

Quality of Sleep among Elderly: A Cochrane Review

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Abstract

People must cherish throughout their life. Elderly is natural and inevitable. Individuals must accept the natural transition and change the lifestyle accordingly. Physical, mental social and sexual changes occurs when an individual get older. Along with these changes, sleep pattern disturbance is a part of the normal aging process. As people age, they tend to have a harder time falling asleep and more trouble staying asleep than younger. It is a common misconception that as age increases sleep needs decline. The aim of this article is to explore the quality of sleep of elderly.

Extensive literature review was done involving quality of sleep among elderly. Electronic database and search engine like PubMed (PMC – PubMed Central), SciELO (Scientific Electronic Library Online), CINAHL (Cumulative Index of Nursing & Allied Health Literature), Scopus, VHL (Virtual Health Library), PsycINFO, APAPsycNET, LILACS (Latin American & Caribbean Health Sciences Literature), IBESCS and journals like IJBNSA, European Journal of Physiotherapy, MRM were reviewed. The search strategy was extended by combining “Quality of Sleep” and “Elderly” keywords. Moreover, lifestyle modification and quality of sleep were reviewed respectively. Certain specific sleep hygiene like ROM Exercises, avoiding coffee, tea, soda & chocolate, bed schedule, wash feet with cold water before going to bed and regularly taking the medicines were included in the review.

In conclusion, there is no magic number or ideal amount of sleep to get each night that could apply broadly to all. The optimal amount of sleep should be individualized, as it depends on many factors. However, it is a fair assumption to say that the optimal amount of sleep, for most people, should be within the age-appropriate sleep duration recommended ranges. In the meantime, promoting the importance of a good night’s sleep should be a priority given its influence on other behaviors and the well-known adverse consequences of insufficient sleep. Important sleep hygiene tips include removing screens from the bedroom, exercising regularly during the day, and having a consistent and relaxing bedtime routine.

Keywords: Quality of Sleep, Elderly, Old age, Sleep hygiene, Cochrane review.

Introduction

Aging is tied to numerous health concerns, including sleep difficulties. In fact, poor sleep can contribute to many of these problems, reducing the quality of life in people over 65. Survey data show that half of the elderly individuals report some form of sleep difficulty, including longer sleep onset times, lower rates of sleep efficiency, more time in bed, more awakenings during the night, earlier wake-up times, and more daytime naps. The causes of sleep disturbances in the elderly are circadian rhythm changes, primary sleep disturbances e.g., SRBD, PLMS, RBD, medical illness e.g., Hyperthyroidism, arthritis, psychiatric illness e.g., Depression, anxiety, multiple medications, or poor sleep hygiene¹.

Circadian (24-h) rhythms are biological rhythms or changes that control many physiologic functions, including core-body temperature, endogenous hormone secretions, and the sleep-wake cycle. These rhythms originate in the suprachiasmatic nucleus (SCN) in the anterior hypothalamus, which houses the internal circadian pacemaker. The rhythms are also under the control of external cues such as light, time of day, social activities, and meals. Circadian rhythm sleep disturbances typically develop when there is a desynchrony between the internal circadian pacemaker and external environment demands².

Insomnia is a common sleep disturbance among the elderly. Insomnia is defined as the inability to initiate or maintain sleep that results in daytime consequences. Studies have found that 40%–50% of those over the age of 60 report difficulty in sleep³. An annual incidence rate of 5% in those over the age

of 65⁴. Insomnia complaints include difficulty falling asleep, difficulty staying asleep and early morning awakenings Women tend to have higher rates of insomnia than men⁵.

Various studies conducted earlier among the elderly regarding the quality of sleep show that lack of awareness on adopting healthy lifestyles was found to be the cause of insomnia in the elderly. To the best of our knowledge, there was no systemic reviews or meta-analysis that examined the quality of sleep among the elderly. Therefore, this review was carried out to summarize that ROM exercises, avoiding coffee, tea, soda & chocolate, bed schedule, washing feet with cold water before going to bed, and regularly taking medicines might improve the quality of sleep among the elderly.

Materials and Methods

Search Strategy

A Cochrane literature review was done on the quality of sleep among the elderly. Electronic databases and search engines like PubMed (PMC – PubMed Central), SciELO (Scientific Electronic Library Online), CINAHL (Cumulative Index of Nursing & Allied Health Literature), Scopus, VHL (Virtual Health Library), PsycINFO, APAPsycNET, LILACS (Latin American & Caribbean Health Sciences Literature), IBECs and journals like IJBNPA, European Journal of Physiotherapy, MRM were reviewed. The search strategy was extended by combining “Quality of Sleep” and “Elderly” keywords.

Inclusion Criteria

As the literature review is a discipline of a broad range, literature review was carried out by using definite and concise criteria to identify, scrutinize and select the literature. The studies taken up for review were limited by topic, keywords, date, and year of publication & language. Studies carried out recently within 15 years are included in this literature review.

Exclusion Criteria

The sources of literature are of the language other than English and studies conducted 15 years before were excluded. Studies not related to the keywords like quality of sleep and elderly are excluded from the literature review.

Results

A Cochrane review of appropriate literature resulted in the identification of 20 relevant references. The literature retrieved was of a descriptive cross-sectional study, randomized controlled trial, secondary data analysis, meta-analysis, and articles of literature review which are focused on the evaluation of the quality of sleep among the elderly. Results of most of the studies concluded that elderly people not adopting healthy lifestyles were more likely to have a poor quality of sleep as well poor quality of life. Healthy lifestyle interventions like exercises, yoga, meditation, diet, smoking cessation, quitting alcohol, managing stress, ROM Exercises, avoiding coffee, tea, soda & chocolate, bed schedule, washing feet with cold water before going to bed, and regularly taking medicines were found to improve the quality of life of elderly.

A cross-sectional study among 266 randomly selected elderly people in a sub-district in rural Chiang Rai Province, northern Thailand. This study aimed to characterize the prevalence of poor sleep quality and to identify associated factors among community-dwelling elderly individuals in northern Thailand. The participants were interviewed using the Thai version of the Pittsburgh Sleep Quality Index (PSQI). Roughly 44% of the participants had poor sleep quality (PSQI score, >5), 9.4% used sleep medication, 27.1% had poor family relationships, and 12.0% had mild depression. Multiple logistic regression analysis indicated that being female (odds ratio [OR], 1.74; 95% confidence interval [CI], 1.10 to 3.02), a higher education level (OR, 3.03; 95% CI, 1.34 to 6.86 for primary school; OR, 2.48; 95% CI, 1.31 to 5.44 for higher than primary school), mild depression (OR, 2.65; 95% CI, 1.11 to 6.36), and poor family relationships (OR, 3.65; 95% CI, 1.98 to 6.75) were significantly associated with poor sleep quality. The prevalence of poor sleep quality among the elderly was moderately high. Healthcare providers should regularly conduct screenings for sleep quality and depression; provide sleep health education; and conduct interventions to encourage participating in family activities, resolving conflicts, sharing ideas, and making compromises within the family⁶.

A systematic literature review on Exercise and Sleep in Community-Dwelling Older Adults was conducted. The review indicated that Insomnia and other sleep complaints are highly prevalent in community-dwelling older adults yet often go under-detected. Age-related physiological changes may affect sleep, but sleep disturbances and complaints should not be considered normal in the population. Various physiological, psychological, and social consequences have been associated with insomnia and sleep complaints. Treatment options are available, so it is imperative to diagnose and treat these individuals to promote healthy aging. Exercise is known to have a wide variety of health benefits, but unfortunately, older adults engage in less exercise with advancing age. This paper describes age-related changes in sleep, clinical correlates of insomnia, consequences of untreated insomnia, and nonpharmacological treatments for insomnia in older adults, with a focus on the relationship between exercise and sleep in community-dwelling older adults with insomnia or sleep complaints. Possible mechanisms explaining the relationship between exercise and sleep are discussed. While the research to date shows promising evidence for exercise as a safe and effective treatment for insomnia and sleep complaints in community-dwelling older adults, future research is needed before exercise can be a first-line treatment for insomnia and sleep complaints in this population⁷.

A Randomized Control Trial was conducted to assess the efficacy of moderate aerobic physical activity with sleep hygiene education to improve sleep, mood, and quality of life in older adults with chronic insomnia. RCT compared 16 weeks of aerobic physical activity plus sleep hygiene to nonphysical activity plus sleep hygiene control. The findings of the study includes; Physical activity group improved in sleep quality (global PSQI $p < 0.0001$), sleep latency ($p = 0.049$), sleep duration ($p = 0.04$) daytime dysfunction ($p = 0.027$), and sleep efficiency ($p = 0.036$) on the PSQI subscales compared to controls. Reductions in depressive symptoms ($p = 0.044$), daytime sleepiness ($p = 0.02$), and improvements in vitality ($p = 0.017$) compared to baseline. So it is concluded that aerobic physical activity and sleep hygiene education are effective to improve sleep quality, mood, and quality of life in this population⁸.

Baron et al., conducted a secondary data analysis to evaluate the daily bidirectional relationships between exercise and sleep in the elderly. The result showed that global PSQI improved ($p < 0.05$); baseline sleepiness was negatively associated with exercise duration ($p < 0.05$) Participants had a shorter aerobic exercise for 30 min 3 times /week for 16 weeks duration following nights of longer SOL ($p < 0.05$) TST moderated the daily relationship between TST and next-day exercise ($p < 0.05$). The secondary data analysis concluded that sleep influences next-day exercise rather than exercise influencing sleep⁹.

King et al., conducted a randomized controlled trial (RCT) to determine the 12-month effects of exercise on objective and subjective sleep quality in inactive older adults with mild to moderate sleep complaints. RCT assigned to a 12-month program of moderate-intensity endurance exercise or a health education control. Relevant data like PSG, subjective measures of sleep quality, physical activity, and physical fitness are obtained for analysis. Major findings of the study include exercisers spent less PSG time in stage 1 sleep ($p = 0.03$), more time in stage 2 sleep ($p = 0.04$), and fewer awakenings during the first third of the sleep period ($p = 0.03$). Reported improvements in PSQI sleep disturbance subscale ($p = 0.009$), sleep diary-based minutes to fall asleep ($p = 0.01$), and more rested in the morning ($p = 0.02$) compared to controls. The study concludes that, there was some improved objective and subjective dimensions of sleep to modest degree¹⁰.

A secondary analysis of RCT (a 12-month program of moderate-intensity endurance exercise or a health education control) was carried out by Buman et al., to determine whether physical exercise reduces intra-individual variability (IIV) in self-rated sleep outcomes among middle-aged and older adults with sleep complaints. Data like daily sleep logs, PSQI, in-home PSG; IIV for SOL, time in bed, feeling rested in the morning, number of night-time awakenings, and wake after final awakening are collected for analysis. Findings include SOL-based IIV was reduced in the exercise group ($p = 0.025$) IIV for the time in bed, and rested in the morning, WAFAs were not significantly different in either group. Secondary analysis of RCT concluded that 12 months of moderate-intensity exercise reduced night-to-night fluctuations in self-rated time to fall to sleep¹¹.

Irwin et al., conducted a randomized controlled trial to determine the efficacy of Tai Chi Chi to promote sleep quality in older adults with moderate sleep complaints. RCT is assigned to 16 weeks of teaching followed by practice and assessment 9 weeks later (25 weeks total) or health education control. Baseline poor sleep quality (PSQI ≥ 5) improved in 63 % of interventions vs 32 % in the control group (PSQI global score of < 5 after 25 weeks ($p < 0.05$)). Baseline poor sleep quality showed significant improvements in PSQI global score ($p < 0.001$), and subscores, sleep quality, sleep efficiency, sleep duration, and sleep disturbance (all $p < 0.05$). The study concluded that Tai Chi chi, slow-moving meditation, can be considered a useful nonpharmacologic approach to improve sleep quality in older adults with moderate complaints¹².

Chen et al., conducted a randomized controlled trial to test the effects of 6 months of silver yoga exercises in promoting the mental health of older adults, especially their *sleep quality*, depression, and self-perception of health status. RCT assigned to a 6-month program of yoga three times per week or control group. Significant improvements in PSQI global score in the yoga intervention group at 3 months ($p = 0.003$) and 6 months ($p < 0.001$). SOL did not improve after 3 months of the yoga training program ($p = 0.717$) but did decrease after 6 months ($p < 0.001$) The research findings concludes that improvements in sleep quality were seen in the yoga intervention group¹³.

Further Chen et al., in a study, aimed to explore the effectiveness of a Baduanjin exercise program on sleep quality in the Taiwanese elderly. RCT was assigned to 12 weeks of Baduanjin exercise training or a control group. Tools like PSQI and Geriatric Depression Scale were used to collect the data. There was a significant improvement in mean scores of sleep quality in the exercise group over the control group in overall sleep quality ($p < 0.001$) and in all subscales ($p = 0.024$ to $p < 0.001$). The result concludes that Baduanjin, a traditional Chinese exercise characterized by simple, slow, relaxing movement improved sleep quality in Taiwanese community-dwelling older adults¹⁴.

A similar secondary data analysis of the clinical trial of lifestyle intervention was conducted by Dzierzewski et al., 2014, to examine the chronic and acute relationships between exercise behaviour and self-reported sleep in older adults. Tools like Modified Leisure-Time Exercise Questionnaire, (LTEQ), Self-reported SOL, and WASO Sleep quality rating (SQR) on a five-point scale were used. The major findings of the data analysis include a small positive between-person association between exercise and WASO, and a within-person association between exercise and general sleep quality Education ($p = 0.02$) between person predictor of SOL; age and physical activity ($p = 0.03$, $p = 0.01$) between person predictors of WASO; physical activity within-person ($p = 0.05$) predictor of SQR Age and WASO ($p = 0.05$ and 0.008) between person predictors of physical activity; SQR ($p = 0.001$) predictor of physical activity. Hence it is concluded that more chronic levels of exercise were associated with lower self-reported WASO, increased prior day exercise was associated with high subsequent nights of self-reported sleep quality, the acute exercise-SQR relationship was reciprocal in nature and location in which the exercise was conducted did not impact the relationship between exercise and sleep¹⁵.

Claudio F. Donner et.al. conducted a randomized controlled trial regarding home exercise improves the quality of sleep and daytime sleepiness of elderlies, from May to September 2017, in North-eastern Brazil, with elderlies of the community aging 60 years old or older, sedentary, with lower scores or equal to 5 at the Pittsburgh Sleep Quality Index (PSQI) and without cognitive decline. From one hundred ninety-one potential participants twenty-eight refused to participate, therefore, one hundred thirty-one (mean age 68 ± 7 years), and 88% female, were randomly assigned to an intervention group - IG (home exercise and sleep hygiene, $n = 65$) and a control group - CG (sleep hygiene only, $n = 66$). Sleep assessment tools were used: PSQI, Epworth sleepiness scale (ESS) and clinical questionnaire of Berlin. The level of physical activity has been assessed by means of International Physical Activity Questionnaire adapted for the elderly (IPAQ) and Mini-Mental State Examination for cognitive decline. All participants were assessed before and after the 12-week intervention period, also, the assessors were blind. The result showed significant improvement in the quality of sleep with a mean reduction of 4.9 ± 2.7 points in the overall PSQI ($p < 0.01$) and in all its 7 components of evaluation ($p < 0.05$), and improvement of secondary endpoint, daytime sleepiness, a decline of 2.8 ± 2.2 points in the ESS ($p <$

0.01). Results suggest that semi-supervised home exercise is effective in improving the quality of sleep and self-referred daytime sleepiness of sedentary elderlies of the community who presented sleep disorders

Conclusion

The elderly people have low sleep quality and there is a close relationship between a healthy lifestyle, sleep quality, and quality of life. The quality of sleep should be continued by ensuring sleep hygiene among elderly people and thus the quality of life should be improved.

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