

The Effectiveness of Progressive Muscle Relaxation (PMR) in Older Adults with Hypertension in RW 07, Rawasari Village

Neneng Kurwiyah¹, Meli Noveliasari¹, Syilfani Tri Handayu¹, Atiyah Nuru Sa'adah¹

¹Fakultas Ilmu Keperawatan, Universitas Muhammadiyah Jakarta, Jakarta Pusat, Indonesia

Article Info

Keywords :

Elderly, Hypertension, Pain,
Progressive Muscle Relaxation

Corresponding Author :

Neneng Kurwiyah

E-mail: nenengkurwiyah@umj.ac.id

ABSTRACT

Background & Objective: Hypertension is a common non-communicable disease among the elderly that can cause serious complications if blood pressure is poorly controlled. Management includes pharmacological therapy (antihypertensive drugs) and non-pharmacological therapy as a complement, such as lifestyle modification, dietary adjustment, physical activity, stress management, and complementary therapies like Progressive Muscle Relaxation (PMR). This study aimed to determine the effectiveness of PMR on blood pressure in elderly people with hypertension in RW 07, Rawasari Village. **Method:** Nursing care was provided to three elderly hypertensive patients using the nursing process: assessment, diagnosis, intervention, implementation, and evaluation. PMR was performed for 3 consecutive days according to the SOP at each elderly person's home. **Result:** On the first day, the average blood pressure decrease was 5 mmHg for both systolic and diastolic pressure. On the second day, the average decrease was 7.3 mmHg, and on the third day, it was 8.7 mmHg. The average decrease in the pain scale over three days was 1. These findings prove that PMR is effective in reducing blood pressure and pain in elderly individuals with hypertension. **Conclusion:** The application of Progressive Muscle Relaxation (PMR) in elderly hypertensive patients with pain problems is proven effective. This non-pharmacological therapy can be recommended as a nursing intervention in the management of hypertension in the elderly.

DOI: <https://doi.org/10.56359/igi.v5i3.1111>



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

Introduction

The elderly are individuals who have entered the final stage of the human life cycle, characterized by the age of 60 years and above. The World Health Organization (WHO) classifies the elderly into several groups: middle age (45–59 years), elderly (60–74 years), old (75–90 years), and very old (above 90 years) (World Health Organization, 2023). Multidimensional changes due to aging include four main domains: physical, psychological, social, and spiritual.

Physically, the aging process is characterized by decreased organ function, reduced muscle mass and strength, and decreased blood vessel elasticity, which increases vulnerability to degenerative diseases and impacts limitations in daily activities. From a psychological aspect, the elderly tend to experience changes in thinking patterns, emotional instability, and are more prone to feeling anxious or sad due to the loss of social roles, partners, or independence. Socially, the elderly often experience decreased participation in community activities, a narrowing circle of friends, and an increased risk of social isolation. Meanwhile, from a spiritual aspect, the elderly generally show an increased need to seek meaning in life and draw closer to God, which plays an important role in helping the elderly face physical, psychological, and social changes (Octavia et al., 2022).

Physical changes in the elderly, particularly in the cardiovascular system, cause an increased risk of non-communicable diseases, one of which is hypertension. Hypertension is one of the cardiovascular diseases commonly experienced by the community and is a major risk factor for heart disease, stroke, kidney failure, and diabetes mellitus (Sari et al., 2025).

Globally, the World Health Organization (WHO) estimates that approximately 1.28 billion adults aged 30–79 years worldwide suffer from hypertension. In the Southeast Asian region, the age-standardized prevalence of hypertension in the 30–79 age group reaches 32.4%. According to Riskesdas 2018, the prevalence of hypertension increases with age. In the 55–64 age group, the prevalence of hypertension reaches 55.2%, increasing to 63.2% at age 65–74, and is highest at age ≥75, namely 69.5%.

The management of hypertension in the elderly includes pharmacological and non-pharmacological therapy (Shofiana & Mulyaningsih, 2024). Pharmacological therapy is carried out by administering antihypertensive drugs according to the patient's condition. This pharmacological management of hypertension aims to prevent death and complications. Meanwhile, non-pharmacological management includes efforts to lose weight, limit alcohol and sodium consumption, exercise regularly, and apply relaxation techniques. Several complementary therapies that can be applied to the elderly include progressive muscle relaxation, music therapy, aerobic exercise, yoga, and cupping therapy, which are proven to help reduce stress and improve blood circulation (Wahyuningsih & Wulandari, 2023).

Stress in elderly people with hypertension is influenced by various physical and psychosocial factors. Therefore, stress management has an important role in the management of hypertension, considering that stress can trigger increased sympathetic nerve activity, which impacts increased blood pressure. Stress management techniques are developed to prevent, reduce, and overcome stress, with

a focus on implementing adaptive strategies so that maladaptive behaviors can be minimized (Keliat & Hargiana, 2020).

One non-pharmacological intervention that can be applied in nursing care is Progressive Muscle Relaxation (PMR). PMR is a systematic relaxation technique by tensing and relaxing skeletal muscle groups gradually and sequentially and has been proven capable of reducing muscle tension and reducing stress (Aminiyah et al., 2022).

Several studies have shown that Progressive Muscle Relaxation (PMR) is effective in lowering blood pressure in hypertensive patients, as in the study conducted by Aminiyah et al. (2022). In this study, PMR was performed for 3 days, once daily, with blood pressure measurements taken before and after the implementation of progressive muscle relaxation (PMR). Nur Khasanah et al. (2025) also explained in their study that progressive muscle relaxation was given twice a day for 3 consecutive days and also showed a decrease in blood pressure after the intervention.

Furthermore, Shofiana & Mulyaningsih (2024) in their study performed PMR twice a day for 3 days with a duration of 20 minutes. Blood pressure measurements were taken before and after the relaxation. In the study by Margiyati and Setiawan (2023), PMR was given once a day for 6 days, with a duration of 20–30 minutes. Blood pressure was checked 10 minutes before and after the implementation of progressive muscle relaxation. Although there are variations in the frequency and duration of implementation, the study by Pratiwi & Soesanto (2023) serves as the Evidence-Based Practice reference in this study, with PMR performed for 10–20 minutes, once a day for 3 days, and blood pressure measurement 5 minutes before and after the intervention accompanied by evaluation of the client's subjective response.

In the RW 07 area of Rawasari Village, there are 208 elderly people, with 40 experiencing hypertension and 85 actively participating in the Elderly Posyandu. Most elderly people with hypertension complain of headaches, neck pain, dizziness, easy fatigue, and worry about long-term medication consumption. Observation results show that the elderly's understanding of the signs and symptoms of hypertension is still limited, blood pressure checks have not been routinely performed at home, and there are psychological complaints such as anxiety and easy tension due to health conditions and decreased independence.

Based on these conditions, the routine application of Progressive Muscle Relaxation has the potential to help lower blood pressure, reduce pain, and improve the comfort and quality of life of elderly people with hypertension. Therefore, the author is interested in composing the Final Scientific Paper of the Nurse (KIAN) "Application of Progressive Muscle Relaxation (PMR) Technique in Nursing Care for the Elderly with Hypertension in RW 07 Rawasari Village."

Objective

This case study was conducted to determine the effectiveness of Progressive Muscle Relaxation (PMR) in elderly people with hypertension in RW 07, Rawasari Village.

Method

This case study was conducted using a nursing care approach that includes assessment, diagnosis, intervention, implementation, and evaluation. The focus of the case was on 3 elderly clients, Mr. R, Mrs. K, and Mr. L, who had hypertension and were controlled (taking medication). Data were collected using elderly and family assessments, blood pressure measurements, and pain scale (NRS) measurements conducted at each client's home in the RW 07 area of Rawasari Village. The intervention given to the 3 elderly clients was the application of PMR (progressive muscle relaxation), based on the study by Pratiwi & Soesanto (2023) as Evidence-Based Practice. The intervention was carried out for 3 consecutive days with a duration of 10–20 minutes, once a day. Evaluation was conducted through blood pressure and pain scale measurements 5 minutes before and after the implementation of PMR, as well as assessment of the client's subjective response to comprehensively assess the effectiveness of the therapy.

Data analysis was presented descriptively by displaying the progression of blood pressure and pain scale (NRS) measurement results before and after the intervention for 3 consecutive days at the same time for each client.

Results

This case study was conducted on three elderly people with a medical diagnosis of hypertension in the RW 07 area of Rawasari Village. All three clients had a history of hypertension for more than nine years and were still undergoing routine pharmacological therapy.

TABLE 1. Characteristics of Elderly People with Hypertension in Rawasari Village

Client Characteristics	Initial Name		
	Mr. H	Mrs. K	Mr. L
Age	69 Years	63 Years	81 Years
Last Education	Senior High School	Senior High School	Junior High School
Address	Rawasari Village	Rawasari Village	Rawasari Village
Gender	Male	Female	Male
Past Medical History	Client stated he had suffered from hypertension since 10 years ago; client stated he often consumed salty food and forgot to take hypertension medication, and smoked 1 pack/day.	Client stated she had suffered from hypertension since 10 years ago; client stated she often consumed salty food, junk food, and fried food and rarely exercised.	Client stated he had suffered from hypertension since 9 years ago; client stated he often consumed salty food.
Family Medical History	Regarding the family medical history of Mr. H, he stated that his father had a history of hypertension during his lifetime and died of stroke. Meanwhile, Mrs. D's mother had the same history, namely hypertension and stroke.	The family health history of Mrs. K shows the presence of chronic diseases. Mrs. K's mother had a history of hypertension and diabetes and died due to complications of these diseases, while her father had no medical history. Of Mrs. K's four siblings, two suffer from diabetes and two others have hypertension. On her husband's side, her father-in-	Mr. L's family has no history of diseases related to hypertension or stroke. Mr. L has no family members who suffered from such medical history.

Client Characteristics	Initial Name		
	Mr. H	Mrs. K	Mr. L
		law died of heart disease, while her mother-in-law had no medical history. Mrs. K's husband died in 2025 due to heart disease and lung spots, with a history of uncontrolled hypertension and heavy smoking habits.	
Medication Taken	Amlodipine 5 mg	Amlodipine 5 mg and Candesartan 16 mg	Amlodipine 5 mg
Body Mass Index (BMI)	22.9 (Normal)	28.3 (Obese)	18.8 (Normal)
Chief Complaint	Pain in the back of the head accompanied by stiffness in the nape of the neck	Pain in the back of the head accompanied by stiffness in the nape of the neck	Pain in the back of the head accompanied by stiffness in the nape of the neck
Pain Scale (NRS)	5 (Moderate)	5 (Moderate)	5 (Moderate)
Other Disorders	Sleep disturbance	Sleep disturbance and anxiety	Sleep disturbance, anxiety, risk of falling

Table 1 shows that the three elderly people with hypertension in Rawasari Village were in the age range of 63–81 years, consisting of two males and one female, with an educational level predominantly of senior high school graduates. All three clients had a long history of hypertension (approximately 9–10 years) with various risk factors, such as the habit of consuming high-salt food and junk food, lack of physical activity, and smoking. Some clients also had a family history of hypertension and chronic diseases. The therapy used was amlodipine, with one client receiving an additional candesartan, and nutritional status varying from normal to obese. All three clients complained of the same symptoms, namely pain in the back of the head accompanied by stiffness in the nape of the neck with a moderate pain scale (5), sleep disturbance, and anxiety, and some clients had a risk of falling. These findings indicate that the condition of elderly people with hypertension is multifactorial, with similarities in clinical symptoms but differences in risk factors and individual conditions.

TABLE 2. The Effect of Progressive Muscle Relaxation (PMR) on Blood Pressure Reduction in Elderly People with Hypertension

Client	Blood Pressure	Day 1		Day 2		Day 3	
		Before	After	Before	After	Before	After
Client 1 (Tn. H)	Systolic	160	159	158	154	160	159
	Diastolic	85	85	81	86	86	85
Client 2 (Ny. K)	Systolic	140	137	142	134	142	134
	Diastolic	77	82	73	82	73	82
Client 3 (Tn. L)	Systolic	146	135	146	145	163	146
	Diastolic	93	92	96	95	97	97

Table 2 shows that progressive muscle relaxation therapy for lowering blood pressure in the three elderly hypertensive patients over three days resulted in varying changes among the individuals. In Client 1 (Mr. H), systolic blood pressure showed a downward trend after the PMR intervention, albeit to a small extent. On the first day, there was a decrease from 160 mmHg to 159 mmHg, and on the second day, from 158 mmHg to 154 mmHg. Meanwhile, on the third day, blood pressure returned relatively to its initial value, from 160 mmHg to 159 mmHg. For diastolic blood pressure, there were no significant changes. This indicates that ROP provides a relaxing effect that can help lower systolic blood pressure but has not yet had a significant impact on diastolic blood pressure. Meanwhile, in clients (Mrs. K and Mr. L), the response to the ROP intervention appeared quite good, particularly regarding systolic blood pressure. This indicates that ROP is capable of producing a relaxation effect that results in a significant reduction in systolic blood pressure; thus, it can be concluded that the intervention's effect is more pronounced on systolic blood pressure than on diastolic blood pressure.

TABLE 3. The Effect of Progressive Muscle Relaxation on Pain Scale Reduction in Elderly Hypertensive Patients

Client	Day 1		Day 2		Day 3	
	Before	After	Before	After	Before	After
Client 1 (Tn. H)	7	6	5	4	4	3
Client 2 (Ny. K)	6	5	5	4	4	3
Client 3 (Tn. L)	6	5	6	5	4	3

Table 3 shows that for Client 1 (Mr. H), the pain scale decreased gradually from 7→6 (Day 1), 5→4 (Day 2), and 4→3 (Day 3). This indicates that the ROP intervention provided a relaxation effect that was sufficiently effective in gradually reducing pain perception. For Client 2 (Ms. K), there was a decrease from 6 to 5 (Day 1), 5 to 4 (Day 2), and 4 to 3 (Day 3), indicating a good response to the intervention provided. Client 3 (Mr. L) showed a decrease in pain scores from 6→5 (Day 1), 6→5 (Day 2), and 4→3 (Day 3). Although the decrease on the second day was slower, an overall reduction in pain was still evident following the intervention.

Discussion

1) Blood Pressure Before Progressive Muscle Relaxation (PMR) in Elderly Patients with Hypertension

The majority of these three elderly individuals, before being given the progressive muscle relaxation (PMR) intervention, had blood pressure above the normal limit or in an uncontrolled condition. This situation commonly occurs in the elderly age group due to the aging process that affects the structure and function of the cardiovascular system. As age increases, there is a decrease in the elasticity of arterial walls due to atherosclerosis and blood vessel thickening, thereby increasing arterial stiffness and total peripheral resistance, which impacts the increase in systolic blood pressure in the elderly (Perki, 2025).

Blood pressure in the elderly is also fluctuating and influenced by various factors, such as physical activity, emotional conditions or lack of sleep, and dietary patterns. Psychological factors, particularly stress and anxiety, play a role in increasing blood pressure through the activation of the sympathetic nervous system, which stimulates the secretion of catecholamine hormones such as adrenaline and noradrenaline. The increase in these hormones causes vasoconstriction of blood vessels and an increase in heart rate, which ultimately contributes to the rise in blood pressure (Unger et al., 2020). This condition is often unrecognized by the elderly, so blood pressure remains high without optimal control.

In addition to physiological and psychological factors, lifestyle also plays a significant role in influencing blood pressure. Dietary patterns can also be one of the factors of hypertension; consuming too much food with high salt and fat content can increase cholesterol levels in the blood and trigger the formation of plaque on blood vessel walls, thereby obstructing blood flow. In addition, lack of physical activity can also trigger hypertension. When the body rarely moves, organ function, blood flow, and oxygen supply decrease, thereby worsening the condition because it can reduce heart fitness and increase the risk of obesity, which contributes to hypertension. In the elderly, mobility limitations often cause low physical activity, thereby aggravating the condition of unstable blood pressure (Azizah et al., 2021). Furthermore, adherence to treatment is an important aspect in hypertension control. Elderly people who do not routinely take antihypertensive medication or do not follow the advice of health workers tend to have uncontrolled blood pressure, thereby increasing the risk of complications such as stroke and heart disease.

2) Blood Pressure After Progressive Muscle Relaxation (PMR) in Elderly People with Hypertension

Based on the majority of the three elderly people with hypertension who were given the progressive muscle relaxation (PMR) intervention, there was a decrease in blood pressure after it was performed routinely for 3 days. This finding indicates that PMR is effective as a non-pharmacological therapy in helping to control blood pressure in the elderly. Progressive muscle relaxation is carried out through the process of tensing and relaxing muscle groups systematically, which produces a whole-body relaxation effect and contributes to the improvement of cardiovascular function.

Physiologically, the progressive muscle relaxation technique works by reducing the activity of the sympathetic nervous system and increasing the activity of the parasympathetic nervous system. A decrease in sympathetic activity will reduce heart rate and peripheral pressure, while an increase in parasympathetic activity triggers vasodilation of blood vessels, so that both systolic and diastolic blood pressure can decrease (Sari et al., 2025). In addition, the relaxation process also reduces muscle tension and inhibits the production of stress hormones such as adrenaline and cortisol, which play a role in increasing blood pressure (Meyla Putri et al., 2023).

This finding is in line with Wulandari et al. (2023), who stated that relaxation exercises performed routinely can improve the body's ability to control stress responses and maintain the balance of the cardiovascular system. Besides providing physiological effects, progressive muscle relaxation also affects the

psychological aspects of the elderly. This technique is proven capable of reducing pain levels and can also improve sleep quality and the overall comfort of the elderly.

3) The Effect of Progressive Muscle Relaxation on Pain Scale Reduction in Elderly People with Hypertension

The results showed that after being given the Progressive Muscle Relaxation (PMR) intervention for three consecutive days, there was a decrease in pain intensity in all three elderly people with hypertension. The decrease occurred gradually from day to day, indicating a positive response to the non-pharmacological therapy provided.

Pain in elderly people with hypertension is influenced by various factors, including physiological conditions such as increased blood pressure, muscle tension, and stress. Complaints of pain in the head and nape of the neck generally occur due to increased blood vessel resistance accompanied by continuous muscle tension. Progressive Muscle Relaxation is proven effective in reducing pain because it is able to suppress sympathetic nerve activity and increase parasympathetic nerve activity, so that the body becomes more relaxed, muscle tension decreases, blood flow becomes smoother, and pain perception decreases.

Based on the study by Aminiya et al. (2022), it was stated that the Progressive Muscle Relaxation (PMR) technique is effective in reducing muscle tension and improving the body's relaxation response. In addition, the study by Pratiwi and Soesanto (2023) also showed that the application of progressive muscle relaxation in elderly people with hypertension can improve comfort and help reduce physical complaints related to muscle tension, including pain.

Based on the analysis results, the decrease in pain scale in the three elderly individuals shows that Progressive Muscle Relaxation (PMR) not only provides a physical impact in the form of reduced muscle tension but also provides a psychological effect in the form of a feeling of calm and comfort. This is important considering that pain in elderly people with hypertension is multifactorial, influenced by physiological, psychological aspects, and responses to stress.

In addition, there are variations in response between clients in pain reduction. This difference is influenced by several factors, such as the level of participation during therapy, the ability to follow instructions, and family support. Clients who are more cooperative and receive good family support tend to experience more optimal pain reduction compared to clients who are less active in communicating.

4) Analysis of the Effect of Progressive Muscle Relaxation (PMR) on Blood Pressure and Pain Scale Reduction in Elderly People with Hypertension

The results showed that the administration of the Progressive Muscle Relaxation (PMR) intervention for three consecutive days was able to reduce blood pressure and pain levels in three elderly people with hypertension. The average blood pressure decrease was seen to increase gradually, namely 5 mmHg on the first day, 7.3 mmHg on the second day, and reaching 8.7 mmHg on the third day. In addition, the pain scale also decreased progressively during the intervention period. This finding indicates that PMR provides a positive impact on the physical condition and comfort of the elderly.

The decrease in blood pressure and pain can be explained through the working mechanism of progressive muscle relaxation, which affects the autonomic nervous system. This technique plays a role in suppressing sympathetic nerve activity and increasing parasympathetic nerve activity, thereby causing a decrease in heart rate, dilation of blood vessels (vasodilation), and reduced peripheral resistance. This condition contributes to a decrease in blood pressure. In addition, the relaxation effect also helps reduce muscle tension and stimulates the release of endorphin hormones, which function to reduce pain perception.

These results are in line with the study by Aminiyah et al. (2022), which stated that progressive muscle relaxation is effective in lowering blood pressure in elderly people with hypertension through the mechanism of nervous system relaxation. The study by Pratiwi and Soesanto (2023) also showed that the continuous administration of PMR can lower blood pressure while improving comfort in hypertensive patients. In addition, the findings of Shofiana and Mulyaningsih (2024) strengthen these results by stating that progressive muscle relaxation therapy has a significant effect on blood pressure reduction when performed routinely.

Based on the analysis, the decrease in blood pressure and pain scale in the elderly shows that Progressive Muscle Relaxation provides comprehensive benefits, both from physiological and psychological aspects. Physiologically, PMR helps control blood pressure through a decrease in sympathetic nerve activity. Meanwhile, from a psychological perspective, PMR provides a calming effect that can reduce stress and anxiety, which are known as triggering factors for increased blood pressure and pain.

In addition, the success of the intervention is also influenced by individual factors, such as the level of adherence in following the therapy, the ability to understand instructions, and family support during the implementation of the intervention. Elderly people who are cooperative and receive good family support tend to show more optimal results compared to elderly people who have limitations in communication or social support.

Thus, it can be concluded that Progressive Muscle Relaxation (PMR) has a significant effect in reducing blood pressure and pain scale in elderly people with hypertension. This therapy can be recommended as one of the effective, safe, and easy-to-apply non-pharmacological interventions in nursing care practice to improve the quality of life of the elderly.

Conclusion

The application of Progressive Muscle Relaxation (PMR) in elderly people with hypertension in RW 07, Rawasari Village, for three days showed a decrease in systolic and diastolic blood pressure in the three clients, although the results of the decrease were not yet significant and not fully consistent. This condition is influenced by various factors, both internal and external. Internal factors include advanced age, accompanying physical conditions such as musculoskeletal pain, suboptimal sleep quality, and adherence to antihypertensive medication consumption. Meanwhile, external factors include family support, involvement of the surrounding environment, and the daily activity patterns of the elderly.

Acknowledgement

Acknowledgments are extended to various parties who have contributed to the preparation of this journal, including the academic institution, supervising lecturers, field supervisors, respondents, and colleagues who have provided valuable support and input.

References

- Akbar, F., Nur, H. & Humaerah, U. I., 2020. Karakteristik Hipertensi pada Lanjut Usia di Desa Buku. *Jurnal Wawasan Kesehatan*, Volume Vol 5 no 2, pp. 35-42.
- Aminiyah, R., Ariviana, I. S., Dewi, E. W., Fauziah, N. H., Kurniawan, M. A., Susumaningrum, L. A., & Kurdi, F. (2022). Efektivitas Pemberian Teknik Relaksasi Otot Progresif Terhadap Tekanan Darah pada Lansia di UPT PSTW Jember. *Jurnal Keperawatan Florence Nightingale*, 5(2), 43–49.
- Anatasta, L., Ainiyah, N., Hatmanti, N. M., & Maimunah, S. (2023). Hubungan Obesitas dengan Kualitas Hidup Lansia Hipertensi Diwilayah Puskesmas Wonokromo Surabaya. *Sehat Rakyat: Jurnal Kesehatan Masyarakat*, 2(3), 380-387.
- Andini, S. P., & Marlina, L. (2024). Pengendalian Hipertensi Dengan Tehnik Relaksasi Dan Otot Progresif Di Satuan Pelayanan Griya Lansia Karawang. *Jurnal Riset Kesehatan Modern*, 6(2).
- Asharani, P. V., Lai, D., Koh, J., & Subramaniam, M. (2022). Purpose in Life in Older Adults: A Systematic Review on Conceptualization, Measures, and Determinants. *International Journal of Environmental Research and Public Health*, 19(10).
- Ayu Prabasari, N., Sukmawati, E., Ardhanawati, S., & Keperawatan Universitas Katolik Widya Mandala Surabaya, F. (2024). Gambaran Terjadinya Hipertensi Pada Lanjut Usia Di Komunitas (Description Of Hypertension Elderly In The Community). *Jurnal Ners LENTERA*, 12(1).
- Azizah, C. O., Hasanah, U., Pakarti, A. T., Dharma, A. K., & Metro, W. (2021). Penerapan Teknik Relaksasi Otot Progresif Terhadap Tekanan Darah Pasien Hipertensi. *Jurnal Cendikia Muda*, 1(4).
- Bagus Tri Saputra, P., Dyah Lamara, A., Eko Saputra, M., Achmad Maulana, R., Eko Hermawati, I., Anugrawan Achmad, H., Ageng Prastowo, R., & Her Oktaviono, Y. (2023). *Diagnosis dan Terapi Non-farmakologis Hipertensi* (Vol. 50, Issue 6).
- Briliansyah, M. R., & Safitri, E. D. (2022). *Aktivitas Fisik Dan Olahraga Bagi Penderita Hipertensi Physical Activities And Sports For Hypertension Patients*.
- Byba Suhita, M., Nurdina, S., Suprpto Imam, S., & Nurwijayanti. (2021). *Relaksasi Progresif Terhadap Perubahan Tekanan Darah dan Kualitas Tidur Pada Lansia Penderita Hipertensi*. STRADA PRESS.
- Carey, R. M., Muntner, P., Bosworth, H. B., & Whelton, P. K. (2022). *Prevention and control of hypertension: JACC health promotion series*. *Journal of the American College of Cardiology*, 79(17), 1754–1765.

- Cipto Utomo, A., & Kharin Herbawani, C. (2022). Kajian Sistematis Faktor-Faktor Risiko Hipertensi pada Lansia. *MEDIA KESEHATAN MASYARAKAT INDONESIA*.
- Dewi Astuti, A., Oktodia Basuki, H., & Priyanto, S. (2024). *KEPERAWATAN GERONTIK*.
- Dewi Cahyaningrum, E., Rochmah Ida Ayu, Trisno Putri, N., & Dewi, P. (2022). Hubungan Usia dan Tingkat Pendidikan dengan Peningkatan Tekanan Darah Lansia. *Seminar Nasional Penelitian Dan Pengabdian Masyarakat Purwokerto*, 1–7.
- Ekaputri, M., Susanto, G., Paryono, Prima Dwi, Aisyah, Farhan, M., Naryati, Sulistia, & Yuliana, M. (2024). Proses Keperawatan Konsep, Implementasi, Dan Evaluasi (T. Media, Ed.). TAHTA MEDIA GROUP.
- Farid Husaini, & Fonna, T. R. (2024). Hipertensi dan komplikasi yang menyertai hipertensi. *Jurnal Medika Nusantara*, 2(3), 135–147.
- Ferdisa, R. J., & Ernawati, E. (2021). Penurunan Nyeri Kepala Pada Pasien Hipertensi Menggunakan Terapi Relaksasi Otot Progresif. *Ners Muda*, 2(2), 47.
- Gulati, M., Moore, M. M., & Cibotti-Sun, M. (2025). 2025 High Blood Pressure Guideline-at-a-Glance. *Journal of the American College of Cardiology*, 86(18), 1560–1566.
- Husaini, F., & Fonna, T. R. (2024). Hipertensi dan komplikasi yang menyertai hipertensi. *Jurnal Medika Nusantara*, 2(3), 135–147.
- Imelda, Sjaaf, F., & PAF T, P. (2020). *Faktor- Faktor yang Berhubungan dengan Kejadian Hipertensi pada Lansia di Puskesmas Air Dingin Lubuk Minturun*.
- Iqbal, A. M., & Jamal, S. F. (2025). Essential Hypertension. *StatPearls*.
- Ismiriyam, F. V., & Waluyo, U. N. (2025). Pengaruh Sleep Hygiene terhadap Kualitas Tidur Lansia dengan Insomnia. 7(1), 155–163.
- JUMU, LA, and Isak Juruan Hans Tukayo. "Efektivitas Kesiapan Sikap Perawatan Diri (Self Care) Terhadap Pencegahan Komplikasi Hipertensi Pada Lansia Di Kampung Mamoribo Distrik Biak Barat Papua." Book Chapter of Hypertension (2024).
- Keliat, B. A., & Hargiana, G. (Eds.) (2020). *Modul Manajemen Stres*. Fakultas Ilmu Keperawatan Universitas Indonesia.
- Kemenkes RI. Riset Kesehatan Dasar (Riskesdas) 2018. Jakarta: Kemenkes RI; 2018.
- Kurniawan, D., Sahar, J., Rekawati, E., Ayu, R., Sartika, D., Keperawatan, P. D., Keperawatan, F. I., & Indonesia, U. (2025). Intervensi Pencegahan Jatuh Pada Lansia Berbasis Keperawatan Keluarga : Tinjauan Sistematis. 9, 2539–2545.
- Kusuma, N. D., & Ariwibowo, D. D. (2025). *Gambaran komplikasi hipertensi di RSUD Cengkareng tahun 2021–2022*. *Jurnal Sehat Indonesia (JUSINDO)*, 7(1), 370–381.

- Ladyani, F., Febriyani, A., Prasetya, T., & Berliana, I. (2021). Hubungan antara Olahraga dan Stres dengan Tingkat Hipertensi Pada Lansia. *Jurnal Ilmiah Kesehatan Sandi Husada*, 10(1), 82–87.
- Laila, A. Z., Asmarani, D., Sumardi, E. P. N., Ridwan, H., Nur'aeni, I., Boys, M. D. V., & Lestari, R. P. (2025). Tinjauan literatur: Ketidakpatuhan minum obat pada pasien hipertensi sebuah analisis dan rekomendasi: Literature review: Medication noncompliance in hypertensive patients an analysis and recommendations. *Jurnal Ilmiah Keperawatan (Scientific Journal of Nursing)*, 11(1), 71-79.
- Margiyati, & Setiawan, A. (2023). Penerapan Terapi Relaksasi Otot Progresif Untuk Menurunkan Tekanan Darah Pada Lansia Dengan Hipertensi Di Keluarga Wilayah Binaan Puskesmas Pegandan Semarang. *JURNAL FISIOTERAPI DAN ILMU KESEHATAN SISTHANA*, 5.
- Melda Azizah, Siska Dhewi, & Ahmad Zacky Anwary. (2023). Faktor-Faktor yang Mempengaruhi Kejadian Hipertensi pada Lansia di Wilayah Kerja Puskesmas Kubur Jawa Kabupaten Hulu Sungai Tengah. *Media Publikasi Promosi Kesehatan Indonesia (MPPKI)*, 6(2), 314–320
- Meyla Putri, L., Merke Mamesah, M., Iswati, & Sasti Sulistyana, C. (2023). *Faktor Risiko Hipertensi Pada Masyarakat Usia Dewasa & Lansia Di Tambaksari Surabaya*.
- Mirdawati, E., Hidayati, H., & Atika, S. (2024). Asuhan keperawatan keluarga pada Ny. M dengan hipertensi. *Indonesian Journal of Health Science*, 4(1), 40–46.
- Nasution, F., Rambe, I. M., Ramadani, S. V., Tanjung, N. A., Anjani, N., & Fanani, W. A. (2025). Batasan Usia Dewasa Akhir (Lansia) dan Keadaan Penduduk Lansia di Indonesia. In *Edu Society: Jurnal Pendidikan, Ilmu Sosial, dan Pengabdian Kepada Masyarakat* (Vol. 4).
- Nidzar, A., S1, F., Stikes, K., & Garut, K. H. (2022). Gambaran Kecemasan Lansia Yang Menderita Hipertensi Di Wilayah Kerja Puskesmas Sukaraja. 3(3).
- Ningtyas, V. M. (2024). Hubungan kualitas tidur terhadap kejadian hipertensi pada lansia. *Jurnal SAGO Gizi dan Kesehatan*, 5(2), 288-295.
- Nur Khasanah, A., Nur Imamah, I., & Sugito. (2025). Penerapan Terapi Relaksasi Otot Progresif Terhadap Tekanan Darah Pada Lansia Hipertensi Di RSUD Kartini Karangayar. *IJOH: Indonesian Journal of Public Health*.
- Pannya Sakti, I., & Luhung, M. (2025). *Buku Ajar Penatalaksanaan Lansia Hipertensi*.
- Perhimpunan Dokter Spesialis Kardiovaskular Indonesia (PERKI). (2025). *Pedoman Tatalaksana Hipertensi pada Penyakit Kardiovaskular*.
- Prabasari, N. A., Sukmawati, E., & Ardhanawati, S. (2024). Gambaran Terjadinya Hipertensi Pada Lanjut Usia Di Komunitas. *Jurnal Ners LENTERA*, 12(1), 10-18.
- Pratiwi, L. M. D., & Soesanto, E. (2023). Efektivitas Relaksasi Otot Progresif dalam Menurunkan Tekanan Darah pada Pasien Hipertensi di RW 04 Kelurahan Gemah Kota Semarang. *Ners Muda*, 4(2), 219.

- Rachman, A., Machelia Champaga Nursery, S., & Permata Hati, I. (2023). Hubungan Kualitas Tidur Dengan Tekanan Darah. *Jurnal Keperawatan*, 15.
- Rasdini, I. A., Wedri, N. M., Rahayu, V. E. S., & Putrayasa, I. (2021). Pengaruh Terapi Komplementer Massage Punggung Terhadap Tekanan Darah pada Lansia dengan Hipertensi. *Jurnal Smart Keperawatan*, 8(1), 40.
- Saimi, Dr., & Sartika, H. A. (2025). *Cegah Hipertensi: Kenali Pencetus dan Temukan Solusi* (1st ed.). Penerbit Adab.
- Sari, R. P., Hermawati, & Widodo, P. (2025). Penerapan Hydrotheraphy Rendam Kaki Air Hangat Pada Tekanan Darah Lansia Dengan Hipertensi Di Kelurahan Purwodiningratan Kecamatan Jebres Surakarta. *IJOH: Indonesian Journal of Public Health*.
- Shofiana, S., & Mulyaningsih. (2024). Penerapan Terapi Relaksasi Otot Progresif Terhadap Penurunan Tekanan Darah Pada Penderita Hipertensi Di Desa Joyotakan. *IJOH: Indonesian Journal of Public Health*.
- Situmorang, F. D., Sri, I., & Wulandari, M. (2020). Hubungan Tingkat Stres Dengan Kejadian Hipertensi Pada Anggota Prolanis Di Wilayah Kerja Puskesmas Parongpong. 2(1).
- Sumarsih, G. (2023). *Asuhan Keperawatan Lansia Dengan Gangguan Tidur* (D. Larasati, Ed.; 1st ed.). CV. Mitra Edukasi Negeri.
- Susilo, A. F., Mustain, M., Haryani, S., & Minardo, J. (2024). Studi Kasus Pengelolaan Gangguan Pola Tidur Pada Pasien Hipertensi Dengan Pijat Refleksi Kaki. *JURNAL KEPERAWATAN MUHAMMADIYAH BENGKULU*, 12(2). <https://doi.org/10.36085/jkmb.v12i2.6677>
- Suwignjo, P., Nurhaeni Asmara, L., Saputra, A., & Khasanah, U. (2022). Gambaran Kelengkapan Dokumentasi Asuhan Keperawatan Di Instalasi Rawat Inap RSUD Kota Bandung. *Jurnal Keperawatan BSI*, 10(2).
- Thompson, H. S., Mancia, G., & Williams, B. (2023). Laboratory medicine in arterial hypertension. *Journal of Hypertension*, 41(4), 567–575.
- Trilestari, Y., & Shifa, N. A. (2025). Efektivitas Progressive Muscle Relaxation Terhadap Penurunan Tingkat Kecemasan Pada Pasien Hipertensi Di Ruang Kiwi Rsud Cengkareng Tahun 2024 *Effectiveness Of Progressive Muscle Relaxation On Reducing Anxiety Levels In Hypertension Patients In The Kiwi Room Of Cengkareng Regional Hospital In 2024*. 000, 3109–3118
- Unger, T., Borghi, C., Charchar, F., Khan, N. A., Poulter, N. R., Prabhakaran, D., Schutte, A. E. (2020). 2020 International Society of Hypertension global hypertension practice guidelines. *Hypertension*, 75(6), 1334–1357.
- Wahyuningsih, S. D. E., & Wulandari, R. (2023). Penerapan Terapi Relaksasi Otot Progresif Terhadap Tekanan Darah Pada Lansia Dengan Hipertensi. *Jurnal Anestesi: Jurnal Ilmu Kesehatan Dan Kedokteran*, 1(4), 202–215.

- Wicaksono, R., & Lestari, P. (2024). Dukungan Keluarga dengan Self-Management pada Pasien Hipertensi: Family Support with Self-Management in Hypertensive Patients. *Journal of Holistics and Health Sciences*, 6(1), 1-9.
- Wijaya, E., & Nurhidayati, T. (2020). Penerapan Terapi Relaksasi Otot Progresif Dalam Menurunkan Skala Nyeri Sendi Lansia. *Ners Muda*, 1(2), 88. <https://doi.org/10.26714/nm.v1i2.5643>
- Williams, B., Mancia, G., Spiering, W., et al. (2023). 2023 ESC/ESH guidelines for the management of arterial hypertension. *European Heart Journal*, 44(17), 1529–1614.
- Whelton, P. K., Carey, R. M., Aronow, W. S., Casey, D. E., Collins, K. J., Dennison Himmelfarb, C., ... Wright, J. T. (2022). 2022 guideline for the prevention, detection, evaluation, and management of high blood pressure in adults. *Hypertension*, 79(6), e1–e104.
- Whelton, P. K., Carey, R. M., Aronow, W. S., et al. (2021). 2021 guideline for the prevention, detection, evaluation, and management of high blood pressure in adults. *Hypertension*, 77(4), e58–e90.
- World Health Organization. (2023). *Guideline for the pharmacological treatment of hypertension in adults*. WHO Press.
- WHO, W. H. O. (2023). Hypertension. March. <https://www.who.int/news-room/fact-sheets/detail/hypertension>.
- World Health Organization. 2022. "Ageing and Health."
- Yang, F.-F., Kejadian, M., Pada, H., Di, L., Kerja, W., Kubur, P., Kabupaten, J., & Tengah, H. S. (2023). *The Indonesian Journal of Health Promotion MPPKI Media Publikasi Promosi Kesehatan Indonesia*. 6(2).
- Zuhda Laila, A., Asmarani, D., Putri Nurhaliza Sumardi, E., Ridwan, H., Nur, I., Della Vega Boys, M., Agung Pangistu, M., Naufal Lukmanul Hakim, M., Sholahuddin Anshori, M., Rahidah Hana Rifdah, N., Sopiah, P., & Putri Lestari, R. (2025). Literature Review: Medication Noncompliance in Hypertensive Patients: Analysis and Recommendations. *Jurnal Ilmiah Keperawatan*.