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Psychological Interventions for Late-life Insomnia: Current and Emerging Science

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Abstract

Purpose of Review: Late-life insomnia is a serious medical condition associated with many untoward consequences. The high prevalence of late-life insomnia, along with the concomitant risks inherent in the use of hypnotic medications in older adults necessitates non-pharmacological (i.e., psychological) treatment options. We aim to summarize and evaluate the state-of-the-science of psychological treatment options for late-life insomnia.

Recent Findings: Cumulative scientific evidence suggests the efficacy of psychological treatment of late-life insomnia. During the previous decade, trials of psychological treatments for insomnia have begun to test various modifications to treatments that have the potential to improve access for older adults, along with expanding their focus to include individuals with comorbid conditions that are common to older adults. While these modifications represent positive advances in the science of treatment for late-life insomnia, the evidence is still largely explanatory/efficacious in nature.

Summary: Psychological strategies represent the best approaches for the treatment of late-life insomnia. Future investigations would be wise to progressively move towards increasingly pragmatic/effectiveness investigations, adding to the literature base regarding the treatment of late-life insomnia under usual/real-world conditions as opposed to ideal/artificial conditions.

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Conflict of Interest

Sarah C Griffin, Scott Ravyts, Bruce Rybarczyk declare no conflicts of interest.

Human and Animal Rights and Informed Consent

This article does not contain any studies with human or animal subjects performed by any of the authors.

Keywords

Insomnia; Sleep problems; Older adults; Late-life; Treatment; Intervention; Nonpharmacological

Insomnia in Older Adults

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) and International Classification of Sleep Disorders Third Edition (ICSD-3), insomnia is a condition that causes significant distress or impairment and is characterized by dissatisfaction with sleep quantity or quality as evidenced by one or more of the following symptoms: difficulty initiating sleep, difficulty maintaining sleep, or early-morning awakenings [1]. In order to meet criteria for insomnia, symptoms must be present for at least three nights per week, for a minimum of three months, despite adequate opportunity for sleep [1,2]. While the rate of insomnia is known to be higher among older than middle-aged adults, the exact prevalence of insomnia varies depending on the sample and criteria used. Nevertheless, the prevalence of insomnia in late-life is estimated to range anywhere from 13% to 60% [3,4]. Beyond those meeting criteria for insomnia, approximately 70% of older adults are estimated to report having at least one insomnia symptom [5]. Moreover, while insomnia severity has been shown to increase with age, race/ethnic background may moderate this relationship, with insomnia in late-life being more pronounced among Hispanics than non-Hispanic whites [6].

Insomnia symptoms have been linked to a range of negative physical and mental health outcomes in older adults, from reduced quality-of-life to greater risk of mortality. Sleep disturbance and depression commonly co-occur; a recent systematic review and meta-analysis indicated that 10.6% of community-dwelling older adults suffer from both depressive symptoms and sleep disturbance [7]. Several studies have also linked self-reported sleep disturbance with greater anxiety symptoms [8–10]. Regarding physical health, poor sleep is a stronger and more reliable predictor of pain, than pain is of sleep [11], and greater insomnia symptoms and use of sleep medications independently predicts falls at two-year follow-up [12]. Sleep deficiency among older adults, even in the absence of day-time consequences, is also associated with an increased risk of motor vehicle accidents [13]. Lastly, a recent systematic review and meta-analysis by Itani, Jike, Watanabe, & Kaneita synthesized 103 studies to show that short sleep duration, as defined by each study (modal definition was < 5 hours), increased the risk of developing diabetes mellitus, hypertension, cardiovascular diseases, coronary heart diseases, and obesity [13]. Moreover, two recent meta-analysis have linked short sleep duration with all-cause mortality [13,14].

Beyond its impact on health, late-life insomnia is also associated with significant economic burden. Ozminkowski, Wang, & Walsh (2007) estimated that the direct medical costs for older Americans with untreated insomnia were \$1,143 higher over a six-month period [15]. Similarly, Kaufmann et al. examined the 2006 and 2008 waves of the Health and Retirement Study to show that insomnia symptoms were significantly associated with greater health services use [16]. Although the disparity in medical costs and usage has undoubtedly changed over the past decade--especially given the healthcare policy changes that have

occurred—it is likely that the economic burden of late-life insomnia remains. There is also evidence that behavioral treatment of insomnia can reduce healthcare usage and costs [17]. The above-summarized evidence clearly explicates the need for effective treatments of late-life insomnia.

Psychological Treatment Options for Late-life Insomnia

The American College of Physicians, the British Association for Psychopharmacology, the American Academy of Sleep Medicine, and the European Sleep Research Society identify cognitive behavioral therapy for insomnia (CBTi) or behavioral therapy for insomnia (BTi) as the front-line treatment for insomnia [18–21]. However, psychological treatment for late-life insomnia is often overlooked in favor of pharmaceutical treatments, in particular prescription of benzodiazepines and other sedative-hypnotics [22]. Yet, the long-term benefits of sedative hypnotics on sleep remain dubious, and their use has been linked to a host of negative outcomes, to include memory impairment, falls, fractures, and motor vehicle accidents [23–27]. Psychological treatments for insomnia include sleep hygiene, relaxation and mindfulness, stimulus control, sleep restriction or compression, cognitive therapy, and exercise. CBTi and BTi encompass various combinations of these interventions. Table 1 summarized the evidence for these interventions and modifications used with older adults.

Sleep hygiene is an intervention designed to educate patients about the influence of environmental and behavioral practices on sleep. Recommendations to improve sleep hygiene typically include limiting caffeine and alcohol consumption, avoiding napping, engaging in regular physical activity, and maintaining a dark and quiet sleeping environment. While some epidemiological and experimental research supports the presence of associations between individual sleep hygiene components (e.g., caffeine, napping) and sleep disturbance, empirical support regarding the use of sleep hygiene recommendations as a treatment for insomnia is lacking [28,29]. Moreover, older adults with insomnia receiving only sleep hygiene education have shown poorer treatment outcomes compared to individuals receiving other non-pharmacological treatments [30,31]. Taken together, these findings suggest that sleep hygiene education may not be an effective stand-alone treatment for insomnia and may instead be more effective as part of a multi-modal therapy approach.

Mindfulness interventions aim to promote non-judgmental awareness of present moment experiences. In the context of late-life insomnia, general relaxation interventions have not been an effective treatment [32], but mindfulness has a unique focus on learning a tool for reducing reactivity to maladaptive thoughts some of which may be related to sleep. Preliminary evidence among adults suggest that mindfulness interventions for insomnia decrease total wake time and improve sleep quality [33]. However, use of these interventions among older adults with insomnia has been limited to date. In one study, older adults with insomnia receiving mindfulness-based stress reduction showed significant reductions in insomnia symptoms compared to participants in a wait-list control group [34]. Similarly, compared to individuals in a sleep hygiene education group, a mindfulness meditation intervention significantly improved sleep quality in a sample of older adults with moderate sleep disturbance [30]. Finally, older adults who received a combination self-relaxation and

meditation training showed significant improvements in sleep quality compared to those who only received sleep hygiene education [35]. Future research may benefit from examining the long-term effects of mindfulness and other relaxation interventions on insomnia outcomes and comparing these interventions to well-established insomnia treatments.

Stimulus control is a behavioral treatment which aims to strengthen the natural association of the bedroom and one's bed with sleep. Stimulus control typically consists of encouraging individuals to reduce non-sleep related activities in bed (e.g., reading, watching television), leave the bed/bedroom when unable to sleep, and maintain a regular sleep schedule. Recent empirical research on stimulus control as a standalone treatment for insomnia in late-life has been limited. Nevertheless, in one study, older adults who received stimulus control training showed similar improvements in diary and actigraphy-measured sleep as individuals who received either sleep restriction therapy or a multi-component therapy but significantly greater improvements in both objective and subjective sleep than participants in a control group. [36]. As such, stimulus control appears to be a promising approach to improve late-late sleep.

Sleep restriction is the reduction of time in bed to a set window, with the rationale that reducing time spent in bed will increase homeostatic sleep pressure and thus improve sleep efficiency [37]. The window is then slowly widened as the patient's sleep improves [38]. Sleep restriction is considered integral to CBTi and BTi, though it has also been studied as a stand-alone treatment [39]. Miller and colleagues conducted a systematic literature review, in which four trials met rigorous methodological criteria, two of which used older adult samples [39]. Collectively, these trials indicated that stand-alone sleep restriction improved subjective sleep outcomes. However, Kyle et al. (2014) showed that stand-alone sleep restriction therapy increased daytime sleepiness and lowered performance on a measure of cognitive functioning [40].

One potential way to circumvent excessive daytime sleepiness and impairment associated with sleep restriction is sleep compression. Sleep compression is similar to sleep restriction, but instead of a sudden reduction in time in bed, it is slowly titrated. Although sleep compression has been less studied than sleep restriction, there is evidence that it improves self-reported sleep when combined with relaxation [41] or psychoeducation [42] in older adults. Further research is necessary to directly compare the tolerability and efficacy of sleep restriction as opposed to sleep compression in older adults.

Cognitive therapy in insomnia treatment uses cognitive restructuring to target maladaptive thoughts that may perpetuate insomnia, to include unrealistic expectations about sleep, misconceptions about insomnia causes, catastrophization of consequences, and false beliefs about ways to promote sleep [43,44]. Harvey et al. (2014) conducted the first randomized controlled trial with a cognitive therapy only condition, comparing the treatment to full cognitive behavior therapy for insomnia and behavior therapy for insomnia. CBT showed the best treatment effects, but all three treatments were effective in lowering insomnia severity, reducing nighttime sleep disturbance, and improving daytime functioning, with sustained

benefits 6 month later, indicating that cognitive therapy is effective as a stand-alone treatment [45]. These findings have yet to be replicated in an older adult sample.

A meta-analysis of 66 studies examining the influence of physical activity on sleep among adults across the lifespan suggests that acute exercise has a small beneficial effect on total sleep time, sleep onset latency, and sleep efficiency, as well as a moderate effect on wake after sleep onset [46]. Among older adults, a randomized controlled trial found that older adults with mild sleep disturbance assigned to an aquatic exercise program displayed significant improvement in sleep onset latency and sleep efficiency, but not total sleep time or wake after sleep onset, compared to individuals in the control group [47]. Another study examined the effect of a moderate-intensity exercise intervention for sedentary community dwelling older adults compared to participants in a health education group [48]. Results demonstrated a preventative effect whereby older adults in the intervention condition were less likely to develop poor sleep quality during the intervention (PSQI > 5), however, the physical activity program failed to improve sleep quality for those with preexisting sleep disturbance. Future research in this domain may benefit from identifying whether certain types of physical activity or specific exercise characteristics (e.g., regularity, duration) differentially improve insomnia outcomes in late-life. For example, chronic levels of exercise among older adults appears to be associated with a decreased wake after sleep onset, whereas acute physical activity predicts higher sleep quality [49]. Similarly, a randomized controlled trial found evidence to suggest that low-intensity physical and mental activity improved sleep quality among older adults with self-reported sleep and cognitive difficulties more than moderate or high-intensity activities [50].

CBTi is multi-component treatment for insomnia that typically consists of sleep education, stimulus control, sleep restriction, cognitive restructuring, relaxation training, and sleep hygiene. CBTi generally involves 6–8 weekly 45–60 minute individual sessions. A recent comprehensive review of behavioral and psychological treatments for insomnia found that CBTi improved sleep onset latency, wake after sleep onset, and sleep efficiency for adults with insomnia [51]. However, these effects were weaker in older adults than middle-aged adults. Recent large randomized controlled trials have shown similar benefits with improvements in sleep quality and insomnia severity scores along with other positive effects on other sleep parameters for adults receiving CBTi versus individuals in control groups [52,53]. Beyond the sleep-related effects of CBTi, recent evidence also indicates that CBTi may reduce systemic inflammation in older adults and thus have important implications on future inflammatory disease risk [54].

Brief Behavioral Treatment for Insomnia (BBTi) is a treatment for insomnia which differs from CBTi in its duration and content, generally consisting of 4 sessions or less, and focusing solely on the behavioral components of insomnia [55]. Consequently, BBTi typically consists of sleep education, stimulus control, and sleep restriction. Older adults receiving BBTi show significant reductions in sleep onset, wake after sleep onset, sleep efficiency, and sleep quality compared to individuals in a self-monitoring control group [56]. However, the same study found that individuals receiving BBTi reported similar levels of depressive symptoms following treatment as older adults in the control condition and no changes in cognitive functioning. Preliminary research also suggests that older adults with

higher baseline levels of sleep variability may benefit more from BBTi than those with lower sleep variability [57]. Although additional research is needed, preliminary findings indicating that BBTi may lead to improvements in several sleep parameters, suggest that BBTi may be a feasible and cost-effective treatment for insomnia in late-life.

Emerging Science in the Psychological Treatment of Late-life Insomnia

Despite their efficacy, psychological strategies are frequently overlooked as treatments for late-life insomnia, potentially in part due to the scarcity of resources, limited mobility, and financial restrictions of older adults [58–60]. To address this issue Espie (2009) and more recently Mack & Rybarczyk (2011) have argued for stepped-care CBTi, whereby patients are channeled to different levels of cost and intensity depending on their needs and resources [62]. Innovations in treatment delivery include abbreviated CBTi, administration of CBTi by non-sleep specialists, web-based CBTi, and CBTi smartphone applications [61,62].

One way to lower costs of CBTi and thus reach a wider patient population is to reduce the number of sessions. The treatment is frequently compressed into four sessions [63], and has been successfully abbreviated into as few as one [64] or two [65] sessions. Buysse et al. showed that older adults who received a brief (two face-to-face sessions + two phone calls) behavioral treatment for insomnia showed improved self-reported sleep as compared to older adults who received printed educational materials [55]. Moreover, these effects endured for six months. Further research is necessary to replicate these findings and extend to older adults with comorbid medical conditions.

A second way to reduce costs is for non-sleep specialists to administer CBTi. Nurses, student trainees, and social workers, typically without previous experience in psychological treatments, have effectively provided care [36,55,66–69]. Alessi and colleagues (2016) showed that older veterans treated with manualized CBTi administered by sleep coaches showed greater improvements in sleep than older veterans who received general sleep education. The sleep coaches were nonclinicians who trained with a 2-day workshop or six-session webinar and received weekly telephone supervision with a psychologist with expertise in behavioral sleep medicine [52].

A third innovation in CBTi delivery is via the internet. A recent meta-analysis by Seyffert et al. synthesized results from fifteen randomized control trials to show that internet-delivered CBTi reduced insomnia severity, increased total sleep time, and decreased depressive symptoms relative to a wait-list control, with benefits lasting for four to forty-eight weeks post-treatment [70]. However, most of samples studied were middle-aged adults, and there was no study specific to older adults. As such the efficacy of internet-delivered CBTi for late-life insomnia remains unclear, though there is some evidence supporting the use of internet-delivered CBT more broadly [71,72].

Another cost-effective delivery method is smartphone applications. Two recent studies provide preliminary support for the use of CBTi apps, though neither study examined older adults specifically [73,74]. Chen, Hung, & Chen reported on a case study of a 64-year-old woman who benefited from the use of a CBTi app [75]. Further research is necessary to

determine the efficacy of app-delivered CBTi for older adults, address problems in delivery specific to older adults, and identify patient characteristics linked to receptivity to app-delivered CBTi and treatment response. Smartphone applications may reach older adults who prefer to have access resources on a mobile device, or could serve as a complement to internet-delivered or other treatment modalities of CBTi. On the other hand, some older adults may prefer, or feel more capable of navigating, CBTi via a computer.

In addition to modifying the delivery of CBTi to reach a wider audience, it has also been tested with a variety of older adult patient populations. Evidence suggests that psychological interventions for insomnia may be effective for older adults living in residential communities. For example, in a sample of older adults living in assisted living facilities with co-morbid mild cognitive impairment, CBTi improved both objective and subjective sleep parameters [76]. Similarly, another study examined the effect of a physical and social activity intervention among nursing home residents with observed sleep difficulty and found significant reductions in subjective insomnia severity symptoms compared to individuals in an inactive control group [77]. Finally, older adults attending an adult day healthcare program receiving a brief behavioral sleep intervention program displayed improvements in objective and subjective sleep immediately following treatment and at a 4-month follow-up [31].

In the initial decade of CBTi research, older adults with comorbid chronic conditions were generally excluded from studies, with the assumption being that the treatment would only apply to individuals with *primary insomnia*, which was caused by cognitive and behavioral factors. *Secondary insomnia*, on the other hand, was thought to be caused by the accompanying symptoms of a primary medical condition (e.g., coughing, reflux, pain, frequent nighttime urination, or side effects from necessary medications). It was believed that this type of insomnia needed to be alleviated with direct pharmacologic or other medical treatments. However, beginning around the year 2000, studies began to demonstrate that the perpetuating factors identified as the key target for CBTi in primary insomnia were equally present in comorbid insomnia and CBTi was, in fact, equally efficacious for this form of insomnia [78]. Thus, the term *comorbid insomnia* was coined to replace the previously used diagnostic term of *secondary insomnia* [78]. In 2002, the first study was conducted to show that CBTi was effective among older adults with insomnia and a range of different comorbid medical conditions [79]. Later studies demonstrated the efficacy of CBTi with specific age-related comorbid medical conditions including arthritis [32], heart disease [32], COPD [32], and Parkinson's disease [80].

Newer studies with older adults with comorbid insomnia need to focus on combined treatments. For example, older adults receiving a hybrid CBT for both insomnia and chronic pain secondary to arthritis displayed reduced insomnia severity and improved sleep efficiency post-treatment compared to individuals in a control group [81]. However, the treatment benefits observed at a 9-month follow-up were no longer present 18 months post-treatment, except for a subset of individuals with high levels of both insomnia and chronic pain [82]. Similarly, a hybrid CBTi + PAP Adherence program has been shown to significantly improve both insomnia symptoms and PAP adherence in older adults with comorbid insomnia and sleep apnea [83]. This line of treatment is very important given

recent evidence suggesting high rates of comorbidity between insomnia and sleep apnea in older adults [84]. Finally, although not limited to older adults, a recent comprehensive review suggests that individuals with cancer receiving CBTi show clinically significant changes in subjective sleep outcomes with some additional secondary effects on mood, fatigue, and quality of life [85]. Future research is needed to replicate these results with larger sample sizes and examine the effect of CBTi and other sleep interventions on older adults with comorbid cancer diagnoses.

Recent meta-analyses suggest that CBTi for patients with co-morbid mental health conditions appear to be effective in reducing insomnia symptoms and may have positive secondary effects on mental health [86,87]. However, examinations of CBTi among older adults with co-morbid mental health conditions have been scarce. Nevertheless, preliminary research has shown promising results. In one study, traditional CBTi, as well as CBTi with an added mood module both resulted in significant reductions in both insomnia and depression severity compared to a psychoeducation only control group [88]. Similarly, research examining the effect of a mindfulness-based intervention found that improvements in insomnia symptoms were associated with reductions in depressed mood [89]. Older adults with insomnia and comorbid generalized anxiety disorder (GAD) showed a decrease in GAD severity, overall anxiety, depression, and insomnia severity following CBTi [90]. Further research is needed to replicate these findings and examine the effectiveness of psychological treatments for insomnia among older adults with other pertinent mental health disorders such as substance use disorders or post-traumatic stress disorder.

Salient Issues for CBTi with Older Adults: Napping, Sleep Discrepancy, and Nocturia

Napping is common in older adults, with prevalence rates above 22% [91]. Napping has been linked to both positive and negative health outcomes [91], perhaps due to differences in overall sleep duration, length of naps, and timing of naps [92–94]. Experimental research, research on different populations, and research with different nap parameters (i.e., time of day, length, and frequency) is necessary to determine the health benefits and risks of napping. In terms of late-life insomnia, napping is often cited as a perpetuating factor for insomnia because it may interfere with circadian rhythms and decrease homeostatic sleep drive [95,96]. On the other hand, napping may be salubrious specifically for older adults who sleep under seven hours [92,97]. As such, it remains unclear whether naps are recommended for older adults with insomnia. However, elimination of naps is recommended in the short-term, as to not decrease the impact of sleep restriction or compression interventions. But if a strict non-nap rule cannot be tolerated by the patient, we recommend to patients that naps be 20 minutes or less and that they take place in the afternoon only – preferably at the same time daily. Those naps should be planned and take place in the bedroom to promote sleep-bedroom conditioning.

Sleep discrepancy, defined as the difference between objective and subjective measures of sleep, is well-documented among older adults especially among those with insomnia or sleep disturbance [98,99]. Although sleep discrepancy has traditionally been viewed as an

artifact of measurement error, emerging research suggests that it may be a clinically relevant factor, with the potential to shed light on the efficacy of psychological treatments for insomnia. For example, sleep discrepancy among older adults receiving CBTi has been shown to become less negative and less variable following treatment [98]. Moreover, reductions in sleep discrepancy following non-pharmacological treatment appear to account for a significant portion of improvement in self-reported sleep [100]. Based on these findings, it is our observation that teaching patients about the high likelihood that they are misinterpreting sleep as wakefulness and providing objective information from any sleep studies that have been conducted with them to verify this discrepancy is an important element of the cognitive aspect of CBTi with older adults. Once mobile technologies have developed to the point of being able to provide consumers with reliable and accurate data about time spent asleep, there may be opportunities to investigate the potential of adding this discrepancy feedback as a formalized element of CBTi.

One final salient issue for insomnia in older adults is nocturia, defined as an increase in nocturnal urination. Regardless of quality of sleep, older adults report the need to urinate more frequently during the night than younger adults [101]. The increased nocturia in late-life is partly explained by three factors. First, older adults produce less of the antidiuretic hormone (ADH). ADH is produced during sleep and promotes sleep by causing individuals to produce less urine with a higher concentration of waste products. Second, older adults gradually lose bladder capacity with age. Finally, older adults are more likely to have a medical problem or take a medication that has an effect on the bladder [102].

In addition to these age-related factors, individuals with insomnia release even less ADH and frequently get up repeatedly throughout the night to empty their bladder even if only partially full as an anxiety-driven “safety behavior.” A similar cognitive treatment issue found among older adults is post-hoc reasoning and a misattribution that bladder sensations are the cause of their awakenings. When sleep is normal, bladder cues for urination do not trigger an awakening. Normal sleepers generally awaken in the morning with the bladder being at its fullest daily level. Older adults with insomnia can be educated about these facts and the clinician can challenge the belief that they need to awaken “3 to 4 times a night to go to the bathroom” by pointing out days on their sleep log when they are able to sleep through the night with few or no awakenings. The clinician can also create a positive expectancy that better sleep will produce an increase in ADH and therefore less bladder volume at night. After successful completion of CBTi, older adults commonly report how surprised they were to see that their nocturia could be substantially reduced or eliminated. Please refer to a recent comprehensive review on sleep and nocturia in older adults for additional information [102].

Conclusions

Insomnia in older adults is a serious medical condition. Its high prevalence, many negative physical and mental health correlates, along with countless contraindications for pharmacological management set the stage for psychological treatment options. Fortunately, decades of empirical evidence strongly suggest the efficacy of psychological strategies for the treatment of late-life insomnia. Recent decades have seen a growth in studies

investigating methods to widely increase the ability to disseminate these treatments. These modification studies have traditionally fallen along two lines: (1) Variations to treatment delivery modality, and (2) Variations in the patient populations targeted. Along these lines, psychological treatments for late-life insomnia have been found efficacious when delivered in a reduced number of sessions, by non-sleep professionals, and via alternative delivery modalities (i.e., internet and application-based treatments). Similarly, psychological treatments for late-life insomnia have demonstrated efficacy when delivered to older adults with numerous comorbid physical and mental health conditions. While the cumulative empirical evidence should yield much hope, additional work is needed to move the state-of-the-science from explanatory to pragmatic investigations, which would allow conclusions to be drawn about the psychological treatment of insomnia in real-world conditions.

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Table 1:

Summary of Psychological Interventions for Insomnia and Potential Modifications for Older Adults.

Intervention/Technique	Core or optional for CBTi?	Evidence as standalone treatment?	Evidence specific to older adults?	Modifications for older adults
Multicomponent Treatment (CBTi)	N/A	Strong	Strong	See below.
Brief Behavioral Treatment of Insomnia (BBTi)	N/A	Strong	Strong	See below.
Sleep Restriction	Core	Moderate	None	Restrict time in bed to no less than 6 hours.
Sleep Compression	Optional	Moderate	None	Potential replacement if sleep restriction is not tolerated.
Stimulus Control	Core	Moderate	Limited	Address safety concerns around leaving bed/bedroom during the night.
Cognitive Treatment	Optional	Limited	None	Target beliefs related to inevitability of poor sleep with age/comorbid conditions.
Sleep Hygiene	Optional	None	None	Allow consistent, scheduled 20-minute naps in the afternoon only, in bedroom.
Relaxation Training	Optional	Limited	None	Avoid progressive muscle relaxation with frail older adults.
Mindfulness	Not included	Limited-Moderate	Limited	None.
Exercise	Not included	Limited-Moderate	Limited	Address any safety concerns regarding exercise in older adults.