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The Effect of Relaxation and Slow Breathing Technique (RSBT) as A Non-Pharmacological Intervention on Blood Pressure Level Among Stage 1 Hypertensive Older Adults

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Abstract

The prevalence of hypertension is relatively high, and the number still increases by year. Various studies have demonstrated that non-pharmacological methods have been shown capable of lowering blood pressure such as relaxation techniques, and also slow breathing technique. This study aims to determine the effects of relaxation and slow breathing technique (RSBT) on blood pressure level among stage 1 hypertensive older adults. This study utilized quantitative research method and the research design employed in this study is the one group interrupted time series pre-test post-test quasi-experimental design. Two types of instruments were used in this study to gather the pertinent data and information. The researcher utilized the checklist form to record the result of observation. The researcher also utilized biophysiologic instrument to measure to measure the blood pressure level of the participants. The participants of the study were ten (10) male and ten (10) female older adults with stage 1 hypertension who were selected through purposive sampling technique. Repeated-Measures ANOVA and the Post Hoc test was utilizing series of t-test. The result shows that there is a significant difference in the systolic and diastolic blood pressure level among participants before and after the implementation of the RSBT in both initial phase (first week) and reinstituted phase (third week). Prolonging of implementation of RBST would be more powerful to reduce blood pressure level among older adult with stage I hypertension.

Keywords: Relaxation; Blood Pressure; Hypertension

Introduction

Hypertension or high blood pressure (BP) is responsible for 7.6 million deaths per annum worldwide (Arima, Barzi, & Chalmers, 2011). The World Health Organization (WHO) has identified high blood pressure as one of the most important causes of premature morbidity and mortality in both developed and developing countries (WHO, 2012). The prevalence of hypertension increases with age, rising steeply after the age of 50 years and affected more than 50 percent of this population (Mancia, Grassi, & Redon, 2014).

The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) recommend

that antihypertensive therapy should start with patients who have a systolic blood pressure greater than 140 mm Hg and a diastolic blood pressure greater than 90 mm Hg based on the average of two or more accurate blood pressure measurements (Chobanian, Bakris, Black, Cushman, Green, Izzo, et al., 2003; Smeltzer, Bare, Hinkle, & Cheever, 2013).

The treatments of hypertension most commonly involve the use of alpha-blockers, angiotensin converting enzyme inhibitors, angiotensin II receptor blockers, beta-blockers, calcium channel blockers or diuretics (Timby & Smith, 2010; Mahvan & Mlodinow, 2014).

With the availability of wide array of pharmacological treatment, management of essential hypertension continues to pose a difficult problem. There are patients who do not respond to pharmacological treatment, or face intolerable side effects or who adhere poorly to drug regime and also complain that the cost of antihypertensive drugs are very expensive (Eckel, Jakicic, Ard, De Jesus, Miller, Hubbard, et al., 2014; James, Oparil, Carter, Cushman, Dennison-Himmelfarb, Handler, et al., 2013; Patel, Kathrotia, Pathak, & Thakkar, 2012). These have led to a search of non- pharmacological methods to reduce blood pressure level either as a first line or adjunctive treatment (Patel et al., 2012; Zencirci, 2013).

Various studies have demonstrated that non-pharmacological methods have been shown capable of lowering blood pressure such as life-style modification, increase in intake of fruits and vegetable, reduction in salt intake, weight reduction, regular physical exercises, yoga, relaxation techniques, and also slow breathing technique (Eckel et al., 2014; Mainguy, Malenfant, Neyron, Saey, Maltais, Bonnet, et al., 2014; Mohamed, Hanafy & Gomaa, 2013; Patel et al., 2012; Posadzki, Cramer, Kuzdzal, Lee, & Ernst, 2014; Subramanian, Soudarssanane, Jayalakshmy, Thiruselvakumar, Navasakthi, Sahai., et al, 2013; Turankar, Jain, Patel, Sinha, Joshi, Vallish, et al., 2013). Those interventions modify the risk factors responsible for the development of hypertension.

The beneficial effects of relaxation technique and slow breathing on the physiological and psychological status of cardiac patients have been documented widely. According to Patel et al. (2012), relaxation technique reduces the arousability of cerebral cortex, thereby decreasing the impulse from various centres to the hypothalamus, decreasing the sympathetic tone and thus a decrease in blood pressure. Dickinson, Campbell, Beyer, Nicolson, Cook, and Ford (2008) reported a significant reduction in systolic blood pressure of 5.5 mmHg and diastolic blood pressure of 3.5 mmHg after implementing relaxation technique. These data are in agreement with those of Shinde, Shinde, Khatri, Hande, and Bhushan (2013) who showed a significant decrease of both systolic and diastolic blood pressure in hypertensive patients after a single session of relaxation technique. The study conducted by Kumutha, Aruna, and Poongodi (2014) revealed the beneficial effects of progressive muscle relaxation technique on reducing systolic blood pressure and also on reducing diastolic blood pressure among geriatric population.

As for slow breathing, it has been reported in one study that a single ten (10) minute session of slow breathing caused a significantly higher fall in systolic and diastolic blood pressures, heart rate and respiratory rate (Kaushik, Kaushik, Mahajan, & Rajesh, 2006). The study by Mohamed, Hanafy, and Gomaa (2013) has proven that practicing slow deep breathing exercise daily for one

week 4 times a day for 10 minutes has significantly decreased the systolic and diastolic blood pressure of patients newly diagnosed with essential hypertension.

In combination between relaxation and slow breathing, Gupta (2014) reported that there was significant reduction of mean systolic blood pressure by 16.5 mmHg after relaxation and deep breathing technique. Those two kinds of intervention, relaxation and slow breathing, have been proven to reduce blood pressure level. At this point, the researcher is interested to study the combination of relaxation and slow breathing technique that may produce a better outcome in the treatment of hypertension especially among older patients.

According to Health Ministry of the Republic of Indonesia (2018), Indonesia has high prevalence of hypertension that is about 31.3 percent on male and 36.9 percent on female in 2018 of civilians who are more than 18 years old. This prevalence is relatively high. And the number still increases by year.

Based on the researcher's observation, most of hypertensive patients in Indonesia seldom monitor their health condition. They assume that the conditions they experienced are a natural thing to older adults. They consult doctors only when they manifest signs and symptoms of hypertension. They also lack self-care awareness to prevent increase of blood pressure. They lack strength to travel because of inaccessible location of health care facilities.

Yet, hypertension is identified as a contributing factor for stroke, renal failure, heart disease and also is the leading cause of death. Hence, hypertension should be treated as soon as possible. Early treatment prevents further complication. However, the current pharmacological treatments for hypertension are costly, and may cause serious side effects.

This situation leads to the searching of non-pharmacological methods to treat hypertension, thus preventing the elevation of blood pressure level. Related to this, the use of relaxation and slow breathing technique (RSBT) as a therapy has no significant side effects, inexpensive, and easy to accomplish (James et al., 2013; Khan, Hemmelgarn, Herman, Bell, Mahon, Leiter, et al., 2009; Patel et al., 2012).

The available researches separately indicate possibilities for the use of relaxation and slow breathing in treating many varied physical problems including hypertension. However, there is limited research to document the effect of both combinations for reducing blood pressure level, especially in Indonesia. Hence, the researcher became interested to explore the inexpensive alternative nursing intervention as a non-pharmacological intervention which may help decrease the blood pressure level among stage 1-hypertensive older adult

The introduction contains (sequentially) general background, previous literature review (state of the art) as the basis for scientific novelty statements from articles, scientific novelty statements, and research problems.

Method

This study utilized quantitative research method. This method consists of the collection, tabulation, summarization, and analysis of numerical data for the purpose of answering research questions or hypotheses. The research design employed in this study is the one group interrupted time series pre-test post-test quasi-experimental design. The interrupted time series design involves collecting data at multiple instances over time before and then after implementation

of a treatment or intervention. It is the strongest quasi-experimental approach for evaluating the longitudinal effects of interventions (Salazar, Crosby, & DiClemente, 2015). Specifically, the researcher followed the interrupted time series with withdrawn and reinstituted treatment that researcher modify based on Polit and Beck (2010) to conduct this study.

The measurement of the study included the systolic and diastolic blood pressure level of participants collected in three (3) weeks of three (3) phases. The RSBT was implemented in the first week for seven (7) days, called as initial phases, and blood pressure measurements were measured before and after every implementation. In the second week, the RSBT was withdrawn but the blood pressure was measured every day for seven (7) days. In the third week or reinstituted phase, the RSBT was reinstituted. The participants repeated the RSBT in seven (7) days and the blood pressures of the participants was measured. The researcher used the results of the measurements to determine the effect of the RSBT on blood pressure level among stage 1 hypertensive older adults.

Two types of instruments were used in this study to gather the pertinent data and information. The researcher utilized the checklist form to observe the effect of the intervention or the RSBT which was implemented. During the implementation of the RSBT, the researcher filled the checklist to ensure participants are following the correct steps of RSBT. The checklist of RSBT which include the guidelines, had been translated by a Certified Translator into Bahasa (Indonesian Language) to ensure that the procedure of RSBT would be understood by participants. At the end of the study, the researcher gave this checklist and guidelines to the participants as an instruction to demonstrate the RSBT in the future.

The researcher also utilized biophysiologic instrument to measure the dependent variables. In this study, the researcher used the automatic oscillometric sphygmomanometer to measure the blood pressure level of the participants. The aim of using automatic oscillometric sphygmomanometer was to achieve the accurate data blood pressure level without rounding technique. In other words, it would lead to the attainment of the exact number of systolic and diastolic blood pressure level. The automatic oscillometric sphygmomanometer that researcher used has passed both Association for the Advancement of Medical Instrumentation (AAMI) and European Society of Hypertension (ESH) validation protocols (Grim & Grim, 2010; O'Brien, Atkins, Stergiou, Karpettas, Parati, Asmar, et al., 2010).

The participants of the study were ten (10) male and ten (10) female older adults with stage 1 hypertension who were selected through purposive sampling technique. The participants included in this study met the inclusion criteria which are: 1) Male and female older adults who are 65–75 years old (Hogstel & Curry, 2005); 2) Has stage 1 hypertension with double measurements (systolic blood pressure is 140–159 mmHg and diastolic blood pressure is 90–100 mmHg) (Chobanian et al, 2003); 3) Able to follow instructions; 4) Did not use medical treatment or medication when the study was conducted; and 5) Signed the informed consent. If there were subjects who took the medication during the study, they would be excluded from the study.

The exclusion criteria of the subjects are: 1) Smoking within the past six (6) months; 2) Had history of heart disease, peripheral artery disease, kidney disease, or other cardiovascular problems; 3)

Refuse to become a participant.

Repeated-Measures ANOVA was used to judge the difference in the blood pressure level of the participants between initial phase, withdrawal phase and reinstituted phase (Thomas, Nelson, & Silverman, 2015). When the result of F-ratio in the Repeated-Measures ANOVA was significant, the researcher performed post hoc tests. It can be used to highlight exactly where these differences occur. A series of t-test might be computed to compare all of possible pairs of means.

However, Repeated-Measures ANOVA required each group of the independent variable needs to be approximately normally distributed. The alternative test which was Friedman test would be established when the normality data is violated. And the following test for post hoc test after the significant result of Friedman was a series of Wilcoxon Signed-rank test (Pett, 2013). The statistical tests were done using Statistical Package of Social Sciences (SPSS) 16.0 for Windows.

Results and Discussion

The blood pressure level of the participants before the RSBT

Table 1. Descriptive Statistics for the Participants' Blood Pressure Level Before the RSBT

No	Blood Pressure	Min	Max	SD	Mean	Classification
1	**Initial Phase**					
	Systolic	133	182	6.268	156.71	Stage 1 Hypertension
	Diastolic	67	102	5.847	88.85	
2	**Reinstituted Phase**					
	Systolic	136	174	6.511	156.66	Stage 1 Hypertension
	Diastolic	77	98	4.713	88.72	

The data presented in Table 1 are divided into two (2) groups; data from the initial phase (first week) and the reinstituted phase (third week). It can be seen that the systolic blood pressure level of the participants before the implementation of the RSBT in the initial phase range from 133 to 182 mmHg. The minimum systolic blood pressure level was 133 mmHg and the maximum was 182 mmHg. The mean for systolic blood pressure level was recorded 156.71 mmHg with a standard deviation of 6.268.

Likewise, the systolic blood pressure level of the participants before the implementation of RSBT in the reinstituted phase range from 136 to 174 mmHg. The minimum systolic blood pressure level was 136 mmHg and the maximum was 174 mmHg. The mean for systolic blood pressure level was recorded 156.66 mmHg with a standard deviation of 6.511.

Meanwhile, the diastolic blood pressure level of the participants before the RSBT in the initial phase was 67 mmHg for the minimum and the maximum was 102 mmHg. The mean for diastolic blood pressure level was 88.85 mmHg with the standard deviation of 5.847. The minimum diastolic blood pressure level of the participants before the RSBT in the reinstituted phase was recorded 77 mmHg and the maximum was 98 mmHg. The mean for diastolic blood pressure level was at 88.72 mmHg with a standard deviation of 4.713.

In other words, the blood pressure level of the participants before the implementation of the RSBT in both initial and reinstituted phases was recorded at the stage 1 hypertension classification. These findings were based on the average of all pre-test blood pressure measurement that the researcher

did when the RSBT was implemented in the first week and third week.

The findings show that the participants had the same stage of hypertension before the implementation of the RSBT. This is because the researcher purposely selected the same stage of hypertension which is stage 1 hypertension for all male and female participants. The purpose of this selection is to enhance the achievement of homogeneity of the participants. Homogeneity of the participant should be attained in order to increase internal validity and also to manage extraneous subject characteristics that might have influence to the study.

Results and discussion contains the results of research findings and discussion. Write down the findings obtained from the results of research that has been carried out and must be supported by adequate data. Research results and findings must be able to answer the research questions or hypotheses in the introduction.

The blood pressure level of the participants after the RSBT

Table 2. Descriptive Statistics for the Participants' Blood Pressure Level After the RSBT

No	Blood Pressure	Min	Max	SD	Mean	Classification
1	**Initial Phase**					
	Systolic	122	168	8.609	140.54	Stage 1 Hypertension
	Diastolic	66	95	5.538	81.29	
2	**Reinstituted Phase**					
	Systolic	123	155	6.295	138.56	Prehypertension
	Diastolic	71	92	4.886	80.00	

The data shown in Table 2 are gathered from the initial phase (first week) and reinstituted phase (third week) of implementation of the RSBT. As seen from Table 4, the systolic blood pressure level of the participants after the implementation of the RSBT in the initial phase range from 122 to 168 mmHg. The minimum systolic blood pressure level was 122 mmHg and the maximum was 168 mmHg. The mean for systolic blood pressure level was 140.54 mmHg with a standard deviation of 8.609.

As for the systolic blood pressure level of the participants after the implementation of the RSBT in the reinstituted phase, it was 123 mmHg at the minimum and the maximum was 155 mmHg. The mean of systolic blood pressure level was 138.56 mmHg with a standard deviation of 6.295.

On the other hand, the diastolic blood pressure level of the participants after the implementation of the RSBT in the initial phase was 66 mmHg at the minimum and the maximum was 95 mmHg. The mean of diastolic blood pressure level was at 81.29 mmHg with a standard deviation of 5.538. The minimum diastolic blood pressure level of the participants after the implementation of the RSBT in the reinstituted phase was 71 mmHg and the maximum was 92 mmHg. The mean of diastolic blood pressure level was 80.00 mmHg with a standard deviation of 4.886.

The data imply that the blood pressure level of the participants after the implementation of the RSBT remained at the stage 1 hypertension in the initial phase, however in the reinstituted phase the blood pressure level of the participants became prehypertensive.

Although the classification of hypertension in the initial phase is unchanged from the previous phase, the mean of the systolic and diastolic blood pressure changed. Likewise in the reinstituted phase, the classification and the mean of blood pressure changed as

compared with the previous phase.

The blood pressure level of the participants before and after the RSBT

The assessment of the difference in the blood pressure level of the participants before and after the RSBT was done utilizing the Paired t-test. Since the requirement of this test is the normality of data, the researcher provided the alternative test which is Wilcoxon Signed-rank test in case the normality of data unachievable. It is the nonparametric test equivalent to the Paired t-test which does not assume normality in the data.

The test of difference between the blood pressure level of the participants before and after the implementation of the RSBT is presented in Table 3.

Table 3. Test of Difference on the Participants' Blood Pressure Level Before and After the RSBT

No	Systolic	Mean	*p*-value	Description
1	**Initial Phase**			
	Pre-test	156.71	0.000	Significant
	Post-test	140.54		
2	**Reinstituted Phase**			
	Pre-test	156.66	0.000	Significant
	Post-test	138.56		
No	**Diastolic**	**Mean**	***p*-value**	**Description**
1	**Initial Phase**			
	Pre-test	88.85	0.000	Significant
	Post-test	81.29		
2	**Reinstituted Phase**			
	Pre-test	88.72	0.000	Significant
	Post-test	80.00		

Significant at 0.05 level of significance.

As seen from the above table, all of the level of significance (p-value) in both systolic and diastolic blood pressure of initial and reinstituted phase is less than 0.05. Thus, the null hypothesis of no significant difference is rejected. It means that there is a significant difference in the systolic and diastolic blood pressure level among participants before and after the implementation of the RSBT in both initial phase (first week) and reinstituted phase (third week).

In other words, the implementation of RSBT was able to decrease the blood pressure level among stage 1 hypertensive older adults. The maximum systolic blood pressure before the RSBT was 182 mmHg, then decreased to 168 mmHg after the implementation of RSBT. The mean systolic blood pressure before the RSBT also decreased from 156.71 mmHg to 140.54 mmHg in the initial phase and from 156.66 mmHg to 138.56 mmHg in the reinstituted phase. Moreover, the mean diastolic blood pressure was decreased from 88.85 mmHg to 81.29 mmHg in the initial phase and from 88.72 mmHg to 80.00 mmHg in the reinstituted phase.

It can be gathered from the data in Table 5 that the RSBT was able to reduce the systolic blood pressure level to as much as 16.17 mmHg on the average in the initial phase and as much as 18.10 mmHg on the average in the reinstituted phase. The RSBT was also able to reduce the diastolic blood pressure level to as much as 7.56 mmHg on the average in the initial phase and as much as 8.72 mmHg in the reinstituted phase.

This finding is supported by a previous study conducted by Gupta (2014) among 40 patients of essential hypertension. The study showed that there was significant reduction in blood pressure to normal value after giving progressive muscle relaxation and slow breathing technique. Patel et al. (2012) mentioned that the possible mechanism underlying this effectiveness could be that relaxation reduces the arousability of cerebral cortex, thereby decreasing the impulse from various centers to the hypothalamus, decreasing the sympathetic tone and thus a decrease in blood pressure. Moreover, Sharma, Frishman and Gandhi (2011) reported that slow breathing increases the tidal volume while maintaining minute

ventilation. This results in increased cardiopulmonary stretch receptor stimulation, which reduces the sympathetic efferent discharge, resulting in vasodilatation and reduces the blood pressure. Combination of both relaxation and slow breathing produce better outcome in lowering blood pressure level among older adults.

From the result of this study, the researcher also discovered that the RSBT has an immediate effect in the reduction of the blood pressure level among stage 1 hypertensive older adults. The researcher presents Figure 5 to show the day to day changes of the blood pressure level of the participants during the initial phase in the implementation of RSBT.

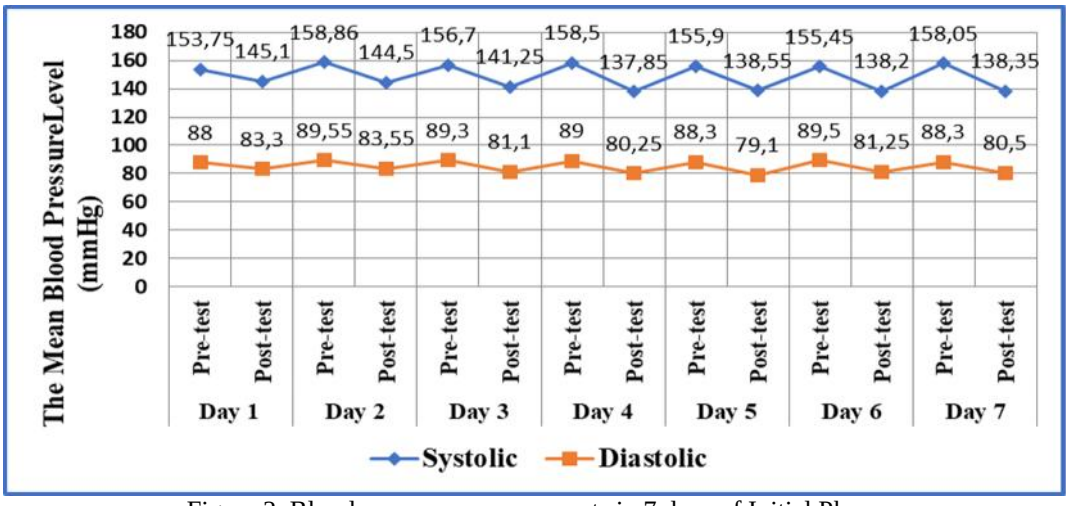

Figure 2. Blood pressure measurements in 7 days of Initial Phase

It can be gathered from Figure 2 that there are significant reductions in the post-test systolic and diastolic blood pressure level of the participants every day compared with the pre-test measurement. It means that the effect of RSBT in lowering the blood pressure of older adults is immediate effect. In other words, it can reduce the blood pressure immediately after the implementation of the RSBT. The highest reduction in the systolic blood pressure level as shown in Figure 2 was in the day fourth which is 20.65 mmHg and the highest reduction in the diastolic blood pressure level was in the day fifth which is 9.2 mmHg.

This finding is consistent with previous research findings. Kaushik et al. (2006) reported the same outcome show which show that both relaxation and slow breathing resulted in a decrease in the systolic blood pressure and diastolic blood pressure level of the participants. Their study revealed that even a single session of relaxation and slow breathing is effective in reducing blood pressure level at least temporarily. Indeed, in every session of RSBT that participants did in this study, there was a significant reduction in the blood pressure level of the participants. This immediate effect of the RSBT on lowering blood pressure caused by increases on parasympathetic tone, decreases sympathetic activity, improves cardiovascular and respiratory functions of the body after implementation (Adhana et al., 2013; Kaushik et al., 2006; Mohamed et al., 2013).

Difference in the blood pressure level of the participants of the following phases: initial, withdrawal and reinstituted phase

The judgment of significant difference

in the blood pressure level of the participants of the following phases which are initial, withdrawal and reinstituted phase was done through Repeated-Measures ANOVA and the Post Hoc test was utilizing series of t-test. Nevertheless, Repeated-Measures ANOVA as a parametric test is also needed to be normally distributed of data. Therefore, the researcher utilized Friedman test as a substitution test for Repeated-Measures ANOVA and the series of Wilcoxon Signed-rank test as Post Hoc test. The result of test of difference in the blood pressure level of the participants of the initial, withdrawal and reinstituted phase is presented in Table 3.

Table 3. Test of Difference on the Participants' Blood Pressure Level of the Following Phases: Initial, Withdrawal And Reinstituted Phase

No	Experimental Phases	Mean	*p*-value	Description
1	**Systolic**			
	Initial Phase	140.54	0.000	Significant
	Withdrawal Phase	155.44		
	Reinstituted Phase	138.56		
2	**Diastolic**			
	Initial Phase	81.29	0.000	Significant
	Withdrawal Phase	87.96		
	Reinstituted Phase	80		

Significant at 0.05 level of significance.

As presented in the Table 3, all of the level of significant (p-value) are less than 0.05. It means that there is a significant difference in the blood pressure level of the participants in the the initial, withdrawal and reinstituted phases.

While there is a significant difference, the post hoc test was done to determine which specific means differed from the others. In this study, post hoc test was used to confirm where the differences of blood pressure level occurred between the initial, withdrawal or reinstituted phases. It was done through a series of Wlicoxon signed-rank test and the result is presented in Table 4.

Table 4. Post Hoc Test Results of the Participants' Blood Pressure Level of Difference in the Initial, Withdrawal and Reinstituted Phases

No	Difference	Mean	Mean Difference	*p*-value	Description
Systolic					
1	Initial	140.54	14.9	0.000	Significant
	Withdrawal	155.44			
2	Initial	140.54	1.98	0.024	Significant
	Reinstituted	138.56			
3	Withdrawal	155.44	16.88	0.000	Significant
	Reinstituted	138.56			
Diastolic					
1	Initial	81.29	6.67	0.000	Significant
	Withdrawal	87.96			
2	Initial	81.29	1.29	0.016	Significant
	Reinstituted	80			
3	Withdrawal	87.96	7.96	0.000	Significant
	Reinstituted	80			

Significant at 0.05 level of significance.

As seen in Table 4, all of the level of significance (p-value) of the systolic and diastolic blood pressure between initial, withdrawal and reinstituted phases is less than 0.05. It means that there are significant differences in the systolic and diastolic blood pressure level of the participants between the initial phase (first week), withdrawal phase (second week) and reinstituted phase (third week).

In other words, the systolic and diastolic blood pressure level of the participants in the initial phase is different from the withdrawal phase, and the result in both initial and withdrawal phases is also different with those of the reinstituted phase.

The findings imply that when the RSBT was implemented in the initial phase, the mean of systolic blood pressure was recorded at 140.54 mmHg. Then, it was elevated to 155.44 mmHg when the participants did not implement the RSBT in the withdrawal phase. In the reinstituted phase, this systolic blood pressure decreased at 138.56 mmHg.

As for the mean for the diastolic blood pressure, it was 81.29 mmHg in the initial phase. And it measured to 87.96 mmHg when the RSBT was withdrawn in the second week. Then, it decreased again at 80 mmHg when the RSBT was reinstituted in the third week.

It can be deduced that the implementation of the RSBT was able to prevent the elevation of systolic and diastolic blood pressure level of hypertensive older adults. Once the RSBT was not implemented, the blood pressure would increase.

The result of the study also revealed that prolonging the implementation of RSBT would make the effect of RSBT to decrease the blood pressure level more effective. It can be seen from the post hoc test that there is a significant difference in the blood pressure level between the initial phase and reinstituted phase (p-value of 0.024 in systolic and 0.016 in diastolic). Although, there was no difference in the implementation of the RSBT in the initial phase (first week) and reinstituted phase (third week), the effect of the RSBT is seen to be more powerful in the third week. The implementation of RSBT in the reinstituted phase was 1.98 mmHg more effective to reduce systolic blood pressure, and 1.29 mmHg more effective to reduce diastolic blood pressure compared with the initial phase.

This finding is similar with the results of a previous study conducted by Shinde, Shinde, Khatri, Hande and Bhushan (2013), which stated that relaxation can be highly beneficial if practiced routinely in ones everyday life. It can strengthen the immune system and produce a host of other medically valuable physiological changes. Khumuta et al. (2014) also have the same opinion saying that implementing the relaxation technique in regular practice is beneficial for elderly with hypertension in order to reduce stress and high blood pressure. Likewise, Mohamed et al. (2013) added that practicing slow deep breathing exercise daily has therapeutic benefit to hypertensive patients. It has significantly decreased their systolic and diastolic blood pressure as well as their heart rate.

The continuous implementation of relaxation technique combined with slow breathing without interruption was able to prevent the elevation of blood pressure level. The constant blood pressure at normal level among hypertensive patients defined the adequate blood pressure control. In addition, the adequate management of blood pressure would be able to avoid the complications which usually follows hypertension such as stroke, myocardial infarction (MI), chronic heart failure (CHF), peripheral arterial disease, and chronic renal disease.

Difference in the blood pressure level of the participants after the RSBT when grouped according to gender

The assessment of the difference in the blood pressure level of participants after the RSBT when grouped according to gender also was done utilizing the Independent t-test. Similar with the previous discussion, the researcher employed the Mann-Whitney U test as an alternative test when the normality of data was unachievable. The result of the test of difference in the blood pressure level of the participants after the RSBT when grouped according to gender is shown in Table 5.

Table 5. Test of Difference on the Participants' Blood Pressure Level After the RSBT when Grouped According to Gender

No	Gender	Mean	*p*-value	Description
1	**Systolic**			
	Male	140.73	0.001	Significant
	Female	138,37		
2	**Diastolic**			
	Male	80.27	0.350	No Significant
	Female	81.02		

Significant at 0.05 level of significance.

It can be gathered from the data of Table 5 that the level of significance (p-value) of the systolic blood pressure is less than 0.05. It means that there is a significant difference in the systolic blood pressure level of the participants after the RSBT when grouped according to gender.

It can also be noted that the level of significance (p-value) of the diastolic blood pressure of the participants is greater than 0.05, which means that there is no significant difference in the diastolic blood pressure level of the participants after the RSBT when grouped according to gender.

In other words, there is different effect of the implementation of RSBT on blood pressure level between male and female participants in this study, especially on systolic blood pressure. The systolic blood pressure was 140.73 mmHg and the diastolic blood pressure was 80.27 mmHg for male participants but the systolic blood pressure of the female participants was 138.37 mmHg and the diastolic blood pressure was 81.02 mmHg. It can be implied that the female participants have lower systolic blood pressure of 2.36 mmHg on average than male participants after implemented the RSBT.

The difference in the effect of RSBT among male and female participants in this study might be caused by the female participants being more cooperative and more focused than the male participants. The RSBT requires the coordination of the mind and body because the release of muscle tension is seen as creating a generalized and non-specific state of relaxation (Payne, 2010). Controlling the breath and thus calming the nerves is a prerequisite to controlling the mind and the body (Adhana et al., 2013; Mohamed et al., 2013). The state of being fully relaxed and breathing slowly will be achieved if the person can control the mind and body completely. This was seen among female participants rather than male participants. The female participants implemented the RSBT perfectly, showed the breath control effectively and expressed the positive feelings after the RSBT implementation. This makes the effect of the RSBT to decrease the blood pressure level more efficient among female participants rather than male participants.

Conclusions

The RSBT is able to decrease the blood pressure level of the older adults. The researcher discovered that there are significant reductions in the post-test systolic and diastolic blood pressure level

of the participants every days compare with the pre-test measurement. There is a significant difference in the blood pressure level of the participants in the initial, withdrawal, and reinstituted phases of the experimental phases of the study. The effect of RSBT on blood pressure level between male and female participants was different specifically in the systolic blood pressure. The mean of systolic was recorded 140.73 mmHg and the diastolic blood pressure was 80.27 mmHg among male participants. While, the mean of systolic was recorded 138.37 mmHg and the diastolic blood pressure was 81.02 mmHg among female participants.

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