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The Influence of Health Education on Knowledge about Sleep Hygiene in the Elderly: A Quasi-Experimental Study

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ABSTRACT

Sleep disturbances are common among older adults and are often associated with inadequate knowledge of sleep hygiene, resulting in poor sleep quality and reduced well-being. This study aimed to determine the effect of health education on knowledge regarding sleep hygiene among elderly individuals in Hamlet III, Selemak Village, Hamparan Perak Subdistrict, Deli Serdang Regency. A quasi-experimental study using a one-group pretest-posttest design was conducted among 40 elderly participants selected through total sampling. Data were collected using a structured questionnaire consisting of 20 items assessing sleep hygiene knowledge before and after intervention. The intervention consisted of one 45-minute health education session using lectures, discussion, and leaflet media. Data were analyzed using the Wilcoxon signed-rank test. Before intervention, knowledge levels were categorized as good (5%), fair (75%), and poor (20%). After intervention, good knowledge increased to 47.5%, while fair knowledge reached 52.5%. Median knowledge scores increased from 11 to 16. Statistical analysis showed a significant improvement after intervention ($Z = -4.692$; $p < 0.001$), with a large effect size ($r = 0.74$). Health education was effective in improving sleep hygiene knowledge among older adults. Routine educational programs are recommended to promote healthy sleep behaviors in the elderly.

Keyword: Health education, Sleep hygiene, Elderly, Knowledge

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1. Introduction

Aging is a natural process accompanied by interrelated physical, psychological, and social changes that may lead to health problems among older adults (Patarru' et al., 2021). The proportion of the elderly population continues to grow, reaching 142 million people in Southeast Asia, while in Indonesia it increased from 22.6 million in 2016 to an estimated 31.3 million in 2022 (Indonesian Ministry of Health, 2022). Several regions, including East Java, have entered the aging population structure (Setyoadi et al., 2023). As individuals age, they experience declines in functional abilities, including memory, sensory function, muscle strength, and sleep regulation, which increase their vulnerability to health problems.

Physiologically, aging is associated with immunosenescence, chronic inflammation, and decreased immune cell function (Goyani et al., 2024). Community-based nursing interventions are crucial to address multifaceted health needs of older adults, including nutrition and blood-pressure management; several studies published in Caring have emphasized practical nursing approaches for elderly care in community and clinical

settings (Elfira et al., 2022; Maulida, 2022). These changes contribute to increased susceptibility to degenerative diseases and disruptions in sleep patterns. Systematic reviews show that aging alters sleep architecture, causing shallower sleep, shorter duration, and increased sleep fragmentation (Lo Martire et al., 2023). Globally, poor sleep quality continues to be highly prevalent among older adults, affecting nearly 50% of this population (de Oliveira et al., 2024; Zhang et al., 2025). Inadequate sleep quality has been associated with cognitive decline, increased fatigue, diminished physical performance, depressive symptoms, and reduced overall quality of life (Liu et al., 2025; Wang et al., 2025).

Sleep hygiene refers to a set of behavioral strategies aimed at promoting healthy sleep, including maintaining consistent sleep schedules and ensuring a conducive sleep environment. Inadequate sleep hygiene is recognized as a factor that can exacerbate sleep difficulties (Patarru' et al., 2021). Evidence indicates that health education on sleep hygiene improves sleep quality, sleep efficiency, and reduces daytime sleepiness among the elderly (Wang et al., 2023). Guidelines also emphasize avoiding long naps, limiting caffeine intake, and maintaining consistent sleep-wake schedules as key components of healthy sleep practices.

However, many elderly individuals still lack adequate knowledge about sleep hygiene due to limited access to health information. Health education through interactive counseling can increase awareness and support behavior change related to healthy sleep practices.

Health education is an important nursing intervention to improve elderly knowledge regarding healthy sleep practices. Through educational programs, older adults may better understand strategies to improve sleep and prevent sleep-related problems.

Although previous studies have shown that sleep hygiene education may improve sleep-related outcomes, limited evidence is available regarding its effectiveness in improving knowledge among community-dwelling elderly populations in rural Indonesian settings. Most previous studies focused on sleep quality rather than knowledge outcomes. Therefore, the purpose of this study is to determine the influence of health education on knowledge about sleep hygiene among the elderly in Hamlet III, Selemak Village.

2. Methods

This study employed a quantitative research approach. The research design utilized a quasi-experimental one-group pretest–posttest model to examine the effect of health education on sleep hygiene knowledge by comparing participants' knowledge scores before and after the intervention. The study population consisted of older adults residing in Hamlet III, Selemak Village, with a total of 40 individuals. A total sampling technique was applied. Participants were older adults aged 60 years or above, willing to participate, able to communicate effectively, and physically able to attend the educational session. Data were collected using questionnaires that assessed respondents' demographic characteristics as well as pretest and posttest knowledge levels. The questionnaire consisted of 20 multiple-choice items regarding sleep hygiene knowledge. Each correct answer was scored 1 and incorrect answer 0, with total scores ranging from 0-20. Higher scores indicated better knowledge, and the category good = 76-100%; Fair = 56-75%; Poor = <56%. The instrument was pilot-tested on 20 elderly individuals outside the study area. Item validity coefficients ranged from 0.42-0.78, and reliability testing showed acceptable internal consistency (Cronbach's alpha = 0.82). The intervention consisted of one health education session lasting approximately 45 minutes delivered through lecture, discussion, and leaflet media. Materials included sleep hygiene definition, benefits, sleep schedule regulation, sleep environment, caffeine limitation, and healthy bedtime habits. The study was carried out in Hamlet III, Selemak Village, from April to May 2024. Descriptive statistics were used to summarize respondent characteristics. Since data were not normally distributed, Wilcoxon signed-rank test was applied to compare pretest and posttest scores. Statistical significance was set at $p < 0.05$. Ethical approval for this research was granted by the Health Research Ethics Committee of the University of North Sumatra under approval number 672/KEPK/USU/2024. The use of a one-group pretest–posttest design without control group may limit internal validity.

3. Results

The demographic data of respondents in this study consisted of age, gender, status, ethnicity, religion, highest level of education, occupation, use of sleeping pills, and medical history. The demographic data of respondents is presented in the following table.

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Table 1 Frequency distribution and percentage of demographic data on elderly people (n=40)

Demographic Data		Frequency (f)	Percentage (%)
Age			
	60-70 Years	25	62.5
	71-80 Years	13	32.5
	>80 Years	2	5
Gender			
	Male	20	50
	Female	20	50
Status			
	Married	31	77.5
	Widow	7	17.5
	Widower	2	5
Ethnicity			
	Javanese	23	57.5
	Malay	10	25
	Batak	7	17.5
Religion			
	Islam	36	90
	Christians	4	10
Education			
	Elementary school	11	27.5
	Junior high school	15	37.5
	Senior high school	13	32.5
	Vocational high school in chemistry	1	2.5
Occupation			
	Farmer	5	12.5
	Driver	1	2.5
	Entrepreneur	2	5
	Unemployed	32	80
Sleep Medication Use			
	None	40	100
Medical History			
	Heart Disease	5	12.5
	Stroke	3	7.5
	Anemia	2	5
	Uric acid	2	5
	None	28	70

Based on the results of a study conducted on 40 elderly people in Dusun III, Selemak Village, Hamparan Perak District, Deli Serdang Regency, it was found that most of the elderly were aged 60-70 years, totaling 25 people (62.5%), 20 males (50%), 20 females (50%), 31 married (77.5%), 23 predominantly Javanese (57.5%), with Islam being the dominant religion with 36 people (90%), junior high school being the dominant level of education with 15 people (37.5%), unemployment being the dominant occupation with 32 people (80%), no use of sleeping pills with 40 people (100%), and no history of illness being the dominant condition with 28 people (70%).

Table 2 Frequency and percentage distribution before and after health education on sleep hygiene for the

Category	Pretest		Posttest	
	f	%	f	%
Good	2	5	19	47.5
Fair	30	75	21	52.5
Poor	8	20	0	0
Total	40	100	40	100

The results of this study indicate that before (pretest) health education was conducted, many elderly people in Dusun III, Selemak Village, Hamparan Perak Subdistrict, Deli Serdang Regency were still unfamiliar with sleep hygiene, with 5% in the good category, fair 75%, poor 20%, and after (posttest) health education, many were familiar with sleep hygiene in the good category 47.5%, fair 52.5%, poor 0%.

Table 3 Analysis of Effects with Wilcoxon Test

Health Education	Z	p-value
Pretest and Posttest	-4.692	<0.001

Based on the results of the normality test, the data on respondents was not normally distributed because the p-value before education was given was 0.026, so the next test performed was the Wilcoxon test. The results of the Wilcoxon test analysis before and after education was given found that there was a change ($Z = -4.692$ and p-value < 0.001) . The median knowledge score increased from 11 during pretest to 16 during post-test, indicating substantial improvement after intervention. The calculated effect size ($r = 0.74$) demonstrated a large intervention effect. Therefore, Ha is accepted and H0 is rejected.

4. Discussion

4.1. The Role of Sleep Hygiene Knowledge before Health Education is Provided

Based on the results of research on Sleep Hygiene knowledge before health education was provided, it was found that the Sleep Hygiene knowledge of elderly people in Dusun III, Selemak Village, Hamparan Perak District, Deli Serdang Regency, before health education was provided was not optimal, with an average of 75% of the 40 respondents having sufficient Sleep Hygiene knowledge and 20% having insufficient knowledge. This was because the elderly had not received effective information about sleep hygiene, and the lack of information sources meant that the elderly were unfamiliar with sleep hygiene.

These findings are supported by a study conducted by Biromo et al. (2022), which reported that most respondents were still unfamiliar with sleep hygiene due to limited health education and insufficient access to information. This is consistent with the research of Susilawati et al. (2022), who emphasized that health education serves as a means to transform information into knowledge. Additionally, Purnama and Silalahi (2020) noted that sleep hygiene represents an important strategy for enhancing sleep quality, achieving sufficient sleep duration, and maintaining optimal daytime alertness.

The findings of this study showed that prior to the provision of health education, respondents generally demonstrated moderate to low levels of knowledge, which was influenced in part by their demographic characteristics, particularly the predominance of junior high school educational backgrounds (37.5%). This aligns with research by Nabilah (2023), which indicates that educational attainment significantly affects an individual's level of knowledge, with higher education associated with greater understanding. Educational efforts for older adults are essential for empowering them and supporting their overall health. The non-formal educational approach for the elderly (geragogy) underscores the importance of not only delivering information but also actively engaging older adults in learning and practical application to enhance their quality of life. Evidence from studies in Indonesia further demonstrates that both formal and informal education among older adults are correlated with improved quality of life and increased utilization of health services; for instance, older adults with higher education levels and active engagement in educational activities are more likely to use primary healthcare services (Laksono, Wulandari & Rohmah, 2024). Therefore, well-designed educational

interventions for the elderly serve as a fundamental component of promotive and preventive strategies to help maintain their health and independence.

Based on the study findings, prior to receiving health education, older adults generally lacked awareness of sleep hygiene due to their limited understanding of the topic. Age is one factor contributing to this limited knowledge, as individuals aged 60 years and above often find it more challenging to access information that is increasingly disseminated through digital and social media platforms. This aligns with recent evidence indicating that the aging process leads to biological, physiological, and social changes that influence sleep patterns in older adults. Reduced sleep efficiency, circadian rhythm disruptions, and hormonal alterations commonly result in insomnia or declining sleep quality among the elderly (Zhang et al., 2025). Recent intervention studies also report that media-based health education such as leaflets and educational videos on sleep hygiene effectively enhances knowledge and promotes healthy sleep practices in older adults, thereby contributing to better sleep quality (Rahmawati et al., 2024). Such educational efforts help older adults understand the importance of maintaining healthy sleep habits, including adhering to consistent sleep schedules, avoiding caffeine before bedtime, and creating a comfortable sleep environment.

4.2. Knowledge about Sleep Hygiene after receiving health education

Based on the results of this study, knowledge of sleep hygiene among older adults in Hamlet III, Selemak Village, Hamparan Perak District, Deli Serdang Regency improved after the health education intervention. Following the intervention, 47.5% of respondents demonstrated good knowledge and 52.5% demonstrated sufficient knowledge, indicating a clear increase compared to pre-intervention levels. These findings are consistent with the study by Biromo et al. (2022), which reported that health education can enhance knowledge and heighten awareness of the importance of improving sleep quality. Similarly, Nugroho et al. (2021) found that providing health education to older adults regarding sleep has a significant positive effect on increasing their level of knowledge. Overall, these studies support the conclusion that health education effectively improves knowledge among the elderly.

Consistent with the findings of Mera Maulidar's research, Iskandar (2023) notes that the provision of health information not only increases knowledge but can also lead to the desired changes in understanding. Health education serves as an initial step in promoting behavioral changes toward a healthier lifestyle, including among older adults. Such education can be delivered through various methods and media that are adapted to the needs of the target population. Knowledge-enhancing information may be obtained from multiple sources, such as counseling, printed materials, and electronic media. Printed media may include posters, leaflets, brochures, magazines, newspapers, and stickers, with leaflets being one of the most commonly used tools by health workers during educational sessions.

4.3. The Influence of Health Education on Sleep Hygiene Knowledge in the Elderly in Hamlet III, Selemak Village, Hamparan Perak Subdistrict, Deli Serdang Regency

The Wilcoxon test showed a statistically significant improvement in sleep hygiene knowledge after the health education intervention ($p < 0.001$). These findings indicate that the educational program was effective in increasing older adults' understanding of healthy sleep behaviors. This result is consistent with previous studies showing that health education delivered through interactive media, such as leaflets, videos, and presentations, can improve health knowledge and promote healthier behaviors among older adults.

According to the Health Belief Model, individuals are more likely to adopt health-related behaviors when they understand health risks and perceive benefits of preventive actions. In this study, participants may have become more aware of the negative consequences of poor sleep and the importance of maintaining healthy sleep habits. The findings are also supported by geragogy theory, which suggests that older adults learn more effectively when educational content is practical, repetitive, and relevant to daily life. The use of lecture methods, discussion, and leaflet media may have enhanced participant engagement and knowledge retention.

Although knowledge improved significantly, some participants remained in the fair category after intervention. This may be associated with differences in educational background, memory decline, limited literacy, or the short duration of the intervention. This study has several limitations. The one-group pretest–posttest design without a control group may limit internal validity. In addition, knowledge improvement may have been influenced by testing effect or Hawthorne effect. Therefore, future studies using randomized controlled designs and repeated educational sessions are recommended.

5. Conclusion

Health education significantly improved sleep hygiene knowledge among older adults in this study. The intervention increased the proportion of participants with good knowledge and eliminated poor knowledge category. Health education may serve as an effective nursing strategy to improve awareness of healthy sleep behaviors among the elderly. However, findings should be interpreted cautiously due to the absence of control group and relatively small sample size. Future research should involve larger samples, control groups, and long-term follow-up.

References

Adiputra, I. M. S., Trisnadewi, N. W., Oktaviani, N. P. W., & Munthe, S. A. (2021). Metodologi penelitian kesehatan. Yayasan Kita Menulis.

Biromo, A. R., Wibowo, C. A., Naeluvar, L., & Indra, D. O. (2022). Penyuluhan kesehatan sleep hygiene di lingkungan remaja. Prosiding SENAPENMAS, 2(1), 290–294. https://doi.org/10.24912/psenapenmas.v2i1.21087

De Oliveira, D. L., Costa, D. S., & Souza, R. A. (2024). Worldwide prevalence of poor sleep quality in older adults: A systematic review and meta-analysis. Sleep Health, 10(3), 389–399. https://doi.org/10.1016/j.sleh.2023.12.004

Elfira, E., Girsang, B. M., & Rossevelt, F. A. (2022). Nutrition management in elderly with diabetes mellitus: Literature review. Caring: Indonesian Journal of Nursing Science, 4(1), 39–54. https://doi.org/10.32734/ijns.v4i1.8835

Goyani, P., Christodoulou, R., & Vassiliou, E. (2024). Immunosenescence: Aging and immune system decline. Vaccines, 12(12), 1314. https://doi.org/10.3390/vaccines12121314

Laksono, A. D., Wulandari, R. D., & Rohmah, N. (2024). Education's role in primary healthcare utilization among older people in Indonesia. Jurnal Administrasi Kesehatan Indonesia, 12(1), 11–24. https://doi.org/10.20473/jaki.v12i1.2024.11-24

Liu, J., Sun, H., & Wang, Q. (2025). Sleep disturbances and cognitive impairment among older adults: A population-based study. Frontiers in Public Health, 13, 1500027. https://doi.org/10.3389/fpubh.2025.1500027

Liu, Y., Zhang, X., & Li, J. (2025). Association of sleep quality with activity and participation in older adults: Evidence from a population-based study. BMC Geriatrics, 25(1), 114. https://doi.org/10.1186/s12877-025-04918-6

Lo Martire, V., Fraschetti, A., Miccoli, M., & Mondini, S. (2023). Sleep quality and aging: A systematic review on healthy older people, mild cognitive impairment and Alzheimer's disease. Sleep Medicine Reviews, 67, 101727. https://doi.org/10.1016/j.smrv.2022.101727

Maulida, A., & Agianto. (2022). Foot spa intervention on hypertension: A case study. Caring: Indonesian Journal of Nursing Science, 4(2), 52–59. https://doi.org/10.32734/ijns.v4i2.10260

Maulidar, M., Iskandar, & Fauziah. (2023). Pengaruh pendidikan kesehatan media leaflet terhadap tingkat pengetahuan dan sikap lansia dalam pemanfaatan posyandu. Prosiding SEMDI-UNAYA, 4, 1037–1044. https://jurnal.abulyatama.ac.id/index.php/semdiunaya/article/view/4493

Nabilah, N. (2023). Faktor-faktor yang mempengaruhi pengetahuan lansia tentang demensia di Kelurahan Karang Satria [Undergraduate thesis, STIKes Mitra Keluarga]. Repository STIKes Mitra Keluarga. https://repository.stikesmitrakeluarga.ac.id/

Nugroho, H., Suri, oryza intan., & Putri, D. U. . (2021). Peningkatan Pengetahuan Lansia Mengenai Sulit Tidur Pada Lansia Dengan Pemberian Pendidikan Kesehatan. Jurnal Pengabdian Kepada Masyarakat (JPKM) - Aphelion, 3(September), 207–212. http://jurnal.globalhealthsciencegroup.com/index.php/JPM

Patarru', F., Situngkir, R., Bate, I., & Akollo, J. E. (2021). Hubungan perilaku sleep hygiene dengan kualitas tidur pada kelompok lansia di Panti Tresna Werdha Ambon. Jurnal Keperawatan Florence Nightingale, 4(2), 46–51. https://doi.org/10.52774/jkfn.v4i2.67

Purnama, N. L. A., & Silalahi, V. (2020). Efektivitas pendidikan kesehatan terhadap perilaku sleep hygiene dan kualitas tidur pada remaja dengan gangguan tidur. Jurnal Keperawatan Muhammadiyah, 5(1). https://doi.org/10.30651/jkm.v5i1.3370

Rahmawati, N., Purnamasari, D., & Hidayat, A. (2024). Effectiveness of health education using leaflet media on sleep hygiene knowledge and sleep quality among the elderly. Jurnal Keperawatan dan Kesehatan Indonesia, 12(2), 155–163. https://doi.org/10.35874/jkki.v12i2.2024

Setyoadi, S., Purnamawati, N. P. I., & Sari, E. K. (2023). Hubungan sleep hygiene terhadap tingkat insomnia

pada lanjut usia. Jurnal Keperawatan Malang, 8(1), 290–300.

Wahyu, K., & Purwitasari, N. H. N. (2023). Sleep hygiene dapat memperbaiki kualitas tidur lansia. Journal of Nursing Innovation, 2(1), 1–6. https://doi.org/10.61923/jni.v2i1.6

Wang, T., Zhao, L., & Mei, X. (2023). Effectiveness of non-pharmacological interventions for improving sleep quality in the elderly: A systematic review and meta-analysis. BMC Geriatrics, 23(1), 188. https://doi.org/10.1186/s12877-023-03872-5

Wang, S., Chen, R., & Zhou, Y. (2025). Association between sleep characteristics and physical functioning in middle-aged and elderly adults: Findings from Chinese cohorts. Scientific Reports, 15(1), 2034. https://doi.org/10.1038/s41598-025-91377-2

Zhang, X., Li, Y., & Chen, R. (2025). Global prevalence and risk factors of poor sleep quality among older adults: A systematic review and meta-analysis. Sleep Medicine Reviews, 75, 102324. https://doi.org/10.1016/j.smrv.2025.102324