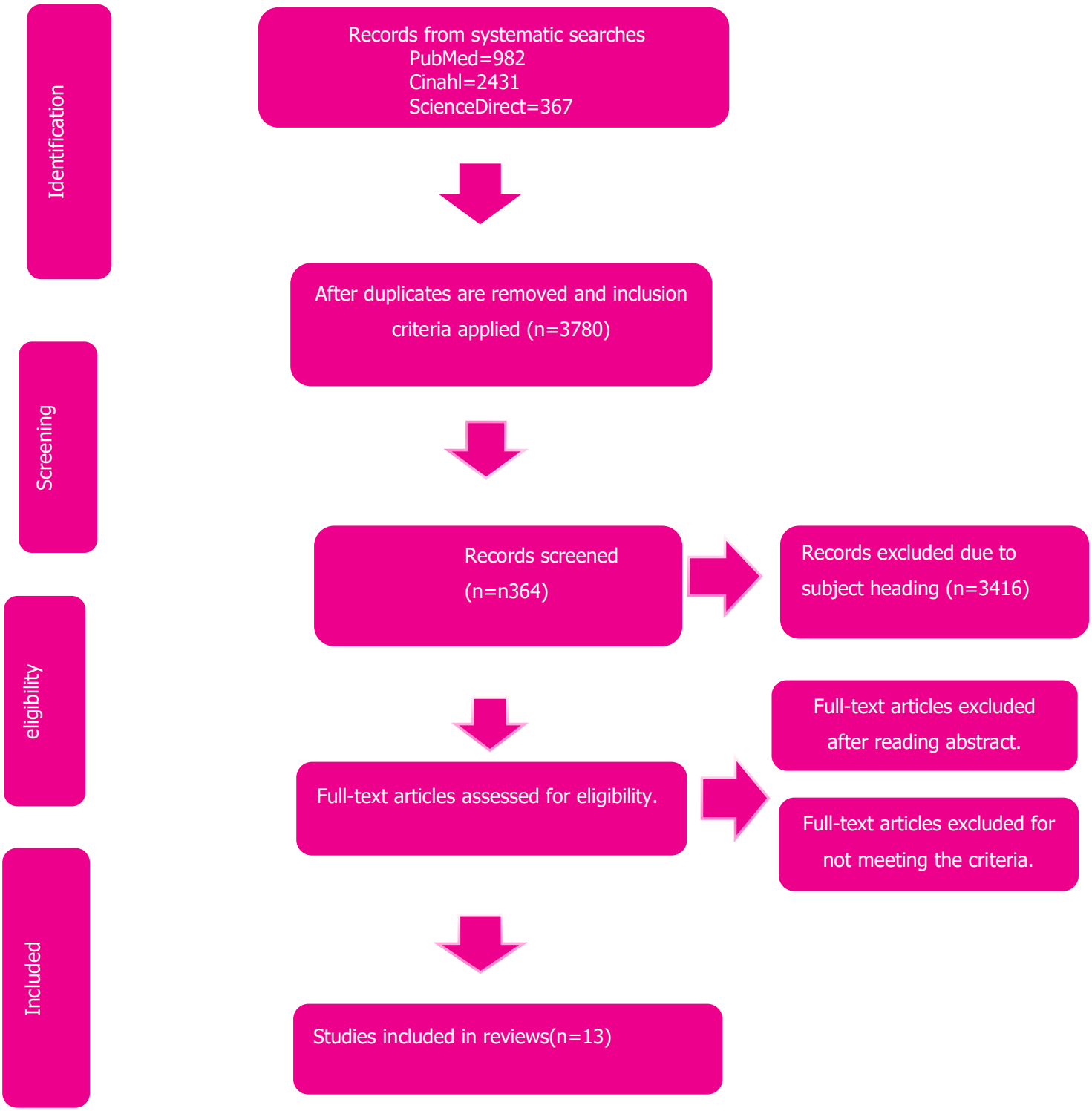

FIGURE 3**.** Record search, selection, and screening process of non-pharmacological methods of managing Insomnia with the use of cognitive behaviour therapy (CBT-I) The PRISMA statement.

The articles were accessed using Savonia University's authenticated login access through the academic research databases listed in figure 3 below. The researchers had access to both free and some paid articles. Additionally, each of the authors independently also applied the selection criteria on the abstracts and the full article.

In PubMed 982 articles were found after applying the criteria earlier mentioned above, Cinahl has 2431 articles, and ScienceDirect 367 articles, respectively. Database specific search results are shown in figure 3 above.

4.1.7 Synthesizing or assessing the quality of primary studies

This phase involves structuring the categorized data in a particular format. (Juntunen & Lehenkari 2021, 333). Content analysis was adapted as the method of data analysis. Content analysis is a qualitative analysis method that permits researchers to demonstrate a research phenomenon at a theoretical level in a systematic way. Content analysis can help researchers create concepts, categories, and themes that can be further used to produce a conceptual model or map describing the subject of the study. However, it is important to recognize that the content analysis fails to explain the research phenomenon's mechanism (Kyngäs, Mikkonen & Kääriäinen 2020, 13.). In nursing studies, content analysis can be used to understand and explore the research question posed by researchers using literature, e.g., peer-reviewed scientific articles and books. However, it is the researchers who decide the use of content analysis and its types, conductive or inductive, to be used in their research, and it is entirely based on the research question of the thesis. The inductive content analysis is used when the data collection approach is open or when prior knowledge is fragmented. The authors chose inductive content analysis for this thesis work and followed the methodological approach of content analysis as described by (Kyngäs, Mikkonen & Kääriäinen 2020, 14.).

Searching of unit of analysis is the first and most crucial step of our thesis. To find answers to our research question (How CBT-I can be adopted to manage Insomnia in elderly care?), the authors considered reading the methodology section of each literature as it contains the approaches adopted as CBT-I to treat Insomnia. Additionally, sentences reporting the main outcome were included as a unit of analysis. Once an appropriate method and result section was found, the authors used them as a unit of analysis.

The second step involves data reduction and sub-concept generation. In this step, the whole sentence from the previous step was reduced to a shorter form. This was done by creating a sub-concept by including only the keywords from the selected whole sentence. The keywords were selected based on the research questions. For example, methods that successfully improved Insomnia were shortlisted together with the main result. Once the sub-concept was confirmed relevant, the author created the concepts by grouping the sub-concepts.

In concept creation, authors carefully examined the similarities between the sub-concepts and continued further to create concepts only when the similarities were matched. In this step, special care was given to avoid overlapping the sub-concepts.

Finally, the main concept was created by grouping the concepts and main findings of the respective studies. In this step, again, special care was given to whether the main concept answered the research questions or not. Authors considered a stop in the data abstraction once the main concepts

were generated and the research question was answered, and we concluded, "CBT-I improves sleep quality and decreases subjective-objective sleep discrepancy, and treatment includes psychoeducation, sleep hygiene, stimulus control, sleep restrictions, fatigue management, and cognitive therapy" as our findings.

5 RESULTS

The findings in this review indicate that CBT-I on its own is an effective targeted intervention for the elderly who experience Insomnia. The main results show that six core interventions or components of CBT-I stood out in all the literature analyzed. These components are often tailored to an individual's specific needs and can be adjusted or combined based on their insomnia severity and underlying causes. Below are descriptions of the components and how it is carried out on patients.

5.1 Sleep hygiene

Sleep hygiene involves adopting a range of behaviors and environmental practices to support patient's attainment of healthy sleep and establishing behaviors conducive to restorative sleep (Alessi et al. 2016, 2). Traditionally, sleep hygiene education comprised a set of 10 recommendations: (1) refraining from oversleeping, (2) setting a consistent wake time, (3) engaging in daily exercise, (4) reducing potentially disruptive noise, (5) regulating room temperature, (6) consuming a light snack before bedtime to manage hunger, (7) avoiding chronic use of hypnotics, (8) steering clear of evening caffeine, (9) abstaining from alcohol before sleep, and (10) not resisting the inability to sleep but rather turning on a light and engaging in another activity (Pigeon et al. 2013, 156.)

5.2 Stimulus control

Stimulus control encompasses a set of instructions designed to assist patients in re-establishing positive associations between the bed, bedtime, and bedtime stimuli with sleep, rather than with the frustration or anxiety that can arise from unsuccessfully trying to sleep (Trauer et al. 2015, 2313). This approach operates on the premise that both the timing of bedtime and the sleep environment, such as the bed and bedroom, become conditioned cues for arousal due to repeated unsuccessful sleep attempts, resulting in Insomnia over time (Vitiello et al. 2009, 2314).

The primary goal of stimulus control is to reduce the duration during which sleep-related stimuli and negative thoughts are linked, thereby breaking counterproductive associations between the bed and sleep. This is typically achieved by following specific rules related to the patient's sleep behavior (Pigeon et al. 2013, 156-157.)

Patients are advised to adhere to sleep restriction guidelines, including maintaining a consistent wake time regardless of nightly sleep duration, avoiding daytime napping, using the bed or bedroom primarily for sleep and intimacy, lying down to sleep only when genuinely sleepy, and leaving the bed if unable to sleep after approximately 15–20 minutes of wakefulness. These rules aim to limit the total time patients spend awake in bed (Beglion et al. 2019, 7.)

5.3 Sleep restriction

This approach aims to enhance the body's natural sleep regulation mechanisms and stabilize the control of sleep-wake cycles by reducing the patient's chance to sleep progressively over consecutive nights (Beglion et al. 2019, 7 & Alessi et al. 2016, 2.) Sleep restriction is a common intervention for Cognitive Behavioral Therapy for Insomnia (CBT-I), it is frequently employed in insomnia treatment and is a key element in comprehensive non-pharmacological approaches. The therapy focuses on consolidating the patient's disrupted sleep by extending periods of wakefulness, such as limiting the patient's time spent in bed attempting to sleep. This strategy enhances the patient's drive for sleep, resulting in more consolidated blocks of sleep, decreased time to fall asleep (sleep latency), and fewer and shorter awakenings (Pigeon et al. 2013, 158.)

To optimize the benefits of sleep restriction therapy (SRT), it is recommended that the patient's bedtime be postponed rather than advancing the wake time. Delaying bedtime serves a dual purpose: facilitating sleep onset by boosting the drive for sleep and preventing the patient from coping with Insomnia by extending the opportunity for sleep (Pigeon et al.2013, 158).

5.4 Fatigue management

Fatigue is an overwhelming sense of lack of energy and apathy (losing interest in doing things or motivation), causing a decreased participation in activity, resulting in reduced capacity in both physical and mental bearing. (Torossain & Jacelon 2021, 1.) CBT-I interventions, including fatigue management have been shown to improve cancer and depression-associated insomnia. (Peoples et al. 2017, 406; Tanaka, Kusaga, Nyamathi & Tanaka 2019, 81.) and subjective-objective sleep discrepancy among the elderly (Kay, Buysse, Germain, Hall & Monk 2015, 6; Tanaka, Kusaga, Nyamathi & Tanaka 2019, 81.)

Relaxation, a form of fatigue management, was found to be effective in improving depression linked Insomnia when implemented in the forms of breathing control, progressive, muscle relaxation methods, and music therapy. (Tanaka, Kusaga, Nyamathi & Tanaka 2019, 81.) Improvement in total time (by 148% towards positive sleep discrepancy) after initially falling asleep was found in the elderly with Insomnia (Kay, Buysse, Germain, Hall & Monk 2015, 6). It is suggested that the perception of wakefulness after initially falling asleep in elderly with Insomnia becomes more like elderly without Insomnia after the intervention. (Kay, Buysse, Germain, Hall & Monk 2015, 7.)

5.5 Cognitive restructuring

Cognitive restructuring is a method of changing ways to think and has been found effective in improving quality of life by treating Insomnia related comorbidities, e.g., osteoarthritis pain and sleep disorder breathing (Yeung et al 2022, 4; Wantonoro 2020, 2314; Tanaka, Kusaga, Nyamathi & Tanaka 2019, 81; Fung et al. 2016, 6). Additionally, like fatigue management, cognitive restructuring is also shown to improve sleep discrepancy and subjective sleep measures (Kay, Buysse, Germain, Hall & Monk 2015, 6; Alessi et al. 2016, 8). Advising the elderly about not being concerned about waking frequently or losing sleep during the night and educating them that those awakenings are because of age and natural physiological changes related to sleep patterns seems to be an effective cognitive

therapy for treating depression-related Insomnia. (Tanaka, Kusaga, Nyamathi & Tanaka 2019, 83; Wantonoro 2020, 2314.)

5.6 Psychoeducation

One of the main components of CBT-I is psychoeducation. Psychoeducation aims to empower individuals, especially the elderly with knowledge and skills to make informed decisions and behavioural changes that can positively impact their sleep. It helps foster a more holistic understanding of sleep and insomnia, allowing individuals to participate actively in their treatment and improve their sleep outcomes.

Implementing psychoeducation for an elderly client suffering from Insomnia involves tailoring education and information to their specific needs and challenges. For example, meet with the elderly client to discuss their sleep patterns and experiences. This may involve assessing their sleep routines, any existing sleep disturbances, their knowledge about sleep hygiene, and their concerns or misconceptions about Insomnia. Provide information on sleep hygiene tailored to the elderly individual. Discuss the importance of a consistent sleep schedule, maintaining a relaxing sleep environment, the effects of caffeine or alcohol on sleep, and the role of physical activity in promoting better sleep. (Reynolds et al 2023, 2.)

Introduce relaxation exercises or techniques, such as deep breathing, progressive muscle relaxation, or guided imagery, to help the individual manage stress or anxiety that might be interfering with their sleep. Then set realistic sleep expectations and regularly follow up to reinforce the information based on the elderly individual's progress and feedback. (Reynolds et al 2023, 2.)

6 DISCUSSION

Conducting a narrative literature review, our study aims to explore the effective way of non-pharmacological, i.e., CBT-I, interventions that can improve Insomnia in the elderly. Our narrative literature review identifies six major components of CBT-I, psychoeducation, sleep hygiene, stimulus control, sleep restriction, fatigue management, and cognitive restructuring, as effective modes to improve Insomnia and enhance the quality of life in the elderly.

These six interventions, either given collectively or in a collection of some are found to improve Insomnia caused by diverse health conditions, ranging from elderly who experience depression and anxiety (Sadler, Mclaren, Klein & Jenkins 2020, 936; Tanaka, Kusaga, Nyamathi & Tanaka 2019, 83; Irwin et al. 2022, 39), osteoarthritis (Yeung et al. 2022, 8; Wantonoro 2020, 2314.), obstructive sleep apnea (Alessi et al. 2021, 10), cancer (Peoples et al. 2017, 408), cognitive impairment (Cassidy-Eagle, Siebern, Unti, Glassman & O'Hara 2018, 140-143.), and occult sleep disorder breathing (Fung et al. 2016, 6).

Additionally, those interventions were also found to improve sleep discrepancy (difference between objective and subjective measures of sleep as a self-reporting) and perception of sleep during the night by the elderly (Kay, Buysse, Germain, Hall & Monk 2015, 6; Alessi et al. 2016, 8; Dzierzewski et al. 2019, 7.) Therefore, by improving Insomnia regardless of its cause and shifting the perception

about sleep, CBT-I has been shown to improve the quality of life in the elderly. Implementing the above identified interventions is crucial for managing insomnia, which can be achieved by different specific methods.

According to Wantonoro (2020, 6) sleep restriction is a very regular therapy. This therapy aim was to lessen the total number of hours people spend in bed unable to sleep, to the exact number of hours they usually sleep. For example, healthcare professionals may recommend for the elderly to avoid oversleeping and follow a consistent wake time. Additionally, they can be advised to remain physically active and to avoid sleep-disturbing substances, such as caffeine and alcohol (Pigeon et al. 2013, 156.) Suggesting elderly not spend more time in bed if they are not feeling sleep is also another effective way, and this can be done by, for example, avoiding daytime napping, postponing bedtime, and using the bed or bedroom primarily for sleep and intimacy (Beglion et al. 2019, 7 & Pigeon et al.2013, 158).

Giving a good exposure and making elderly to do relaxation techniques such as breathing control, muscle relaxation, and music therapy in a routine basis can be another way (Reynolds et al. 2023, 2.) Moreover, educating the elderly about changes in sleep patterns with age and about not worrying for being awake frequently or losing sleep during the night, and discussing about the importance of good and consistent sleep could be some additional ways (Tanaka, Kusaga, Nyamathi & Tanaka 2019, 83 & Wantonoro 2020, 2314 & Reynolds et al. 2023, 2.)

Although these various interventions have been shown to improve Insomnia and quality of life in the elderly, there are also some limitations and suggestions that are highlighted to increase the efficiency of the interventions. For example, Wantonoro (2020, 2309) suggests that education about cognitive therapy and pain to nurses delivering CBT-I is important for clinical practice. Similarly, (Sadler, Mclaren, Klein & Jenkins 2020, 932) suggests that increasing the length of therapy, adding multidimensional learning opportunities such as audio/video and various mode of treatment delivery (such as telephone/group/individual) could be considered for future CBT-I program for elderly who experience Insomnia because of depression.

Not only limitations and suggestions but also researchers have emphasized some aspects of interventions to be considered in future research to treat Insomnia in the elderly. For example, (Peoples et al. 2017, 408) suggest that for the cancer patient, CBT-I should be considered an integral part of cancer care with a consideration of future research that focuses on screening for clinical Insomnia and increasing awareness and access to evidence-based non-pharmacologic insomnia interventions. Similarly, (Kay, Buysse, Germain, Hall & Monk 2015, 8) have highlighted that studying sleep discrepancy must consider explicit questions in the sleep diary regarding estimating perceived sleep length or total sleep time.

Overall, our narrative literature review confirmed that various interventions adopted in CBT-I are beneficial in improving comorbid Insomnia and perception of sleep, thus improving the quality of life among elderly experiencing Insomnia.

7 CONCLUSION

The review findings have indicated that the components of CBT-I, including stimulus control, sleep restriction, psychoeducation, cognitive restructuring therapies, sleep hygiene practices, and fatigue management, have not only enhanced the sleep patterns but have also positively impacted the mental health, cognitive function, and daily activities of elderly clients, ultimately improving their overall quality of life.

Based on the findings, it is also important to state that, applying these five components of CBT-I in the elderly population will aim to modify behaviours, thoughts, and environmental factors that contribute to insomnia. These interventions offer a holistic approach, addressing both behavioral and psychological aspects, thereby promoting healthier sleep patterns, and enhancing overall well-being in the elderly.

Healthcare providers need to recognize that sleep disturbances in the elderly are not solely due to aging itself. Nurses can aid in improving sleep by minimizing unnecessary overnight checks of vital signs and limiting the frequency of changing a client's wet diapers and night wears. This approach is crucial as sleep deprivation can result in increased daytime napping, which subsequently exacerbates sleep difficulties during the following night. It's also crucial to understand that effectively managing insomnia can significantly enhance the overall well-being of older individuals.

7.1 Ethics and reliability

The authors adhered to ethical principles throughout the literature review process, ensuring that each step was meticulously executed. To uphold research integrity, the authors have implemented an unbiased data collection strategy aligned with the study objectives, offering comprehensive justifications for data representations. Ethical and sustainable acquisition of research materials is imperative, as emphasized by the Finnish Advisory Board on Research Integrity (TENK 2012, 30-31). The authors exclusively utilized professional databases in their study. As an outcome of their research, they selected thirteen (n=13) articles to write their results. All the articles included in the study were reviewed and published within 2015-2023.

Transparency was a key element in this research endeavour, with the authors openly discussing the research process and the criteria applied in the review. The results were presented with utmost care and objectivity, ensuring alignment with the underlying data, and avoiding biases. Following the system outlined by Savonia University of Applied Sciences, proper referencing was employed to credit the original authors appropriately.

Furthermore, ethical guidelines from The Rectors' Conference of Finnish University of Applied Sciences Arene (2020, 3-12) were strictly adhered to, emphasizing the importance of ethical conduct in research. Importantly, the authors declared no conflicts of interest throughout the thesis, underscoring their commitment to unbiased inquiry. Their profound understanding of the ethical

guidelines governing research and the specific thesis topic further fortified the ethical integrity of the study.

Regarding the reliability of this study, the authors diligently ensured a comprehensive and meticulous approach. The interpretation and outcomes of the research rely solely on the materials gathered, as indicated by (Kananen 2011, 138-139). While many articles delved into cognitive behaviour therapy, the authors specifically focused on Cognitive Behaviour Therapy for Insomnia (CBT-I), potentially omitting some data. The analysis encompassed 13 articles (N=13), 9 articles from the USA, 1 article from Indonesia, 1 from Australia, 1 from Sweden, and 1 from China.

7.2 Limitations and Recommendations

There are several potential limitations that the authors encountered while conducting narrative literature review. Some of these limitations include firstly, narrative literature review lacks a strict and methodical process, potentially leading to incomplete coverage of all the literatures we used in this thesis and making it challenging to replicate or verify our review. This means that analysis of 13 articles used in this thesis cannot provide generalizable findings due to the lack of a systematic selection process in narrative literature review, potentially limiting their applicability to broader contexts.

Secondly, there were very few articles that met the inclusion criteria of this study because data from the literature search was limited to only three databases and articles written in English. Languages other than English might have provided more insight and given the study on how CBT-I can be adopted to improve Insomnia in institutionalized elderly clients a broader scope.

Even though, the database used may contain lots of information on our topic, they were not accessible and available to university online library services. This shows that more studies are needed on the topic of application of CBT-I in institutionalized elderly clients. Lastly, time constraints would possibly be a limiting factor that affected the reviewers during this thesis. The listed limitations in this thesis might be addressed by future studies on this topic.

The authors come to conclude on the following recommendations: That there is need for a comprehensive education and training programs for healthcare professionals, particularly nurses, to effectively deliver CBT-I to elderly patients. Focus should be on cognitive therapy, pain management, and specialized techniques for this demographic.

Secondly, hospitals and home care establishments may develop CBT-I programs specifically designed more for the elderly population, considering their unique needs, challenges, and potential comorbidities (such as depression or chronic pain). There is an urgent need for more research to explore the impact of extended CBT-I therapy duration on treatment outcomes. Investigate whether longer treatment periods yield more sustainable improvements in insomnia among the elderly.

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APPENDIX 1: LIST OF SELECTED ARTICLES

No.	Title of the article/Year of publication	Authors	Aims	Participants	Methods	Findings
1.	Effects of cognitive behavioral therapy for Insomnia and Rosco armodafinil on quality of life in cancer survivors: a randomized placebo-controlled trial 2017	Anita R. Peoples 1 & Sheila N. Garland2 & Michael L. Perlis3 & Josée Savard4 & Charles E. Heckler 1 & Charles S. Kamen1 & Julie L. Ryan5 & Karen M. Mustian1 & Michelle C. Janelsins 1 & Luke J. Peppone 1 & Gary R. Morrow1 & Joseph A.	examines the effects of CBT-I, with and without armodafinil, on QOL both directly and indirectly through improvements of Insomnia.	96 participants	randomized placebo-controlled trial	Results indicates that Cognitive behaviour therapy (CBT-I) improve quality of life, whereas Armodafinil has no effect on quality of life.
2.	Cognitive Behavioral Therapy for Insomnia in Older Veterans Using Nonclinician Sleep Coaches: Randomized Controlled Trial 2016	Cathy, Alessi, Jennifer L, Martin, Lavinia, Fiorentino, Constance H, Fung, Joseph M, Dzierzewski, Juan C, Rodriguez, Tapia, Yeonsu, Song, Karen, Josephson, Stella, Jouldjian, Micheal N, Mitchell	To test a new cognitive behavioral therapy for insomnia (CBT-I) program designed for use by nonclinicians.	Community-dwelling veterans aged 60 and older who met diagnostic criteria for Insomnia of 3 months duration or longer (N = 159)	Randomized controlled trial	Chronic Insomnia was improved by sleep coaches via manual based CBTI delivered by nonclinician

3.	Randomized controlled trial of an integrated approach to treating Insomnia and improving the use of positive airway pressure therapy in veterans with comorbid insomnia disorder and obstructive sleep apnea. 2021	Cathy A, Alessi, Constance H, Fung, Joseph M, Dzierzewski, Lavinia, Fiorentino, Carl, stepnowsky, Juan C, Rodriguez, Tapia, Yeonsu, Song, Mitchelle R, Zeidler, Karen, Josephson, Micheal N, Mitchell, Stella, Jouldjian, Jennifer L, Martin	Cognitive behavioral therapy for Insomnia (CBT-I) for comorbid Insomnia and obstructive sleep apnea (OSA) has had mixed results. We integrated CBT-I with a positive airway pressure (PAP) adherence program and tested effects on sleep and PAP use.	125 veterans (mean age 63.2, 96% men, 39% non-Hispanic white, 26% black/African American, 18% Hispanic/Latino) with comorbid Insomnia and newly diagnosed OSA (apnea-hypopnea index ≥ 15).	Randomized controlled trial	Improvement in sleep and PAP in comorbid Insomnia and OSA after implementing an intervention integrating CBT-I with a PAP adherence program delivered by a supervised sleep coach.
4.	Efficacy of Cognitive Behavioral Therapy for Insomnia in Older Adults with Occult Sleep-Disordered Breathing 2016	Constance H, Fung, Jennifer L, Martin, Karen Josephson, Lavinia, Fiorentino, Joseph M, Dzierzewski, Stella, Jouldjian, Juan Carlos, Rodriguez, Tapia, Micheal N, Mitchell, Cathy, Alessi	The aims of the study were to determine whether mild, occult sleep-disordered breathing (SDB) moderates the efficacy of cognitive behavioral therapy for Insomnia (CBT-I) in older adults and to explore whether CBT-I reduces the number of patients eligible for positive airway pressure (PAP) therapy.	134 adults 60 years or older with Insomnia and apnea-hypopnea.	Randomized controlled trial	Sleep was improved by CBT-I in veterans with Insomnia with Insomnia and untreated mild SDB.

5.	Subjective-objective sleep discrepancy among older adults: associations with insomnia diagnosis and insomnia treatment 2015	Daniel B, Kay, Daniel J, Buysse, Anne, Germain, Martica, Hall, Timothy H, Monk	This study describes differences between older adults with Insomnia and controls in sleep discrepancy and tests the hypothesis that reduced sleep discrepancy following cognitive behavioral therapy for Insomnia correlates with the magnitude of symptom improvement reported by older adults with Insomnia.	Participants were 63 adults >60 years of age with Insomnia, and 51 controls.		Insomnia Severity Index was dramatically reduced and was correlated with changes in mean level and night-to-night variability in wake after sleep onset discrepancy after treatment with cognitive behavioral therapy for Insomnia
6.	CBT for late-life Insomnia and the accuracy of sleep and wake perceptions: Results from a randomized-controlled trial 2019	Joseph M, Dzierzewski, Jennifer L, Martin, Constance H, Fung, Yeonsu, Song, Lavinia Fiorentino, Stella, Jouldjian, Juan Carlos, Rodriguez, Michael, Mitchell, Karen Josephson, Cathy A, Alessi	This study examined the impact and durability of cognitive behavior therapy for Insomnia (CBT-I) on improving the accuracy of sleep and wake perceptions in older adults and tested whether changes in sleep quality were related to changes in the accuracy of sleep/wake perceptions.	159 older veterans (97% male, mean age 72.2 years) who met diagnostic criteria for insomnia disorder	Randomized controlled trial	sleep/wake discrepancy among older adults with Insomnia was reduced by CBT-I and the underlying reasons was due to improvements in sleep quality. Improving sleep quality could be a path to improve sleep perception and may contribute to the underlying effectiveness of CBTi .
7.	Cost-effectiveness of telephone cognitive behavioral therapy for osteoarthritis-related insomnia 2021	Kai, Yeung, Weiwei, Zhu, Susan M, McCurry, Michael Von, Korff, Robert, Wellman, Charles M, Morin, Michael V, Vitiello	The objective of this study was to use data from our recently published trial to evaluate the incremental cost-effectiveness of telephone-delivered CBT-I for insomnia-specific, arthritis-specific, and general quality of life outcomes.	325 community-dwelling older adults with insomnia and osteoarthritis pain	Randomized controlled comparative efficacy trial	A comorbid insomnia caused by arthritis was improved after. CBT-I. CBT-I via telephone could be a way to treat comorbid OA insomnia in older adults.
8.	Effects of Brief Cognitive Behavioral Therapy for Insomnia	Mika Tanaka, Mari Kusaga, Adey M Nyamathi, and Katsutoshi Tanaka	This study sought to examine the effectiveness of a brief CBT-I intervention delivered	49 older adults	A This randomized controlled	Results shows that GDS-SF scores in the CBT-I group exhibited

	on Improving Depression Among Community-Dwelling Older Adults 2019		by public health nurses to improve depressive symptoms among older adults recruited from a community setting.		study compared sleep status and depression at baseline and a 3-month follow-up using a wait-list control design. Depression was evaluated using the Geriatric Depression Scale short form (GDS-SF).	improvement, indicating the efficacy of a concise CBT-I intervention for depression.
9.	Digital cognitive Behavioral Therapy for Insomnia- The first Georgian version. Can we it in practice? 2019	Okujava .N, Malashkhia .N, Shagidze .S, Tsereteli. A, Arevadze. B, Chikhladze. N, A. de Weerd, Straten. A. V	The aim of the study was to evaluate a Georgian version of an innovative, internet-delivered digital CBT (dCBT) for Insomnia in terms of therapeutic efficacy, adherence, and ease of handling.	52 adult's patients with Insomnia were recruited from a randomized controlled trial testing dCBT. 34 women and 18 men aged 18-64 years	Randomized controlled trial	The Georgian dCBT result showed significant therapeutic effect within one month of using CBT
10.	Cognitive behaviour therapy for Insomnia and depression: qualitative reflections from older adults who participated in a randomized controlled trial 2020	Paul Sadlera , Suzanne McLarena , Britt Kleinb and Megan Jenkins	To explore the experiences of older adults who participated in a randomized controlled trial (RCT) that tested cognitive behaviour therapy for Insomnia and depression.	42 participants aged 65 and above	a randomised controlled trial	Results suggested that future CBT-I programs could benefit from extending therapy duration (e.g., 8 to 12 sessions), incorporating multi-dimensional learning approaches (e.g., visual/audio/mentorship), and providing diverse modes of treatment delivery (e.g., group,

						individual, internet, telephone).
11.	Effect of Telephone Cognitive Behavioral Therapy for Insomnia in Older Adults with Osteoarthritis Pain: A Randomized Clinical Trial 2021	Susan M, McCurry, Wewei, Zhu, Michael Von, Korff, Robert, Wellman, Charles M, Morin, Manu, Thakral, Kai, Yeung, Michael V, Vitiello	To evaluate the effectiveness of telephone CBT-I vs education-only control (EOC) in older adults with moderate to severe osteoarthritis pain.	327 participants 60 years and older were double screened 3 weeks apart for moderate to severe Insomnia and osteoarthritis (OA) pain symptoms.	Randomized controlled trial	Results revealed that telephone-based CBT-I, compared to a credible attention control, exhibited both short-term and long-term efficacy in enhancing sleep, reducing fatigue, and, to a lesser extent, alleviating pain.
12.	Cognitive-Behavioural Therapy Improved Quality of Sleep and Reducing Pain among Elderly with Osteoarthritis: Literature Review 2020	Wantonoro, Nursing Department, Universitas 'Aisyiyah Yogyakarta, Indonesia. Jalan Ringroad Barat Nomor 63, Mlangi Nogotirto, Gamping, Area Sawah, Nogotirto, Kec. Gamping, Kabupaten Sleman, Daerah Istimewa Yogyakarta	To overview evidence of cognitive-behavioural therapy for Insomnia older adults with osteoarthritis. Five randomized control trial study was included in this literature review. Cognitive-behavioural therapy for Insomnia (sleep hygiene education, stimulus control, sleep restriction, and daily sleep monitoring.	Five randomized controlled trials on cognitive-behavioural therapy were included in this literature review. 1st= CBT-I 100 patients 2nd=CBT-I 23 patients 3rd=CBT-I plus pain management 367 paticipant 4th=CBT-I plus pain management 122 patients 5th=CBT-I plus pain management 101 patients	Randomized controlled trail	Results shows that CBT-I enhanced sleep quality. -CBT-I also decrease both immediate and long-term reported pain (Vitiello et al., 2009)

13.	Change in Dysfunctional Sleep-Related Beliefs is Associated with Changes in Sleep and Other Health Outcomes Among Older Veterans with Insomnia: Findings From a Randomized Controlled Trial 2021	Yeonsu, Song, Monica R, Kelly, Constance H, Fung, Joseph M, Dzierzewski, Austin M, Grinberg, Michael N, Mitchell, Karen, Josephson, Jennifer L, Martin, Cathy A, Alessi	To examine whether changes in sleep-related beliefs from pre- to post-CBTI predicted changes in sleep and other outcomes in older adults.	144 older veterans with Insomnia from a randomized controlled trial testing CBTI.	Randomized controlled trial	Results shows CBT-I decrease in dysfunctional sleep-related beliefs. changes in various aspects of sleep and daytime