

Analysis Of Gerontic Nursing Care for Mrs. T With Hypertension Through the Application of Isometric Handgrip Exercise Therapy in The Bougenville Room Of The Satpel Griya Lansia Garut

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Abstract: Hypertension or high blood pressure is a disease of the heart and blood vessels characterized by increased blood pressure. Factors that influence the incidence of hypertension include genetic, racial, regional, socio-cultural and unhealthy lifestyle. This study aims to determine the analysis of nursing care with hypertension through the application of isometric handgrip exercise therapy in the Griya Lansia Garut service unit. The research method used in this study is descriptive qualitative in the form of a case study by conducting nursing care for the elderly which includes assessment, nursing diagnosis, intervention, implementation, and evaluation of nursing carried out on March 3-9, 2025. Based on the results of the assessment, diagnosis, intervention, implementation and evaluation carried out by the researcher, 4 nursing problems were found, namely impaired physical mobility, anxiety, knowledge deficit and risk of falling. Researchers planned mobilization support by implementing Isometric Handgrip Exercise therapy based on Evidence-Based Practice, which aims to lower blood pressure and increase muscle strength. Nursing care was provided for 5 days, including assessment, diagnosis, intervention, implementation, and evaluation. Results showed a decrease in blood pressure from 170/97 mmHg to 154/80 mmHg and an improvement in muscle strength from scale 4 to 5 after the intervention. The study concluded that isometric handgrip exercise therapy is effective in lowering blood pressure and increasing muscle strength in hypertensive elderly patients. Further quantitative research is recommended to examine the long-term effects of this intervention.

Keywords: Hypertension, Elderly, Isometric Handgrip Exercise, Nursing Care, Case Study

Received: 7 June 2025

Revised: 8 July 2025

Accepted: 15 July 2025

Published: 12 August 2025

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Introduction

Good health is not simply the absence of disease, but encompasses a balanced physical, mental, and social state. The concepts of health and illness are complex and multidimensional, influenced by various bio-psycho-social factors. Health is a dynamic, constantly changing

state characterized by overall bodily balance. Conversely, illness is defined as an abnormal condition, reflecting a disturbance or deviation from optimal bodily function. One degenerative disease with high morbidity and mortality rates frequently found in the elderly is hypertension (Silfiani et al., 2024).

How to Cite: Sophia Fauziah, M., & Puspita, T. (2025). Analysis Of Gerontic Nursing Care for Mrs. T With Hypertension Through the Application of Isometric Handgrip Exercise Therapy in The Bougenville Room Of The Satpel Griya Lansia Garut. *Nursing Case Insight Journal*, 3(2), 65-68. <https://doi.org/10.63166/83nnrg31>

The aging process causes a decline in body functions, including a decrease in the elasticity and capacity of blood vessels. This condition is a major factor in hypertension in the elderly. Hypertension, or high blood pressure, is a degenerative disease that increases the risk of serious complications. Known as "The Silent Killer," hypertension often has no symptoms, so diagnosis is usually made through blood pressure measurements of $\geq 140/90$ mmHg on more than one occasion. The elderly are at higher risk of developing hypertension due to hardening of the arteries (arteriosclerosis), which forces the heart to work harder to pump blood (Mahfuzah et al., 2023).

World Health Organization (WHO, 2019) data shows that around one billion people worldwide suffer from hypertension and this figure is expected to increase to 1.6 billion (29% of the global population) by 2025. Data from 2022 shows that 1 in 3 people worldwide have high blood pressure. Southeast Asia ranks third with a prevalence of 25% of the region's population (Kemenkes RI, 2022).

In Indonesia, the prevalence of hypertension in the elderly is quite high, at 45.9% in those aged 55–64, 57.6% in those aged 65–74, and increasing to 63.8% in those aged 75 and over (Ministry of Health of the Republic of Indonesia, 2022). Based on the 2022 Basic Health Research (Riskesdas), West Java Province ranked second with a hypertension prevalence of 44.1%. In Garut Regency, hypertension cases reached 861,321 in 2023 (BPS Garut, 2023). At the Griya Lansia (Elderly Home) in Garut Regency, hypertension was the most common disease, affecting 38 of 86 elderly people (approximately 45%) (Satpel Griya Lansia Garut, 2025).

Risk factors for hypertension can be divided into two categories: controllable and uncontrollable. Controllable factors include obesity, lack of physical activity, smoking, excessive caffeine consumption, a high-sodium diet, alcohol consumption, stress, and education and occupational status. Uncontrollable factors include age, gender, race, and family history. Untreated hypertension can lead to complications such as stroke, heart disease, chronic kidney failure, and retinal damage (Purwono et al., 2020).

Hypertension can be managed through pharmacological and non-pharmacological therapies. Pharmacological antihypertensive medications are generally taken for life. Non-compliance with medication can lead to blood pressure fluctuations and suboptimal disease control. Long-term use can also cause adverse side effects that affect certain organs. Therefore, non-pharmacological approaches, such as physical activity, are needed to reduce dependence on medication and help improve the quality of life of people with hypertension (Prastiani et al., 2023).

Regular physical activity such as aerobics, walking, swimming, yoga, and light strength training has been shown to reduce the prevalence of hypertension by up to 50%. One effective form of physical exercise for controlling blood pressure is isometric handgrip exercises, which involve gripping with a handheld device. This exercise involves contracting the muscles of the forearm and hand without moving the joints. Because it doesn't require special equipment or a lot of time, this exercise is considered practical, safe, and easy for seniors to perform (Zainudin, 2020).

Isometric handgrip exercises have various benefits, including improving hand strength, forearm muscle endurance, and wrist stability. They also improve muscle tone and coordination. If not performed regularly, blood pressure can remain high, increasing the risk of cardiovascular disease, reducing quality of life, and causing hand muscle weakness (Pratiwi, 2020).

Several studies have shown that isometric handgrip exercise can lower systolic and diastolic blood pressure by an average of 5–7 mmHg and increase muscle strength from a scale of 3 to 5. Choirillailly (2020) reported that this exercise is effective in lowering blood pressure. The effectiveness of the intervention increases when combined with medication adherence, lifestyle changes, and other complementary therapies. Siregar (2021) also found that routine isometric handgrip exercise therapy in the elderly can lower blood pressure and serve as a supportive therapy in addition to pharmacological treatment.

Based on the background description above, the author is interested in further exploring the application of nursing care for elderly patients with hypertension using isometric handgrip exercise intervention. Therefore, the author chose the title: "Analysis of Generic Nursing Care for Mrs. T with Hypertension Through the Application of Isometric Handgrip Exercise Therapy in the Bougenville Room of the Satpel Griya Lansia Garut."

Method

This study used a qualitative descriptive method with a case study approach to describe the application of nursing care for elderly patients with hypertension through isometric handgrip exercise therapy. The subject was selected using purposive sampling based on criteria including elderly with a medical diagnosis of hypertension, willingness to participate, and physical ability to perform isometric handgrip exercises. Data was collected through interviews, observation, physical examination, and documentation. The intervention was carried out for 5 consecutive days, with each session lasting 15 minutes. Data analysis was performed

descriptively to evaluate changes in blood pressure and muscle strength before and after the intervention.

The research instruments used included a nursing assessment format that included patient identification, medical history, physical examination, and supporting examinations. A vital signs observation sheet recorded blood pressure, pulse rate, respiration, and body temperature before and after the intervention. A nursing documentation sheet recorded diagnosis, intervention, implementation, and evaluation. A Standard Operating Procedure (SOP) for Isometric Handgrip Exercise served as a guide for implementing the intervention.

The research procedure was conducted following the stages of the nursing process which included: assessment through interviews, observation, and physical examination. The establishment of nursing diagnoses referred to the Indonesian Nursing Diagnosis Standards (SDKI); intervention planning was based on the Indonesian Nursing Intervention Standards (SIKI) with a focus on isometric handgrip exercises; implementation was carried out for 5 consecutive days with a time of + 15 minutes; and evaluation to assess changes in blood pressure and hand muscle strength.

Data analysis was carried out descriptively to describe the patient's condition before and after the intervention, then compared with previous research theories and findings as a form of evidence-based practice regarding isometric handgrip exercise.

Result and Discussion

The implementation of nursing care for Mrs. T, a 68-year-old hypertensive patient, showed significant improvements after 5 days of isometric handgrip exercise therapy. Blood pressure decreased from 170/97 mmHg to 154/80 mmHg, and muscle strength increased from scale 4 to 5. These findings are consistent with previous studies indicating that isometric handgrip exercises can reduce blood pressure by 5–7 mmHg and improve muscle strength. The mechanism is believed to involve increased nitric oxide release and reduced sympathetic nervous system activity, leading to vasodilation and improved blood flow. Additionally, the exercise contributed to better fine motor skills and reduced anxiety in the patient.

The procedure for implementing this isometric handgrip exercise includes a pre-interaction stage; namely preparing the equipment, introducing oneself and identifying the patient, explaining the procedure, and arranging a comfortable position for the patient. The interaction stage; greeting and saying the patient's name, explaining the purpose and procedure of the procedure, asking for readiness for consent and a time contract. The work stage; washing hands, positioning the patient sitting upright, measuring the patient's blood pressure and muscle strength, adjusting the handgrip weight to the patient's strength, asking the patient to relax, holding

the handgrip tool then pulling the handgrip until it touches both parts and holding for 45 seconds while inhaling slowly through the nose and exhaling slowly through the mouth, doing the handgrip 2x then resting for 15 seconds, repeating 5x, inviting the patient to drink water if they want, resting the patient for 30 minutes and measuring blood pressure and muscle strength again. The termination stage; recording the patient's identity and the actions taken, recording the patient's response, tidying up the equipment, saying goodbye to the patient, and washing hands (Sutrisno, 2022).

The results of this study indicate that regular isometric handgrip exercise can reduce systolic blood pressure by 16 mmHg and diastolic by 17 mmHg in 5 days, while simultaneously increasing hand muscle strength from a scale of 4 to 5. These findings align with research by Prastianni et al. (2023), which reported a 5-7 mmHg reduction in blood pressure and increased muscle strength in hypertensive patients.

The mechanism of blood pressure reduction through this exercise is thought to occur due to static contraction of the forearm muscles temporarily increasing peripheral resistance, followed by compensatory vasodilation after exercise. This is related to increased release of nitric oxide, an endogenous vasodilator, and adaptation of the autonomic nervous system, which reduces sympathetic activity, thereby reducing blood vessel tone (Zainudin, 2020).

This isometric handgrip exercise can cause muscle pressure on blood vessels, which will produce an ischemic stimulus. The ischemic stimulus induces increased brachial artery flow to reduce the direct effects of ischemia on the blood vessels. When the pressure is released, the flow in the forearm blood vessels increases due to dilation of the distal blood vessels, which will induce a shear stress stimulus in the brachial artery. The shear stress mechanism causes the release of endothelial-derived nitric oxide (NO), which is produced by endothelial cells as a blood vessel vasodilator. Some nitric oxide will also diffuse into the walls of arteries and veins (smooth muscle) and activate enzymes that will stimulate and trigger muscle relaxation, allowing blood vessels to dilate (increase blood vessel diameter), resulting in smoother blood flow and decreased blood pressure (Amaliyah, 2021).

Increased hand muscle strength contributes to improved fine and gross motor function, enhancing patients' ability to perform daily activities such as holding cutlery and carrying light objects. According to Siregar (2021), Isometric handgrip exercises can reduce the risk of falls in older adults by improving wrist stability and grip strength. In addition to the physical benefits, isometric handgrip exercises also have positive psychological effects. Patient anxiety is reduced, motivation to exercise increases, and patients become more active in group activities. This reflects the success of a holistic geriatric nursing approach that encompasses

biological, psychological, social, and spiritual aspects. Based on these results, isometric handgrip exercises can be recommended as an effective, safe, and easily implemented non-pharmacological intervention for older adults with hypertension in long-term care facilities.

Conclusion

Isometric handgrip exercise therapy is an effective non-pharmacological intervention for managing hypertension in the elderly. It not only helps lower blood pressure but also improves muscle strength and psychological well-being. This intervention is practical, safe, and easily applicable in long-term care facilities. Further quantitative studies are recommended to validate these findings and explore long-term benefits.

Acknowledgments

We would like to thank the respondents for their willingness to participate in this research. We also thank our colleagues who provided invaluable advice and support to refine this research. We also extend our gratitude to the Garut Elderly Care Unit and the Nursing Profession Study Program at Karsa Husada Garut Health College.

Author Contributions

The author maintains full transparency regarding potential conflicts of interest, confirming there are no financial or personal relationships that could influence the objectivity of this work.

Funding

This research received no external funding.

Conflicts of Interest

The author declares no conflict of interest.

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