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Original Research

The Effect of Foot Massage on Quality of Sleep in Elderly

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ABSTRACT

Background: *Sleep disruptions and pattern alterations are more common in the elderly. Physical well-being, mental clarity, and overall quality of life of the elderly can all be greatly impacted by these changes. The following are some of the main problems with the elderly's sleep quality. The objective of this research is to determine the effect of foot massage on quality sleep in the elderly.*

Methods: *Quasi-experimental research with pretest and posttest control group design approach. Participants were selected using a non-probability purposive sampling technique based on inclusion criteria related to age and sleep disturbances, with a total of 25 elderly individuals. Subjects were randomly divided into 2 groups. Group I receives the foot massage treatment and group II is the control group. This study measured the quality of sleep in the elderly. The research instrument used the Pittsburgh Sleep Quality Index (PSQI).*

Results: *The analysis includes 25 participants, divided into two groups. In Group 1, all 14 participants showed a decrease in sleep quality scores, which is statistically significant ($p<0.001$). In group II, the change is not statistically significant ($p=0.724$), indicating that most participants did not experience substantial changes in sleep quality.*

Conclusion: *Foot massage is a non-pharmacological intervention demonstrated to enhance sleep quality among elderly individuals. The analysis indicates that foot massage significantly enhances blood circulation and muscle relaxation, contributing to improved sleep quality. This intervention shows potential as a practical and non-pharmacological method for managing sleep disturbances in the elderly.*

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INTRODUCTION

A sleeping disorder could be a clutter in which sufferers encounter trouble starting and keeping up rest so that they cannot keep up their rest needs, both in quality and amount (Ramadanti et al., 2024). When someone enters old age, the function of body organs will decline, this is the same as what happened in the research conducted by Albakri et al., (2021) where age factors can affect sleep quality. Sleep quality is a person's sleep needs in achieving a level of satisfaction with sleep.

Sleep disorders are a common problem experienced by the elderly and can hurt their physical and psychological health. Disturbance of the amount and quality of rest causes inconvenience and meddling with the required quality of life. The need for rest quality causes the elderly to have trouble resting, trouble staying awake, frequently wake up within the center of the night at that point have trouble going back to rest, wake up as well early, and do not rest well (Sutriyawan et al., 2021).

Foot massage is a non-pharmacological therapy that is considered safe and easy to apply to improve sleep quality in the elderly. Through nerve stimulation in the feet, foot massage can improve blood circulation, reduce muscle tension, and provide a relaxing effect that helps speed up the process of falling asleep and improve sleep duration. Physiologically, foot massage stimulates the nervous system related to the sleep center in the brain, so it can trigger drowsiness and improve sleep quality (Lubis et al., 2023).

Foot massage, according to (Ainun et al., 2021) is the manipulation of connective tissue using techniques such as tapping, rubbing, and kneading, aimed at improving blood circulation, enhancing the physiological properties of muscles, and promoting relaxation. Foot massage is a technique of gentle and rhythmic kneading on both feet using various techniques in different positions to elicit a relaxation response, thereby reducing anxiety, and pain, and improving an individual's sleep quality. This study offers a novel contribution by specifically examining the effects of foot massage as a non-pharmacological intervention on sleep quality among the elderly, a population highly vulnerable to sleep disturbances.

While previous studies have explored various relaxation techniques to improve sleep (Albakri et al., 2021; Her & Cho, 2021; Petrovsky et al., 2021; Wang et al., 2021), limited research has focused on foot massage as a targeted, simple, and low-cost intervention. The uniqueness of this research lies in its focus on physiological mechanisms, particularly the stimulation of the peripheral nervous system through foot massage that influences the central nervous system involved in sleep regulation. By linking foot massage with improved circulatory and neurological responses, this study provides new insights into its potential as an alternative therapy to enhance the sleep quality of older adults.

MATERIALS AND METHOD

This research employed a quasi-experimental design with a pretest-posttest control group approach. The study aimed to evaluate the effectiveness of foot massage in improving sleep quality among elderly individuals (Dahlan, 2021). Participants were divided into two groups: an intervention group that received foot massage therapy, and a control group that did not receive any treatment. Participants in the intervention group received foot massage therapy delivered by trained personnel.

The massage consisted of gentle, rhythmic techniques including kneading, rubbing, and pressing, performed on both feet for approximately 15 minutes per foot, once daily for five consecutive days. The control group received no massage or placebo intervention. A non-probability purposive sampling method was used to select participants who met specific criteria relevant to the study objectives (Dahlan, 2020). This sampling technique allowed the researchers to focus on elderly individuals experiencing sleep disturbances.

Participants were included in the study if they met the following criteria: (1) aged 60 years or older; (2) had a Pittsburgh Sleep Quality Index (PSQI) score of ≥ 5, indicating poor sleep quality; (3) were physically and mentally capable of participating in the

intervention; (4) were not receiving any other non-pharmacological therapy for sleep; and (5) provided written informed consent.

Participants were excluded from the study if they: (1) had a psychiatric or neurological disorder (e.g., depression, dementia, Parkinson's disease); (2) had open wounds, ulcers, infections, or deformities on the feet; (3) suffered from unstable cardiovascular conditions or deep vein thrombosis; (4) had diabetic neuropathy or peripheral vascular disease in the lower limbs; and (5) were absent during the post-test, leading to incomplete data.

The variables in this study consisted of an independent variable, a dependent variable, and a control variable. The independent variable was a foot massage, which was given as an intervention to the elderly in the intervention group. The dependent variable was sleeping quality, which was measured before and after the intervention to assess any changes. The sleep quality of participants was assessed using the Indonesian version of the Pittsburgh Sleep Quality Index (PSQI). Validity and reliability testing using Cronbach's alpha resulted in a value of 0.63, which reflects moderate internal consistency. While this value is slightly below the commonly accepted threshold of 0.70, the instrument was still deemed acceptable for use in this population (Made et al., 2019).

Sleep quality data were collected at two points: before (pre-test) and after (post-test) the intervention. Due to the non-normal distribution of post-test data (Shapiro-Wilk test, $p = 0.035$), the Wilcoxon signed-rank test was used for statistical analysis within groups. The significance level of $p < 0.05$ was considered statistically significant. Ethical approval was obtained from the Health Research Ethics Commission, Faculty of Medicine, Aisyah University of Surakarta, with clearance number 4968/B.2/KEPK-FKUMS/VIII/2023. Written informed consent was obtained from all participants, and confidentiality and the right to withdraw were guaranteed.

RESULTS

The research titled "The Effect of Foot Massage on Sleep Quality in the Elderly" was conducted with 30 subjects. The subjects were then divided into 2 groups, with Group I receiving the treatment consisting of 15 people and Group II serving as the control group, also with 15 people. During the treatment period, 5 subjects dropped out from both Group I and Control Group due to their absence during the post-test. Thus, the total number of research subjects obtained is 25 people.

Table 1. Respondent Characteristics by Gender (n = 25)

Variable	Intervention Group		Control Group	
	n	%	n	%
Gender				
Woman	11	78.6	11	100
Man	3	21.4	0	0
Total	**14**	**100**	**11**	**100**

Note: n = number of observation; % = percentage

Based on the characteristics of respondents in both groups according to gender, the majority of participants in both groups were women. Group I consisted of 85.71% women, while Group II had 90.91% women.

Table 2. Respondent Characteristics by Age (n = 25)

Variable	Intervention Group			Control Group		
	Minimal	Maximal	Mean	Minimal	Maximal	Mean
Age (years)	47	73	60.36	49	72	60.09

Intervention Group subjects have an average age of 60 years, with a minimum age of 47 years, a maximum age of 73 years. Meanwhile, Control Group subjects also have an average age of 60 years, with a minimum age of 49 years, a maximum age of 72 years.

Table 3. Sleep Quality Value (n = 25)

Characteristics	Control Group		Intervention Group	
	Pre-Test	Post-Test	Pre-Test	Post-Test
Minimum	6	2	5	5
Maximum	21	12	22	23
Mean	13.14	4.79	13.18	13.27
Standar Deviation	3.88	2.97	6.18	6.65

Based on research data on sleep quality before treatment using PSQI in the intervention group. The average value was 13.14 with a standard deviation value of 3.88. Meanwhile, the control group had a mean value of 13.8 with a standard deviation of 6.178. The posttest results obtained a minimum value of 5, a maximum value of 23, and an average of 13.27 with a standard deviation of 6.65. The final condition of the subjects in both groups after being given showed that the sleep quality measurement results in both groups after being given treatment in the intervention group had an average value of 4.79 with a standard deviation value of 2.97. Meanwhile, in the control group, the mean was 13.27 with a standard deviation value of 6.650.

Table 4. Comparison of Pre- and Post-Test Results in Intervention and Control Groups (n = 25)

Group	p-value*
Intervention Group (Pre-Post Test)	<0.001
Control Group (Pre-Post Test)	0.724

Note: *Wilcoxon Test

Based on the results of the data analysis using the Wilcoxon test, it was found that for the Intervention Group, a total of 14 subjects showed an effect of foot massage on sleep quality in the elderly with a p-value of 0.001, where $p<0.05$. Meanwhile, for the control group, the results indicated no significant statistical change ($p=0.724$), where most participants did not experience major changes in sleep quality. The data shows that foot massage can significantly improve sleep quality. The average PSQI score decreased from 13.14 to 4.79. The results indicate a significant improvement in the quality of sleep of the subjects after receiving a foot massage.

DISCUSSION

The results showed that foot massage significantly enhances sleep quality. The reduction in the mean sleep quality score from 13.14 to 4.79 in the intervention group highlights a substantial improvement in sleep quality. The intervention group shows a greater improvement in sleep quality compared to the control group. This could be

attributed to various factors such as differences in the duration or frequency of the foot massage or individual variability in response to the intervention.

These results support the use of foot massage as an effective non-pharmacological intervention to improve sleep quality, particularly among specific populations that might be more responsive to this technique. Massage done on the feet can increase blood supply and relax tense muscles, thus facilitating blood flow to the heart. As a result, a person will feel relaxed, can reduce fatigue, anxiety and stress (Natassia & Riniasih, 2021).

According to Naikwadi et al., (2020) the effect of this foot massage provides comfort such as a feeling of relaxation in the body, reduces pain perception, improves sleep quality, by affecting the locomotor system and nervous system, and cardiovascular system. In addition to blood pressure medication, diet, and lifestyle changes, foot massage therapy can also improve sleep quality, because most patients are unable to easily maintain healthy blood pressure and normal sleep duration (Adha Aprilea et al., 2024). The results of the study are consistent with the research conducted by (Wang et al., 2020), following a foot massage, 45% report good sleep quality, while 55% still experience poor sleep quality.

This research suggests that massage therapy impacts sleep quality in older adults, as evidenced by a reduction in the number of seniors facing poor sleep quality. The reason respondents continue to experience poor sleep quality is anxiety, despite having sleep duration. Meta-regression shows that a rise in total foot reflexology duration ($p=0.002$) and time ($p=0.01$) can greatly enhance sleep quality. Foot massage could offer an extra non-pharmacological treatment option for adults experiencing depression, anxiety, or sleep issues.

Massage carried out will control body tissues with uncommon strategies beginning from a foot knead and finishing with a foot rub reacting to foot nerve sensors which at that point rub on this foot increments serotonin and dopamine neurotransmitters whose incitement is transmitted to the hypothalamus and produces Corticotropin Discharging Calculate (CRF) which fortifies the pituitary organ to extend the generation of Pro-opioid melanocortin (POMC) and stimulates the adrenal medulla to extend the discharge of endorphins that actuate the parasympathetic so that vasodilation happens in vessels and encourages blood stream subsequently making a difference tense muscles to unwind so that the RAS is fortified to discharge serotonin and offer assistance invigorate rest and invigorate rest, hence moving forward rest quality (Fazlollah et al., 2021).

According to Field, (2020) foot massage can lower cortisol levels, a stress hormone that can disrupt sleep, and can increase serotonin levels, a neurotransmitter that can contribute to feelings of calm and happiness. Serotonin is a precursor to melatonin. Massaging the feet can lower cortisol and increase serotonin, which can create a hormonal balance that supports better sleep.

The study has several limitations. Regarding the first limitation, the sample size was small. The second limitation was that participants were not informed about the use of classical foot massage in order not to create a fake treatment impact. Future studies are recommended to involve a larger sample size to enhance the generalizability of the findings. Researchers should also consider informing participants about the intervention or applying a standardized placebo procedure to better control for placebo effects. In addition, future research may explore variations in the duration and frequency of foot massage to determine the most effective protocol.

CONCLUSION

The analysis suggests that foot massage plays a significant role in enhancing blood circulation, which subsequently improves sleep quality. By reducing sleep quality scores, improving muscle relaxation and possibly aiding in the regulation of sleep-related hormones, foot massage demonstrates potential as apractical intervention for sleep improvement.

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DECLARATION OF USE OF AI IN SCIENTIFIC WRITING

The authors declare that the use of artificial intelligence (AI) tools in the preparation of this manuscript, if any, has been disclosed transparently, including the name of the tool, its purpose, and the extent of its use. The authors take full responsibility for the accuracy, originality, integrity, and final content of the manuscript.

CONFLICT OF INTERESTS

The authors declare that there are no conflicts of interest that could have influenced the research, interpretation of the results, or publication of this manuscript.

REFERENCES

Adha Aprilea, N., Sofia, N., Rohmah Prihatanti, N., & Rusmilawaty, R. (2024). Impact of infant massage on weight gain: A study in Banjar District, South Kalimantan. *Jurnal Keterapian Fisik*, 9(2), 74–83. https://doi.org/10.37341/jkf.v9i2.448

Ainun, K., Kristina, K., & Leini, S. (2021). Terapi foot massage untuk menurunkan dan menstabilkan tekanan darah pada penderita hipertensi. *Abdimas Galuh*, *3*(2), 328. https://doi.org/10.25157/ag.v3i2.5902

Albakri, U., Drotos, E., & Meertens, R. (2021). Sleep health promotion interventions and their effectiveness: An umbrella review. *International Journal of Environmental Research and Public Health*, *18*(11), 1–39. https://doi.org/10.3390/ijerph18115533

Dahlan, S. (2020). *Besar sampel dalam penelitian kedokteran dan kesehatan* (5th. Ed). Penerbit Salemba Medika.

Dahlan, S. (2021). *Statistik untuk kedokteran dan kesehatan* (6th Ed.). Epidemiologi Indonesia.

Fazlollah, A., Babatabar Darzi, H., Heidaranlu, E., & Moradian, S. T. (2021). The effect of foot reflexology massage on delirium and sleep quality following cardiac surgery: A randomized clinical trial. *Complementary Therapies in Medicine*, *60*(May), 102738. https://doi.org/10.1016/j.ctim.2021.102738

Her, J., & Cho, M. K. (2021). Effect of aromatherapy on sleep quality of adults and elderly people: A systematic literature review and meta-analysis. *Complementary Therapies in Medicine*, *60*, 1–12. https://doi.org/10.1016/j.ctim.2021.102739

Lubis, K., Adawiyah, Y., Agustian, I., Sri, F., & Sitanggang, M. (2023). Pengaruh pijat kaki terhadap kualitas tidur pada lansia di Puskesmas Sering Kecamatan Medan Tembung Tahun 2023. *Jintan*, *5*(1), 153–158.

Made, N., Sukmawati, H., Gede, I., & Putra, S. W. (2019). Reliabilitas kuesioner Pittsburgh Sleep Quality Index (PSQI) versi bahasa Indonesia dalam mengukur kualitas tidur lansia. *Wicaksana Jurnal Lingkungan & Pembangunan*, *3*(2), 1–9. https://ejournal.warmadewa.ac.id/index.php/wicaksana

Natassia, K., & Riniasih, W. (2021). The Effect of foot massage on insomnia for elderly In Grobogan District, Grobogan Regency. *CITRA*, 1(1), 82–88.

Petrovsky, D. V., Ramesh, P., McPhillips, M. V., & Hodgson, N. A. (2021). Effects of music interventions on sleep in older adults: A systematic review. *Geriatric Nursing*, *42*(4), 869–879. https://doi.org/10.1016/j.gerinurse.2021.04.014

Ramadanti, A. S., Widiarti, A. W., & Triyana, T. (2024). The Effectiveness of facial massage on reducing sleep disorders (insomnia) in The Elderly In Tohudan Village Karanganyar. *Jurnal Keterapian Fisik*, 9(1), 59–65.

Sutriyawan, A., Apriyani, R., & Miranda, T. G. (2021). The relationship between lifestyle and hypertension cases at UPT Cibiru Public Health Center Bandung City. *Disease Prevention and Public Health Journal*, *15*(1), 50. https://doi.org/10.12928/dpphj.v15i1.2456

Wang, C., Li, G., Zheng, L., Meng, X., Meng, Q., Wang, S., Yin, H., Chu, J., & Chen, L. (2021). Effects of music intervention on sleep quality of older adults: A systematic review and meta-analysis. *Complementary Therapies in Medicine*, *59*, 1–7. https://doi.org/10.1016/j.ctim.2021.102719

Wang, W. L., Hung, H. Y., Chen, Y. R., Chen, K. H., Yang, S. N., Chu, C. M., & Chan, Y. Y. (2020). Effect of foot reflexology intervention on depression, anxiety, and sleep quality in adults: A meta-analysis and metaregression of randomized controlled trials. *Evidence-Based Complementary and Alternative Medicine*, *2020*. https://doi.org/10.1155/2020/2654353