

Section: Medical Surgical Nursing

Foot massage to improve sleep quality in patient with hypertension

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Abstract

Hypertension is a chronic disease commonly experienced by the elderly and is often accompanied by sleep disturbances. Poor sleep quality in hypertensive patients can worsen blood pressure regulation and reduce overall quality of life. This study aims to evaluate the effectiveness of foot massage therapy in improving sleep quality in clients with hypertension. The study used a case study design with an Evidence-Based Nursing Practice (EBNP) approach. The subject was a 67-year-old elderly patient diagnosed with hypertension and a Pittsburgh Sleep Quality Index (PSQI) score of 8, indicating poor sleep quality. The intervention, which consisted of foot massage therapy, was carried out for 20 minutes daily for seven consecutive days. The evaluation results showed a decrease in the PSQI score to 5 after the intervention, reflecting improved sleep quality. Blood pressure also showed a decrease from 165/106 mmHg to 151/98 mmHg. The patient reported better sleep, fewer nighttime awakenings, and a feeling of greater refreshment upon waking. Foot massage therapy provides a relaxing effect, improves blood circulation, and lowers stress hormone levels, thus positively impacting sleep quality and blood pressure. This intervention is non-pharmacological, safe, effective, and easy to implement at home with nursing assistance. In conclusion, foot massage therapy is a practical and effective nursing intervention for improving sleep quality in older adults with hypertension and can be used as part of a holistic, community-based nursing approach.

Keywords: elderly, foot massage, hypertension, nursing, sleep quality

Introduction

Hypertension is one of the most common chronic diseases in the elderly and a leading cause of morbidity and mortality worldwide. This condition is characterized by persistently elevated systolic blood pressure of ≥ 140 mmHg and/or diastolic blood pressure of ≥ 90 mmHg (Unger et al., 2020). Hypertension is often called the "silent killer" because it can occur without symptoms, but it carries a high risk of causing gradual organ damage if not treated properly (Kusdiana & Maryoto, 2023). Globally, according to the World Health Organization (WHO), the number of hypertension sufferers has doubled in the last three decades, from around 650 million in 1990 to 1.3 billion in 2019. In Indonesia, the prevalence of hypertension in people aged over 18 years reached 34.1% (Melyani et al., 2023), and in Central Java Province, it was 37.57%. Magelang City recorded 9,570 cases of hypertension in 2023. Despite a slight decrease in the national prevalence to 30.8% based on the 2023 Indonesian Health Survey (SKI), hypertension remains the fourth leading cause of death, contributing 10.2%. The causes of hypertension are multifactorial. Essential hypertension, which accounts for approximately 90–95% of cases, has no known cause, but is closely linked to genetic factors, advanced age, high salt intake, obesity, stress, and lack of physical activity (Coffman, 2021). Meanwhile, secondary hypertension is generally caused by kidney disease, endocrine disorders, and side effects of certain medications. Dysregulation of the sympathetic nervous system and the renin-angiotensin-aldosterone system (RAAS) also plays an important role in the pathogenesis of hypertension (Goorani et al., 2024).

Uncontrolled hypertension can cause various serious complications such as stroke, coronary heart disease, kidney failure, and visual impairment (Oparil et al., 2018). The risk of stroke in people with hypertension is reported to be seven times higher than in individuals without hypertension (Li et al., 2022; Kokkinos et al., 2024). In addition, chronic hypertension can cause progressive damage to the renal blood vessels and increase the risk of end-stage renal failure (De Bhailis & Kalra, 2022). In addition to organ complications, symptoms such as headaches, neck stiffness, heart palpitations, fatigue, and sleep disturbances are also common and negatively impact the quality of life of sufferers (Masenga & Kirabo, 2023). Hypertension management involves pharmacological and non-pharmacological approaches. Pharmacological therapy involves the use of antihypertensives such as ACE inhibitors, ARBs, beta-blockers, calcium channel blockers (CCBs), and diuretics to control blood pressure and prevent complications. Non-pharmacological approaches include maintaining a healthy diet, reducing salt intake, increasing physical activity, managing stress, and improving sleep quality, which have been proven effective in supporting blood pressure control.

In nursing practice, a holistic approach is essential, especially for elderly patients with hypertension who frequently experience sleep disturbances. Poor sleep quality can increase sympathetic nervous system activity and stress hormones like cortisol, triggering spikes in blood pressure (Hirotsu et al., 2015). Sleep disorders in elderly patients with hypertension have been reported to have a high prevalence in various countries: Turkey (63.3%), China (52.5%), Ethiopia (35.5%), and in some regions of Indonesia exceeding 50% (Feng et al., 2025). One non-pharmacological intervention proven effective in improving sleep quality is foot massage. This therapy works by applying pressure to reflexology points on the feet that correspond to various organs in the body, improving blood circulation, reducing muscle tension, and stimulating the parasympathetic nervous system to produce relaxation and increase melatonin production (Tawil et al., 2024). Foot massage is safe, inexpensive, and easy to perform, making it suitable for home use with minimal training and assistance from a nurse. This topic was chosen based on the real-world situation, namely the large number of elderly hypertensive patients experiencing sleep disturbances without adequate intervention. An initial assessment of a 67-year-old client in Bumirejo Village revealed sleep disturbances in the form of difficulty falling asleep, frequent awakenings, and a PSQI score of 8, indicating poor sleep quality. Therefore, foot massage therapy was chosen as an appropriate evidence-based nursing practice (EBNP) intervention that can be applied in community nursing practice. Based on this description, it can be concluded that foot massage therapy is an applicable, effective, and appropriate nursing intervention for improving sleep quality and supporting blood pressure management in older adults with hypertension. This approach aligns with holistic nursing principles and can be integrated into community nursing practice to improve the health and quality of life of people with hypertension.

Case Description

The client in this case study is Mrs. S, a 67-year-old woman who lives in Bumirejo Village with her children and grandchildren. The client has a history of hypertension for several years, but does not take regular medication. The main complaint she conveyed was sleep disturbances in the form of difficulty falling asleep, frequently waking up at night to urinate, and feeling unrefreshed upon waking in the morning. The assessment results using the Pittsburgh Sleep Quality Index (PSQI) instrument showed a score of 8, indicating poor sleep quality. Vital signs at the initial assessment included blood pressure of 163/101 mmHg, pulse rate of 83 beats/minute, body temperature of 36.5°C, and respiratory rate of 20 breaths/minute. The client weighs 54 kg and is 156 cm tall with adequate nutritional status. No comorbidities were found, elimination was within normal limits, and the client was not taking sleeping pills. Supporting examination results, including blood pressure measurements using a digital sphygmomanometer, indicated grade I hypertension. Other physical examinations revealed no abnormalities. Psychosocially, the client lives with her family and receives good emotional support from her children and grandchildren.

Based on the assessment results, the established nursing diagnosis is "Sleep pattern disturbance related to physical condition (hypertension) characterized by complaints of restless sleep and a PSQI score >5." The nursing plan focused on improving sleep quality through non-pharmacological interventions in the form of foot massage therapy. This intervention was selected based on the Evidence Based Nursing Practice (EBNP) approach, referring to scientific evidence showing that foot massage therapy is effective in improving sleep quality and lowering blood pressure in elderly with hypertension. The implementation phase involved providing a 20-minute foot massage every night before bed, performed on both feet for seven consecutive days. The massage technique was performed slowly, starting from the soles of the feet and working up to the ankles, using moderate pressure and a consistent rhythm. In addition to the intervention, the nurse also provided education to the family so they could continue the therapy independently at home. Daily monitoring was conducted to assess the client's blood pressure and sleep quality. Evaluations were conducted daily to monitor the response to the intervention. After seven days of therapy, the client reported improvements in her sleep patterns: she was able to fall asleep faster, had fewer nighttime awakenings, and felt more refreshed upon waking. Her PSQI score decreased from 8 to 5, indicating an improvement in sleep quality from poor to fair. Furthermore, her blood pressure decreased to 149/92 mmHg, her pulse rate stabilized at around 80 beats/minute, and she had no other physical complaints. Collaborative therapy involves referral to a healthcare facility for regular blood pressure monitoring and consultation with a physician regarding the possibility of further pharmacological therapy. Although the client did not receive pharmacological antihypertensive therapy during the monitoring period, the family was educated about the importance of regular checkups and ongoing blood pressure monitoring.

Discussion

Assessment is the initial and fundamental step in the nursing process, conducted systematically to obtain comprehensive data regarding the client's condition. In this case, the client is a 67-year-old woman with uncontrolled hypertension and a chief complaint of sleep disturbance. A PSQI score of 8 indicates poor sleep quality. Vital signs assessment results showed high blood pressure (163/101 mmHg), pulse 83 beats/minute, temperature 36.5°C, and respirations 20 breaths/minute. Elimination is within normal limits; there are no comorbidities or use of sleeping pills. From a social aspect, the client lives with family and receives good emotional support. The PSQI has proven to be an appropriate measurement tool, but elderly patients require assistance during completion to ensure more valid results. The complex time and frequency scales in this instrument often lead to confusion, necessitating effective

communication. A comprehensive assessment concluded that the client's sleep quality was impaired due to hypertension, advanced age, and possible changes in circadian rhythms, which are common in the elderly. Based on the results of the assessment and data classification according to the Indonesian Nursing Diagnosis Standards (SDKI), the primary diagnosis established is Ineffective Sleep Pattern (00095) related to physical disorders, characterized by complaints of difficulty sleeping, frequent awakenings, and feeling unrefreshed upon waking. Sleep disorders in the elderly can worsen hypertension through activation of the sympathetic nervous system and increased stress hormones such as cortisol. Research supports that poor sleep quality in older adults with hypertension increases the risk of blood pressure spikes (Li & Shang, 2021). Therefore, interventions should focus on improving sleep quality to support non-pharmacological blood pressure control, as this approach is safer and can be implemented independently by families.

To address these nursing issues, the chosen intervention was 20 minutes of foot massage every night for seven consecutive days. The massage technique was applied from the soles of the feet to the ankles, using moderate pressure and a steady rhythm. This intervention was complemented by education for the family so they could continue the therapy independently at home. Foot massage aims to reduce sympathetic nervous system activation, promote relaxation, improve blood circulation, and stimulate the release of serotonin and dopamine, which help improve sleep quality. Blood pressure and sleep quality are monitored routinely as part of the evaluation. Evaluation results after seven days of therapy showed a significant improvement in sleep quality. The PSQI score decreased from 8 to 5, reflecting an improvement from poor to fair sleep quality. The patient reported sleeping better, waking up less frequently, and feeling more refreshed in the morning. Blood pressure decreased from 163/101 mmHg to 149/92 mmHg, and pulse remained stable. The relaxing effects of massage therapy may explain these results, as decreased sympathetic activity leads to vasodilation and increased blood circulation, thus lowering blood pressure. This success is further enhanced by family involvement, both in support and in the therapy. The findings of this study have important implications for nursing practice. At the primary care level, such as community health centers (Puskesmas), foot massage therapy can be incorporated into SOPs for the non-pharmacological management of sleep disorders in elderly people with hypertension. This therapy is safe, affordable, and easy for families to learn. For nurses, the results of this study emphasize the importance of implementing EBNP. Interventions such as foot massage can be part of a holistic service that emphasizes client comfort and family involvement. Nurses act as educators, facilitators, and motivators to empower families in community nursing care.

Conclusion

This case study demonstrates that seven consecutive days of foot massage therapy are effective in improving sleep quality and lowering blood pressure in elderly patients with hypertension. Initial assessment showed a PSQI score of 8, indicating poor sleep quality. After the intervention, the PSQI score decreased to 5, indicating significant improvement. The patient also showed positive subjective responses, such as falling asleep faster, waking up less frequently during the night, and feeling more refreshed upon waking. Furthermore, blood pressure decreased from 165/106 mmHg to 151/98 mmHg. These findings confirm that foot massage therapy can be an effective, safe, and easily implemented alternative non-pharmacological nursing intervention, both in community nursing practice, family services, and healthcare facilities. This therapy also strengthens family involvement in self-care, contributing to the continuity and long-term success of therapy. Therefore, this intervention is worthy of integration into SOPs for healthcare services and nursing education. For further research, it is recommended to examine the long-term effects and combine foot massage with other relaxation techniques for more optimal results in the management of hypertension and sleep disorders in elderly patients.

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