

Effectiveness of Sleep Hygiene Intervention on the Sleep Quality of the Elderly in Nursing Homes in Salatiga City

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Abstract

The aging process, physiologically, brings about changes and increases the risk of disease. Twenty-eight older adults in three different nursing homes in Salatiga City had difficulty sleeping at night. Poor sleep quality can cause disorders, such as being at higher risk of diseases, forgetfulness, confusion, disorientation, and decreased concentration ability. This research contributed to identifying the effectiveness of sleep hygiene on elderly sleep disorders in Salatiga City nursing homes. The research method is a quasi-experiment with a one-group pretest-posttest design research design among 28 older people who lived in the nursing home from April to July 2023. Sleep hygiene intervention in the form of aerobic exercise and education was carried out five times in five weeks. Sleep quality was measured through the Pittsburgh Sleep Quality Questionnaire (PSQI), and data was analyzed using descriptive statistics (percentage and mean). The results of the pre-experiment study revealed a 33.21% prevalence of sleep disturbances among older individuals, with the majority falling into the category of moderate sleep quality (64%). After receiving a sleep hygiene intervention, there was a reduction of 2.89 in the number of elderly individuals experiencing sleep disturbances. Additionally, 36% of the elderly were found to be sleeping without any disorders, while 64% experienced only mild sleep disturbances. This means that there will be a significant change after the intervention. Conclusion Sleep hygiene effectively improves sleep quality in older people in nursing homes. Future research is expected to conduct physical and laboratory examinations to support the respondent's sleep quality results.

Keywords: *Elderly; Sleep Hygiene; Sleep Quality*

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1. Introduction

The elderly population's annual growth is steadily increasing (Husna & Ariningtyas, 2019). According to the Indonesian Central Bureau of Statistics, the projected number of older adults in Indonesia reached 29.3 million in 2021. Furthermore, BPS estimates anticipate a substantial increase in the elderly demographic, comprising approximately 19.9% of the Indonesian population by the year 2045.

On a national scale, Central Java ranks third among provinces in Indonesia in terms of the highest proportion of older adults, accounting for 14.17% of the total population. Salatiga City, located in Central Java Province and known as a retirement destination, had a significant population of older adults, with 24,816 individuals, representing 12.82% of the city's population in 2021. This prevalence of older adults in Salatiga City exceeds the percentage found in the Central Java region, which was at 21.71% (Dinkes Jawa Tengah, 2021).

Physiologically, the aging process brings about changes that increase the vulnerability to a range of health conditions. Cognitive decline, alterations in eating patterns, and physical deterioration exemplify the physiological transformations experienced by the elderly. An initial inquiry conducted among older adults living in three nursing homes in Salatiga City indicated disturbances in sleep during the night. Episodes of waking up during the night presented difficulties in resuming sleep, leading to feelings of dissatisfaction or perceived insufficiency in sleep duration among the elderly. The typical sleep duration for older adults was observed to be between four to five hours, with five elderly residents exhibiting assessments suggesting less than ideal sleep quality.

Quality sleep is described as a peaceful state that aids in rejuvenating vitality and promoting well-being, fostering a sense of tranquility upon awakening. Individuals experiencing sleep challenges often demonstrate sleep disorders,

underscoring the significance of addressing these issues (Handayani, 2022). Sleep hygiene, encompassing training to regulate sleep habits, emerges as a therapeutic approach aimed at enhancing sleep quality (Khoiriyah, 2021). Moreover, insufficient sleep has been linked to various negative consequences, such as increased vulnerability to illness, forgetfulness, confusion, disorientation, and diminished concentration capacity.

The effectiveness of providing sleep hygiene education in improving the sleep quality of older adults with subpar sleep patterns has been confirmed through a one-week intervention, as demonstrated by the results of pre- and post-analysis (Ansari & Yanuarini, 2022). Combining exercise and educational elements, this intervention aims to regulate sleep patterns, promote better sleep practices, and tackle challenges associated with insomnia (Wartningsih, Juliasih, 2021). Notably, non-pharmacological therapy, specifically sleep hygiene therapy, has demonstrated effectiveness in overcoming insomnia by identifying and motivating behaviors and environmental factors conducive to enhanced sleep quality (Patarru, Situngkir, et al., 2021; Tarnoto & Purwitasari, 2023). The study aims to evaluate how effective sleep hygiene interventions are in alleviating sleep disorders among elderly residents in Nursing Homes located in Salatiga City.

This study contributes to geriatric nursing practice by emphasizing the effectiveness of nursing interventions focus on sleep hygiene. These interventions, which include aerobic exercise and educational sessions led by nurses, offer viable options for improving sleep quality among the elderly population, particularly those residing in nursing homes.

2. Method

This quasi-experimental research employs a one-group pretest-posttest design. Research conducted at nursing homes, namely Panti Wredha Salib Putih, Panti Wredha Merbabu, and Wisma Lansia Maria Martha, located in Salatiga City, Central Java Province. Each location received the intervention on different days of the week. The research duration spans from April to July 2023. The group of participants consists of 28 individuals who meet specific criteria, including 20 women and eight men aged 60 years and above. These individuals are experiencing sleep disorders and have expressed willingness to participate in the study.

The research instrument comprises three components. First, respondent profile. It captures details such as name, education, and length of stay at the nursing home. Second, the Pittsburgh Sleep Quality Questionnaire (PSQI), a validated

and reliable tool in the Indonesian context, demonstrated by Malini, (2015) with a Cronbach alpha test for validity ($r = 0.87$) and reliability of 0.766. Third, sleep hygiene intervention. This intervention involves aerobic exercise and educational sessions using media leaflets, designed to prevent sleep disorders among elderly.

Respondents completed the PSQI questionnaire before (pre-experiment) and after (post-experiment) the five-week intervention period (Figure.1). The pre-experiment questionnaire assessed the baseline sleep quality, following which the researchers implemented the sleep hygiene intervention. This intervention lasted for five weeks and included both exercise and educational elements. Each session had a duration of approximately 50 minutes, starting with 30 minutes allocated for morning aerobic exercise, followed by a 20-minute segment dedicated to educating elderly individuals on methods to achieve better sleep quality. These sessions were conducted once a week, repeated over the course of five weeks. Because of the different locations, each nursing home receives intervention on different days of the week. Thus, all the nursing homes have exercises program for older adults. Panti Wredha Salib Putih, and Panti Wredha Merbabu have weekly exercises program while Wisma Lansia Maria Martha has twice a week exercises program. This intervention adds an aerobic exercise for older adults, so they have two or three exercises weekly for five weeks. The research employed descriptive statistical analysis, including the measurement of percentages and means, both before and after the intervention. Participants were given the PSQI before starting the sleep hygiene intervention in the first week and again after completing the exercise and education components in the fifth week.

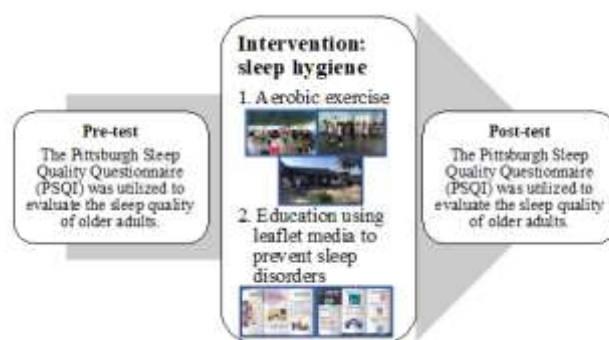


Figure 1. Conceptual Framework

3. Results and Discussion

Table 1. Shows that 28 elderly respondents experienced sleep disorders at the nursing home,

the majority of those who experienced sleep disorders were female, 20 people (71.4%). Thus, the majority of respondents resided in the nursing home for less than one year, comprising 12 individuals, which accounts for 42.9% of the total. Sleep quality in nursing home residents may be influenced by factors such as age, gender, and the duration of their stay. As a result of increasing age, older people experience disturbances and changes in the nervous system because older people experience shrinkage of neurons, an increase in serotonin and a decrease in the hypothalamus. The aging process contributes to nervous system disturbances, including neuronal shrinkage, serotonin increase, and hypothalamic decrease, resulting in sleep disorders (Hastuti, 2019; Setianingsih, et al., 2019). Females are especially vulnerable because of declining estrogen levels, which can result in increased anxiety and emotional instability (Faridah & Indrawati, 2021). Sleep disturbances among older adults in institutional settings could worsen due to challenges adapting to the environment, frequent rumination on past experiences, occurrence of nightmares, restlessness, and excessive daytime sleepiness (Utami, et al., 2021).

Table 1. Respondent Characteristics

Sex	f (n=28)	%
Male	8	28,6%
Female	20	71,4%
Length of Stay		
< 1 year	12	42,9%
1 -5 years	11	39,3%
6-10 years	5	17,9%

According to Table 2, 28 elderly individuals residing in Salatiga nursing homes have sleep disorders. Before the intervention, 11% had mild disorders, 64% had moderate disorders, and 25% had severe disorders. After the intervention, 36% showed no disorders, while 64% had mild disorders.

Table 2. Sleep Quality of the Elderly Before and After Sleep Hygiene Intervention

Quality of Sleep	Pre		Post	
	n	%	n	%
No sleep disturbance	0	0%	10	36%
Mild sleep disturbance	3	11%	18	64%
Moderate sleep disturbance	18	64%	0	0%
Severe sleep disorders	7	25%	0	0%

The way older individuals respond to sleep disorders can be influenced by their perceptions of how sleep impacts bodily health and metabolism. Through educational components incorporated into the sleep hygiene intervention, the mindset of the elderly can be changed to prioritize regular sleep schedules (Dhari & Silvitasari, 2022). In accordance with the Health Belief Model theory, the adoption of health behaviors aimed at enhancing sleep quality undergoes several stages or processes, namely perceived susceptibility, perceived seriousness, perceived benefits, and cues to action. Perceived susceptibility is an action of nurses to help the older people develop a perception of the impact of insomnia on the risk of chronic diseases. Then, perceived seriousness is the perception of the severity of the disease if the problem of insomnia is not overcome, while the perceived benefits of sleep hygiene behaviour to improve sleep quality. Lastly, cues to action is the act of older adults to decide to follow sleep hygiene as an action. These are process to improve sleep quality (Berhimpong, Ratu & Pertiwi, 2020).

Table 3. demonstrates a significant decrease in the likelihood of sleep disorders post-intervention (2.89) compared to pre-intervention (33.21). This means there was a significant change before and after the intervention.

Table 3. Mean of Sleep Disturbances Scores Before and After Sleep Hygiene Intervention

Variable	Sleep Disorders	
	Pre	Post
Mean	33,21 (a)	2,89 (b*)

Sleep hygiene is provided in the form of exercise and educational interventions. Exercise can aid older individuals in maintaining physical fitness and vitality by strengthening their bones, promoting optimal heart function, and assisting in the elimination of harmful free radicals within the body. Furthermore, elderly who do exercise can improve the cardiorespiratory system by increasing tissue oxygenation, the heart's capacity to pump blood and cell oxidation. Enhancing body fitness can also lead to improvements in muscle strength and flexibility (Nuraeni, et al., 2019).

This study used aerobic exercise. Aerobic exercise is beneficial as it boosts the body's metabolism, aiding in the processing of consumed nutrients. This process leads to an increase in plasma levels of free tryptophan and a subsequent decrease in competing amino acids until tryptophan is synthesized in the raphe nucleus. This triggers the secretion of the hormone serotonin, promoting relaxation and facilitating easier sleep for the elderly. Additionally, apart from its physiological effects, aerobic exercise serves as a relaxation

technique to reduce stress and enhance mood, thereby promoting deeper and more restful sleep among older individuals. (Lukmawati, Wilandika & Widiyanti, 2020). The intervention consists of 30-40 minute aerobic exercise sessions conducted once a week.

In addition to aerobic exercise, education is provided on how to address sleep disorders among older adults for five-week. Sleep hygiene education intervention demonstrates that providing education can enhance patients' understanding of managing sleep disorders, leading to improvements in sleep quality (Sumah, 2019; Waluyo, Rosyita & Sumarno, 2021). Sleep hygiene education offers guidance on improving the management of one's sleeping environment, habits, and emotional well-being. Specific instructions included refraining from drinking water two hours before bedtime and emptying the bladder before sleep to minimize nighttime waking for urination. Additionally, techniques for relaxation before bed were taught, such as wearing socks and using blankets to keep warm, applying eucalyptus oil to alleviate foot discomfort caused by cold weather, and avoiding the use of cell phones for one hour before bedtime, with phones kept away from the bed. Furthermore, older individuals were encouraged to limit nighttime water intake and explore music therapy as part of their bedtime routine (Pvs & Murharyati, 2020; Ximenes, Syafitri & Amigo, 2019).

4. Conclusions and Suggestions

The five-week sleep hygiene intervention notably enhanced the sleep quality of the elderly participants. Prior to the intervention, experimental tests indicated a moderate prevalence of sleeping disorders among participants (33.21%). However, after the intervention, the occurrence of sleep disorders decreased significantly to 2.89%, with 18 elderly individuals experiencing deep sleep. Furthermore, 10 elderly individuals sleep without any disturbances. This experiment demonstrated significant improvements before and after the intervention.

This study utilized the Pittsburgh Sleep Quality Questionnaire to evaluate sleep quality. It suggests that future research should measure changes in sleep quality after sleep hygiene interventions using physical and laboratory examinations. However, this research has proven valuable in enhancing comprehension of strategies to attain improved sleep quality and in effectively enhancing the sleep quality of elderly individuals.

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