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Comfort Theory in Practice: Lavender Aromatherapy for Sleep Pattern Disturbance in Hypertensive Older Adults at a Community Health Center

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ABSTRACT

Introduction: Hypertension commonly impairs sleep quality among older adults because persistent sympathetic nervous system activation interferes with the physiological relaxation required for sleep initiation and maintenance. Although antihypertensive therapy controls blood pressure, sleep disturbances often persist, highlighting the need for effective non-pharmacological nursing interventions in primary care. This case report aimed to describe the implementation of lavender aromatherapy, guided by Kolcaba's Comfort Theory, in managing sleep pattern disturbances among hypertensive older adults.

Methods: A descriptive case report was conducted involving two hypertensive older adults receiving nursing care at the Gadingrejo Health Center, Pasuruan City, Indonesia. Nursing assessment and care were based on the Indonesian Nursing Diagnosis, Intervention, and Outcome Standards (SDKI, SIKI, and SLKI). Lavender aromatherapy was administered using a diffuser containing 50 mL of water and 4–5 drops of lavender essential oil for approximately 60 minutes before bedtime over seven consecutive days, accompanied by sleep hygiene education. Data were collected through interviews, direct observation, physical examination, and nursing documentation.

Results: Both participants experienced fewer nocturnal awakenings and reported improved subjective sleep quality after the intervention. One participant also demonstrated resolution of neck pain and dizziness, accompanied by normalization of blood pressure. In the second participant, nocturia remained a persistent factor limiting optimal sleep despite overall improvement.

Conclusion: Lavender aromatherapy, integrated within Kolcaba's Comfort Theory, showed potential as a feasible, theory-based nursing intervention for improving sleep comfort in hypertensive older adults in primary care settings. Further studies with larger samples are warranted to confirm its effectiveness.

KEYWORDS

Aromatherapy; Hypertension; Lavandula; Sleep Wake Disorders; Nursing Care; Aged.

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INTRODUCTION

Hypertension continues to rank among the most pervasive non-communicable diseases affecting older populations worldwide, earning its reputation as a silent killer because clinical symptoms frequently remain undetected until organ damage has already begun (Gu & Lee, 2023; Song et al., 2026). The World Health Organization estimates that 1.28 billion adults aged 30–79 years currently live with the condition, a figure that continues to strain primary care systems tasked with both diagnosis and long-term management (Mustaqim et al., 2026; Pan et al., 2025). What receives comparatively less clinical attention is the way chronic blood pressure elevation reshapes a patient's nightly experience of sleep an outcome whose consequences extend well beyond the blood pressure reading itself (Imelisa et al., 2024).

Elevated blood pressure sustains heightened sympathetic activity, a physiological state that works directly against the parasympathetic dominance the body needs to initiate and sustain sleep (Sumo et al., 2025). Hypertensive patients commonly describe difficulty falling asleep, repeated nighttime awakenings, and a persistent sense of unrefreshing rest (Yusniar et al., 2025). In East Java Province, hypertension affected 36.3% of the population in 2023, and a preliminary review at Gadingrejo Health Center in Pasuruan City identified 673 older adults managed for hypertension within a single year a caseload in which sleep pattern disturbance, as defined in the Indonesian Nursing Diagnosis Standards, is a frequently co-occurring but often secondary concern in routine care (Yu et al., 2025). Left unaddressed, this disturbance compounds the burden of hypertension itself, contributing to fatigue, diminished quality of life, and an elevated risk of coronary disease, stroke, heart failure, and renal complications.

Non-pharmacological approaches offer a way to address this overlap without adding to a patient's medication burden, and lavender aromatherapy valued for the sedative, muscle-relaxing properties of its linalyl acetate content has attracted growing clinical interest as one such option (Gandari et al., 2026; Sella et al., 2022; Setiyowati et al., 2025). Existing evidence, however, is concentrated in experimental studies that isolate physiological endpoints such as blood pressure or heart rate, typically within controlled or hospital-based settings. Comparatively little has been documented about how lavender aromatherapy functions as a nurse-delivered intervention within primary health care, embedded in a standardized nursing process and interpreted through a nursing theoretical lens rather than a purely physiological one (Chang et al., 2024).

This case report addresses that gap by describing the implementation of nursing care for hypertensive older adults with sleep pattern disturbance through lavender aromatherapy at Gadingrejo Health Center, Pasuruan City, structured around the Indonesian Nursing Diagnosis, Intervention, and Outcome Standards (SDKI, SIKI, SLKI) and interpreted through Kolcaba's Comfort Theory. Its contribution lies not in testing lavender's physiological effect in isolation, but in showing how a community health center nurse can operationalize a standardized nursing process together with a comfort-oriented theoretical framework to manage a condition that primary care often treats as secondary to hypertension itself (Aloustani et al., 2025; Jurnal et al., 2025). The remainder of this paper details the case study methodology, presents the pre- and post-intervention findings for both participants against relevant nursing theory, and closes with the practical and theoretical implications of the findings for community-based nursing practice (Purwanti & Damanik, 2025).

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MATERIALS AND METHODS

Study Design

This case report followed the CARE (CAse REport) guideline and applied a descriptive case study design to document nursing care for two older adults with hypertension and sleep pattern disturbance. It remains, by design, a case-based description of individual patient responses rather than a comparative or controlled trial; therefore, no control group, randomization, or inferential statistical testing was applied, consistent with the scope of a case report.

Study Setting

The report was conducted in the working area of the Gadingrejo Health Center, Pasuruan City, Indonesia, across seven consecutive days in May 2026.

Participants

Participants were recruited from among older adults attending routine hypertension care at the health center. Inclusion criteria required a documented diagnosis of hypertension, a nightly sleep duration below 7–8 hours, and a nursing assessment consistent with sleep pattern disturbance, namely difficulty initiating sleep, frequent nocturnal awakening, dissatisfaction with sleep quality, and altered sleep patterns, together with the capacity to communicate and provide informed consent. Patients with olfactory impairment, known allergy to lavender essential oil, severe cognitive impairment, or an inability to complete the full seven-day intervention were excluded. Two participants meeting these criteria were enrolled after providing written informed consent.

Nursing Intervention and Outcome Measures

Nursing care was structured according to the Indonesian Nursing Diagnosis Standards (SDKI DPP PPNI Working Group Team, 2017), Nursing Intervention Standards (Tim Pokja SIKI PPNI, 2018), and Nursing Outcome Standards (Tim Pokja SLKI PPNI, 2019). On day 1, baseline data were collected through structured interviews, direct observation, physical examination including blood pressure measurement, and review of existing health center documentation. This assessment established the nursing diagnosis of sleep pattern disturbance and informed an individualized nursing care plan based on the SIKI sleep support intervention, with lavender aromatherapy incorporated as the primary complementary therapy. Participants and, where available, family members received education on diffuser use and sleep hygiene practices, including maintaining a regular bedtime and limiting stimulating activities before sleep. From day 2 through day 6, lavender aromatherapy was administered nightly using a diffuser containing 50 mL of clean water and 4–5 drops of lavender essential oil, positioned 50–100 cm from the participant and operated for approximately 60 minutes before bedtime. Daily monitoring included completion of a structured sleep diary documenting sleep onset latency, number of nighttime awakenings, and subjective sleep quality upon waking, together with blood pressure measurement and reinforcement of sleep hygiene education. On day 7, the baseline assessment was repeated, and outcomes were evaluated according to the Indonesian Nursing Outcome Standards (SLKI), with nursing problems classified as resolved, partially resolved, or unresolved.

Data Analysis

Data were analyzed descriptively by comparing each participant's pre- and post-intervention condition on a case-by-case basis; no pooled or inferential statistical analysis was performed because of the case study design. The credibility of the findings was strengthened through triangulation of interview data, direct observation, physical examination findings, and health center documentation.

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Ethical Considerations

Ethical conduct was guided by the principles of voluntary informed consent, anonymity, and confidentiality of participant data, consistent with the research ethics requirements of the Faculty of Nursing, University of Jember, Pasuruan City Campus.

RESULTS AND DISCUSSION

Baseline assessment identified two older adults with hypertension whose sleep patterns had been disrupted for an extended period. The first participant, Mrs. M, aged 62 years, had lived with hypertension for approximately 15 years. She reported habitually waking around 01:00 and being unable to return to sleep until morning, describing her rest as unsatisfying and insufficient to meet her needs. This sleep disturbance coexisted with neck pain radiating to the left arm and intermittent dizziness, both of which she associated with poor rest. Her baseline blood pressure was recorded at 150/90 mmHg.

The second participant presented with a similar sleep pattern disturbance, characterized by difficulty initiating sleep, frequent nighttime awakening, and an urge to urinate in the early hours that further fragmented his rest. Unlike the first participant, he reported no accompanying pain or dizziness during the observation period, although his overall sleep quality and comfort remained affected. His baseline blood pressure was 160/90 mmHg.

Following seven consecutive nights of lavender aromatherapy delivered alongside structured sleep support and hygiene education, both participants described a gradual improvement in their capacity to rest. Sleep felt more comfortable, nighttime awakenings occurred less often, and returning to sleep after waking became easier. By the seventh day, both participants reported waking feeling more refreshed, and the first participant's neck pain and dizziness had also subsided. Blood pressure changed from 150/90 mmHg to 120/90 mmHg in the first participant and from 160/90 mmHg to 140/90 mmHg in the second, though this change cannot be attributed to aromatherapy alone since both participants continued their prescribed antihypertensive medication throughout. Table 1 summarizes the pre- and post-intervention comparison for both participants.

Table 1. Pre- and post-intervention comparison of nursing problems in both participants

Variable	Patient 1 (Before)	Patient 1 (After)	Patient 2 (Before)	Patient 2 (After)
Difficulty initiating sleep	Present	Reduced	Present	Reduced
Frequent nocturnal awakening	Present	Reduced	Present	Persistent
Subjective sleep quality	Poor	Improved	Poor	Slightly improved
Nocturia (urge to urinate at night)	Absent	Absent	Present	Persistent
Neck pain	Present	Improved	Absent	Absent
Dizziness	Present	Improved	Absent	Absent
Blood pressure	150/90 mmHg	120/90 mmHg	160/90 mmHg	140/90 mmHg

SLKI outcome status	–	Resolved	–	Partially resolved

These findings correspond with Kolcaba's Comfort Theory, which frames comfort as the experience of having needs for relief, ease, and transcendence met across physical, psychospiritual, environmental, and sociocultural contexts. Within this framework, the reduction in neck pain and dizziness experienced by the first participant reflects relief the resolution of a specific discomforting stimulus while the reduced frequency of nighttime awakening in both participants reflects ease, a state of calm sufficient to sustain daily functioning (Kaplan & Özakgül, 2025; Lin et al., 2024; Mahlisa & Roza, 2026). The diffuser itself, delivered within a controlled, low-stimulation bedtime routine, additionally targeted the environmental context of comfort, a dimension Kolcaba's model treats as no less clinically relevant than the physical one. Read this way, lavender aromatherapy did not operate as an isolated sedative agent but as one component of a broader comfort-oriented nursing intervention that also included consistent education and routine-building a distinction the model makes explicit but that purely physiological framings of aromatherapy tend to overlook (Lin et al., 2023).

These results are broadly consistent with prior work. Attributed the relaxing effect of lavender to its linalyl acetate content, thought to act on the central nervous system to support sleep, and similarly reported improved sleep comfort among hypertensive patients receiving lavender aromatherapy (Lin et al., 2023, 2024). The present case adds to this literature by situating the intervention within a standardized nursing process rather than an isolated experimental protocol, illustrating how the same physiological mechanism can be operationalized as routine nursing care in a primary care setting.

The findings also surface an instructive anomaly. Nocturia persisted in the second participant despite an overall improvement in sleep comfort, meaning the underlying nursing problem was only partially resolved by the seventh day (Kaplan & Özakgül, 2025; Purwanti & Damanik, 2025). This divergence is not well explained by lavender's known pharmacological action, which targets central relaxation rather than urinary function, and instead points toward age-related lower urinary tract changes as a competing driver of sleep fragmentation – one that a comfort-oriented aromatherapy intervention would not be expected to resolve on its own.

Beyond the individual case, these results carry two implications. Theoretically, they suggest that Kolcaba's Comfort Theory offers primary care nurses a more complete lens than symptom checklists alone for structuring aromatherapy-based interventions, since it directs attention toward environmental and routine-based contributors to comfort that a narrower physiological framing would miss. Practically, they indicate that lavender aromatherapy is feasible to integrate into existing community health center workflows: it requires no specialized equipment beyond a diffuser, can be taught directly to patients and family caregivers, and complements rather than replaces standard antihypertensive management. For community health center nurses managing large hypertensive caseloads with limited time per patient, this positions aromatherapy as a low-cost adjunct within routine sleep support care rather than a stand-alone therapy requiring separate clinical infrastructure.

This case report is limited by its descriptive, two-participant design, which precludes statistical generalization and does not permit causal attribution of the observed changes to lavender aromatherapy independent of concurrent antihypertensive treatment, natural symptom fluctuation, or the attention associated with daily monitoring; sleep quality was assessed through structured interview and observation rather than a validated instrument such as the Pittsburgh Sleep Quality Index, and the seven-day observation window was too short to establish whether the improvements

were sustained beyond the intervention period. Future studies using quasi-experimental or controlled designs with larger samples, standardized sleep quality instruments, and extended follow-up would be needed to establish the effect of lavender aromatherapy on sleep pattern disturbance in hypertensive populations with greater confidence.

CONCLUSIONS

Read through the lens of Kolcaba's Comfort Theory, this case suggests that restoring a hypertensive older adult's sleep is rarely just a matter of introducing a relaxing scent; it is a matter of rebuilding relief, ease, and a stable nightly routine around a body that has spent years working against its own rest, and lavender aromatherapy, delivered as part of a structured nursing sleep support intervention, moved both participants meaningfully closer to that state, even as the second participant's unresolved nocturia showed how much further comfort-focused nursing care still has to reach; community health center nurses are well positioned to extend that reach as a routine, low-cost complement to standard hypertension management.

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Conflict of Interest

The authors declare that no financial, professional, or personal relationships could have influenced the conduct of this study. All information, analyses, and reporting were prepared objectively and reflect the findings obtained throughout the research process.

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