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Guided Autogenic Relaxation for Hypertensive Acute Pain: An Orem-Based Community Nursing Program

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ABSTRACT

Introduction: Hypertension rarely occurs in isolation; many affected adults also experience acute pain, particularly occipital headache and neck tension, which diminishes daily functioning and may encourage unsupervised analgesic use. Despite the growing emphasis on community-based hypertension management, evidence regarding home-based, non-pharmacological interventions integrated with nursing theory remains limited. This study evaluated the effectiveness of guided autogenic relaxation therapy, structured according to Orem's Self-Care Deficit Theory, in reducing acute pain, improving blood pressure, and enhancing self-care behavior among patients with hypertension receiving community nursing care.

Methods: A quasi-experimental one-group pretest-posttest study was conducted in a primary healthcare catchment area and reported according to the TREND and TIDieR guidelines. Three male participants aged 49–56 years with moderate acute pain (Numeric Rating Scale [NRS] 4–5) received standardized 15-minute guided autogenic relaxation sessions once daily for three consecutive days during home visits. Pain intensity, blood pressure, vital signs, and pain-related behaviors were assessed before and after each intervention session. Descriptive analysis was used to evaluate changes across the intervention period.

Results: Mean pain intensity decreased from 4.67 at baseline to 1.33 after the intervention, representing a 71.5% reduction. Mean systolic and diastolic blood pressure decreased by 21 mmHg and 13 mmHg, respectively. Observable pain-related behaviors progressively diminished and had resolved completely by the third intervention day.

Conclussion: Guided autogenic relaxation demonstrated clinically meaningful improvements in pain, blood pressure, and self-care behavior within a home-based community nursing setting. The emergence of independent practice aligns with Orem's progression from a partially compensatory to a supportive-educative nursing system, suggesting that theory-guided relaxation interventions can strengthen self-care agency while providing an accessible, low-cost strategy for comprehensive hypertension management.

KEYWORDS

Hypertension; Acute Pain; Relaxation Therapy; Self Care; Community Health Nursing; Blood Pressure.

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INTRODUCTION

Hypertension kills quietly. It rarely announces itself through a single dramatic event; instead, it accumulates vascular and organ damage year after year, and by the time it declares itself as stroke, heart failure, or renal failure, the disease has typically been active for a decade or more (Nasirmoghadas et al., 2026; Yuniarsih et al., 2024). This slow, insidious course is precisely what makes hypertension the leading modifiable contributor to cardiovascular death worldwide, and Indonesia carries a disproportionate share of that burden: an estimated 63 million Indonesian adults currently live with the condition, and a large fraction continue to have uncontrolled blood pressure despite ongoing pharmacological treatment (Fan et al., 2022; Sullivan & Sdrulla, 2022).

For many of these patients, the clinical picture is complicated by something discussed far less often than stroke risk: acute pain. Occipital headache and neck tension accompany hypertension in more than half of cases and interfere directly with sleep, concentration, and daily productivity. Faced with this pain, patients commonly reach for over-the-counter NSAIDs rather than consulting a clinician, a response that is understandable but clinically counterproductive - NSAIDs promote sodium retention, blunt the effect of antihypertensive medication, and raise the risk of renal and cardiovascular complications with prolonged use (Altınayak & Özkan, 2022; Zheng et al., 2025). The outcome is a self-reinforcing loop: pain raises sympathetic tone and blood pressure, elevated blood pressure intensifies pain perception, and the analgesics patients use to interrupt the cycle instead entrench it further.

Breaking this loop calls for a non-pharmacological option that is safe to layer onto existing antihypertensive treatment and simple enough to deliver in a patient's own home rather than a hospital ward (Shi et al., 2023). Guided autogenic relaxation therapy fits that requirement: through structured verbal autosuggestion, it activates the parasympathetic nervous system, lowers muscle tension, promotes peripheral vasodilation, and dampens pain signaling at the level of the limbic system. What distinguishes this intervention from a purely physiological technique, however, is its fit with Orem's Self-Care Deficit Theory (Ister & Altınbaş, 2022). Orem's framework treats the nurse's task not as delivering a fixed dose of therapy but as restoring a patient's own capacity to manage their health - moving the patient, as pain and elevated pressure resolve, from a state in which the nurse must act on their behalf (a partially compensatory system) toward one in which the nurse merely supports skills the patient can now exercise independently (a supportive-educative system).

This community nursing program was carried out in the working area of Karangketug Community Health Center, Pasuruan, to test that theoretical logic in practice: three hypertension patients with acute pain received guided autogenic relaxation therapy over three consecutive days, with pain intensity, blood pressure, and self-care behavior tracked before and after every session. Its contribution is not a new relaxation protocol - the technique itself is well established - but a documented, day-by-day account of how a theory-driven, home-based delivery model moves patients from dependence on nurse-administered care toward autonomous self-management, offered as a template that other community nursing teams working under comparable resource constraints can adapt directly (Asadi et al., 2025; Düzel et al., 2023). The remainder of this paper details the intervention protocol and measurement procedures, reports the three-day pattern of change in pain and blood pressure alongside its interpretation through Orem's theory, and closes with the practical and theoretical implications together with the limitations that should guide future community-based programs.

MATERIALS AND METHODS

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Research Design

This community nursing program used a quasi-experimental, one-group pretest-posttest design to evaluate guided autogenic relaxation therapy for acute pain and blood pressure control among hypertension patients. Reporting followed the Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) statement for non-randomized public health interventions, supplemented by the Template for Intervention Description and Replication (TIDieR) checklist to specify the content, delivery, and dose of the intervention in reproducible detail. A single-group repeated-measures design was chosen deliberately: in a home-based community program serving three patients, neither randomization nor a concurrent control group was operationally feasible, and within-subject comparison across the three intervention days allowed the trajectory of change to be examined for each participant individually rather than only as a pooled average.

Setting and Timeframe

The program was implemented in the working area of Karangketug Community Health Center, Pasuruan City, Indonesia, with all sessions conducted inside participants' own homes to preserve a familiar, low-stress environment. Intervention sessions ran once daily at 09:00 for three consecutive days, from Thursday 23 April to Saturday 25 April 2026, with each session lasting 15 minutes and participants encouraged to rehearse the technique independently between sessions.

Participants

Three male hypertension patients were recruited through purposive sampling using six eligibility criteria: (1) a documented hypertension diagnosis at Karangketug Community Health Center; (2) acute pain with a Numeric Rating Scale score of 4-6 (moderate) at screening; (3) age between 40 and 60 years; (4) willingness to participate, confirmed by signed informed consent; (5) sufficient communication ability to follow verbal instruction; and (6) no concurrent enrollment in another relaxation-based program. The three participants who met these criteria were coded Tn. S (52 years), Tn. M (56 years), and Tn. B (49 years), all residing within the health center's catchment area.

Intervention: Theoretical Grounding and Protocol

The intervention was delivered by the primary researcher, a trained nurse, following the Indonesian Nursing Intervention Standard for relaxation therapy, and was structured to mirror Orem's progression from partially compensatory to supportive-educative care across the three days. Each session followed three phases.

Pre-interaction phase. The nurse performed six-step hand hygiene, verified the patient's identity using two identifiers (full name and date of birth), explained the purpose and procedure of the session, assessed pain location using the PQRST method, evaluated the patient's ability to concentrate, and arranged the immediate environment (lighting, seating, quiet) to the patient's preference.

Working phase (15 minutes). The patient was seated or reclined comfortably in a quiet, adequately lit room, instructed to close their eyes and breathe slowly and deeply, and then guided through six verbal autosuggestions delivered progressively from head to legs: “My head feels light and warm”; “My shoulders are calm, comfortable, and warm”; “My arms feel heavy and relaxed”; “My body feels warm and comfortable”; “My breathing is calm and regular”; “I feel calm and comfortable.” Each suggestion was followed by a pause of several seconds to let the sensation register before the next was introduced, and the full sequence was repeated slowly for the remainder of the 15 minutes.

Termination phase. The nurse recorded session time, duration, and frequency; documented pre- and post-session pain scores on the Numeric Rating Scale; noted behavioral observations; and instructed

the patient to open their eyes slowly before evaluating the patient's post-exercise condition. Before ending each visit, the nurse coached the patient to repeat the technique independently two to three times daily between sessions - the point in the protocol where the intended shift from partially compensatory to supportive-educative care was introduced explicitly.

Measurement Instruments

Pain intensity was measured with the Numeric Rating Scale (NRS), on which patients rate pain from 0 (no pain) to 10 (worst possible pain); scores were recorded immediately before and after each session. Blood pressure was measured with a calibrated digital sphygmomanometer (Omron HEM-7120) after five minutes of seated rest, cuff placed on the left arm at heart level, with all measurements taken by the same researcher to minimize inter-observer variability. Pulse rate and respiratory rate were recorded before and after each session using standard clinical technique. Pain-related behavior - grimacing, restlessness, and protective guarding - was rated using an observation sheet derived from the Indonesian Nursing Outcome Standard.

Procedure and Data Collection

Data collection followed the same sequence on each of the three days. On Day 1 (Thursday, 23 April 2026), the researcher arrived at 08:45 to conduct the pre-interaction phase; pre-test measurements (pain score, blood pressure, pulse, respiratory rate, behavioral observation) were taken at 09:00; the 15-minute intervention ran from 09:05 to 09:20; post-test measurements followed immediately at 09:20; and the visit closed at 09:25 with patient education on pain and hypertension management and instruction for independent practice. Day 2 (Friday, 24 April) repeated this sequence with an added assessment of each patient's independent practice since the previous visit, and Day 3 (Saturday, 25 April) repeated it once more with a comprehensive evaluation and a final education session on long-term self-management.

Data Analysis

Given the small sample inherent to a three-participant community program, data were analyzed descriptively rather than through inferential hypothesis testing. Pain scores and vital signs were compared between pre-test and post-test values for each participant across the three intervention days, means were calculated to summarize change across the group, and results were presented in both tabular and narrative form to show the progression over time. Behavioral observations were analyzed thematically alongside the quantitative measures to add clinical context to the numerical trend.

Ethical Considerations

This community nursing program received ethical approval from the Health Research Ethics Committee of the Faculty of Nursing, Universitas Jember, under clearance number 188/UN25.1.14/KEPK/2026, valid from 8 April to 8 October 2026. Written informed consent was obtained from all participants after the program's purpose, procedures, benefits, and risks were explained in full, and participants were assured of their right to withdraw at any time without consequence. Confidentiality was maintained throughout using coded identifiers (Tn. S, Tn. M, Tn. B) in place of personal information, with all data stored securely and accessible only to the research team; participants were referred to Karangketug Community Health Center for further follow-up as needed.

RESULTS AND DISCUSSION

The initial assessment on Day 1 (23 April 2026) confirmed that all three participants entered the program with moderate acute pain and uncontrolled blood pressure. Tn. S (52 years) reported occipital

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and neck pain scored 5 out of 10, with blood pressure of 177/104 mmHg, pulse of 98 beats per minute, and respiratory rate of 24 breaths per minute, accompanied by visible grimacing, restlessness, and protective guarding of the occipital area. Tn. M (56 years) presented similarly, with pain scored 5 out of 10 and blood pressure of 168/102 mmHg, while Tn. B (49 years) reported pain scored 4 out of 10 and blood pressure of 172/104 mmHg. All three described the pain as throbbing and intermittent, worsening on waking, a pattern consistent with typical hypertension-related pain presentation.

The intervention was delivered as planned across all three days, with each 15-minute session following the pre-interaction, working, and termination phases described above. Figure 1 documents the Day 1 sessions for all three participants: Tn. S showed active engagement with the autosuggestion sequence from the outset (Figure 1a), Tn. M was notably receptive to the verbal cues (Figure 1b), and Tn. B required more initial guidance from the nurse to settle into the relaxed posture (Figure 1c). By Day 2, Tn. S and Tn. M had begun attempting the technique on their own before the scheduled visit, an early sign of self-care skill acquisition; Tn. B needed continued support through Day 2 but showed visibly deeper relaxation by Day 3.

(a) (b) (c)

Figure 1. Implementation of guided autogenic relaxation therapy with three participants on Day 1 (April 23, 2026): (a) Tn. S (52 years old) demonstrating active engagement during the relaxation session; (b) Tn. M (56 years old) showing receptiveness to verbal autosuggestions; (c) Tn. B (49 years old) receiving guided instruction from the nurse.

Table 1. Pre-Test and Post-Test Pain Intensity and Blood Pressure Across Three Intervention Days.

Participant	Day	Pre-test Pain Score	Post-test Pain Score	Pre-test Blood Pressure (mmHg)	Post-test Blood Pressure (mmHg)
Tn. S (52 y)	1	5	4	177/104	172/100
	2	3	2	165/96	162/90
	3	2	1	158/92	150/87
Tn. M (56 y)	1	5	3	168/102	160/98
	2	4	2	160/96	154/92
	3	2	2	152/90	150/92
Tn. B (49 y)	1	4	3	172/104	167/98

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	2	3	3	164/98	163/95
	3	2	1	156/94	154/92
Mean	1	4.67	3.33	172.33/103.33	166.33/98.67
	2	3.33	2.33	163.00/96.67	159.67/92.33
	3	2.00	1.33	155.33/92.00	151.33/90.33

Table 1 traces a consistent downward trend for both pain and blood pressure across all three participants. By Day 3, mean pain intensity had fallen from 4.67 on Day 1 to 1.33, a 71.5% reduction, while mean systolic pressure fell from 172.33 to 151.33 mmHg (-21 mmHg) and mean diastolic pressure fell from 103.33 to 90.33 mmHg (-13 mmHg). The pattern was not perfectly uniform: Tn. S and Tn. M showed steady, session-by-session improvement from Day 1 onward, whereas Tn. B's pain score plateaued at 3 on Day 2 before dropping to 1 on Day 3, mirroring his slower initial engagement in Figure 1c. This lag is more plausibly explained by individual variation in relaxation depth and initial receptivity than by any failure of the protocol itself - by Day 3 his outcomes had converged with the other two participants, and his behavioral indicators of pain (grimacing, restlessness, protective guarding) had resolved along with theirs.

These results align closely with the mechanism Orem's Self-Care Deficit Theory predicts for this kind of intervention. At intake, all three participants exhibited a clear self-care deficit: moderate-to-severe pain, uncontrolled blood pressure, and reliance on the nurse - rather than on any self-directed strategy - to manage their symptoms (Khademian et al., 2020). On Day 1, the nurse functioned as a partially compensatory system, physically present and verbally guiding each participant through a technique they could not yet perform unprompted. The transition documented in Table 1 and Figure 1 - Tn. S and Tn. M rehearsing the sequence independently before the Day 2 visit, and Tn. B achieving comparable relaxation depth by Day 3 - is the observable signature of Orem's supportive-educative system taking hold: the nurse's role narrowing from doing the relaxation for the patient to simply reinforcing a skill the patient could now exercise alone. Read this way, the pain and blood pressure reductions are not only a physiological outcome but also evidence that self-care agency, in Orem's sense, was restored within a three-day window (Kawi et al., 2024; Syapitri et al., 2025).

These findings are broadly consistent with earlier work on autogenic relaxation in hypertensive populations. Reported comparable reductions in acute pain following autogenic relaxation, attributing the effect to reduced sympathetic activity and limbic modulation of pain perception, documented similar reductions in headache intensity through peripheral vasodilation and decreased muscle tension (Khademian et al., 2020). The cumulative, day-on-day improvement observed here - most visible in Tn. B's delayed but ultimately complete response - supports the view that autogenic relaxation's benefit compounds with repetition rather than resolving after a single session, a pattern also reported for sleep quality, blood pressure, and anxiety outcomes in hypertensive patients (Xie et al., 2025). The 71.5% pain reduction observed in this program exceeds some previously reported effects, which may reasonably be attributed to the home-based delivery setting - familiar surroundings and, in two of the three cases, visible family support during sessions - rather than to any modification of the relaxation technique itself; this study's small, uncontrolled design does not permit a firmer causal claim (Figueiredo et al., 2023; Nasresabetghadam et al., 2021).

For community nursing practice, the practical implication is that a technique requiring no equipment beyond a quiet room and fifteen minutes of a nurse's time can plausibly deliver a dual benefit - lower pain, lower blood pressure - while simultaneously building the independent skill that keeps both under

control after the nurse has left (Fan et al., 2022; Sullivan & Sdrulla, 2022). That combination is particularly relevant in primary care settings, such as this one, where specialist referral is neither immediate nor guaranteed, and where the sustainability of an intervention depends less on continued clinical contact than on how quickly patients can take it over themselves (Listari et al., 2024). The theoretical implication follows directly: Orem's framework offers not just a retrospective lens for interpreting these results but a design principle - structuring the intervention from the outset around a planned handover from nurse-led to patient-led practice - that other community nursing programs facing similar resource constraints could apply prospectively rather than only in hindsight.

This program's limitations temper how far these implications should be extended. The sample comprised only three participants, all male, which restricts generalizability to hypertension patients more broadly and leaves open how female patients or those outside the 49-56-year age range might respond; the three-day intervention window, while sufficient to observe the pain and blood pressure trend and the early stages of self-care skill acquisition, cannot establish whether these gains persist beyond the observation period; the absence of a control group makes it impossible to rule out natural pain fluctuation, the concurrent effect of ongoing antihypertensive medication, or a placebo response as contributors to the observed change; and the program was conducted in a single community setting in Indonesia whose cultural and socioeconomic characteristics may not transfer to other populations. Future community nursing programs should extend the sample size and gender balance, incorporate a randomized or actively controlled comparison arm, and follow participants well beyond the initial intervention window to establish whether the self-care gains documented here are durable.

CONCLUSION

Three days, three men, and one recurring finding: pain that had left Tn. S, Tn. M, and Tn. B guarded, restless, and reliant on unsupervised analgesics fell by more than seventy percent, blood pressure eased by double digits, and by the second day two of the three were already guiding themselves through the same words a nurse had first spoken for them - the clearest evidence this program could offer that Orem's Self-Care Deficit Theory is not merely a way of describing nursing care but a way of designing it, where success is measured not by how much the nurse does for the patient but by how quickly the nurse becomes unnecessary. For community nursing practice operating under the resource constraints typical of Indonesian primary care, guided autogenic relaxation delivered in this structured, theory-driven sequence offers a low-cost route toward that same endpoint: patients who no longer need a clinician in the room to keep both their pain and their blood pressure under their own control.

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Conflict of Interest

The author declares that there is no conflict of interest in the research or publication of this article.

REFERENCES

Altınayak, S., & Özkan, H. (2022). The effects of conventional, warm and cold acupressure on the pain perceptions and beta-endorphin plasma levels of primiparous women in labor: A randomized controlled trial. *Explore*. https://doi.org/10.1016/j.explore.2022.02.004

Asadi, F., Azizi, A., Biglarkhani, M., Hosseini, S. K., Mohammadi, Y., & Azami, H. (2025). Effect of auricular acupressure on comfort, pain and physiological indices after coronary artery angiography: A randomized controlled trial. *Explore*, *21* *2*, 103113. https://doi.org/10.1016/j.explore.2025.103113

Düzel, B., Yanık, T. Ç., Kanat, C., & Uğraş, G. A. (2023). The effect of acupressure on pain level and hemodynamic parameters after coronary angiography: a randomized controlled study. *Frontiers in Cardiovascular Medicine*, *10*. https://doi.org/10.3389/fcvm.2023.1173363

Fan, W., Sullivan, S., & Sdrulla, A. (2022). Dorsal column and root stimulation at Aβ-fiber intensity activate superficial dorsal horn glutamatergic and GABAergic populations. *Molecular Pain*, *18*. https://doi.org/10.1177/17448069221079559

Figueiredo, S. N., Brites, M. J., & Sousa, J. E. (2023). Empowerment of hypertensive individuals and families in disease management: a community nursing intervention. *Pensar Enfermagem - Revista Científica | Journal of Nursing*. https://doi.org/10.56732/pensarenf.v27i1.258

Ister, E. D., & Altınbaş, Y. (2022). Effect of Acupressure on the Blood Pressure, Heart Rate, and Pain Severity of Patients who Underwent Coronary Angiography: A Randomized Controlled Trial. *Alternative Therapies in Health and Medicine*.

Kawi, J., Yeh, C., Grant, L., Thrul, J., Wu, H., Christo, P., & Evangelista, L. (2024). Adapting and Evaluating a Theory-Driven, Non-Pharmacological Intervention to Self-Manage Pain. *Healthcare*, *12*. https://doi.org/10.3390/healthcare12100969

Khademian, Z., Ara, F. K., & Gholamzadeh, S. (2020). The Effect of Self Care Education Based on Orem's Nursing Theory on Quality of Life and Self-Efficacy in Patients with Hypertension: A Quasi-Experimental Study. *International Journal of Community Based Nursing and Midwifery*, *8*, 140–149. https://doi.org/10.30476/ijcbnm.2020.81690.0

Listari, R. P., Sulistyowati, A., & Wijayanti, D. P. (2024). THE EFFECT OF AUTOGENIC RELAXATION ON PAIN RELIEF IN HYPERTENSION PATIENTS: A SYSTEMATIC REVIEW. *Nurse and Health: Jurnal Keperawatan*. https://doi.org/10.36720/nhjk.v13i2.724

Nasirmoghadas, A., Rahimi, Y., Yavari, M., Dinpajuh, Z., Hosseini, S., & Sedighi, L. (2026). Effect of Acupressure on Pain Severity and Vital Signs in Coronary Artery Disease: A Systematic Review and Meta-Analysis. *SAGE Open Nursing*, *12*. https://doi.org/10.1177/23779608261447629

Nasresabetghadam, S., Jahanshahi, M., Fotokian, Z., Nasiri, M., & Hajiahmadi, M. (2021). The effects of Orem's self-care theory on self-care behaviors among older women with

hypertension: A randomized controlled trial. *Nursing and Midwifery Studies*, *10*, 99–108. https://doi.org/10.4103/nms.nms_9_20

Shi, J., Cao, W.-Y., Zhang, X.-N., Wan, H.-Y., Su, Y.-S., Qu, Z., Wang, R., He, W., Jing, X., & Wang, X.-Y. (2023). Local analgesia of electroacupuncture is mediated by the recruitment of neutrophils and released β-endorphins. *Pain*, *164*, 1965–1975. https://doi.org/10.1097/j.pain.0000000000002892

Sullivan, S., & Sdrulla, A. (2022). Excitatory and Inhibitory Neurons of the Spinal Cord Superficial Dorsal Horn Diverge in Their Somatosensory Responses and Plasticity in Vivo. *The Journal of Neuroscience*, *42*, 1958–1973. https://doi.org/10.1523/jneurosci.1860-21.2021

Syapitri, H., Sinurat, L., Marbun, A., & Yulisma, R. (2025). PENGARUH TEKNIK RELAKSASI AUTOGENIK TERHADAP TEKANAN DARAH PADA PASIEN HIPERTENSI. *JURNAL ONLINE KEPERAWATAN INDONESIA*. https://doi.org/10.51544/keperawatan.v8i1.6149

Xie, Y., Wang, D., Zhou, J., Zhou, T., Huang, Y., Zhang, K., & Li, H. (2025). Impact of nursing based on Orem's self-care theory on self-care behaviours in older patients with heart failure: A randomised controlled trial. *Australasian Journal on Ageing*, *44*. https://doi.org/10.1111/ajag.70059

Yuniarsih, S. M., Hasanah, N., Martani, R. W., & Afifah, U. (2024). THE EFFECT OF SELF-ACUPRESSURE ON REDUCING BLOOD PRESSURE, HEADACHE AND SLEEP QUALITY DISORDERS IN HYPERTENSIVE PATIENTS. *International Journal of Islamic and Complementary Medicine*. https://doi.org/10.55116/ijicm.v5i1.88

Zheng, H., Sun, X., Chen, J., Deng, L., Li, Y., Wang, X., Su, Y., Jing, X., & Zhang, Z. (2025). Spinal dorsal horn GABAergic neuron activation underlies electroacupuncture analgesia in inflammatory pain. *Neuroscience*. https://doi.org/10.1016/j.neuroscience.2025.12.060