

Mozart Classical Music Therapy Lowering Blood Pressure in Patients with Hypertension

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ABSTRACT

Background: Hypertension, known as the silent killer, is a rising in the pressure of blood above normal and results in insufficient oxygen and nutrients to the brain. Maintaining blood pressure within normal limits will ensure adequate blood flow to the brain (cerebral perfusion). One important factor affecting cerebral perfusion is mean arterial pressure, which is determined by the value of systolic and diastolic pressure. Besides pharmacological therapy, the provision of Mozart Classical Music is an alternative option for non-pharmacological therapy to treat hypertension. Objective: The study aim was to determine the effect of Mozart Classical Music Therapy on the blood pressure of hypertensive patients in Sungai Limau Public Health Center, Dharmasraya Regency, Indonesia. Methods: This study design was a quasi-experiment with intervention and control group. The subjects were 20 hypertensive patients participated in regular check-up monthly in Sungai Limau Public Health Center divided into 2 groups, 10 participants assigned in experimental group and 10 in the control group chosen purposively. Data were obtained using a Sphygmomanometer digital Omron and observation sheet. Results: The study results found differences in the average of the blood pressure before and after being given Mozart Music Therapy. The t-test independent resulting p-value 0.027 ($p \leq 0.05$) for systolic and 0.023 ($p < 0.05$) for diastolic. Statistically, there was an effect of Mozart Classical Music Therapy on the blood pressure in hypertensive patients. Conclusion: Mozart Classical Music Therapy lowering systolic and diastolic pressure of blood among hypertensive patients in Sungai Limau Public Health Center, Dharmasraya Regency, Indonesia.

Keywords: *Mozart Classical Music Therapy, hypertension*

1. BACKGROUND

Hypertension causing approximately 12.8% (7.5 million) of deaths worldwide[1]. One out of 3 adults or about 77.9 million people suffer from hypertension in the United States. It is expected to continue to increase by 7.2% or about 83.5 million people by 2030[2]. Based on Indonesia Health Survey[3], 26.5% of adult people living with hypertension in Indonesia, while for West Sumatra Province it reaches 22.6 The West Sumatra Provincial Health Office in 2014 recorded,

hypertension is the top 10th disease in the community with the number of sufferers 84,345 people. The number of people living with hypertension in the Dharmasraya Regency reached 7,880 people, and the top 1 of the number of sufferers found in Sungai Limau Public Health Center.

Hypertension, known as the silent killer, is an above-normal increase in blood pressure and causes blood flow to the brain (cerebral perfusion) to be disrupted resulting in the lack of oxygen and nutrients

to the brain. Cerebral perfusion is affected by arterial blood pressure which is determined by systolic and diastolic pressure values. Maintaining blood pressure within normal limits can reduce morbidity and mortality[4].

Treatment of hypertension consists of pharmacological and non-pharmacological therapies[5]. Non-pharmacological therapy has always been an option for people with hypertension because the costs incurred for pharmacological therapy are relatively expensive and cause unwanted side effects, such as worsening the state of the disease or other fatal effects.[6]. Prolonged use of antihypertensive drugs can cause fatigue, dizziness, coughing, frequent urination, fluid retention, sexual dysfunction, abnormal heartbeat, and allergies[7]. A widely used form of non-pharmacological therapy, among others, is complementary therapies, carried out to complement pharmacological treatment[8]. One of them is Mozart Classical Music Therapy.

Classical Music is the essence of order and reading on all things good, fair, and beautiful. Based on the notion of music in general, classical music is interpreted as a beautiful human creation, taste, and poured in the form of sounds, melodic sounds, rhythms, and harmonies that can evoke emotions and can make the mood happy, relieve stress, accompaniment during the learning process and can reduce pain. ⁸ Lately many types of music can be heard but music that can be classed as medically meaningful music is Mozart classical music. Mozart has various characteristic in the development of health science for example its soft tone provided alpha wave stimulation, calm, stress relieve and relaxes. Relaxation, as a response to cognitive, physiological, and behavioral stimulation stimulate the appearance of chemicals useful for decreasing tension and lowering

pressure in the arterial blood vessels. However, the provision of Mozart Classical Music Therapy and its effect on the blood pressure is still insufficiently presented in the literature.

2. METHODS

The study design used a quasi-experiment study with intervention and control group. 20 hypertensive patients aged 45-69 years old who participated in regular check-up monthly in Sungai Limau Public Health Center recruited in this study, 10 participants assign to experimental group and 10 into control group using purposive technique. People with mild to moderate hypertension who are willing to be study respondents, can communicate well, have blood pressure more than 140/90 mmHg, and are willing to do Mozart Classical Music Therapy for 2 weeks are included and respondents were not in place at the time of the study, and had an accompanying disease are excluded in the study. Data were obtained using a Sphygmomanometer digital Omron and observation sheet.

The method used in data collection is field research using experiments that take measurements of blood pressure before and after classical music treatment. A 15-minutes Mozart music treatment was given to the experiment group, and standard treatment in the control group. Blood pressure measurements are taken every day for 2 weeks. Blood pressure measurement data is written on the observation sheet and collected to calculate the average arterial blood pressure. Research variables are Mozart Classical Music Therapy as independent variables and blood pressure as dependent variables. Data analysis using the Independent t-Test, with a meaningful rate of 95% and

a p-value of < 0.05. IRB approval number 104 taken Universitas Andalas. from Medical Faculty of Ethics Commission of the

3. RESULT

Blood Pressure Before and After Mozart Classical Music Therapy in the Intervention Group

Table 1. Average Systolic and Diastolic Blood Pressure Before Giving Mozart Classical Music Therapy in the Intervention Group

| Blood Pressure | Pretest | | | Posttest | | |
|----------------|---------|-------------------------|-----------|----------|-------------------------|---------|
| | Mean | Standard Deviation (SD) | Min – Max | Mean | Standard Deviation (SD) | Min-Max |
| Systolic | 148,1 | 4,581 | 140-155 | 128,7 | 8,345 | 120-140 |
| Diastolic | 93,75 | 3,536 | 90-100 | 79,38 | 8,634 | 70-90 |

Table 1 found the mean of systolic and diastolic before and after administering Mozart Music Therapy in the experimental group was 148.1/93.75 mmHg and 128.7/79.38 mmHg. The standard deviation was 4,581/3.536 mmHg and 8.345/8.634 mmHg.

Blood Pressure Before and After Mozart Classical Music Therapy in the Control Group

Table 2. Average Systolic and Diastolic Blood Pressure Before Giving Mozart Classical Music Therapy in the Control Group

| Blood Pressure | Pretest | | | Posttest | | |
|----------------|---------|-------------------------|-----------|----------|-------------------------|---------|
| | Mean | Standard Deviation (SD) | Min – Max | Mean | Standard Deviation (SD) | Min-Max |
| Systolic | 146,8 | 6,512 | 140-155 | 138,7 | 7,906 | 130-150 |
| Diastolic | 94,38 | 4,173 | 90-100 | 88,75 | 5,825 | 80-95 |

Table 2 the average of systolic and diastolic pressure before and after administering Mozart Therapy in the control group was 146.8/94.38 mmHg and 138.7/88.75 mmHg. The standard deviation was 6,512/4.173 mmHg and 7.906/5.825 mmHg.

Effect of Mozart's Classical Music Therapy on Blood Pressure among People with Hypertension

Table 3. Effect of Mozart's Classical Music Therapy on Blood Pressure in People with Hypertension

| Variable | Mean | Std. Deviation (SD) | Std. Error Mean | 95% CI | P Value |
|-----------|--------|---------------------|-----------------|--------------|---------|
| Systolic | 128,75 | 8,345 | 2,950 | 18,717-1,283 | 0,027* |
| diastolic | 79,38 | 8,634 | 3,053 | 17,273-1,477 | 0,023* |

* T-test independent was used, *p<0.05

Based on table 3, the average of systolic and diastolic blood pressure after applying Mozart's Classical Music Therapy in the experimental group was 128.7/79.38 mmHg with a standard deviation was 8.345/8.634 mmHg. Statistical test results with independent t-tests are obtained the p-value of 0,027 for systolic and 0,023 in diastolic (p < 0.05). It is considered meaningful means there is an effect of Mozart's Music Therapy on systolic and diastolic pressure of blood among hypertensive patients in the Sungai Limau Public Health Center, Dharmasraya.

4. DISCUSSION

Mozart's Music Therapy Have Significant Effect in Reducing Blood Pressure among Hypertensive Patients. The current study found the average of pressure of blood before and after administering Mozart Music Therapy in the experimental group was 148.1/93.75 mmHg and 128.7/79.38 mmHg. This finding is slightly different from the control group where the average of systolic and diastolic pressure was 146.8/94.38 mmHg and 138.7/88.75 mmHg.

Hypertension is associated with a higher pressure in systolic and diastolic or a rise in both. Hypertension is categorized in 3 degrees, 120/80 to 139/89 mmHg categorized as pre-hypertensive, (140/90 to 159/99

mmHg) as degree 1 hypertensive, and $\geq 160/\geq 100$ mmHg as 2 degree hypertension. From these limits, it can be said that those with $\geq 120/\geq 80$ mmHg can be considered as normal. Hypertension can cause various complications such as heart disease, stroke, kidney failure, and eye damage. Therefore, it is expected that respondents take treatment and prevention measures so that the impact of hypertension can be prevented and avoided[9].

According to Susilo and Wulandari⁷, factors that cause hypertension include factors that cannot be controlled, namely descendance, sex, and age, and factors that can be controlled such as overweight, smoking, and alcohol consumption. In some people with hypertension, many respondents do not feel the symptoms of hypertension, although accidentally some symptoms occur simultaneously and are believed to be related to blood pressure. The symptoms in question are headaches, dizziness, shock, bleeding in the nose, facial redness, and fatigue, which can occur both in hypertensive patients or healthy people within normal range. Based on the researchers' observations, of the 10 experimental group respondents, there were 70% were overweight, 10% were obese, and 20% were normal weight. It can be said that excess weight or obesity becomes one of the factors causing hypertension[10].

Mozart's is one type of relaxation music with 60 beats. Music that is 60-80 beats can make a listener relax. The function of classical music is to calm the mind and feeling which optimized tempo, rhythm, melody, and harmony that is regular and resulting alpha and beta waves in the auditory to provide calmness that makes the nervous system ready to receive new information, relaxing stimulation, and rest[11].

A study revealed [13] various ways are done to lower blood pressure, including pharmacological therapies that use a variety of drugs and non-pharmacological with complementary therapies such as progressive muscle-relaxing therapy. Mozart classical music is soft music following the heart rate it will act by secreting the hormone serotonin that can make a sense of pleasure and pleasure. In addition, music can stimulate the body to produce Nitric Oxide (NO) molecules, this molecule acts on blood vessel tone so that it can reduce blood pressure[14].

Hypertension is also have a strong relation with an increase in blood sugar, leads the diabetic patients as the high risk. Hypertension can cause cell's insensitivity to insulin leads to insulin resistant[12].

The relaxing effects of Mozart therapy can trigger reduced heart-pumping activity and dilation of arteries so that a lot of fluid comes out of the circulatory circulation. This will reduce the workload of the heart because people with hypertension have a faster heart rate to pump blood due to increased blood pressure.[15] The elastic and easily suspended walls of arterial veins will easily dilate the diameter of the walls of the blood vessels to accommodate changes in pressure. Arterial distention ability prevents dilation of blood pressure fluctuations[4].

Relaxation results in a stretch in the arteries as a

result of vasodilation in the artery and veins facilitated by the vasomotor center. Some types of vasomotor are baroreceptor reflexes, chemoreceptor reflexes, brain pain reflexes, and respiratory reflexes. In this case, the stronger is the reflector of the baroreceptor will decrease parasympathetic and epinephrine nerves activity and increase the parasympathetic nerve which reducing heart rate, the volume of cardiac (CO), and the vasodilatation of blood vessels. In addition, the decreased cardiac output and total resistance of peripheral caused arterial pressure dropped[16].

Based on observational data of experimental group, respondents who have been given Mozart classical music possessed a decrease pressure in blood vessels. Some of the complaints felt by respondents such as headaches, nape, and dizziness have begun to decrease. Overall, the experimental group respondents seemed more relaxed and more comfortable with a cheerful face, frequent joking laughter, and smooth communication. This therapy is also easy to do at home nothing.

A literature[17] revealed the same findings where music therapy affects the blood pressure of primary hypertension clients in Malang City, that there was a significant difference between the mean of blood pressure in the experiment group and control group after Music relaxation therapy with a value of $p = 0.0075 < 0.05$.

According to Shinde, KJ, SM, and Hande[16] on the immediate effect of Mozart music relaxation in hypertension, the results showed significant differences in systolic ($p < 0.01$) and diastolic ($p = 0.05$) and heart rate ($p < 0.05$). Research conducted by Valentine[18], about the effect of music therapy on the pressure of blood among elder people with hypertension in

Semarang, Indonesia. the statistical analysis found systole pressure 0.032 and diatole 0.008 ($p < 0.05$) then there is an influence of music therapy techniques on the pressure of blood in the elder people with hypertension.

A literature revealed⁶ the effectiveness of Mozart therapy against arterial pressure in people with essential hypertension, showing an average systolic pressure post intervention with p -value = 0.000 in the experimental group and diastolic $p = 0.00$ ($p < 0.05$), meaning there is statistically different in mean systolic and diastolic pressure after admistering music therapy in the experimental and control group. In line with the previous study, Kumutha[19], found the effectiveness of music on stress your blood pressure relaxation therapy among elder people living with higher blood pressure that obtained p -value < 0.05 in the study group compare to control group on the average in systolic and diastolic, Mozart musical therapy is effectively reduce stress and blood pressure in the elder people.

Hypertension caused by various risk factors and a person characteristics. The trigger factors of hypertension are distinguished into those that cannot be controlled such as family hereditary, sex, and age. Factors that can be controlled such as overweight, less exercise, cigarette consumption, and food consumption patterns of sodium and saturated fat foods⁷.

Mozart music therapy focuses on relaxation technique which leads to lowering tension and emotion. In addition, relaxation will make individuals better able to avoid overreaction due to stress, overcome stress-related problems such as hypertension, headaches, insomnia, and reduce anxiety levels. Mozart classical music therapy can also reduce the likelihood of stress-related disorders and control anticipatory anxiety before anxiety-inducing situations[20].

5. CONCLUSION

Performing progressive muscle relaxation Therapy was found to be significantly affected Arterial Pressure in people with hypertension. Using this therapy can decrease the pressure in the arterial line in hypertensive patients because this therapy stimulates less activity of the parasympathetic and epinephrine nerves and increase the parasympathetic nerve leads to heart rate decreases, the volume of cardiac (CO) decreases, and the vasodilatation of arterioles and venules occurs.

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