

Efektifitas Kombinasi Senam Tera dan Emotional Freedom Technique dalam Menurunkan Tekanan Darah Lansia Hipertensi di Karanglewas

Effectiveness of Combinied Tera Gymnastics and Emotional Freedom Technique in Reducing Blood Pressure of Older Adults with Hypertension in Karanglewas

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ABSTRACT

Background: Hypertension is a chronic condition characterized by persistently elevated blood pressure.. This condition is the fourth leading risk factor for mortality among older adults in Indonesia, with a prevalence reaching 10,2%. Generally, long-term pharmacological therapy is prone to triggering medication-related adverse effects. Therefore, non-pharmacological approaches such as physical activity and relaxation therapy have been shown to be effective alternatives for controlling blood pressure. To date, no study has examined the combined effect of Tera exercise and the Emotional Freedom Technique on lowering blood pressure, particularly in the Karanglewas Community Health Center (Puskesmas) in Banyumas Regency.

Objective: To determine the effectiveness of combined Tera gymnastics and Emotional Freedom Technique in reducing blood pressure among older adults with hypertension in the Karanglewas Community Health Center (Puskesmas) in Banyumas Regency.

Method: This research employed a quantitative quasi-experimental design with a pretest and posttest control group. A sample of 40 older adult was obtained through purposive sampling. Blood pressure measurements used a calibrated digital sphygmomanometer. Data normality was tested using the Shapiro-Wilk test. Data were analyzed using the paired t-test, Wilcoxon, and Mann-Whitney U test.

Results: In the intervention group, systolic blood pressure decreased significantly from 144,75 to 140,40 ($p = 0,001$) and diastolic blood pressure also decreased significantly from 89,90 to 81,90 mmHg ($p = 0,001$). In the control group, there were no significant changes in systolic blood pressure ($p = 0,064$) and diastolic blood pressure ($p = 0,872$). The Mann-Whitney test showed a significant difference between the intervention group (systolic delta 5,9 and diastolic delta 10,1) and the control group (systolic delta 0,8 and diastolic delta 0,6) with a $p = 0,001$ result ($p \leq 0,05$).

Conclusion: The combination of Tera gymnastics and the Emotional Freedom Technique is effective in reducing blood pressure in the elderly.

Keywords: Blood pressure; elderly hypertension; Emotional Freedom Technique; Tera exercises.

INTISARI

Latar belakang: Hipertensi merupakan kondisi meningkatnya tekanan darah yang abnormal. Masalah ini menjadi faktor risiko untuk kematian terbesar keempat pada lanjut usia di Indonesia, dengan prevalensi mencapai 10,2%. Umumnya, pengobatan terapi farmakologis jangka panjang rentan memicu efek samping negatif terkait obat (*drug related problems*). Oleh karena itu, pendekatan nonfarmakologis aktivitas fisik dan terapi relaksasi menjadi alternatif yang efektif untuk mengontrol tekanan darah. Hingga saat ini belum ada yang meneliti efek gabungan antara senam tera dan *Emotional Freedom Technique* terhadap penurunan tekanan darah khususnya di wilayah Puskesmas Karanglewas Banyumas.

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Tujuan: Mengetahui apakah kombinasi senam Tera dan *Emotional Freedom Technique* efektif dalam menurunkan tekanan darah pada lansia dengan hipertensi di wilayah Puskesmas Karanglewas Kabupaten Banyumas.

Metode: Desain kuantitatif kuasi-eksperimen dengan rancangan *pretest* dan *posttest control group* diterapkan dalam riset ini. Sampel sebanyak 40 lansia diperoleh melalui teknik *purposive sampling* (*non-probabilitas*). Pengukuran tekanan darah menggunakan *sfigmomanometer* digital yang sudah dikalibrasi. Uji normalitas data menggunakan uji Saphiro Wilk. Analisis data menggunakan *Paired t-test*, Wilcoxon dan Mann Whitney.

Hasil: Pada kelompok intervensi tekanan darah sistolik menurun signifikan dari 144,75 ke 140,40 ($p=0,001$) dan tekanan diastolik juga turun signifikan dari 89,90 ke 81,90 ($p=0,001$). Pada kelompok kontrol tidak ada perubahan signifikan pada tekanan darah sistolik ($p=0,064$) dan diastolik ($p=0,872$). Uji Mann Whitney menunjukkan terdapat perbedaan yang signifikan antara kelompok intervensi (delta sistolik 5,9 dan diastolik 10,1) dan kontrol (delta sistolik 0,8 dan diastolik 0,6) dengan hasil $p=0,001$ ($p \leq 0,05$).

Simpanan: Kombinasi senam Tera dan *Emotional Freedom Technique* efektif dalam menurunkan tekanan darah tinggi pada lansia.

Kata kunci: *Emotional Freedom Technique*; hipertensi; lansia; senam Tera; tekanan darah.

INTRODUCTION

Hypertension is a medical condition defined by abnormally high blood pressure beyond acceptable thresholds, particularly when systolic readings surpass 140 mmHg and diastolic readings exceed 90 mmHg. This issue is among the most frequent health disorders experienced by the elderly group, particularly those aged ≤ 60 years. The Global Health Body calculates that roughly 1,28 billion citizens aged 30–79 years globally experience hypertension, with almost two thirds living in poor and mid-revenue nations. Hypertension causes approximately 1.000 deaths every hour worldwide; therefore, it is a disease that can lead to other complications and places a very serious burden on public health.¹

According to the results of the 2011–2021 non-communicable disease cohort study and the 2023 Indonesian Health Survey, hypertension accounts for 10,2% of all mortalities, ranking as the fourth leading cause of death in Indonesia.² Nationally, the prevalence of hypertension was recorded at 34,1% in 2022 and 30,8% in 2023.³ In Central Java Province, prevalence figures stood at 29,3%, 38,2%, and 26,9% in 2022, 2023, and 2024, respectively. At the district level, Banyumas Regency reported 172.022 cases in 2022, rising to 181.948 in 2023, before declining to 169.400 in 2024. A preliminary study conducted at the Banyumas District Health Office in 2024 identified Puskesmas Karanglewas as ranking fourth highest in prevalence with 8.345 cases of hypertension. To address this, to prevent adverse impacts and reduce the prevalence of increased blood pressure, preventive measures must be taken immediately. The most appropriate preventive measure to overcome this is lowering blood pressure through pharmacological and non-pharmacological methods.

Pharmacological therapy can be performed through the use of medications for hypertension. One type of medication that can be consumed is Amlodipine. Amlodipine works to lower blood pressure.⁴ Due to these side effects, people are choosing alternatives to control blood pressure, namely non-pharmacological therapy. Non-pharmacological therapies that can be

used to lower blood pressure include physical exercise and stress management. Physical activity and stress management can lower blood pressure.⁵

Emotional Freedom Technique is a non pharmacological method that utilizes a cognitive approach combined with the stimulation of meridian points to reduce stress, anxiety, and hypertension. Research has confirmed that Emotional Freedom Technique significantly affects blood pressure reduction, with significant differences observed in both systolic ($p=0,020$) and diastolic ($p<0,001$) blood pressure following intervention.⁶ In addition to stress management therapy, physical activity can also control blood pressure. One physical activity that can be used by the elderly is Tera gymnastics. Tera gymnastics is an exercise style that combines breathing methods with physical movement, proven to be a useful drug-free strategy for controlling high blood pressure in the elderly.^{7,8}

Although many previous studies have examined the effectiveness of Tera gymnastics and Emotional Freedom Technique alone in lowering blood pressure, research on the combination of the two is still limited.⁹ The Tera gymnastics intervention influences physiological regulation, and the Emotional Freedom technique helps manage emotional aspects. Based on existing studies, there is no research investigating this from Tera gymnastics and Emotional Freedom Technique.¹⁰ Therefore, this study aims to determine whether the combination of Tera gymnastics and Emotional Freedom Technique is effective in reducing blood pressure in elderly people with hypertension in the Karanglewas Community Health Center area, Banyumas Regency.

METHODS

This study used a quasi-experimental with a pretest-posttest design and a control group design. The population in this study were 111 elderly people at the Pambudiwaras Post, Karanglewas District, Banyumas Regency. The sample size of 40 respondents and divided into intervention and control groups with a 1:1 ratio. The sampling technique used was purposive sampling. Inclusion criteria included hypertensive patients aged ≤ 60 years without other comorbidities, cooperative, and not regularly taking anti hypertensive medication. Exclusion criteria included elderly people with severe musculoskeletal disorders and patients with stage 3 hypertension.

This study used the following research instruments: calibrated ONEMED digital sphygmomanometers and blood pressure observation sheets. Primary data were collected through direct blood pressure measurements before and after the intervention.

The study began by measuring pretest blood pressure in the intervention and control groups. The intervention group was then given Tera gymnastics and the Emotional Freedom Technique for two weeks, with a total of six sessions (three times per week). Tera gymnastics duration was 20 minutes and 15 minutes for Emotional Freedom Technique. Both interventions were conducted using established SOP. Then, the researchers measured post-test blood pressure in both the intervention and control groups.

The research results include data normality test, univariate analysis and bivariate analysis. The results of the normality test data analysis using Shapiro-Wilk presented on Table 1.

Table 1. Results of the normality test of diastolic and systolic blood pressure data pretest posttest

Group	Variables	Measurement	Sig	Interpretation
Intervention	Systolic	Pretest	0,013	Non-normal
		Posttest	0,053	Normal
		Difference	0,445	Normal
	Diastolic	Pretest	0,530	Normal
		Posttest	0,173	Normal
		Difference	0,044	Non-normal
Control	Systolic	Pretest	0,006	Non-normal
		Posttest	0,023	Non-normal
		Difference	0,001	Non-normal
	Diastolic	Pretest	0,474	Normal
		Post-test	0,387	Normal
		Difference	0,011	Non-normal

Univariate analysis was used to describe the frequency distribution of respondent characteristics and blood pressure before and after the Tera exercise and Emotional Freedom Technique interventions, both in the intervention and control groups. This includes the mean, minimum, maximum, and standard deviation of respondent's blood pressure. The bivariate analysis in this study used the Mann-Whitney U and Wilcoxon tests to determine the differences in blood pressure between the intervention and control groups.

The researchers obtained approval from the Research Ethics Committee of the Faculty of Health Sciences, Muhammadiyah University of Purwokerto, under No. KEPK/UMP/47/X/2025, prior to conducting the study. This study has obtained research permits from the Banyumas District Health Office and Karanglewas Community Health Center, and was conducted after obtaining informed consent from all participants.

RESULTS

Respondent characteristics are shown in Table 2.

Table 2. Frequency Distribution of Respondent Characteristics (n=20)

Characteristics	Intervention Group		Control Group		p-value
	Frequency (f)	%	Frequency (f)	%	
Gender					0,168 ^a
Female	19	95	16	80	
Male	1	5	4	20	
Age					0,342 ^b
45-52 years old	10	50	9	45	
53-60 years old	10	50	11	55	

^aanalyzed using paired t test; ^banalyzed using Wilcoxon Signed Rank

The characteristics of respondents based on gender between the intervention and control groups have almost the same frequency and percentage, with the majority of respondents being female. Based on age, in the intervention group, 10 respondents (50%) are aged 45-

52 years and 53-60 years each, while in the control group, 9 respondents (45%) are aged 45-52 years and 11 respondents (55%) are aged 53-60 years. The Chi-Square test results showed that there were no significant differences in gender ($p = 0,168$) and age ($p = 0,342$) characteristics between the intervention and control groups. This indicates that both groups had similar characteristics before receiving the therapeutic exercise and Emotional Freedom Technique interventions.

The results of the analysis comparing systolic and diastolic blood pressure before and after the intervention in each group are presented in Table 3.

Table 3. Systolic and diastolic blood pressure in the intervention and control groups pretest and after the intervention group was given Tera gymnastics and Emotional Freedom Technique treatment

Group	Blood Pressure (mmHg)	Pre-test	Post-test	Difference pre-post	p-value
		Mean $\pm$ SD or Median (IQR)	Mean $\pm$ SD or Median (IQR)	Mean $\pm$ SD or Median (IQR)	
Intervention	Systolic	144,75 (132-180)	140,40 $\pm$ 15,071	5,9 $\pm$ 3,62	0,001 ^{a*}
	Diastolic	89,90 $\pm$ 10,175	81,90 $\pm$ 7,742	8,9 (2,6-22,8)	0,001 ^{b*}
Control	Systolic	140,20 (133-166)	140,90 (132-167)	1,4 (0,2-6,8)	0,064 ^b
	Diastolic	82,60 $\pm$ 7,485	81,90 $\pm$ 7,582	1,0 (0,0-3,0)	0,872 ^b

^aanalyzed using paired t test; ^banalyzed using Wilcoxon Signed Rank

Table 3, shows that the data analysis results for systolic blood pressure and a Wilcoxon test for diastolic blood pressure with a p-value of 0,001 in the intervention group. This indicates a significant change in the intervention group given a combination of Tera gymnastics and Emotional Freedom Technique. Meanwhile, in the pretest-post test blood pressure control group, a p-value of 0,064 for systolic blood pressure and a p-value of 0,872 for diastolic blood pressure $p > 0,05$. This indicates no significant change in blood pressure in the control group between before and after the Tera exercise and Emotional Freedom Technique treatments post-test.

The results of the analysis comparing the differences in systolic and diastolic blood pressure between the intervention and control groups are presented in Table 4.

Table 4. Differences in pre-posttest systolic and diastolic blood pressure between the intervention and control groups

Variables	Intervention group pre-posttest difference	Control group pre-posttest difference	p-value
	Mean $\pm$ SD or Median (IQR)	Mean $\pm$ SD or Median (IQR)	
Systolic	5,9 $\pm$ 3,62	0,8 (0,2-6,8)	0,001*
Diastolic	10,1 (2,6-22,80)	0,6 (0,0-3,0)	0,001*

Table 4, the average difference in systolic blood pressure in the intervention group was 5,9 mmHg, while in the control group it was only 0,8 mmHg, meanwhile, the average difference in diastolic blood pressure in the intervention group was 10,1 mmHg and in the control group was 0,6 mmHg. The results of the Mann-Whitney U test showed a p-value = 0,001 ($p < 0,05$), which means there was a significant difference between the decrease in systolic and diastolic blood pressure in the control and intervention groups.

Detailed views of systolic and diastolic blood pressure before and after the intervention

are presented in Figure 1 for the control group, while those for the intervention group are presented in Figure 2.

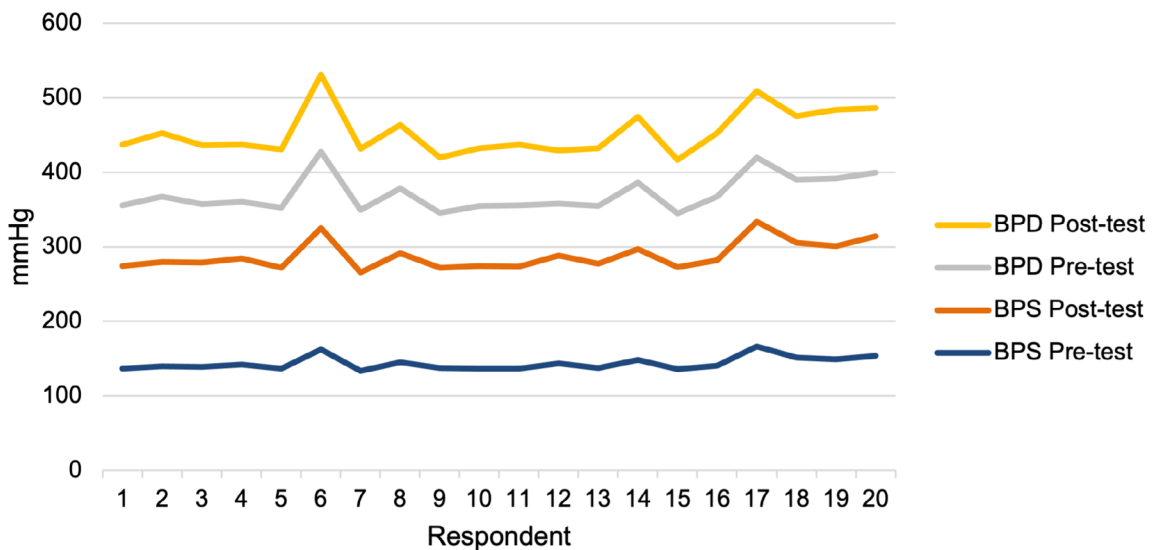


Figure 1. Systolic and diastolic blood pressure values in the control group

In Figure 1, the control group did not show a significant decrease in blood pressure; in fact, some participants experienced an increase in blood pressure. This indicates that participants who did not receive the combined Tera exercise and Emotional Freedom Technique intervention did not experience a significant decrease. In Figure 2, the intervention group showed a significant decrease in blood pressure after receiving the Tera exercise and Emotional Freedom Technique treatment. Overall, the results of the 2-week study with 6 sessions (35 minutes each) showed that the intervention group given a combination of therapeutic exercise and Emotional Freedom Technique was more effective at lowering blood pressure compared to the control group.

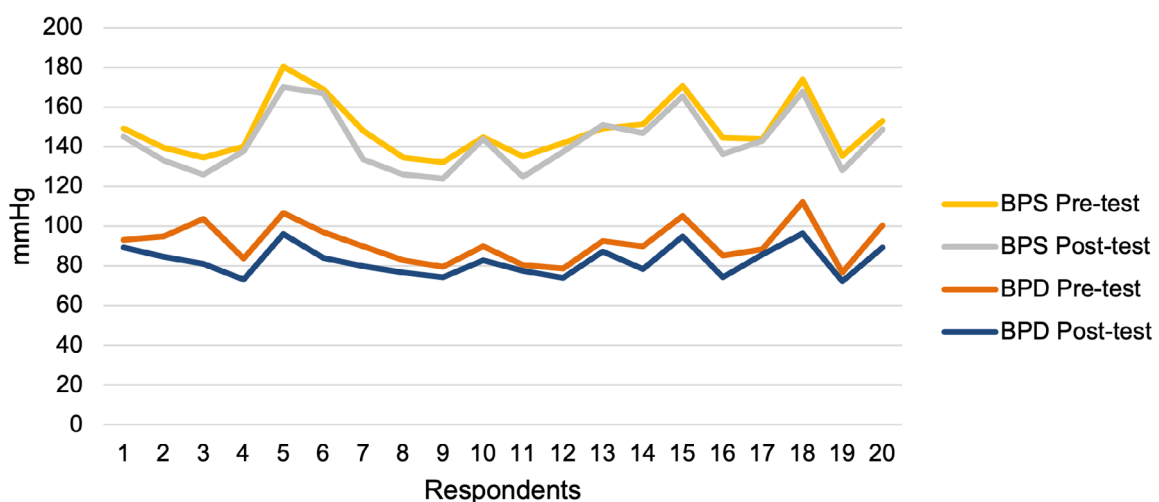


Figure 2. Systolic and diastolic blood pressure values in the intervention group

DISCUSSION

The results of the study showed that the majority of respondents in the treatment and control groups were female. The age of respondents in the treatment group aged 45-52 years and 53-60 years had the same percentage, namely 50%, while in the control group aged 45-52 years 45% and 53-60 years 55%. Based on the research data, it is known that increased blood pressure is more often found in elderly women, who are more susceptible to high blood pressure due to various physiological changes, such as decreased metabolic rate and calcium accumulation in the blood, which increases blood viscosity and blood pressure.¹¹ These physiological changes begin to become more apparent around the age of 45; they result from the accumulation of collagen in the muscular layer of blood vessels, which is characterized by thickening of the arterial walls. This leads the vessels to become stiffer and less elastic hindering blood flow and greater risk of cardiovascular disorders.¹² Other causes of high blood pressure increase as unhealthy practices, such as chronic stress, smoking, lack of physical activity that decrease elasticity of blood vessels and the heart capacity.¹³

The results of this study also support Kalenga,¹⁴ that older women have more risk than men for developing hypertension due to the large number (61%) of females. The condition is related to hypolipidemia with decreasing hormone levels post-menopausal where estrogen loses its cardioprotective action. Prior to menopause, estrogen makes blood vessels more flexible and increases levels of good cholesterol or HDL cholesterol, but that protective effect disappears after menopause occurs.¹⁵ The results of this study are inconsistent with those of another study Hu,¹⁶ which suggests that men have a higher risk of developing hypertension a disparity stemming from lifestyle factors such as smoking and alcohol consumption among the male population.

Based on the Wilcoxon test, the results of the study showed that there was a significant difference in systolic and diastolic blood pressure in the intervention group between before (pretest) and after being given Tera exercise and Emotional Freedom Technique (post-test). The results showed that the intervention group had high systolic and diastolic blood pressure (pretest) and experienced a decrease after being given Tera exercise and Emotional Freedom Technique (posttest). This research aligns with Blacher¹⁷ which states that the Emotional Freedom Technique has been shown to lower blood pressure in the elderly through stimulation of meridian points, increased parasympathetic activity, vasodilation, and decreased plasma norepinephrine levels. Meanwhile, Tera gymnastics, as a form of light physical activity, contributes to lowering blood pressure by stimulating the release of endorphins, which produce a relaxing effect.^{18,19}

Based on the Mann-Whitney U test, the study results showed a significant difference in systolic and diastolic blood pressure between the intervention and control groups after receiving Tera exercise and Emotional Freedom Technique treatments. However, in this study, diastolic blood pressure tended to decrease more than systolic blood pressure. This is consistent with

Patriyani & Sulistyowati²⁰ which indicates that diastolic blood pressure is more sensitive to differences in emotional states and activity levels in the elderly population. This is consistent with Manungkalit et al²¹ which states that relaxation-based interventions require at least 6–8 weeks to produce significant differences between groups. Nevertheless, the downward trend observed in the intervention group indicates strong potential for this intervention as a nonpharmacological treatment for older adults with hypertension.

The difference in systolic blood pressure changes in the intervention group reached 5,9 mmHg and diastolic blood pressure was 8,9 mmHg, whereas in the control group, the systolic difference was only 1,4 mmHg (in the direction of an increase) and the diastolic difference was 1,0 mmHg. The results of this study are consistent with studies Yang and Chen,^{22,23} which demonstrates that both Tera exercise and the Emotional Freedom Technique serve as successful interventions for reducing blood pressure among individuals with hypertension. The results of this study are supported by research Garg et al²⁴ which showed a decrease in systolic blood pressure by 7,6 millimeters of mercury and diastolic blood pressure by 4,8 millimeters of mercury in the intervention group who underwent physical exercise. The results of this study are supported by research Islam²⁵, a reduction in systolic blood pressure of up to 11,4 mmHg and diastolic blood pressure of 12,36 mmHg was recorded after receiving the Emotional Freedom Technique intervention. The effectiveness of this combined intervention is related to its ability to suppress physiological stress responses through activation of the parasympathetic nervous system and improve blood circulation through regular body movement.^{26,27} On the other hand, Tera exercise lowers blood pressure through vasodilation, reduction of peripheral resistance and stimulation of endorphin production.^{28,29}

Compared to a single intervention, ergonomic exercises reduced systolic blood pressure by 15 millimeters of mercury and diastolic blood pressure by 5 millimeters of mercury.³⁰ Similarly, exercise for people with hypertension reduced systolic blood pressure by 15 millimeters of mercury and diastolic blood pressure by 5 millimeters of mercury,³¹ while exercise for heart health reduced systolic blood pressure by up to 29,73 millimeters of mercury and diastolic blood pressure by 12,87 millimeters of mercury.³² Relaxation methods, including Progressive Muscle Relaxation and autogenic relaxation, also successfully lowered blood pressure by 7–13 mmHg (systolic) and 5–7 mmHg (diastolic). While single interventions show numerically greater reductions, Tera exercise combined with the Emotional Freedom Technique provides absolute benefits leading to holistic improvements in both physiology and psychology. Yet, this mix is more complicated, takes much longer and requires more facilitators. Thus, for older people with movement restriction an intervention can be just one Tera exercise or the Emotional Freedom Technique, which makes it still useful and efficient.

CONCLUSIONS AND IMPLICATIONS

Based on the results of the research conducted, it can be concluded that there is a significant difference in blood pressure reduction (both systolic and diastolic) in the intervention

group given Tera gymnastics and Emotional Freedom Technique compared to the control group. It is hoped that the elderly can change their lifestyle for better health, by regulating their diet, exercising regularly, and reducing salt consumption in order to control blood pressure in hypertension.

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