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THE EFFECT OF MARJORAM AROMATHERAPY AND DEEP BREATHING TECHNIQUES ON BLOOD PRESSURE OF HYPERTENSIVE PATIENTS

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ABSTRACT
Hypertension is a major cause and risk factor for death worldwide. Nonpharmacological therapy of hypertension to reduce blood pressure of hypertensive patients, one of which is marjoram aromatherapy and deep breathing techniques that have proven effective in hypertensive patients. Objective: The purpose of the study was to determine the effect of marjoram aromatherapy and deep breathing techniques on blood pressure of hypertensive patients. Methods: This type of research is a quasy experiment with a one group pretest-postest design without control group approach, the number of samples was 20 respondents using total sampling. The data collection technique used is observation through blood pressure measurement. Hypothesis analysis is normality test, One Way Repeated Measurement (ANOVA), and multiple linear regression. Results: There is an effect of marjoram aromatherapy and deep breathing techniques on blood pressure of hypertensive patients (p-value <0.05). Conclusion: There is an effect of marjoram aromatherapy and deep breathing techniques on the blood pressure of hypertensive patients. Marjoram aromatherapy interventions and deep breathing techniques can be socialized in hospitals and can be done independently at home to reduce blood pressure in people with hypertension.

Keywords: blood pressure; deep breathing technique; hypertension; marjoram aromatherapy

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INTRODUCTION

Hypertension is one of the major health problems in both developing and developed countries. Hypertension refers to the most frequent disease that has not been optimally controlled and is the biggest cause of death in the world. In WHO (2021) hypertension affects 1.3 billion people and is the number 1 risk factor for death globally because only a small proportion of people with hypertension cases are under control.People in developing countries are more likely to suffer from hypertension than those in industrialized countries. About 75% of people with hypertension, such as in Indonesia, are also classified as developing countries (Mills et al., 2020). Referring to the diagnosis and analysis of the population under the age of 18 in Indonesia, the prevalence of hypertension increased from 25.8% in 2013 to 34.1% in 2018. The average value of hypertension in each province in Indonesia in 2018 was 34.1%, through the highest proportion of South Kalimantan (44.1%) and Papua through its lowest percentage (22.2%) (Riskesdas, 2018).

The incidence of hypertension covers all regions of Indonesia, one of which is the city of Palembang, South Sumatra. In 2020, the estimated number of people with hypertension in the range ≥ 15 years in South Sumatra province is up to 1,993,269 people (South Sumatra Provincial Health Office, 2022). In accordance with data from the Central Statistics Agency (BPS) (2022), the number of hypertension cases in South Sumatra in 2020 was 645,104 people, then increased in 2022 to 1,497,736 people. Palembang City distributed the largest results, reaching 337,251 people with hypertension (Palembang City Health Office, 2022).In this regard, rapid and effective prevention efforts are needed to reduce the prevalence of hypertension. A number of efforts have been made in the pharmaceutical field, especially the administration of antihypertensive drugs. The main hypertension drugs, identified by Kandarini (2017), come from the diuretic family and include Angiotensin Converting Enzyme (ACE) inhibitors, calcium antagonists, Angiotensin Receptor Blockers (ARBs), and beta blockers. Each of these drugs has been shown to greatly reduce arterial pressure and is recommended as first-line therapy for hypertension. Pharmacologic therapy for hypertension often encounters problems, especially in terms of inaccurate doses of drugs administered and other problems that result in less than optimal therapeutic efforts.

The obstacles that often occur in pharmacological therapy can be overcome by taking preventive steps using non-pharmacological therapy. Nonpharmacological therapy of hypertension is one of the treatments that does not have other effects in the context of continued use and is more effectively applied. The advantages of nonpharmacological therapy can also be applied anytime and anywhere. Nonpharmacological hypertension therapy that can be applied is through the provision of aromatherapy and deep breathing techniques (Iqbal & Handayani, 2022).One of the nonpharmacological treatments for hypertension is through the application of aromatherapy. This method has advantages, among others, can provide a decrease in stress, maintain high blood pressure, heart rate, metabolism, minimize sleeplessness, minimize joint pain, and tension so that it can affect blood pressure reduction (Rosita, 2022). In the study of Mariza & Kalsum (2017) stated that there is a relationship between giving aromatherapy to lower blood pressure. Oil or odor from a component is used in aromatherapy, which is used as a healing technique. When individuals inhale aromatherapy, volatile molecules contain aromatic components that are able to increase blood flow, stimulate memory, trigger emotions that make the individual appear peaceful and calm.

In addition, deep breathing techniques have the main advantage of being self-applied, affordable and simple application procedures, not requiring a long time. In Anggraini's research (2020), almost all those surveyed had healthy systolic and diastolic blood pressure after the application of the deep lung relaxation method. According to Sukiwantoi & Rohana (2019) deep breathing treatments are able to react to the development of baroreceptor operations, decreased receptive spine production, decreased flexibility, decreased strength gained through each heartbeat, and heart rate cuts, which in turn are able to provide shrinkage in blood pressure.Based on preliminary data taken by researchers in medical records at the beginning of 2023 until June 2023 there were approximately 50 cases of hypertension per month. Therefore, the incidence of hypertension must be addressed immediately with the use of nonpharmacological therapies which include the provision of aromatherapy and deep breathing techniques that have the potential to reduce and stabilize blood pressure. The purpose of the study was to determine the effect of marjoram aromatherapy and deep breathing techniques on blood pressure of hypertensive patients.

METHOD

This study used a quasy experiment with a one group pretest-postest design without control group approach. This research was conducted at Siti Khadijah Islamic Hospital Palembang. This research was conducted from March 2023 to September 2023. The population was hypertensive patients with a sample size of 20 respondents using total sampling. The data collection technique used is observation through blood pressure measurement. Hypothesis analysis used is normality test, One Way Repeated Measurement (ANOVA), and multiple linear regression. This study has undergone ethical review with the registration number 1223/F.9-UMJ/VIII/2023.

RESULTS

Overview of Respondent Characteristics

The results of the analysis of characteristics showed that most of them were female, namely 17 people (85%), had low education, namely 15 people (75%), had a working status, namely 14 people (70%), underwent amlodipine treatment therapy, namely 13 people (65%), and suffered from hypertension in the short duration category (1-5 years), namely 16 people (80%). Age had a minimum value of 35 (middle adulthood), a maximum value of 65 (late adulthood), a standard deviation value of 7.897, and an average value of 53.45, while CCI had a minimum value of 0, a maximum value of 2, a standard deviation value of 0.795, and an average value of 1.00 (Table 1).

Univariate Analysis

The results showed that the average systolic blood pressure in measurements before the 1st treatment was 171.55 mmHg (15.756) and decreased after the 1st treatment to 162.30 mmHg (15.479). The average diastolic blood pressure in measurements before the 1st treatment amounted to 102.95 mmHg (4.989) and decreased after the 1st treatment to 100.20 mmHg (4.830). Meanwhile, the average systolic blood pressure in measurements before the 2nd treatment amounted to 169.45 mmHg (16.292) and decreased after the 2nd treatment to 157.10 mmHg (18.854). The average diastolic blood pressure in measurements before the 2nd treatment amounted to 101.80 mmHg (4.775) and decreased after the 2nd treatment to 95.80 mmHg (5.337). The average systolic blood pressure in measurements before the 3rd treatment amounted to 161.35 mmHg (16.897) and decreased after the 3rd treatment to 150.70 mmHg (18.238). The average diastolic blood pressure in measurements before the 3rd treatment amounted to 98.80 mmHg (9.407) and decreased after the 3rd treatment to 94.40 mmHg (5.586) (Table 2).

Effect of Marjoram Aromatherapy and Deep Breathing Technique on Systolic Blood Pressure

The results of the study obtained a p-value in the Repeated Measurement ANOVA test in the systolic blood pressure group of 0.000. This shows that Ha is accepted, which means that there is an effect of marjoram aromatherapy and deep breathing techniques on systolic blood pressure in hypertensive patients at three measured time points, namely before, after, and follow-up. The Partial Eta-Squared value of 0.703 indicates that most of the observed variance, namely the decrease in systolic blood pressure, can be attributed to marjoram aromatherapy and deep breathing techniques (Table 3).

Effect of Marjoram Aromatherapy and Deep Breathing Techniques on Diastolic Blood Pressure

The results of the study obtained a p-value in the Repeated Measurement ANOVA test in the diastolic blood pressure group which amounted to 0.000. This shows that Ha is accepted,

which means that there is an effect of marjoram aromatherapy and deep breathing techniques on diastolic blood pressure in hypertensive patients at three measured time points, namely before, after, and follow-up. The Partial Eta-Squared value of 0.676 indicates that most of the observed variance, namely the decrease in diastolic blood pressure, can be attributed to marjoram aromatherapy and deep breathing techniques (Table 4).

Multivariate Analysis

The results showed that the characteristics of respondents on systolic blood pressure found that the characteristics of age, gender, and occupation that affect systolic blood pressure. In the results of diastolic blood pressure, it was found that the characteristics of age, gender, and occupation influenced diastolic blood pressure (Table 5).

Table 1
Frequency Distribution of Characteristics of Chronic Kidney Disease Patients Undergoing Hemodialysis Based on Age, Duration of Hemodialysis, HB Level, Gender, Education, Occupation, Comorbidities (n=18)

Karakteristik Responden	f	%
Gender		
Male	3	15
Female	17	85
Education		
Low Education	15	75
High Education	5	25
Jobs		
Unemployed	14	70
Employed	6	30
Treatment Therapy		
Amlodiphine	13	65
Candesartan	5	25
Herbeser	2	10
Duration of Hypertension		
Short duration (1-5 Years)	16	80
Medium duration (6-10 Years)	1	5
Long duration (>10 Years)	3	15
Total	20	100
Age		
Mean	53,45	
SD	7,897	
Min	35	
Max	65	
Comorbid Diseases		
Mean	1,00	
SD	0,795	
Min	0	
Max	2	

Tabel 2.
Univariate Analysis

Tekanan Darah	Sebelum			Sesudah		
	Mean ± SD	Min-Max	95%CI	Mean ± SD	Min-Max	95%CI
Measurement 1						
Systolic	171,55 ±15,756	149-208	164,18-178,92	162,30 ± 15,479	140-198	155,06-169,54
Diastolic	102,95 ± 4,989	93-110	100,61-105,29	100,20 ± 4,830	92-113	97,94-102,46
Measurement 2						
Systolic	169,45 ±16,292	145-208	161,83-177,07	157,10 ± 18,854	130-198	148,28-165,92
Diastolic	101,80 ± 4,775	97-115	99,57-104,03	95,80 ± 5,337	80-107	93,30-98,30
Measurement 3						
Systolic	161,35 ± 16,897	134-201	153,44-169,26	150,70 ± 18,238	120-195	142,16-159,24
Diastolic	98,80 ± 9,407	98-132	94,40-103,20	94,40 ± 5,586	80-100	91,79-97,01

Tabel 3.
Bivariate Analysis of Systolic Blood Pressure

Source	Sum of Squares	Degrees of Freedom	Mean Square	F	P-value	Partial Eta-Squared
Time	6680,237	2,248	2971,874	44,961	0,000	0,703
Error	2823,013	42,709	66,099			

Tabel 4.
Bivariate Analysis of Diastolic Blood Pressure

Source	Sum of Squares	Degrees of Freedom	Mean Square	F	P-value	Partial Eta-Squared
Time	1927,000	2,412	798,773	39,582	0,000	0,676
Error	925,000	45,837	20,180			

Tabel 5.
Multivariate Analysis

Variabel	Systolic		Diastolic	
	B	*P-value*	B	*P-value*
Age	5,375	0,008	1,287	0,017
Gender	8,367	0,028	5,543	0,023
Jobs	-14,270	0,015	-1,853	0,047
Comorbid Diseases	3,683	0,459	1,499	0,456
Treatment Therapy	-0,880	0,881	1,295	0,588
Duration of Hypertension	8,769	0,074	0,100	0,957

DISCUSSION

Average Blood Pressure Differences Before and After Being Given Marjoram Aromatherapy and Deep Breathing Techniques

The results showed that there was a difference in the average value before and after the intervention in the intervention group on the first day, where the average before systolic 171.55 mmHg and after the intervention became 162.30 mmHg and for diastolic before intervention 102.95 mmHg and after 100.20 mmHg. Until the last day, the systolic intervention before the intervention was 161.35 mmHg and after 150.70 mmHg, while the diastolic before the intervention was 98.80 mmHg and after 94.40 mmHg. Based on the description above, overall it can be observed that there is a decrease in the average value of systolic and diastolic blood pressure after the application of the intervention. According to the results of the study, marjoram aromatherapy and the application of deep breathing techniques are able to reduce blood pressure in individuals with hypertension. This fact is confirmed

through the posttest results, namely after the subject receives marjoram aromatherapy treatment and deep breathing techniques. This is in line with research conducted by Soraya (2014) that the provision of aromatherapy has a positive impact on lowering blood pressure in patients with hypertension, where the decline does not occur immediately, but is done gradually to see the results. This is also supported by Emil et al. (2023) which revealed that aromatherapy can significantly affect blood pressure reduction.

Based on the findings in the field, respondents consistently took their medication as prescribed by their doctors and regularly attended follow-up appointments to collect their medication. Throughout the study, respondents also showed a very positive attitude toward the use of marjoram aromatherapy and deep breathing techniques. All respondents expressed a high level of interest in marjoram aromatherapy, particularly noting their enjoyment of its fragrance. When practicing deep breathing techniques to inhale the marjoram aromatherapy, they reported feeling relaxed, comfortable, and calm. Furthermore, the data collected indicated a decrease in blood pressure following the use of marjoram aromatherapy and deep breathing techniques compared to previous blood pressure readings.

Effect of Marjoram Aromatherapy on Blood Pressure

The results showed that the Repeated Measurement ANOVA test in the intervention group, the p-value for systolic blood pressure was 0.000, while in diastolic blood pressure was 0.000. These results indicate that the alternative hypothesis (Ha) is accepted, implying that there is a positive effect of marjoram aromatherapy on blood pressure in hypertensive patients. The results obtained are in line with Emil et al. (2023) which states that there is an effect of giving aromatherapy to reduce pain, anxiety, and blood pressure in the elderly who experience hypertension. In addition, this study was supported by Roswita (2022) who suggested that the combination of aromatherapy with other interventions such as music therapy, meditation, and deep breathing techniques was also proven to be successful in reducing blood pressure in hypertensive patients.Marjoram aroma therapy is aroma therapy using marjoram essential oil derived from the marjoram plant (origanum majorana). In marjoram essential oil, there are several main compounds, namely terpinene which has antimicrobial and antioxidant properties, linalool which is muscle relaxant and anti-inflammatory, terpinol which has muscle relaxant effects and antioxidant properties, sabinene which is antispasmodic and anti-inflammatory, and caryophyllene which has potential as anti-inflammatory and analgesic (Dhiman & Bhasin, 2022).

The mechanism of action of marjoram aroma therapy on blood vessels involves the effects of relaxation and stress reduction. Marjoram aromatherapy affects blood vessels in muscle relaxation, where linalool and terpineol compounds play a role in this muscle relaxation. In addition, this aroma therapy can also reduce stress and anxiety levels, where stress causes dilation of blood vessels which increases blood pressure, so relieving stress can have a positive effect on vascular health (Shahnaz, 2018). When essential oils are inhaled, the vaporized molecules of the oil are carried by the airflow to the roof of the nose, where there are fine cilia emerging from receptor cells. When the molecules interact with the hairs, electrochemical messages are transmitted through the olfactory bulb and tract to the limbic system. This process stimulates memory and emotional responses. The hypothalamus functions as a connector and regulator by relaying messages to various parts of the brain and body. The messages received are then converted into action by involving the release of electrochemical compounds that cause relaxation. This relaxation can result in stretching of the body's muscles and a decrease in the production of the hormone adrenaline, which in turn can lead to a decrease in blood pressure (Motulo et al., 2024).

Effect of Deep Breathing Technique on Blood Pressure

The results showed that the Repeated Measurement ANOVA test in the intervention group, the p-value for systolic blood pressure was 0.000, while in diastolic blood pressure was 0.000. These results indicate that the alternative hypothesis (Ha) is accepted, implying that there is a positive effect of deep breathing techniques on blood pressure in hypertensive patients.This research is supported by Lestari & Ramadhaniyati (2018) who stated that deep breathing techniques can affect blood pressure reduction in hypertensive patients. This research is also in accordance with Wahidi et al. (2022) which states that a decrease in blood pressure can be influenced by the intervention of deep breathing techniques.Deep breath techniques can have a significant effect on blood pressure. Controlled deep breathing techniques can help induce a relaxation response in the body. When a person experiences stress or anxiety, blood pressure tends to increase. Through focused and slow breathing techniques, the body can respond by reducing the level of stress hormones, such as cortisol, which in turn can lower blood pressure. Slow and deep breathing can stimulate the activation of the parasympathetic nervous system. This nervous system is known as the rest and digest system, which plays a role in easing the body's activity and lowering blood pressure. Focused deep breathing can signal the body to switch from stress response mode to rest and recovery mode (Asyari et al., 2024; Azizah et al., 2021).

Controlled breathing techniques have been linked to improved Heart Rate Variability (HRV). Optimal HRV, which is the variation in time between heartbeats, is usually considered an indicator of good health. An increase in HRV can synergize with a decrease in blood pressure and deep breathing has been associated with a decrease in the inflammatory response in the body. Low levels of inflammation can help maintain vascular health and prevent an increase in blood pressure (Lestari & Ramadhaniyati, 2018).Deep breathing techniques that activate sympathetic nerves trigger increased activation of various organs and smooth muscles. One of them is by increasing heart rate and the release of epineprin and norepineprin into the bloodstream by the adrenal medulla. Stimulation of sympathetic nerve activity will increase peripheral vascular resistance so that it will increase preload and cardiac output. Increased plasma norepineprin levels increase heart rate and myocardial contraction force as well as peripheral vascular resistance. This initial response is adaptive and good for maintaining the circulatory system by maintaining optimal blood pressure (Wahidi et al., 2022).

Simultaneous Influence of Respondent Characteristics on Blood Pressure

The research results show that the characteristics of respondents including age, gender and occupation influence systolic and diastolic blood pressure. This is in line with Damayanti et al. (2022) who said that as people get older, blood pressure has a tendency to rise. In the elderly group, systolic pressure can increase due to a decrease in blood vessel elasticity. This is supported by Widayanti & Prastyawati (2023) who revealed that increasing age can affect systolic and diastolic blood pressure. In general, blood pressure tends to increase with age because the arteries become stiffer and lose elasticity. In more detail, the increase in arterial pressure with age, aortic regurgitation and degenerative processes can cause physiological changes in the body. These changes include thickening of the artery walls due to the accumulation of collagen substances in the muscle layer, which results in narrowing and stiffness of the blood vessels.Gender factors, both female and male, can influence a person's blood pressure. This happens because it is related to women's menopause and men's lifestyles which tend to be unhealthy, making them susceptible to high blood pressure (Kusumawaty et al., 2016).

Work is also another factor that greatly influences blood pressure. This is related to workload which can increase stress levels. High levels of stress will make blood pressure uncontrolled and tend to continue to increase. Length of work will have an influence on the worker's systolic and diastolic blood pressure, especially working in a noisy room. This is because blood flow can be affected by noise hyperstimulation of the auditory organs. If this event continues for years in organs or tissues, it will cause blood pressure to rise (Kasumayanti et al., 2021).

CONCLUSION

Based on the results of the research conducted, it can be concluded that there is an influence of marjoram aromatherapy and deep breathing techniques on blood pressure in hypertension sufferers. Apart from that, the founding variables that can influence blood pressure, both systolic and diastolic blood pressure, are age, gender and occupation. This research is expected to become reference material in efforts to manage the health of hypertension sufferers by providing marjoram aromatherapy and deep breathing techniques, so that each individual can develop appropriate attitudes and behavior regarding self-management of hypertension in controlling blood pressure.

REFERENCES

Anggraini, Y. (2020). Efektifitas Teknik Relaksasi Nafas Dalam terhadap Tekanan Darah pada Pasien Hipertensi di Jakarta. Jurnal JKFT: Universitas Muhamadiyah Tangerang, 5(1), 41–47. https://doi.org/http://dx.doi.org/10.31000/jkft.v1i1.2806.

Asyari, H., Rohaedi, S., Marsono, Hasni, N. I., & Darmawati, I. (2024). "Terkomfirmasi" Terapi Komplementer Relaksasi Nafas Dalam dan Relaksasi Otot Progresif untuk Klien Hipertensi. Yayasan DPI.

Azizah, W., Hasanah, U., & Pakarti, A. T. (2021). Penerapan Slow Deep Breathing terhadap Tekanan Darah pada Pasien Hipertensi. Jurnal Cendikia Muda, 2(4), 607–616.

Damayanti, R., Sabar, S., Lestari, A., Nurarifah, & Sukmawati. (2022). Pengaruh Pemberian Edukasi terhadap Perubahan Tekanan Darah pada Lansia dengan Hipertensi. Lentora Nursing Journal, 2(2), 64–69. https://doi.org/https://doi.org/10.33860/lnj.v2i2.1337.

Dhiman, N., & Bhasin, A. (2022). Marjoram (Origanum Majorana): an Essential Oil with Potential Pharmacological Properties and Health Benefits. The Pharma Innovation Journal 2022, 11(7), 4454–4460.

Emil, F. S., Safitri, Y., & Juwita, D. S. (2023). Inovasi Pemberian Aromaterapi Lavender pada Tn. M untuk Menurunkan Tingkat Nyeri, Kecemasan, dan Tekanan Darah pada Lansia yang Mengalami Hipertensi di Desa Naumbai Wilayah Kerja UPT Puskesmas Airtiris. Jurnal Kesehatan Terpadu, 1(4), 25–32. https://doi.org/https://doi.org/10.31004/sjkt.v2i3.17810.

Iqbal, M. F., & Handayani, S. (2022). Terapi Non Farmakologi pada Hipertensi. Jurnal Untuk Masyarakat Sehat (JUKMAS), 6(1), 41–51. https://doi.org/https://doi.org/10.52643/jukmas.v6i1.2113.

Kandarini, Y. (2017). Tatalaksana Farmakologi Terapi Hipertensi. RSUP Sanglah Denpasar.

Kasumayanti, E., Zurrahmi, Z., & Maharani, M. (2021). Faktor-faktor yang Berhubungan

dengan Kejadian Hipertensi Usia Produktif di Desa Pulau Jambu Wilayah Kerja UPTD Puskesmas Kuok. Jurnal Ners, 5(1), 1–7. https://doi.org/https://doi.org/10.31004/jn.v5i1.1672.

Kusumawaty, J., Hidayat, N., & Ginanjar, E. (2016). Hubungan Jenis Kelamin dengan Intensitas Hipertensi pada Lansia di Wilayah Kerja Puskesmas Lakbok Kabupaten Ciamis. Mutiara Medika: Jurnal Kedokteran Dan Kesehatan, 16(2), 46–51. https://doi.org/https://doi.org/10.18196/mmjkk.v16i2.4450.

Lestari, L., & Ramadhaniyati. (2018). Falsafah dan Teori Keperawatan. Pustaka Belajar.

Mariza, A., & Kalsum, A. U. (2017). Pemberian Aromaterapi Bunga Mawar terhadap Penurunan Tekanan Darah pada Wanita Lanjut Usia di UPTD Panti Sosial Lanjut Usia Tresna Werdha Natar Lampung Selatan. Jurnal Kesehatan, 8(1), 30–35. https://doi.org/10.26630/jk.v8i1.305.

Mills, K. T., Stefanescu, A., & He, J. (2020). The Global Epidemiology of Hypertension. Reviews Nephrology, 16(4), 223–237. https://doi.org/10.1038/s41581-019-0244-2.

Motulo, F. K. M., Kepel, B. J., & Mariati, N. W. (2024). Pengaruh Aromaterapi Lavender terhadap Tingkat Kecemasan Pasien Sebelum Tindakan Pencabutan Gigi. Jurnal E-Gigi, 12(1), 17–25. https://doi.org/https://doi.org/10.35790/eg.v12i1.48521.

Palembang City Health Office. (2022). Profil Kesehatan Provinsi Sumatera Selatan Tahun 2021. www.dinkes.sumselprov.go.id.

Riskesdas. (2018). Hasil Riset Kesehatan Dasar 2018.

Rosita, A. I. (2022). Pengaruh Relaksasi Napas Dalam dengan Aromaterapi Lavender dalam Pencegahan Hipertensi pada Ibu Hamil di Puskesmas Samata. UIN Alauddin Makassar.

Roswita, R. (2022). Pengaruh Aromaterapi terhadap Penurunan Tekanan Darah pada Pasien dengan Hipertensi: Literature Review. Jurnal Skala Kesehatan, 13(2), 122–130. https://doi.org/https://doi.org/10.31964/jsk.v13i2.368.

Shahnaz, P. (2018). Pengaruh Ekstrak Daun Marjoram (Origanum Majorana) terhadap Kualitas Tidur Pada Lanjut Usia. Universitas Trisakti.

Soraya, U. (2014). Pengaruh Aromaterapi Lavender terhadap Penurunan Tekanan Darah pada Lansia dengan Hipertensi di Kelurahan Siantan Hulu Pontianak Utara. Universitas Tanjungpura.

South Sumatra Provincial Health Office. (2022). Profil Kesehatan Kota Palembang Tahun 2021. https://doi.org/https://doi.org/10.52829/pw.310.

Sukiwantoi, A., & Rohana, N. (2019). Penerapan Teknik Relaksasi Nafas dalam Menurunkan Tingkat Depresi pada Penderita Hipertensi. Proceeding Book The 2nd Widya Husada Nursing Conference (2nd WHNC) 2, 1–5.

Wahidi, K. D., Nursanti, I., Irawati, D., Jumaiyah, W., & Yuniarsih, W. (2022). Pengaruh Pengaturan Suhu Dialisat terhadap Stabilitas Tekanan Darah Intradialitik Pasien Hemodialisis dengan Sindrom Kardiorenal. Jurnal Perawat Indonesia, 6(2), 1096–1108.

https://doi.org/https://doi.org/10.32584/jpi.v6i2.1762.

WHO. (2021). Cardiovascular Diseases. https://www.who.int/en/news-room/fact-sheets/detail/cardiovasculardiseases-(cvds).

Widayanti, M. R., & Prastyawati, I. Y. (2023). Korelasi Usia dengan Tekanan Darah Sistolik-Diastolik, Indeks Massa Tubuh, Kadar Kolestrol pada Lansia. Jurnal Kesehatan Mercusuar, 6(1), 20–25. https://doi.org/https://doi.org/10.36984/jkm.v6i1.352.