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Original Research Paper

The use of five-finger relaxation techniques for reducing stress and sleep quality in hypertension patients

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Abstract

One of the efforts to overcome hypertension experienced by its sufferers is to reduce stress and improve their sleep quality. Patients will usually overcome hypertension by taking drugs (which are chemical). Some use alternative methods. However, not many studies have been conducted to reveal efforts to reduce stress and improve sleep quality in hypertensive patients through this alternative method. It is the main reason research is carried out on non-pharmacological efforts to overcome stress and improve sleep quality that is effective, easy, and can be done alone by patients. This study aimed to determine the effect of five-finger relaxation techniques on stress and sleep quality in hypertensive patients in the working area of the Sukabumi Health Center. This study was a quasi-experiment with two groups of pre-tests and post-tests. The population and sample were hypertensive patients in the working area of the Sukabumi Health Center, with as many as 70 respondents divided into control and intervention groups of 35 respondents, each using purposive sampling techniques. The DASS-42 standard questionnaire was used for stress variables, while the PSQI standard questionnaire was used for sleep quality variables. Data analysis using a paired sample t-test showed differences in the pre-test and post-test stress scores in the control and intervention groups and in the control and intervention groups' sleep quality scores in the pre-test and post-test. The five-finger relaxation technique can lower hypertensive patients' stress and sleep quality scores. This technique is also an easy, inexpensive technique that is very likely to be done by hypertensive patients to maintain stable blood pressure and is an alternative non-pharmacological therapy for overcoming stress problems and sleep quality in hypertensive patients.

Keywords: five-finger relaxation technique; hypertension; sleep quality; stress

1. Introduction

Hypertension is a disease with the highest number of contributors to morbidity and mortality in the world (WHO, 2019). This hypertension is classified as a chronic disease that lasts throughout life and is a silent killer (Dzau & Balatbat, 2019). In 2019, hypertension was the leading cause of premature death worldwide, with more than 1 billion people affected. The prevalence is expected to increase to 1.5 billion by 2025, with 9.4 million people dying each year from hypertension and its complications (Nguyen & Chow, 2021; WHO, 2013). From 2013–2018, there was an increase in the prevalence of hypertension in Indonesia, from 25.8% to 34.1%. The majority of hypertension occurs in the age group of 55–64 years (55.2%), followed by the age group of 45–54 years (45.3%) and the age group of 31–44 years (31.6%) (Kementerian Kesehatan RI, 2019). The estimated number of hypertension cases in Indonesia is 63,309,620, with a mortality rate due to hypertension of 427,218 deaths (Sugito, 2022). Hypertension increases the risk of heart failure, kidney failure, dementia, cerebrovascular disease, atherosclerosis, coronary heart disease, and stroke (Fuchs & Whelton, 2020; Rubattu et al., 2015; van der Veen et al., 2015).

One of the factors related to the incidence of hypertension is sleep quality. Sleep can alter sympathetic nervous system function, affecting blood pressure (Birhanu et al., 2021). Some research results show an interrelated relationship between sleep quality and hypertension. Poor sleep quality affects increased blood pressure and increases the risk of hypertension (Liu et al., 2016; Mao et al., 2016; Yang et al., 2021; Yuan et al., 2021), and vice versa, hypertension significantly causes poor sleep quality for sufferers (Birhanu et al., 2021; Lo et al., 2018). Li et al. (2020) found that, compared to healthy people, hypertensive patients have a 2.66-fold increased risk of poor sleep quality. The prevalence of poor sleep quality in hypertensive patients varies, ranging from 35.5% to 52.5% (Ayanaw et al., 2022; Birhanu et al., 2021; Li et al., 2020).

In addition to sleep quality, stress is one of the important factors triggering hypertension (Syarifah et al., 2022). Stress is important in relation to hypertension because it can stimulate the sympathetic nervous system, improve heart function, and cause arteriole vasoconstriction, increasing blood pressure (Lechan & Margiyati, 2021). The prevalence of stress in hypertensive patients is quite high, reaching 84.3%; however, only 2.4% access health professional services to deal with stress (Sarkar et al., 2019). Stress in hypertensive patients is often ignored, even though persistent stress in people with hypertension can increase the risk of complications from a heart attack and stroke, which can be fatal (Wati et al., 2018). Based on the above, research on non-pharmacological efforts to overcome stress and improve sleep quality that is effective, easy, and can be done alone by patients is needed. One of them is the five-finger relaxation technique. This technique diverts one's thoughts by touching the fingers while imagining pleasant or liked things (Dewi, 2021). This relaxation technique helps patients change their perceptions of anxiety, stress, tension, and fear by receiving suggestions on the subconscious threshold or in a relaxed state by moving their fingers according to commands (Mawarti, 2021). This study aims to determine the effect of the five-finger relaxation technique on stress and sleep quality in hypertensive patients in the Sukabumi Health Center work area.

2. Research Methods

This study was a quasi-experiment with two groups of pre-tests and post-tests. The study sample consisted of hypertensive patients in the working area of the Sukabumi Health Center, with as many as 70 respondents divided into control and intervention groups of 35 respondents each. Purposive sampling is used in sample selection, with inclusion criteria: being mentally healthy and willing to be respondents. Data were collected using the standard Depression Anxiety Stress Scales (DASS-42) questionnaire for stress variables, the Pittsburgh Sleep Quality Index (PSQI) to measure sleep quality variables, and five-finger relaxation technique variables through participatory observation. The PSQI consists of 19 questions used to assess seven components related to sleep quality (scores 0-3) for a maximum total score of 21 points. The higher the PSQI points obtained, the worse the quality of sleep.

Respondents in the intervention and control groups signed informed consent forms and filled out demographic data forms. They received activities of daily living (ADL) sheets, stress questionnaires, and sleep quality tests as pre-tests. The five-finger relaxation technique is implemented 10 times within 3 weeks with a duration of 10-15 minutes and an interval of one day. In the control group, no action was taken. After 3 weeks of the study process, researchers again gave stress and sleep quality questionnaires for the post-test.

Validity and reliability tests on all research variables include stress-independent variables, referring to the results of the DASS-42 standard questionnaire validity test, which is 0.499–0.813 and reliability value 0.90, and sleep quality, referring to the PSQI standard instrument, which is 0.365–0.733 with a Cronbach alpha value of 0.83. The statistical analysis used includes analysis of the description of respondent characteristics using frequency distribution, univariate analysis using mean values and bivariate analysis using paired sample t-test, and independent simple t-test. This research has received

approval from the Research Ethics Commission of the Sukabumi College of Health Sciences with number 10/IV/KEPK/STIKESMI/2022.

3. Results and Discussion

3.1. Overview of Respondent Characteristics

The average age of respondents in the control and intervention groups was not much different. In the control group, the age range of respondents was 47–76 years, while in the intervention group, the age range of respondents was 46–73 years (Table 1). This shows that middle-aged and elderly groups dominate the prevalence of hypertension. A multivariate analysis of previous studies showed that older age groups were independently associated with hypertension (Dewhurst et al., 2013; Lloyd-Sherlock et al., 2014; Pilleron et al., 2017). As we get older, the risk of developing hypertension also increases.

Table 1. Characteristics of respondents by age

Group	N	Mean	SD	Min Score	Max Score
Control	35	60.20	7.619	47	76
Intervention	35	58.57	6.736	46	73

Respondents in the control group had a majority of primary school education (34.3%), while in the intervention group, the majority had primary and junior high school education at 28.6% each (Table 2). Education level affects the incidence of hypertension (Di Chiara et al., 2017; Sun et al., 2022). The lower prevalence of hypertension and a significant decrease in systole and diastole blood pressure occurred in the higher education group than in the lower education group (Sun et al., 2022). This may be associated with increased awareness, ease of access to information, and adherence to hypertension treatment in highly educated patients.

Table 2. Characteristics of respondents based on education and occupation

	Group			
	Control		Intervention	
	f	%	f	%
Education				
Elementary School	12	34.3	10	28.6
Junior High School	9	25.7	10	28.6
Senior High School	8	22.9	8	22.9
College/University	6	17.1	7	20.0
Total	**35**	**100.0**	**35**	**100.0**
Occupation				
Working	12	34.3	8	22.9
Not Working	23	65.7	27	77.1
Total	**35**	**100.0**	**35**	**100.0**

The percentage of respondents who did not work in the control and intervention groups was quite high, at 65.7% and 77.1%, respectively, as shown in Table 2. The results of previous studies showed different results, where the prevalence of hypertension was dominated by high-income and working-class groups (Bhattarai et al., 2021; Rana et al., 2020). The high-income and working groups had 1.33 and 2.26 times more income than those with low incomes and non-workers, respectively (Bhattarai et al., 2021). This is associated with a lifestyle that affects the body mass index (BMI), where BMI is closely related to hypertension (Hossain et al., 2019; Landi et al., 2018).

3.2. Effect of Five-Finger Relaxation Technique on Stress of Hypertensive Patients

The paired sample t-test results in the control and intervention groups obtained a p-value of < 0.05, which showed that the five-finger relaxation technique significantly reduced stress levels in patients with hypertension. This is evidenced by a decrease in the average stress score in the control group from 72.43 to 53.09 and in the intervention group from 76.03 to 42.83, as shown in Table 3. The decrease in scores in the intervention group was much greater (33.2) compared to the control group (19.34).

The decrease in stress levels in the intervention group in this study is in line with the theory that relaxation experienced by a person will affect the body's systems to create a feeling of comfort and calm. The five-finger relaxation technique can also activate the parasympathetic nerve that channels the relaxation response (trophotropic), where the parasympathetic work system reverses with sympathetic nerves so as to reduce muscle tension, blood pressure, and regulate hormones associated with increased stress (Dewi, Panduragan, Umar, Yulianti, and Budiana, 2022; Sukohar, 2014).

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The decrease in stress levels in the control group was influenced by routine treatment and activities carried out daily. Limitations due to hypertension do not make most respondents lose their enthusiasm for life after being diagnosed with hypertension. The results of daily logbook activities evidence this during the research process, where respondents carried out various positive activities such as praying and remembering God five times a day, reading the Quran, and then being supported by doing physical activity for 30 minutes daily, including hobbies. Most respondents have hobbies of meditation and shopping; by doing these activities they like, there is a sense of happiness and enthusiasm for life, so that thoughts and behaviors become positive, ultimately affecting their stress levels.

Table 3. The effect of five-finger relaxation on the stress of hypertensive patients

Stress	N	Mean	Mean Difference	SD	T	*P-value*
Control Group						
Before			19.34			
	35	72.43		7.539	12.477	0.000
After	35	53.09		6.007		
Intervention Group						
Before						
	35	76.03	33.2	9.522	15.624	0.000
After						
	35	42.83		5.327		

3.3. The Effect of Five Finger Relaxation Technique on Sleep Quality of Hypertensive Patients

The paired sample t-test results in the control and intervention groups obtained a p-value of < 0.05 so that there was a significant effect of five-finger relaxation techniques on improving sleep quality in

patients with hypertension. This is evidenced by a decrease in the average sleep quality score in the control group from 16.60 to 15.46 and in the intervention group from 16.83 to 14.91, as shown in Table 4. This decrease in sleep quality score indicates an improvement in sleep quality because, in the PSQI, the fewer points obtained, the better the sleep quality, and vice versa. The more points obtained, the worse the sleep quality.

Table 4. The effect of five-finger relaxation on the sleep quality of hypertensive patients

Sleep Quality	N	Mean	Mean	SD	T	*P-value*
Control Group						
Before	35	16,60	1,14	1,193	5,078	0,000
After	35	15,46		1,094		
Intervention Group						
Before	35	16,83	1,92	1,543	7,260	0,000
After	35	14,91		1,222		

The decrease in the average PSQI score in the control group was not only influenced by routine treatment but also by daily activities. Hypertension they suffered did not make most respondents lose their zest for life. This is evidenced by the results of the logbook's daily activities during the research process. Respondents engage in various positive activities such as praying and remembering Allah five times a day, reading the Quran, doing physical activities, and even carrying out hobbies (the majority of respondents like cooking and shopping). Doing activities you like causes a sense of happiness and enthusiasm for life, and thoughts and behaviors become positive, affecting the improvement of sleep quality. Islam recommends maintaining personal hygiene before going to bed with ablution. People often do this activity with hypertension to improve their sleep quality. Ablution can make muscles more relaxed. The mind feels calm and comfortable, which reduces insomnia and improves sleep quality (Hariawan et al., 2017; Monika et al., 2020; Zein & El Newi, 2019).

The five-finger relaxation technique is a general relaxation technique that involves recalling pleasant experiences that have been had. With the five-finger relaxation technique, a person will be led back to pleasurable experiences through his subconscious so that a feeling of comfort and relaxation arises, reducing anxiety levels and other emotional problems so that it becomes easy to fall asleep (Dewi, 2021). These results are in line with previous research showing the influence of five-finger relaxation techniques on sleep quality (Dewi et al., 2018; Hartono et al., 2019).

3.4. Differences in Stress and Sleep Quality of Hypertensive Patients

There was a significant difference in changes in stress scores between hypertensive patients in the intervention group and the control group ($t = 5{,}268$; p-value < 0.05). Table 5 shows that both groups experienced decreased stress scores, with the difference in score decline being higher in the intervention group than in the control group (33.2 versus 19.34, respectively). Hypertension can be caused by various conditions, one of which is high stress. Stress can impact the nervous system, leading to increased sympathetic nervous system activity. The sympathetic nervous system is responsible for regulating the body's response to stress, and chronic activation of this system can lead to increased blood pressure levels (Aqsho &; Pudjijuniarto, 2021). In people with hypertension, ongoing stress will certainly continue to increase blood pressure and will further worsen health with the occurrence of various serious complications. Therefore, stress must be overcome immediately so as not to cause severe symptoms in people with hypertension. Stress management can be done with non-pharmacological techniques such as the five-finger relaxation technique.

This relaxation technique research has been quite successfully applied to efforts to reduce stress in breast cancer patients conducted by Dewi, Panduragan, Umar, Yulianti, and Budhiana (2022). The results show that the five-finger relaxation technique effectively reduces stress in breast cancer patients.

This technique is easy to practice and can be done in any atmosphere. To practice this technique, individuals perform it in a quiet, comfortable place to sit or lie down, then close their eyes and take a deep breath. This technique is easy to practice and can be done in any atmosphere. To practice this technique, individuals perform it in a quiet, comfortable place to sit or lie down, then close their eyes and take a deep breath. Furthermore, imagine that each finger represents a different aspect of his life, and consciously relax each finger by exhaling slowly and imagining the tension on the finger melting (Dewi, 2019; Norkhalifah & Mubin, 2022).

Patients in the intervention group reported feeling more relaxed and calm after regularly practicing the five-finger relaxation technique. Patients also reported experiencing fewer stress symptoms than before practicing the Five Finger Relaxation Technique. The control group, which did not receive the intervention, showed no significant change in stress levels. In the control group that did not get any intervention, patients usually only relied on medication to overcome hypertension while overcoming stress that can worsen the patient's blood pressure level, they did not get any intervention. Therefore, even though they have received hypertension treatment, hypertensive patients can still experience a significant increase in blood pressure due to other factors that can increase the patient's blood pressure that are not treated and ignored. This proves the effectiveness of the five-finger relaxation technique in reducing stress in hypertensive patients. This technique is a simple relaxation technique, but it is very effective in reducing stress in hypertensive patients. Practicing this technique regularly can significantly reduce stress and hypertension levels. Therefore, it is important to incorporate this technique into the treatment plan for hypertensive patients to help manage their health condition effectively.

Table 5. Differences in stress and sleep quality of hypertensive patients

Variable	N	Mean Difference	T	P-value
Stress				
Control Group	35	19.34	5.268	0.000
Intervention Group	35	33.2		
Sleep Quality				
Control Group	35	1.14	2.225	0.029
Intervention Group	35	1.92		

Related to sleep quality, the results of this study showed a significant difference in changes in sleep quality scores between hypertensive patients in the intervention group and the control group (t = 2,225, p-value < 0.05). Both groups experienced decreased PSQI scores, with more significant differences in score reductions in the intervention group than in the control groups of 1.92 and 1.14, respectively (Table 5). The lower the PSQI score, the better the patient's sleep quality. The decrease in the average sleep quality score in the control group was due to respondents getting hypertension treatment and doing positive activities such as getting closer to God Almighty, exercising, and maintaining a healthy lifestyle. In contrast, respondents in the intervention group, in addition to receiving antihypertensive drug therapy, also received a five-finger relaxation technique that provides calm and comfort.

The five-finger relaxation technique relaxes a person and provides calm. The five-finger relaxation technique results in the activation of the parasympathetic nerves that channel the relaxation response (trophotropic), in which the system reverses with the sympathetic nerves, causing a relaxed and comfortable state. The feeling of relaxation is channeled to the hypothalamus, which then secretes CRF, which stimulates the pituitary gland to increase the production of the hormone serotonin. The relaxation response is due to disruption of the activity of the parasympathetic nervous system in the brain, which causes changes that control autonomic nerve activity in the form of decreased breathing frequency, pulse, muscle tension, and alpha waves in the brain, which cause an easy start to sleep. Hypertensive patients with relaxed, comfortable, and calm conditions will increase the bulbar synchronizing region

(BSR), where the BSR secretes serotonin, which results in sleeping conditions that cause RAS activity to decrease (Jamilah, 2020).

4. Conclusion

The results showed the effect of the five-finger relaxation technique on reducing stress and improving sleep quality in hypertensive patients (p-value 0.05). This was evidenced by a decrease in the average stress score in the control group from 72.43 to 53.09 and in the intervention group from 76.03 to 42.83. The decrease in scores in the intervention group was much greater (33.2) compared to the control group (19.34). Sleep quality decreased, with the average sleep quality score in the control group decreasing from 16.60 to 15.46 and in the intervention group decreasing from 16.83 to 14.91. This 5-finger technique is recommended to be taught to hypotensive patients as an alternative to non-pharmacological treatment that is easy, inexpensive, and can be done independently. It is expected that non-communicable disease program holders will add five-finger relaxation techniques in addition to self-care interventions and non-pharmacological therapies to overcome stress and sleep quality problems in the management of hypertensive patients.

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