



Progressive Muscle Relaxation to Reduce Chronic Pain in Elderly with Hypertension: A Case Study

Moch. Azzam Miftahurroziqin^{1*}, Latifa Aini Susumaningrum², Fahrudin Kurdi², Achmad Ali Basri⁴

- 1 Faculty of Nursing, University of Jember, Jember, Indonesia
- 2 Department of Community Health Nursing and Gerontic Nursing, Faculty of Nursing, University of Jember, Indonesia
- 3 Universitas dr. Soebandi Jember, Indonesia

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Correspondence

Moch. Azzam Miftahurroziqin
 Faculty of Nursing, University of Jember, Indonesia
 Jl. Kalimantan No.37, Sumbersari, Jember, East Java 68121.
 Email: azzammifta13@gmail.com

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Abstract

Increased blood pressure causes vascular damage to the blood vessels in the neck when carrying blood to the brain, resulting in pressure on the muscle nerve fibres, which causes head pain. One of the independent nursing interventions that can be used is Progressive Muscle Relaxation (PMR). This case study is to determine the application of PMR to reduce pain scale in elderly with hypertension at UPT PSTW Jember. This Final Scientific Work uses a descriptive design with the Case report method, which describes the application of Evidence-Based Nursing Practice, namely PMR, for headaches in the elderly with hypertension. Therapy is given to a patient in two meetings a day for seven days for 15 minutes. Measurement of pain scale using the Numeric Rating Scale (NRS). The results after being given PMR showed a decrease in pain levels by reviewing complaints of decreased pain, the average pain scale from 4.4 NRS to 3.4 NRS, the average systolic blood pressure from 155.7 mmHg to 142.8 mmHg and the average diastolic blood pressure from 94.2 mmHg to 90 mmHg. PMR therapy can reduce chronic pain by increasing the elasticity of blood vessels, reducing muscle tension and reducing headaches.

Keywords: Elderly, Pain, Hypertension, Progressive Muscle Relaxation

I. BACKGROUND

A person whose age is more than 60 years is classified as elderly or elderly. The elderly will experience various problems of changing conditions ranging from physical, psychological, spiritual, and social to economic aspects (Indonesian Ministry of Health, 2016). The fundamental problem

experienced by the elderly is degenerative health problems that start from the decline of the body's cells so that the function of the body's organs and immune system decreases and increases the risk of disease (Kholifah, 2016). Basic Health Research (RISKEDSAS) in 2018 reported data on disease patterns in the elderly group,

indicating that most elderly experienced non-communicable diseases, namely hypertension (Indonesian Ministry of Health, 2022).

Hypertension is a condition in which a person experiences an abnormal increase in blood pressure in the arteries, which, after repeated examinations, results in systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg (Hua & Fan, 2019). There are several factors associated with the incidence of hypertension, one of which is age. In old age or the elderly, it is associated with degenerative processes, diseases and behaviours that result in damage and decreased function of the circulatory and cardiovascular systems (Wulandari et al., 2023). This condition will result in Atherosclerosis, namely the thickening of the blood vessels. Large arteries will lose their flexibility, and stiffness in the walls of the blood vessels will occur, which will then cause the narrowing of the blood vessels (Azizah et al., 2021). The constriction of blood vessels makes less space with the same amount of blood, and then the heart pumps blood; it is forced through narrow blood vessels, causing a greater volume and increase in blood pressure (Adam, 2019; Bell et al., 2018).

Symptoms that appear in general for someone with hypertension who has

increased blood pressure are pain in the head that feels dull, neck and shoulders and dizziness (Bell et al., 2018; Hua & Fan, 2019). Headaches that appear in the elderly with hypertension are caused by vascular damage to blood vessels. This condition will increase the pressure on the walls of the blood vessels in the neck when carrying blood to the brain, resulting in pressure on the muscle nerve fibres and pain or discomfort in the head (Nugroho et al., 2022). The pain appears as a body mechanism when the tissue is damaged, resulting in a reaction from the individual by moving the pain stimulus. There is an incidence of pain in patients with hypertension, one of which was found at the Wongsonegoro Hospital, Semarang City, in 2021, namely elderly patients with hypertension who experience moderate acute pain (scale 4-6 NRS), namely respondent 1 with a pain scale of 4 and respondent 2 with a pain scale 5 (Ferdisa & Ernawati, 2021).

Based on WHO data (2015), the prevalence of hypertension in the world is around 1.13 billion people, which will continue to increase yearly and is expected to increase to 1.5 billion people in 2025 (Putri, L.M. & Ruqowiyah, 2021). The highest prevalence of hypertension in the elderly is experienced by the African region, which reaches 27%. The lowest

prevalence of hypertension among the elderly in America is 18%, while Indonesia is in fifth place for countries with the most hypertension, namely as many as 34%, with an estimated number of hypertension cases of 63,309,620 people (Yuniati & Sari, 2022). Based on data from the 2019 Litbangkes Agency, the prevalence of non-communicable diseases in Indonesia, namely hypertension in the elderly, is 32.5% (Indonesian Ministry of Health, 2022). In Indonesia, the province of East Java is ranked 6th for hypertension sufferers after South Kalimantan, West Java, East Kalimantan, Central Java and West Kalimantan (Rahmad, 2020). The prevalence of hypertension in the province of East Java is 36.3% (Putri et al., 2021). In one area of East Java Province, namely Jember district, there were 190,979 out of a total of 741,735 people with hypertension in 2020 who received health services according to standards based on service data at the community health centre (Dinas Kesehatan Kabupaten Jember, 2020).

Gerontic nurses have a role similar to nurses in general, namely as caregivers who manage gerontic nursing care (Sarida & Hamonangan, 2020). Gerontic nursing is a professional nursing practice for healthy and sick elderly that is comprehensive and consists of bio-psycho, social, and spiritual aspects. Gerontic nursing focuses on

improving health, preventing disease, optimizing mental function and overcoming common health problems (Kholifah, 2016). Efforts to overcome health problems of non-communicable diseases such as hypertension can be made by collaborating with other medical teams in providing pharmacological therapy. In addition, nurses can provide independent nursing actions with non-pharmacological therapies such as Progressive Muscle Relaxation (PMR) therapy (Tata et al., 2022).

Provision of Progressive Muscle Relaxation (PMR) therapy is an alternative therapy to reduce blood pressure and can reduce pain. This technique was chosen because it involves the body's muscles relaxing with systematically arranged movements from hand to foot. These movements can reduce peripheral resistance and increase the elasticity of blood vessels so that blood circulation will be perfect for transporting oxygen, lowering blood pressure, and relaxing muscles (Tata et al., 2022). This relaxed state will affect the autonomic nerves to reduce the work of the sympathetic nervous system and increase the parasympathetic nerves, thereby causing smoother blood circulation and facilitating oxygen transportation, and reducing the heart rate by stimulating baroreceptors to

inhibit impulses to the central sympathetic nerves in the brain (Manoppo & Anderson, 2019). In addition, relaxing conditions in the body's muscles will also stimulate the release of the hormones Endorphine, melatonin, and serotonin, which are calming substances. Physiologically, relaxed conditions in the body will make the hypothalamus stimulate the pituitary gland to relax the mind and reduce headaches (Ferdisa & Ernawati, 2021). The effect of PMR showed that there was an average decrease in systolic blood pressure of 30 mmHg and ten mmHg diastolic after therapy, and the pain scale decreased from a scale of 5 to 2 after being given therapy for three days (Ferdisa & Ernawati, 2021).

The effect of PMR is known to have better effectiveness than other relaxation therapies, namely Slow Deep Breathing (SDB) in lowering blood pressure. Research by Manoppo & Anderson (2019) found that SDB did not have a significant effect on systolic blood pressure but had a significant effect on diastolic blood pressure because SDB only involved voluntary breathing patterns by the lungs and did not involve contractions and stretching of muscles that are directly related to blood vessels. In practice, this PMR technique can be done independently or together; it is also easy, without using tools, and can be done anywhere

(Aminiyah et al., 2022). With the explanation above, researchers are interested in implementing Progressive Muscle Relaxation therapy to reduce chronic pain in Elderly Hypertension at UPT PSTW Jember.

2. METHODS

This study uses a descriptive design with the Case report method, which describes the application of Evidence-Based Nursing Practice, namely Progressive Muscle Relaxation (PMR) for headaches in the elderly with hypertension. Comprehensive nursing care was given to 1 elderly patient for seven days. This case study was conducted at Wisma Mawar UPT PSTW Jember from 14 February to 20 February 2023. The criteria for patients who were respondents were older people who experienced moderate headaches (scale 4-6 NRS) with hypertension. Data collection used an assessment sheet, and the measurement used to measure the pain scale was the Numeric Rating Scale (NRS).

This case study was carried out with patients after obtaining approval from the head of UPT PSTW Jember, clinical supervisor and respondent. The data collection mechanism is carried out by assessing and determining diagnoses

and nursing interventions, which will then be carried out by implementing PMR therapy in 2 meetings a day for seven days, with a duration of 15 minutes for each meeting, followed by evaluation. Before carrying out therapy, elderly patients are given education about hypertension, symptoms and causes of hypertension, and then given education about the goals and procedures for carrying out PMR therapy. The first step is to give the elderly a comfortable position and measure vital signs and pain scales in the morning before being given therapy. Therapy is given after the elderly patient feels comfortable with the place and states readiness to start therapy. PMR therapy is given in 2 meetings for 15 minutes, namely in the morning and evening. Then, vital signs and pain scales are measured again in the afternoon after being given therapy. The implementation of PMR therapy is carried out 3 hours before taking hypertension medication and before eating to maximize the effect of giving PMR therapy.

3. RESULTS

The results of a study conducted by PSP2N Batch 30 students in February 2023 at Wisma Mawar UPT PSTW Jember showed that 9 out of 16 elderly (56%) had hypertension. One of the elderly managed

clients is Mrs M, who is female and 66 years old. Mrs M complained of pain in the head, like grunting and pain in the neck that comes and goes on a scale of 6 out of 0-10 and said the pain had often recurred for a long time. Based on the medical record book at the UPT PSTW, headaches and dizziness in clients often recur because of hypertension since two years ago. Mrs M likes salty food and sometimes drinks coffee when coffee is available at the Panti. Blood pressure was 170/100 mmHg, pulse was 115x/minute, RR was 22x/minute, and temperature was 36.8 C. Compositis awareness looked grimacing and massaging the area where the pain was.

The nursing diagnosis that appears is chronic pain problems (D.0078) associated with impaired metabolic function (Hypertension) with focus data in the form of primary subjective data disclosed by the client, namely complaining of intermittent headaches sometimes recurring, hypertension experienced by the client since two years ago often recurring with dizziness, headache based on the medical record book at the UPT PSTW, while the significant objective data that appears and appears in the patient is that the client has difficulty sleeping, the pulse frequency

increases more than normal limits, looks grimacing and restless, BP 170/100 mm Hg, P: hypertension, Q: grunting and dull, R: back of head and neck, S: 6 NRS, T: intermittent. Interventions in chronic pain, namely Pain Management (I.08238): identifying pain using PQRST, controlling

the environment that makes pain worse and less, facilitating rest and sleep, teaching non-pharmacological techniques (Progressive Muscle Relaxation Therapy) and collaborating on providing analgesic drug therapy if necessary (PPNI, 2018).

Table 1. Results Of Measurement of Pain Scale and Blood Pressure Before and After Progressive Muscle Relaxation Therapy

No.	Pre-Intervention			Post-Intervention		
	Systolic (mmHg)	Diastolic (mmHg)	Pain Scale (NRS)	Systolic (mmHg)	Diastolic (mmHg)	Pain Scale (NRS)
1	170	100	6	160	100	5
2	160	100	5	150	90	4
3	160	90	4	140	80	3
4	150	90	4	140	90	3
5	160	100	5	140	90	4
6	150	90	4	135	90	3
7	140	90	3	135	90	2
Average	155,7	94,2	4,4	142,8	90	3,4

Based on Table 1, the results obtained from the implementation of Ny. M, namely the administration of PMR therapy for two meetings a day for seven days with a duration of 15 minutes for each meeting, shows a pain scale and blood pressure before and after administration of Progressive Muscle Relaxation (PMR) therapy. In the administration of PMR therapy from the first day to the fourth day, there was a change in the pain scale from 6 to 3 and a decrease in blood pressure from 170/100 mmHg to 140/90 mmHg. The pain scale and blood pressure increased again on the fifth day to 5 NRS and 160/100

mmHg, but after being given therapy, again decreased until the seventh day, namely the pain scale from 5 to 2 and a decrease in blood pressure from 160/100 mmHg to 135/90 mmHg.

Based on the results of this evaluation, after being given nursing care with PMR therapeutic interventions, the client Ny. M from the first meeting to the seventh meeting showed that the application of PMR therapy could reduce blood pressure and chronic pain complaints in hypertensive clients with an average reduction in pain from 4.4 NRS to 3.4 NRS, an average systolic blood

pressure from 155.7 mmHg to 142.8 mmHg and an average diastolic blood pressure from 94.2 mmHg to 90 mmHg. During the intervention on Mrs M at Wisma Mawar UPT, PSTW Jember had several limitations. The intervention's management went back and forth for approximately 1 hour both in the morning and in the afternoon because the client was still bathing, the staff was still cleaning the guest house, and the client was still sleeping. Then, in the management time interval, manual counting orally sometimes uses a stopwatch, so there is a possibility of differences in time intervals. The client still consumes coffee, but it is rare. In addition, dietary eating patterns are still not based on the client's health condition given by the UPT PSTW. The client also takes the drug Captopril only when complaints of headaches and dizziness appear, and this is known based on the words of the nurse on duty at Wisma Mawar. Some of these are factors that become obstacles and confounders in the effectiveness of PMR therapy in reducing pain in clients with hypertension.

4. DISCUSSION

Based on the study's results on Mrs M, data obtained shows that the client is

66 years old. According to Minister of Health Regulation No. 25 of 2015 concerning the National Action Plan for Elderly Health for 2016-2019, this age is included in the elderly group at risk of non-communicable diseases, namely hypertension. According to research conducted by Hua & Fan (2019), 53.2% of the population aged > 60 years in China has hypertension. Based on the theory, as people get older, they will experience physical changes (Peraturan Menteri Kesehatan Republik Indonesia, 2016). The elderly will experience a decrease in body function, which is a long-term accumulation or occurs for a long time from damage at the cellular and molecular level due to a degenerative process called the ageing process (Indonesian Ministry of Health, 2022).

In the elderly, a degenerative process causes stiffness or tension and widening of the arteries. The proximal arteries are dilated by approximately 10%, and the muscles in the arteries are dilated by about 3% per heartbeat compared to a young age. This condition decreases the elasticity of blood vessels, which causes a decrease in the recoil and capacity of the arterial wall, thus causing changes in the cardiac cycle. In the systole period, arteriosclerosis causes a limited

expansion, increasing systolic blood pressure. Meanwhile, during the diastole period, non-optimal recoil in the arteries causes an increase in diastolic blood pressure (Setiyorini & Wulandari, 2018). In addition, several other disorders due to increasing age cause an increase in blood pressure, namely disorders of the renin-angiotensin-aldosterone system, glomerulosclerosis, intestinal fibrosis and increased peripheral plasma concentrations (Nuraeni, 2019). In line with this theory, the results of a study by Wulandari (2023) showed that the prevalence of hypertension in the elderly was greater than that of adults, namely 100% in the elderly, with a total of 21 people and 59.4% in adults with a total of 38 people out of a total of 64 respondent. According to another study by Sudin and Kartini (2023), 51 older adults aged >60 were treated for hypertension at the Pertiwi Health Center.

The managed client is a 66-year-old female. Gender is another demographic status that is closely related to the incidence of hypertension. According to several studies, it is explained that more women with hypertension experience hypertension than men. Related to older women experiencing menopause where in this condition will experience a decrease in

the hormone estrogen Putri, L.M. & Ruqowiyah (2021). The hormone estrogen protects blood vessels from damage and also increases levels of high-density lipoprotein (HDL). If HDL levels are low, it will increase Low-Density Lipoprotein (LDL) levels, which will cause the process of Atherosclerosis Setiyorini & Wulandari (2018). In atherosclerosis, namely the thickening of blood vessels, the large arteries experience a loss of flexibility and stiffness in the walls of the blood vessels, which then causes the narrowing of the blood vessels (Azizah et al., 2021). This is supported by research conducted by Wulandari (2023), which showed that the percentage of women with hypertension was 62.4% greater than the percentage of men with hypertension of 37.6%. Hua and Fan's research (2019) also found the same thing: there was a prevalence of 55.3% for female hypertension sufferers and 51.5% for male hypertension sufferers.

A person with hypertension will generally experience various signs and symptoms that are felt by sufferers of high blood pressure, including headaches, dizziness, nausea, vomiting, nosebleeds, chest tightness, epistaxis, anxiety, difficulty sleeping, irregular heartbeat, and vision problems (Bell et al., 2018; Hua & Fan, 2019; Nugroho et al., 2022; Setiyorini

& Wulandari, 2018). Signs that someone has hypertension can be known after repeated examinations with systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg (Hua & Fan, 2019). In the managed case report, the client felt symptoms such as back headaches, dizziness and difficulty sleeping. After being examined at the time of assessment, the examination results showed blood pressure of 170/100 mmHg, pulse rate of 115x/minute, and grimacing. Based on the signs and symptoms experienced by Mrs M has indicated that the client has hypertension. When a natural headache appears until it feels like it is spinning, it will make the client feel uncomfortable because of the vasoconstriction of blood vessels, increasing cerebral vascularity.

One of the non-pharmacological therapies to reduce pain and lower blood pressure that will be given to Mrs M is Progressive Muscle Relaxation (PMR) therapy. This technique was chosen because it involves the body's muscles relaxing with systematically arranged movements from hand to foot. These movements can reduce peripheral resistance and increase the elasticity of blood vessels so that blood circulation will be perfect for transporting oxygen, lowering blood pressure, and relaxing

muscles (Tata et al., 2022). In addition, relaxing conditions in the body's muscles will also stimulate the release of the hormones Endorphine, melatonin, and serotonin, which are calming substances. Physiologically, relaxed conditions in the body will make the hypothalamus stimulate the pituitary gland to relax the mind and reduce headaches (Ferdisa & Ernawati, 2021). In practice, this PMR technique can be done independently or together; it is also easy, without using tools, and can be done anywhere (Aminiyah et al., 2022).

In managing PMR non-pharmacological therapeutic measures, information is first given to the client regarding the intent and purpose of the action to be given and to contract the time and place for the client being managed. PMR therapy is given in two meetings daily for seven days, with 15 minutes each. A study conducted by Ferdisa and Ernawati (2021) found that PMR therapy can effectively reduce the pain scale due to hypertension and reduce high blood pressure by taking 10 minutes daily for three days. Another study found that the application of PMR therapy was carried out in 2 meetings a day with a duration of 20 minutes, and in a week, three meetings lasted two weeks (Tata et al., 2022).

Likewise, the application of PMR therapy to the elderly, which is given for seven meetings for seven days with a duration of 20 minutes, can also reduce high blood pressure and relieve headache pain due to hypertension (Apriliani, 2019). Even though there is a longer duration for each session in its application, giving PMR therapy with a duration of at least 10 minutes has a good effect on lowering blood pressure and reducing pain. In addition to lowering blood pressure, this PMR therapy, when done with the proper and routine movements every 1 to 2 times a day, namely morning and evening, can also improve body health (Aminiyah et al., 2022).

This therapy can be managed for 15 to 30 minutes each session and carried out consecutively for at least three days, ideally seven days (Richard et al., 2019 in Noefitasari & Idris, 2022). Research conducted by Murhan in 2019, which provided the implementation of PMR therapy for 20 minutes with two meetings a day for three days, showed an average decrease in systolic blood pressure of 5.34 mmHg and diastolic blood pressure of 4.25 mmHg (Murhan et al., 2020). Likewise, the application of PMR therapy, which is given for 4 meetings for one week with a duration of 20 minutes in 2 weeks, is also

known to be effective in reducing high blood pressure, both systolic and diastolic (Yuniati & Sari, 2022). Before implementing PMR therapy, pre-intervention measurements were carried out in the morning using a sphygmomanometer to measure blood pressure, pain characteristics, pulse and respiratory rates, verbal and verbal responses, and the sleep quality of the clients being treated. Then, position the managed client comfortably according to the client's wishes for PMR therapy.

Progressive Muscle Relaxation (PMR) therapy consists of several movements totalling 14 movements, which include hand muscle exercises, backhand muscle exercises, biceps muscle exercises, shoulder muscle exercises, facial muscle relaxation, jaw and mouth muscle exercises, neck muscle exercises, back muscle exercises, relaxes the chest, abdominal muscle exercises and leg muscle exercises (Widiyono et al., 2022). In providing PMR therapy, one must also pay attention to the things in the administration, namely not to put too much pressure on the muscles when exercising the muscles because they can self-irritate, the body position must be comfortable, the duration of the movements needed is around 20-50

seconds per therapeutic movement to relax the muscles, tense the muscles. With double the power and giving directions or instructions, be early enough (Idris et al., 2019 in Noefitasari & Idris, 2022).

On the fifth day of implementation, the client's health condition, which had previously started to improve with complaints of reduced pain, and now the pain is reappearing. When the examination was carried out, the result was that the client said that last night, he could not sleep for no reason, and his BP was 160/100 mmHg. Reduced quality and quantity of sleep can affect the hormone cortisol and sympathetic nerves, which triggers an increase in heart rate and blood pressure (Novitri et al., 2021). This is supported by the research of Amanda (2017), which said that there was a significant relationship between sleep patterns and the recurrence rate of hypertension in the elderly with a p-value <0.000. The client also said that last night, he ate the boxed rice given this afternoon but only ate it late in the evening because he needed to remember. The boxed rice that is given may have no restrictions on the use of salt. Salt contains sodium, which increases the concentration of sodium in the extracellular fluid when consumed in excess. These conditions make the body

react to normalize it by removing intracellular fluid so that the volume of extracellular fluid increases, burdening the heart's performance and causing an increase in blood pressure (Adam, 2019). This is supported by the research of Sudin (2023), which says that there is a significant relationship between diet, one of which is high in salt, and the incidence of hypertension in the elderly with a square-test showing p-value = 0.020.

With the increasing age of the elderly, there is a decrease in kidney function. Namely, there is a change in the pressure threshold on the kidneys to remove sodium from the body, thus causing an increase in systemic arterial pressure when the kidneys excrete sodium and water. If sodium excretion is inhibited, it will cause a buildup of sodium levels in the body, increasing blood pressure (Setiyorini & Wulandari, 2018). This is in line with the study of the relationship between diet and the incidence of hypertension in the elderly as evidenced by Sudin and Kartini (2023), which shows that 25.5% of the elderly experience hypertension by having bad eating habits, including consuming salted fish, adding excessive salt in the cooking and the use of soy sauce in the working area of the Pertiwi Health Center in Makassar City.

The results of research conducted in the working area of the Poasia Community Health Center, Kendari City, by Jabani (2021) showed that there was a relationship between consuming salt and the incidence of hypertension, namely from 34.6% or as many as 27 respondents had degree 1 hypertension and 87.2% or 34 as many as respondents have grade 2 hypertension.

Besides consuming salt, excessive coffee can cause hypertension because coffee contains caffeine. Caffeine will activate the sympathetic nervous system by increasing the concentration of catecholamines in plasma, stimulating the adrenal glands and increasing cortisol production and binding to adenosine. Adenosine has a function to maintain the elasticity of blood vessels, but high levels of caffeine can disrupt this function. It causes vasoconstriction and increased peripheral resistance, so blood pressure will be high (Putra et al., 2018). Research conducted by Harianja (2021) shows that there is a relationship between consuming coffee and the incidence of hypertension in the Working Area of the Cikampak Health Center, South Labuhan Regency, as evidenced by significant statistical test results ($p\text{-value} = 0.000 < 0.05$).

Based on the results of the nursing evaluation, after being given nursing care with PMR therapy interventions to clients from the first meeting to the seventh meeting, it showed that the application of PMR therapy could reduce blood pressure and chronic pain complaints in hypertensive clients. On the last evaluation day, blood pressure was 135/90 mmHg, the pain scale was 2 NRS, and the pulse rate was 82x/minute. The decrease in pain scale and blood pressure was also proven by research conducted by Ferdisa & Ernawati (2021) found that after being given PMR therapy, there was a decrease in blood pressure from 172/102 mmHg to 130/85 and the headache pain scale decreased from 5 to 2 on the third day. In addition, j Apriliani (2019) also found that the pain scale in the back of the head experienced by clients with hypertension decreased from a scale of 4 to a scale of 0 after being given PMR therapy intervention.

Based on several studies that have been conducted, PMR therapy is administered to see its effectiveness in reducing blood pressure and pain in elderly clients. As research has been conducted by (Tata et al., 2022) shows that there are changes to the decrease in blood pressure, both systolic and diastolic,

namely before the intervention on Mrs S of 180/110 mmHg to 150/80 mmHg and Mrs W of 160/100 mmHg decreased to 130/80 mmHg after being given the intervention. In a study by Noefitasari & Idris (2022), the results showed that the average systolic blood pressure was 155.07 mmHg to 147.25 mmHg after intervention, while the average diastolic blood pressure was 97.10 mmHg to 91.56 mmHg after intervention. It is also in line with the research conducted by Waryantini & Amelia (2021), which showed that there was a difference in mean blood pressure before and after the intervention; both systolic and diastolic, the mean value of systolic blood pressure was 152.17 before the intervention became 150,06 after being given the intervention. Meanwhile, the mean value of diastolic blood pressure was 92.22 to 89.83 after being given the intervention.

Research conducted by Ferdisa & Ernawati (2021) found that after being given PMR therapy, there was a decrease in blood pressure from 172/102 mmHg to 130/85, and the headache pain scale decreased from 5 to 2 on the third day. In line with this research, j Apriliani (2019) also found that the pain scale in the back of the head experienced by clients with hypertension decreased from a scale of 5 to

a scale of 0 after being given PMR therapy intervention. The effect of PMR therapy is known to have better effectiveness than Slow Deep Breathing (SDB) therapy because the PMR intervention had a significant effect ($p > 0.05$) on reducing systolic and diastolic blood pressure. In contrast, SDB intervention only affected reducing diastolic blood pressure. The combination of the two PMR and SDB interventions was considered to have a significant effect on reducing blood pressure and heart rate ($p < 0.05$) (Manoppo & Anderson, 2019).

5. CONCLUSION

The results of this case study indicate that the application of Progressive Muscle Relaxation (PMR) therapy for two meetings a day for seven days with a duration of 15 minutes for each meeting using 14 PMR movements has an effect on reducing pain scale, blood pressure, and pulse frequency and helps improve sleep quality. There were changes in pain levels and systolic and diastolic blood pressure, namely changes in the pre-intervention pain scale with a mean of 4.4 NRS to 3.4 NRS in the post-intervention and systolic blood pressure in the pre-intervention had a mean of 155.7 mmHg to 142.8 mmHg in post-intervention. Likewise, there was a

change in diastolic blood pressure at the pre-intervention, with a mean of 94.2 mmHg to 90 mmHg at the post-intervention.

Health workers can make Progressive Muscle Relaxation therapy a reference consideration for the need for non-pharmacological therapy in comprehensive nursing care for elderly clients with degenerative health problems, one of which is hypertension.

AUTHOR CONTRIBUTIONS

Substantial contributions to conception, data collection, and analysis: Moch. Azzam Miftahurroziqin, Latifa Aini Susumaningrum, Fahrudin Kurdi, Achmad Ali Basri. Writing: Moch. Azzam Miftahurroziqin. Manuscript revisions: Moch. Azzam Miftahurroziqin.

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CONFLICT OF INTEREST

The authors declare no conflict of interest for this publication.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

REFERENCES

- Adam, L. (2019). Determinan Hipertensi Pada Lanjut Usia. *Jambura Health and Sport Journal*, 1(2), 82–89. <https://doi.org/10.37311/jhsj.v1i2.2558>
- Amanda, H., Prastiwi, S., & Sutriningsih, A. (2017). Hubungan kualitas tidur dengan tingkat kekambuhan hipertensi pada lansia di kelurahan tlogomas Kota Malang. *Nursing News*, 2(3), 437–447. <https://doi.org/10.33366/nn.v2i3.680>
- 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. <https://doi.org/10.52774/jkfn.v5i2.106>
- Apriliani, M. W. & J. (2019). Penerapan Terapi Progressive Muscle

- Relaxation (PMR) Dalam Menurunkan Tekanan Darah Pada Lansia Dengan Hipertensi Di Desa Wangunrejo KecamatanMargorejo Kabupaten Pati. *Jurnal Profesi Keperawatan*, 6(2), 145–162. <https://jprokep.jurnal.centamaku.ac.id/index.php/jpk/article/view/70>
- Azizah, C. O., Hasanah, U., Pakarti, A. T., Dharma, A. K., & Metro, W. (2021). Penerapan Teknik Relaksasi Otot Progresif Terhadap Tekanan Darah Pasien Hipertensi Implementation of Progressive Muscle Relaxation Techniques To Blood Pressure of Hypertension Patients. *Jurnal Cendikia Muda*, 1(4), 502–511. <https://jurnal.akperdharmawacana.ac.id/index.php/JWC/article/view/244>
- Bell, K., Sekolah, P. D. C., Twigg, J., Sekolah, P. D. C., Harrison, F., Auburn, U., Olin, B. R., & Pharm, D. (2018). Hypertension: The Silent Killer: Updated JNC-8 Guideline Recommendations. https://cdn.ymaws.com/www.aparx.org/resource/resmgr/CEs/CE_Hypertension_The_Silent_K.pdf
- Dinas Kesehatan Kabupaten Jember. (2020). Profil Kesehatan Kabupaten Jember Tahun 2020. Dinas Kesehatan Kabupaten Jember. <https://jemberkab.bps.go.id/subject/30/kesehatan.html>
- Ferdisa, R. J., & Ernawati, E. (2021). Penurunan Nyeri Kepala Pada Pasien Hipertensi Menggunakan Terapi Relaksasi Otot Progresif. *Ners Muda*, 2(2), 47. <https://doi.org/10.26714/nm.v2i2.6281>
- Harianja, B., P Nadapdap, T., & Anto, A. (2021). Analisis Faktor Yang Memengaruhi Kejadian Hipertensi Pada Suku Batak Di Wilayah Kerja Puskesmas Cikampak Kabupaten Labuhan Batu Selatan. *Jurnal Kesmas Prima Indonesia*, 3(1), 7–12. <https://doi.org/10.34012/jkpi.v3i1.1691>
- Hua, Q., & Fan, L. (2019). 2019 Chinese Guideline for the Management of Hypertension in the Elderly. *Journal of Geriatric Cardiology*, 16(2), 67–99. <https://doi.org/10.11909/j.issn.1671-5411.2019.02.001>
- Jabani, A. S., Kusnan, A., & B, I. M. C. (2021). Prevalensi dan Faktor Risiko Hipertensi Derajat 2 Di Wilayah

- Kerja Puskesmas Poasia Kota Kendari. *Jurnal Ilmiah Ilmu Keperawatan*, 12(4), 31–42. <https://stikes-nhm.ejournal.id/NU/article/view/494>
- on Blood Pressure and Heart Rate on Hypertensive Clients. *KnE Life Sciences*, 2019, 497–509. <https://doi.org/10.18502/kls.v4i13.5281>
- Indonesian Ministry of Health. (2022). Lansia Berdaya, Bangsa Sejahtera. In *Info Datin, Pusat Data dan Informasi Kementerian Kesehatan RI* (p. 12). Kementerian Kesehatan Republik Indonesia. <https://www.kemkes.go.id/article/print/22111500004/2022-lansia-berdaya-bangsa-sejahtera.html>
- Murhan, A., Purbianto, & Sulastri. (2020). Pengaruh Relaksasi Progresif Terhadap Penurunan Tekanan Darah Tinggi Pada Lansia. *Jurnal Ilmiah Keperawatan Sai Betik*, 16(2), 165–170. <https://doi.org/10.52646/snj.v3i2.83>
- Kholifah, S. N. (2016). Modul Bahan Ajar Keperawatan Gerontik. Kementerian Kesehatan Republik Indonesia. <http://repository.uki.ac.id/2742/1/ModulBahanAjarKeperawatanGerontik.pdf>
- Noefitasari, I., & Idris, D. N. T. (2022). Reducing Blood Pressure on Elderly with Hypertension with Progressive Muscle Relaxation Therapy. *Jurnal Ners Dan Kebidanan (Journal of Ners and Midwifery)*, 9(3), 370–378. <https://doi.org/10.26699/jnk.v9i3.art.p370-378>
- Sudin, M. S. & Kartini, H. H. (2023). Faktor Yang Berhubungan Dengan Kejadian Hipertensi Pada Lansia di Wilayah Kerja Puskesmas Pertiwi Kota Makassar. 6(1), 37–47. <http://journal.unpacti.ac.id/index.php/JPP/article/view/662>
- Novitri, S., Prasetya, T., & Artini, I. (2021). Hubungan Kualitas Tidur Dan Pola Makan (Diet Dash) Dengan Kejadian Penyakit Hipertensi Pada Usia Dewasa Muda Di Puskesmas Simbarwaringin Kecamatan Trimurjo Kabupaten Lampung Tengah Provinsi Lampung. *Jurnal Medika Malahayati*, 5(3), 154–162. <https://doi.org/10.33024/jmm.v5i3.42>
- Manoppo, A. J., & Anderson, E. (2019). Effect of Progressive Muscle Relaxation and Slow Deep Breathing

- 08
- Nugroho, R. A., Ayubbana, S., & Atika, S. (2022). Penerapan Pemberian Kompres Hangat Pada Leher Terhadap Skala Nyeri Kepala Pada Pasien Hipertensi Di Kota Metro. *Jurnal Cendikia Muda*, 2(4), 514–520.
<https://jurnal.akperdharmawacana.ac.id/index.php/JWC/article/view/379/0>
- Nuraeni, E. (2019). Hubungan Usia Dan Jenis Kelamin Beresiko Dengan Kejadian Hipertensi Di Klinik X Kota Tangerang. *Jurnal JKFT*, 4(1), 1. <https://doi.org/10.31000/jkft.v4i1.1996>
- Peraturan Menteri Kesehatan Republik Indonesia. (2016). Rencana Aksi Nasional Kesehatan Lanjut Usia Tahun 2016-2019. Permenkes No 25.
- PPNI. (2018). Standar Intervensi Keperawatan Indonesia (SIKI). Dewan pengurus pusat PPNI.
- Putra, A.A. (2018). Perbedaan efektivitas antara pemberian tepid sponge bath dan kompres plester terhadap perubahan suhu tubuh anak batita yang mengalami demam di ruang anak rsud dr. R. Soedjono selong lombok timur.
<https://www.semanticscholar.org/paper>
- Putri, L.M. & Ruqowiyah, T. (2021). Analisis Defisiensi Kesehatan Komunitas Pada Kelompok Hipertensi. *Real in Nursing Journal (RNJ)*, 4(2), 98–110.
<https://dx.doi.org/10.32883/rnj.v4i2.1263>
- Putri, R. R., Widiarini, R., & Marsanti, A. S. (2021). Faktor Yang Berhubungan Dengan Kejadian Hipertensi Pada Lansia Di Posyandu Lansia Abimanyu Kelurahan Tawangrejo Kota Madiun. *Jurnal Kesmas (Kesehatan Masyarakat) Khatulistiwa*, 8(2), 82.
<https://doi.org/10.29406/jkkm.v8i2.2164>
- Rahmad, A. N. (2020). Determinan Kejadian Hipertensi Pada Pra Lansia Dan Lansia Prolanis di Puskesmas Sukowono Kabupaten Jember Tahun 2019. In *Repository.Unej.Ac.Id*. <https://repository.unej.ac.id/handle/123456789/99403>
- Sarida, M., & Hamonangan, D. (2020). *Buku Ajar Keperawatan Gerontik*.

- Setiyorini, E., & Wulandari, N. A. (2018). Asuhan Keperawatan Lanjut Usia dengan Penyakit Degeneratif. In Mnc. https://www.google.co.id/books/edition/Asuhan_Keperawatan_Lanjut_Usia_dengan_Pe/mMVGEEAAAQBAJ?hl=id&gbpv=0
- Tata Dewanti Mehhta, A., & Nurrohmah, A. (2022). Penerapan Teknik Relaksasi Otot Progresif terhadap Perubahan Tekanan Darah pada Lansia di Desa Karanglo. *Indogenius*, 1(3), 125–132. <https://doi.org/10.56359/igj.v1i3.90>
- Waryantini, & , Reza Amelia, L. H. (2021). Pengaruh Relaksasi Otot Progresif terhadap Tekanan Darah pada Lansia dengan Hipertensi. *Healthy Journal*, 5(3), 248–253. <https://doi.org/10.55222/healthyjournal.v10i1.514>
- Widiyono, Suwarni, A., Indriyati, Sutrisno, Putra, F. A., & Vitri Dyah Herawati. (2022). Buku Ajar Terapi Komplementer Keperawatan. Lembaga Chakra Brahmana Lentera. https://www.google.co.id/books/edition/Buku_Ajar_Terapi_Komplementer_Keperawata/U6SnEAAAQBAJ?hl=id&gbpv=1&dq=terapi+progressive+muscle+relaxation+adalah&pg=PA65&printsec=frontcover
- Wulandari, F. W., Ekawati, D., Harokan, A., & Murni, N. S. (2023). Faktor-Faktor Yang Berhubungan Dengan Kejadian Hipertensi. *Jurnal Aisyiyah Palembang*, 8(1), 286–299. <https://jurnal.stikes-aisyiyah-palembang.ac.id/index.php/JAM/article/view/1005>
- Yuniati, I., & Sari, I. M. (2022). Pengaruh Relaksasi Otot Progresif Terhadap Tekanan Darah Pada Lansia Dengan Hipertensi. *Healthy Journal*, 2(2), 72–82. <https://doi.org/10.55222/healthyjournal.v10i1.514>