Available on: *http://nursingjurnal.respati.ac.id/index.php/JKRY/index*
Jurnal Keperawatan Respati Yogyakarta, 8(1), January 2021, 55 – 60

THE EFFECTIVENESS DIFFERENCES OF CANANGA AROMATHERAPY AND JAVA LANGGAM MUSIC ON BLOOD PRESSURE OF THE ELDERLY WITH HYPERTENSION

Dwi Endah Kurniasih[1*)] & Risky Erwanto[2]
[1]*Public Health Program, Faculty of Health Sciences, Respati University of Yogyakarta*
[2]*Nursing Study Program, Faculty of Health Sciences, Respati University of Yogyakarta*
Jl. Raya Tajem Km 1,5 Maguwohardjo, Depok, Sleman, Yogyakarta

Abstract

Elderly encounter decreased body functions, including cardiovascular function. The cardiovascular issue in elderly is hypertension. One of the non-pharmacological managements for hypertension is through the intervention of cananga aromatherapy and java langgam music. Quasi experiment with a control group design approach is the research method. The researcher divided two groups, namely cananga aromatherapy and java langgam music intervention groups. Interventions were given 4 times a week for two weeks. The researcher conducted Repeated Measure ANOVA and Friedman statistic tests for 3 measurement periods, while also performed independent t-test and Mann Whitney test to compare the both groups. The acquired results show that cananga aromatherapy can lower systolic blood pressure significantly (p-value: 0.007), while the java langgam music can lower systolic and diastolic blood pressures significantly (p-value: 0.000). There were disparities between systolic and diastolic blood pressures on both groups during the first week of the intervention (p-value: <0.05). The java langgam music intervention was more effective in lowering the blood pressure in elderly compared to cananga aromatherapy intervention.

Keywords: *Cananga aromatherapy; java langgam music; elderly with hypertension*

---

*) *Corresponding author:*
Email: rizkyerwanto@respati.ac.id

1. Introduction

The elderly population should get attention due to the increasing number of this population. The percentage of elderly aged above 65 years in 2019 was 9.1 percent of the entire population, it is predicted that the number will rise to 11.7% in 2030 and 15.9% in 2050. All countries ensure the well-being of the elderly by protecting basic and economic rights, the access to Health services, the life long learning, and the provision of supports either formal or informal in accordance with SDGs(Nations, 2019).

The elderly population in Indonesia also has increased. The percentage of the elderly in 2019 reached 9.6% or amounted to 25.64 million people. The elderly in Indonesia are going towards a country with ageing population should the number reaches 10%. The province with the largest elderly population in Indonesia that has reached 14.5% is the Special Region of Yogyakarta (Central Statistical Bureau, 2019).

The elderly encounter various decreased body functions, one of them is the cardiovascular decline. The changes of cardiovascular system anatomy in the elderly cause the change in blood pressure of elderly which could cause them to have hypertension (Carol A Miller, 2012). In Yogyakarta Special Region, the current prevalence of hypertension ranked in the top five of provinces with the highest hypertension cases that reached 56.4% in the age range of 65-74 years (Ministry of Health of RI, 2018).

One of the therapies to decrease hypertension is aromatherapy, aromatherapy as the use of essential oil for the fragmentation purpose that encompasses mind, body, and soul, a broad definition that is consistent with the practice of holistic nursing (Lindquist et al., 2014). According the previous study, cananga essential oil might increase the alpha waves inside the brain and these waves that help us to be relaxed, this can decrease the vasoconstriction activity of blood vessel, the blood vessel will be smooth so it will lower blood pressure (Kristina L Silalahi et al., 2020). Music therapy can be used as the next intervention to overcome hypertension. American Heritage Dictionary® of the English Language defines music as the art of arranging sounds in time so as to produce a continuous, unified, and evocative composition, as through melody, harmony, rhythm, and timbre (Lindquist et al., 2014). Music therapy is the use of music to help specific transformations of behaviors, feeling, and

physiologic (Setyoadi, 2011). Music therapy is the technique of using music to improve, maintain, and restore physical, mental, emotional, and spiritual health (Carol A Miller, 2012). Listening to music significantly can improve the level of serum calcium and neostriatal dopamine so vasodilation occurs in the blood vessel that causes the declining of blood pressure (Putri et al., 2020)According to the preliminary study conducted by the previous researcher, it has been acquired that 31.6% of elderly in TresnaWerdha Service Center (BPSTW) Yogyakarta experience hypertension. The activities committed in BPSTW Yogyakarta are still ineffective to prevent and reduce hypertension in elderly. The researcher attempted to compare the effectiveness of both interventions. The cananga aromatherapy intervention was performed in Abiyoso Unit of BPSTW Yogyakarta, while the java langgam music intervention was conducted in Kasongan Unit of BPSTW Yogyakarta.

2. Method

The method in this study was Quasi Experiment with a control group design approach. This study had passed an ethical test number 218.3/FIKES/PL/X/2020 obtained from the Health Research Ethics Commission of UniversitasRespati Yogyakarta. The respondent in this study amounted to 69 people that consisted of 29 people in cananga aromatherapy intervention group and 40 people in java langgam music intervention group. In the cananga aromatherapy intervention group, the researcher mixed the cananga aromatherapy essential oil with a dosage of 20 ml of water added with 5 drops of cananga essential oil put in the aromatherapy dispenser, which given 4 times a week for 2 weeks. In the group given with java langgam music, the researcher used sound and MP3 of java langgam music provided 4 times a week for 2 weeks.

After that, the researcher measured the blood pressure of the elderly 3 times, namely before the provision of therapies (pre-test), after the therapies were given in the week 1 (post-test 1), and after the provision of therapies in the week 2 (post-test 2). Due to the outbreak of COVID-19 pandemic, the data collecting was performed by the health workers in BPSTW Yogyakarta. The research analyses used by the researcher for the bivariate test were paired t-test (normally distributed), Wilcoxon signed rank test (not normally distributed), independent t-test (normally distributed), and Mann Whitney (not normally distributed). The researcher also used the multivariate test by implementing repeated measure ANOVA test (normally distributed) and Friedman (not normally distributed) to measure the blood pressure for 3 measurement periods.

3. Results and Discussion

The collecting results of research data towards 69 elderly as the respondent who experienced hypertension can be seen in the table described below:

Table 1. The characteristics of respondents based on sex and age

Characteristics	Groups			
	Java langgam music intervention		Cananga aromatherapy intervention	
	n	%	n	%
Sex				
Male	16	40	14	48.3
Female	24	60	15	51.7
Age				
Elderly (60-74 years)	20	50	18	62.1
Old (75 – 90 years)	19	47.5	10	34.5
Very Old (>90 years)	1	2.5	1	3.4
Drug Usage				
Yes	37	92.5	21	72.4
No	3	7.5	8	27.6

According to Table 3, the researcher measured blood pressure for 3 measurement periods, namely measurement 1 (conducted before the intervention), measurement 2 (conducted after the first week intervention), and measurement 3 (conducted after the second week intervention). In the cananga aromatherapy intervention group, respondents' TDS experience significant decreased blood pressure during the first and second weeks, with p-value = 0.007 by implementing repeated measured ANOVA. While respondents' TDD experience no significant decreased blood pressure during the first and second weeks with 0.130 of p-value by using Friedman test. In the java langgam music intervention group, respondents' TDD and TDS experience significant decreased blood pressure in the first and second weeks with 0.00 of p-value by using measure repeated ANOVA test.

Table 2. Central tendency values of blood pressure before the interventions, after the first week intervention, and after the second week intervention

Groups	Mean	Median	Minimum	Maximum	Std. Deviation	Std. Error Mean	Normality Test *)
Cananga Aromatherapy Intervention							
Blood Pressure before the Intervention							
TDS	157.03	160	110	200	21.457	3.984	0.811
TDD	82.83	80	60	120	15.814	2.937	0.137
Blood Pressure in Week 1 Intervention							
TDS	146.79	144	122	190	17.693	3.285	0.195
TDD	92.53	77.59	54	100	10.910	2.026	0.514
Blood Pressure in Week II Intervention							
TDS	145.38	142	117	180	16.736	3.108	0.531
TDD	79.34	78	61	100	9.846	1.828	0.578
Java Langgam Music Intervention							
Blood Pressure before the Intervention							
TDS	162.53	160	145	180	10.679	1.689	0.001
TDD	93.58	91	80	110	8.111	1.282	0.033
Blood Pressure in Week 1 Intervention							
TDS	155.10	154.50	138	178	9.018	1.426	0.695
TDD	87.85	86.50	77	100	5.789	0.915	0.103
Blood Pressure in Week II Intervention							
TDS	152.15	151	134	167	8.544	1.351	0.195
TDD	85.03	85	80	96	3.984	0.630	0.001

Note: TDS = Systolic Blood Pressure; TDD = Diastolic Blood Pressure; *) Shapiro Wilk Test

Table 3. The Significant tests of the disparity of blood pressure before and after the intervention on both groups

Groups	Mean Difference		95% CI		p-value 2 tailed	p-value 2 tailed
	Mean	Std. Error	Lower	Upper		
Intervention 2						
Systolic Blood Pressure (TDS)						
Pre test – Post test 1	10.241	4.245	1.546	18.937	0.023[1)]	0.007[3)]
Post test 1 – Post test 2	1.414	3.661	-6.085	8.913	0.702[1)]	
Pre test – Post test 2	11.655	3.368	4.756	18.554	0.002[1)]	
Diastolic Blood Pressure(TDD)						
Pre test – Post test 1	5.241	2.461	0.200	10.283	0.042[1)]	
Post test 1 – Post test 2	-1.759	1.657	-5.153	1.635	0.298[1)]	0.130[3)]
Pre test – Post test 2	3.483	2.298	-1.225	8.191	0.141[1)]	
Intervention 2						
Systolic Blood Pressure (TDS)						
Pre test – Post test 1	7.425	0.914	5.576	9.274	0.000[2)]	0.000[4)]
Post test 1 – Post test 2	2.950	0.654	1.627	4.274	0.000[1)]	
Pre test – Post test 2	10.375	1	8.353	12.397	0.000[2)]	
Diastolic Blood Pressure (TDD)						
Pre test – Post test 1	5.725	0.810	4.086	7.364	0.009[2)]	0.000[4)]
Post test 1 – Post test 2	2.825	0.551	1.710	3.940	0.068[2)]	
Pre test – Post test 2	8.550	1.042	6.442	10.658	0.001[2)]	

Note: [1)]T-test paired test; [2)]Wilcoxon Test[3)] ANOVA Test; [4)] Friedman Test

According to the results of the bivariate test on the cananga aromatherapy intervention group, there were significant differences of mean values in the TDS measurement on the week 1 pre-test to post-test and week 2 pre-test to post-test. The declining of mean values of TDS in week 1 pre-test to post-test amounted to 10.241; week 1 post-test to week 2 post-test amounted to 1.414; week 2 pre-test to post-test amounted to 11.655. TDD measurement experienced a significant decrease in week 1 pre-test to post-test. The declining of mean values of TDD in week 1 pre-test to post-test amounted to 5.241; week 1 post-test to week 2 post-test experienced 1.795 of score increase; week 2 pre-test to post-test experienced 3.483 of score decrease.

Table 4. The mean differences of blood pressure on both groups

Groups	Mean Differences	Std. Error Differences	95% CI		P-value
			Lower	Upper	
TDS Before	5.491	3.923	-2.241	13.322	0.198 [2)]
TDD Before	10.747	2.915	4.930	16.565	0.000 [2)]
TDS Post 1	8.307	3.255	1.809	14.805	0.013[1)]
TDD Post 1	5.680	1.720	2.246	9.114	0.007[2)]
TDS Post 2	6.771	3.081	0.622	12.920	0.031[1)]
TDD Post 2	10.264	2.030	6.213	14.315	0.001[1)]

Note: TDS = Systolic Blood Pressure; TDD = Diastolic Blood Pressure; [1)] Independent t-test; [2)] Mann Whitney Test

According to the results of the bivariate test on the java langgam music intervention group, there were significant differences of mean values in the TDS measurement on the week 1 pre-test to post-test; week 1 post-test to week 2 post-test, and week 2 pre-test to post-test. The declining of mean values of TDS in week 1 pre-test to post-test amounted to 7.425; week 1 post-test to week 2 post-test amounted to 2.950; week 2 pre-test to post-test amounted 10.375. TDD measurement experienced significant decreases in week 1 pre-test to post-test and week 2 pre-test to post-test. The declining of mean values of TDD in week 1 pre-test to post-test amounted to 5.725; week 1 post-test to week 2 post-test experienced 2.825 of score decrease; and week 2 pre-test to post-test experienced 8.550 of score decrease.

According to Table 5, the researcher compares TDS and TDD in cananga aromatherapy intervention group and java langgam music intervention group. According to this table, it can be explained there's no significant difference of TDS's mean value before the intervention. While in the TDD of the pre-test, TDS and TDD of the week 1 post-test, TDS and TDD of week 2 post-test show significant differences on both groups.

The Respondent Characteristics

The characteristics on both groups were similar either from the sex, age category, and drug usage. Most of the sex on both groups is female. Women have a high risk of experiencing hypertension compared to men. This is consistent with the previous study which indicated that women were more vulnerable to hypertension because they experience the declining level of estrogen hormone. Estrogen hormone will experience decreases when women enter the elderly age and get their menopause that make them more vulnerable to hypertension(Kusumawaty et al., 2016). Pre-menopause women are at risk for cardiovascular diseases compared to men in the same age (Wahyuni & Eksanoto, 2013). The increasing age could also become the factor causing the occurrence of hypertension on the elderly(Wahyuningsih & Astuti, 2016).The use of anti-hypertension drugs on both groups is still very high and obedient to consume drugs. This is consistent with the previous study which showed that along with the increasing of age, the adherence of an individual to consume anti-hypertension drugs will also become higher (Hazwan & Pinatih, 2017)

The changes of Systolic Blood Pressure (TDS) and Diastolic Blood Pressure (TDD) before and after the intervention of cananga aromatherapy

The provision of cananga aromatherapy intervention was capable of decreasing systolic blood pressure (TDS) significantly but hasn't been able to decrease diastolic blood pressure (TDD) significantly after 2 weeks of intervention. This is consistent with the previous study which showed that the provision of cananga aromatherapy was capable of decreasing blood pressure because cananga aromatherapy can cause the body to feel relaxed, calm, and sleepy. When body is in a relaxed condition, endorphin hormone will be produced that can decrease blood pressure(Saputra et al., 2018). The decrease in mean value of TDS was greater compared to TDD. This condition is consistent with the study done by the previous researcher in which the provision of cananga aromatherapy for five times a week for 2 weeks can decrease the mean values of TDS to 14 mmHg and the mean value of TDD to 10.6 mmHg (Kristina L Silalahi et al., 2020). however, this result is different with the study conducted by the researcher in which the provision of aromatherapy was conducted 4 times a week for 2 weeks. In addition, it can be seen as well that the greatest declines of blood pressure of the respondents either TDS or TDD were in the first week of intervention and having a slight decline in the second week of intervention.

The changes of Systolic Blood Pressure (TDS) and Diastolic Blood Pressure (TDD) before and after the intervention of java langgam music

The provision of java langgam music intervention can decrease both systolic blood pressure (TDS) and diastolic blood pressure (TDD) significantly. The decrease of TDS was greater compared to TDD. The elderly who listened to java langgam music became more relaxed and calm so it helped lower the blood pressure. According to the result of the previous study, elderly who listened to java langgam music for 3 days experienced decreased blood pressure. Listening music significantly can

enhance the level of serum calcium and neostriatal dopamine so vasodilation occurs in the blood vessel that causes the declining of blood pressure (Putri et al., 2020). Slow rhythm and stable tempo in java langgam music will affect heartbeat in which the heartbeat will slow down following the music, the slower heartbeat will cause the stress level and physical tensions to be lower. Java langgam music was selected because all respondents were Javanese people and love java music instrumental. According to the previous researcher, traditional music is capable of giving positive effects that could lower blood pressure in the elderly with hypertension (Sari & Rekawati, 2019).

The Difference of Systolic Blood Pressure (TDS) and Diastolic Blood Pressure (TDD) on Cananga Aromatherapy and Java Langgam Music Intervention Groups

The mean difference of TDS and TDD between the cananga aromatherapy group and java langgam music group was in the first week after the interventions were performed. This condition means that the provision of interventions of cananga aromatherapy and java langgam music provided significant differences starting from the first week. However, the declining of TDS was higher in the group given with the intervention of cananga aromatherapy compared to the group provided with the intervention of java langgam music. While regarding TDD, the declining mean value of TDD occurred more in the group given with the intervention of java langgam music compared to the group provided with the intervention of cananga aromatherapy. The provision of this music therapy can significantly decrease the blood pressure of the elderly, both TDS and TDD, compared to the provision of cananga aromatherapy that can only significantly decrease TDS. According to the previous study, the provision of music has positive impacts on lowering blood pressure in the elderly who were given with 2 times a week for 8 weeks of intervention (Chan et al., 2009). However, the researcher had conducted the intervention of java langgam music for 4 times a week for 2 weeks.

In addition, there was another factor, such as the use of anti-hypertension drugs in the group given with the intervention of java langgam music which amounted to 92.5% compared to the group given with cananga aromatherapy which only amounted to 72.4%. This condition became one of the factors of more stable and controlled blood pressures of the elderly in the group given with the intervention of java langgam music. The adherence to taking anti-hypertension drugs is higher in the elderly group compared to age groups below it which are expected to have more stable blood pressures (Hazwan & Pinatih, 2017). In addition, the existence of programs from BPSTW to prevent hypertension such as blood pressure examination and medication as well as the counseling from medical workers regarding medication adherence becomes one of the factors that causes the adherence to taking anti-hypertension drugs on the elderly in BPSTW. This condition is consistent with the previous study in which the provision of motivational interviewing counseling can affect the improvement in the adherence to taking medication on the elderly who suffer from hypertension (Harijanto et al., 2015).

4. Conclusions and suggestions

The intervention of cananga aromatherapy 4 times a week for 2 weeks on the elderly who suffer from hypertension can significantly decrease systolic blood pressure (TDS), but unable to decrease diastolic blood pressure (TDS). While the provision of java langgam music 4 times a week for 2 weeks on the elderly who suffer from hypertension can significantly decrease systolic blood pressure (TDS), and diastolic blood pressure (TDD). The provision of java langgam music intervention is more effective to be given towards the elderly with hypertension compared to cananga aromatherapy. This intervention is expected to be one of the intervention programs that can be implemented in BPSTW to overcome hypertension issue in elderly. It is expected that the future researchers can develop this intervention to be applied at the community level.

5. Acknowledgments

The writer team would like to thank the Directorate of Research and Community Service (DRPM) of the Deputy for Research Improvement and Development of the Ministry of Research and Technology/Department of National Research and Innovation over the funding to support the implementation of Junior Lecturer Research (PDP) concerning the Effectiveness Differences of Cananga Aromatherapy and Java Langgam Music on the Blood Pressure of the Elderly in BPSTW Yogyakarta.

6. References

Central Statistical Bureau. (2019). Statistics of Elder People 2019. In *Central Statistical Bureau*.

Carol A Miller. (2012). *Nursing for Wellness in Older Adults* (6th ed.). Lippincott Williams & Wilkins.

Chan, M. F., Chan, E. A., Mok, E., & Kwan Tse, F. Y. (2009). Effect of music on depression levels and physiological responses in community-based older adults: Feature Article. *International Journal of Mental Health Nursing*, *18*(4), 285–294. https://doi.org/10.1111/j.1447-0349.2009.00614.x

Harijanto, W., Rudijanto, A., & N, A. A. (2015). Pengaruh Konseling Motivational Interviewing terhadap Kepatuhan Minum Obat Penderita Hipertensi Effect of Motivational Interviewing

Counseling on Hypertension Patients's Adherence of Taking Medicine. *Jurnal Kedokteran Brawijaya*, *28*(4), 354–353. https://jkb.ub.ac.id/index.php/jkb/article/view/723

Hazwan, A., & Pinatih, G. N. I. (2017). Gambaran Karakteristik Penderita Hipertensi dan Tingkat Kepatuhan Minum Obat di Wilayah Kerja Puskesmas Kintamani I. *Intisari Sains Medis*, *8*(2), 130–134. https://doi.org/10.1556/ism.v8i2.127

Kemenkes RI. (2018). *Hasil Utama Riskesdas 2018*. Kementerian Kesehatan.

Kristina L Silalahi, Ariga, F. A., & Siregar, P. S. (2020). Pengaruh Aromaterapi Kenanga (Cananga Odorata) Terhadap Penurunan Tekanan Darah Pada Pasien Hipertensi. *Jurnal Keperawatan Priority*, *3*(1), 101–108.

Kusumawaty, J., Hidayat, N., &Ginanjar, E. (2016). Hubungan Jenis Kelamin dengan Intensitas Hipertensi pada Lansia di Wilayah Kerja Puskesmas Lakbok Kabupaten Ciamis. *Jurnal Mutiara Medika*, *16*(2), 46–51.

Lindquist, R., Snyder, M., & Mary Fran Tracy. (2014). *Complementary & Alternative Therapies in Nursing* (7th ed.). Springer Publishing Company.

Nations, U. (2019). World Population Prospects 2019. In *Department of Economic and Social Affairs* (Issue 141). United Nations. http://www.ncbi.nlm.nih.gov/pubmed/1228321 9

Putri, A. F., Muflih, &Damayanti, S. (2020). Efektivitas Waktu Terapi Musik Langgam Jawa Terhadap Tekanan Darah Pada Lansia Hipertensi Di Desa Muara Rengas. *Community of Publishing In Nursing (COPING)*, *8*(2), 139–148.

Saputra, R. R., Juniawan, H., & Putra, F. (2018). Perbandingan Antara Pemberian Aromaterapi Kenanga dan Aromaterapi Lemon terhadap Penurunan Tekanan Darah di RSUD Tanah Bumbu. *Dinamika Kesehatan*, *9*(2), 521–533.

Sari, N. L. P. D. Y., & Rekawati, E. (2019). The Effect of Traditional Music Therapy on Blood Pressure Among Elderly with Hypertension: A Literature Review. *International Journal of Nursing and Health Services (IJNHS)*, *2*(2), 55–65. https://doi.org/10.35654/ijnhs.v2i2.103

Setyoadi, K. (2011). *Terapi Modalitas Keperawatan pada Klien Psikogeriatrik.*

Wahyuni, & Eksanoto, D. (2013). Hubungan Tingkat Pendidikan Dan Jenis Kelamin Dengan Kejadian Hipertensi Di Kelurahan Jagalan Di Wilayah Kerja Puskesmas Pucangsawit Surakarta. *Jurnal Ilmu Keperawatan Indonesia*, *1*(1), 112–121.

Wahyuningsih, W., & Astuti, E. (2016). Faktor Yang Mempengaruhi Hipertensi pada Usia Lanjut. *Jurnal Ners Dan Kebidanan Indonesia*, *1*(3), 71. https://doi.org/10.21927/jnki.2013.1(3).71-75