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Gamelan Music Therapy can Decreased Blood Pressure at Hypertension Patients

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Abstract

Background: Hypertension disease becomes a popular disease suffered and most feared. There are various music therapies that can be applied to people with hypertension, namely traditional music, one of which is gamelan music therapy.
Objectives: This study aims to determine the effect of gamelan music therapy on blood pressure reduction in hypertensive patients.
Methods: **Pre** *experimental* research design with *pretest-posttest design*. This research population is all patients with hypertension and samples using total *sampling* techniques with a total of 20 respondents. Data collection is a blood pressure observation sheet and intervention from music gamelan therapy. Using *Shapiro Wilk's* statistical test.
Results: The average blood pressure result before gamelan music therapy was 153.10 systolic and diastolic 91.15. And after systolic therapy 146,10 and diastolic 85,55. Statistic test result obtained p-value value 0.000 < α (0.05)
Conclusion: Shows how gamelan music therapy affects blood pressure reduction in hypertensive patients
Keywords: hypertension, blood pressure, gamelan music therapy.

Introduction

The more modern the development of the times, the more modern the life in society. For example, urban lifestyle changes with a fondness for *fast food* that is fatty, salty, lazy to exercise, and stressed. All of that is the key to the total increase in hypertensive patients.[1] It is known that in most Indonesians, high blood pressure or hypertension becomes a popular disease suffered. Because it is most feared and becomes an enemy for some people who live in the city and countryside.[2]

Where Indonesia is in the 3rd position after stroke and Tuberculosis as the cause of death from hypertension.[3] Thickening of blood vessels, which triggers the formation of arteriosclerosis due to excessively high blood pressure causes a decrease in perfusion in the network and causes damage to other body organs such as myocardial infarction, stroke, heart failure, and kidney failure. As for the arterial baroreceptor system, angiotensin renin system, regulation of body fluid volume, and pulse autoregulation. heart condition and relax the organs.[4] If these factors do not work in a balanced manner, it can cause blood pressure to rise more than normal in arterial blood vessels repeatedly more than once which if sustained could cause damage to the heart and blood vessels.[2]

The presence of headache and chest, easily tired, nausea sometimes vomiting, difficult breath, anxiety, impaired vision, irritability, ear buzzing, troubled sleep, heavy nape, swollen feet, sweat a lot, rapid heart rate even nosebleeds are symptoms that arise in people with hypertension.[4] Nearly 1 billion people worldwide have hypertension. There are 1.56 billion adult populations in the east- and south Asia by 2020 living with hypertension with nearly 8 billion deaths per year in the world.[3] According to the

World Health Organization (WHO) the incidence of hypertension in 2015 mentions that 1.13 billion people worldwide have hypertension, meaning that 1 in 3 people in the world is confirmed hypertension. With a predicted number of cases reaching 1.5 billion people affected by hypertension with cases of death and complications every year approximately 9.4 million people in 2025.[5]

It is known that there are therapies in the control of hypertension, namely farmologic and nonpharmacological therapy. Pharmacological therapy by taking drugs, making an impact, and spending a lot of money. While non-pharmacological without drugs and has no impact that is with a healthy living program through complementary treatment that utilizes the natural ingredients available around us.[6] This complementary treatment is usually in the form of herbal medicine, relaxation, meditation, music therapy, progressive muscle relaxation, autogenic training, and other relaxation exercises. [6] A process of healing therapy by applying music derived from the power released from the music itself is the understanding of Music Therapy.[4] Singing, playing music, ritcmis, and listening to music are methods of applying music therapy.[7]

Where music can stimulate the Parasympathetic nerves by stretching the body, regulating heart rate so that blood pressure decreases. With a slow rhythm in enjoying music is proven to suppress the exit of ketokolamin into the blood vessels so that the concentration becomes shrinking which makes the body into relaxation, stable heart rate and pressure blood to be lowered.[8] There are many kinds of music therapy in people with hypertension that can be applied such as classical music, traditional music (gamelan), the type of music of choice of patients, instrumental music, dominant music of medium frequency, cognitive music, and classical music of India.[9] In purwodarminto Indonesian dictionary, gamelan word with the accent "an" makes the noun and its origin from the Javanese language "nggamel/gamel" means to hit/beat is a set of musical instruments that are applied together with other musical instruments, such as bonang, drums, peking, kenong & tap, xylophone, gong, rebab, flute to accompany a performance. The characteristics of gamelan as music that has a slow harmony, the color of the tone is consistent with the low pitch, reflecting harmony in life is the sense of gamelan. [9]

Based on the information, a preliminary study that has been conducted through interviews of 15 patients said 15 patients have never done gamelan music therapy because they do not have/store gamelan music, and do not have gamelan tools. Where 12 people out of 15 patients interviewed said it has long had a history of high blood pressure and rarely take hypertension medication regularly every day. 10 patients said they often consume herbal herbs such as star fruit juice and cucumber juice in addition to taking regular medicine from the doctor. So from the exposure, the purpose of this study is to find out the influence of gamelan music therapy on blood pressure reduction in hypertensive patients.

Methods

The design in this study uses *before experiment* with the program *pretest-posttest design*. the population of this research is all patients with hypertension at Dr. Mintohardjo Hospital. and samples in this study using technical *total sampling* with a total of 20 respondents. data collection process used by researchers is by using a sheet observations consisting of *Instruments* Dan. *intervention* gamelan music therapy conducted to 20 respondents of hypertensive patients who met the criteria of inclusion and exclusion that have been Set.[8] Subject observed before the intervention, followed by intervention and observed Again after being given intervention. Univariate analysis is used to describe the average value of each variable of blood pressure before being given gamelan music therapy and after being given music therapy Gamelan. Bivariate analysis, researchers conduct the normality test first, because respondents <50 then researchers use the test *Shapiro wilk.* Bivariate analysis of researchers using *statistic nonparametric Paired Sample T-Test* because the data obtained is normally distributed.

The author has conducted ethical tests at the ethics research institute Sekolah Tinggi Ilmu Kesehatan Indonesia Maju (STIKIM) and this research has successfully passed *the ethical clearance* with the letter number: 1813/Sket/Ka-Dept/RE/STIKIM/IX/2020.

Results

Table 1. Blood pressure results before and after gamelan music therapy

BP	N	*Mean*	*Min-Max*	*SD*	*SE*	*95% - CI*

Pre Sistolik	20	153,10	146-174	6,340	1,418	150,13-156,07
Pre Diastolic	20	91,15	75-112	9,708	2,171	86,61-95,69
Post-Sistolik	20	146,10	139-165	6,095	1,363	143,25-148,95
Post-Diastolic	20	85,55	73-104	9,333	2,087	81,18-89,92

*BP = Blood Pressure

Based on table1. the results of the analysis of 20 respondents before gamelan music therapy obtained an average systolic blood pressure result of 153.10 and the lowest systolic value was 146 and the highest was 174. And for the average diastolic blood pressure result of 91.15 with the lowest diastolic score is 75 and the highest is 112. With a standard deviation of systolic blood pressure of 6,340 and diastolic blood pressure of 9,708. From the results of the estimated interval, it can be concluded that 95% is believed to be systolic blood pressure values between 150.13 to 156.07 and diastolic is between 86.61 to 95.69. And after the gamelan music therapy obtained an average systolic blood pressure result of 146.10 and the lowest systolic value was 139 and the highest was 165. And for the average diastolic blood pressure yield of 85.55 with the lowest diastolic score is 73 and the highest is 104. With a standard deviation of systolic blood pressure of 6,095 and diastolic blood pressure of 9,333. From the results of the estimated interval can be concluded that 95% is believed systolic blood pressure value between 143.25 to 148.95 and diastolic is between 81.18 to 89.92.

Tabel 2. Effect of Gamelan Music Therapy on Blood Pressure Reduction in Hypertensive Patients (N=20)

Blood pressure	***Mean***	***Std. Deviation***	***t***	***df***	***P-value***
Before being given gamelan music therapy After being given gamelan music therapy	6.500	3.153	9.217	19	0,000

Based on table 2. showed that from the results of the T-Test Paired Sample test it was seen that the average decrease in blood pressure between before and after the administration of musick gamelan was 6,500. It can also be seen the t count value of 9,217 and obtained a value of ρ value = 0.000 <0.05 then Ho rejected means statistically there is a meaningful difference between blood pressure in hypertensive patients before and after the administration of gamelan music therapy. So it can be concluded that the influence of gamelan music therapy on the decrease in blood pressure in hypertensive patients

Discussion

Blood Pressure Results Before Gamelan Music Therapy

Based on the results of blood pressure research before gamelan music therapy was conducted against 20 respondents obtained an average systolic blood pressure *pre-test* 153.10 and diastolic pre-test 91.15. With standard deviation of systolic value pre-test 6,340 and diastolic *pre-test* 9,708. The results of this study in line with previous research showed the average blood pressure results before the treatment of elderly gymnastics and gamelan music therapy barrel pelog and lendro against 20 respondents in the Social Unit obtained an average result of 166.50 mmHg for systolic pressure and 101.50 mmHg for diastolic pressure. [10]

This is by the definition of hypertension based on the Ministry of Health in 2013, it is said that hypertension when systolic blood pressure is above 140 mmHg and diastolic blood pressure above 90 mmHg. Hypertension with a range of 140-159 mmHg for systolic pressure and 90-99 mmHg for diastolic pressure is classified into mild hypertension *(Grade 1).* And Hypertension *High Normal* is in the range of 130 – 139 mmHg for systolic and 80 – 89 mmHg for its diastolic value. [12] This increase in high blood pressure has the effect of damage to other organs in the body delivered kidneys, heart, and rupture of blood vessels brained if ignored for a long time and no immediate *preventive* measures. [12] The supporting factors of hypertension include hereditary factors and poor lifestyles such as smoking habits,

excessive salt consumption, and alcohol, stress, unhealthy eating, and absence of exercise. [5] And it could also be due to too much consumption of drugs from concomitant diseases, such as tumors and kidneys so that blood pressure tends to be high.[4] A person is at risk of hypertension due to increasing age, the female gender is more vulnerable than men, descendants of hypertension, social environment, unhealthy lifestyle and many thoughts.[13]

From the results of the research conducted by researchers and related research results, it can be concluded that the results of blood pressure before gamelan music therapy is in the category of blood pressure is mostly high due to various factors, one of which has not been stimulated to lower systolic or diastolic blood pressure and lack of awareness in checking themselves because of the activities and busyness of respondents. And there are respondents if sleep is difficult, so often stay up late at night. This causes no change in blood pressure.

Blood Pressure Results After Gamelan Music Therapy

Based on the results of blood pressure research after gamelan music therapy was conducted against 20 respondents obtained average systolic blood pressure and diastolic respondents after gamelan music therapy was 146.10 mmHg and 85.55 mmHg. With a standard deviation of the *post-test* systolic value of 6,095 and diastolic post-test of 9,333.

The results of this study are in line with previous studies showing the results of average blood pressure after the administration of music therapy to 32 elderly respondents in the ICU Room with results of 146.58 mmHg for systole pressure and 89.15 mmHg for diastole. [11] Other studies showed average blood pressure after treatment of elderly gymnastics and gamelan music therapy barrel pelog and slendro against 20 respondents in the Social Unit obtained an average result of 146.50 mmHg for systolic pressure and 89.00 mmHg. [10]

Before being given gamelan music therapy and respondents did not get stimulation from outside his blood pressure is still high. Then after being given gamelan music therapy, getting stimulation of the respondent's blood pressure decreased. This is because gamelan music therapy produces positive emotions that are happy and relax calming the heart and heartbeat following the strains of the music so that it becomes down to blood pressure. [1]

Music therapy is useful to overcome certain problems that are effective in lowering anxiety, creating feelings of relaxation, overcoming insomnia and depression, presenting comfort to the heart, solving a problem or conflict. A therapist in maintaining, adding, and restoring mental, physical, emotional, and spiritual health, must know the influence in each response of the mind and body to the type of music such as tone, melody, harmony, rhythm, timbre, musical form, and style of music. [14]

Giving music for 15 minutes or 30 minutes both affects vital signs. Because gamelan music therapy produces positive emotions that are happy and relaxed to benefit vital signs in a stable state. [13] There is research that suggests that gamelan music therapy affects a person's physiological functions where the heart rate, temperature, respiration, and blood pressure become stable. [7]

From the results of the study conducted by researchers and related research results, it can be concluded that the decrease in average blood pressure in hypertensive patients after being given gamelan music therapy is due to the majority of patients are quite focused on following the process of giving gamelan music therapy when the treatment process takes place and giving at the right time where music gamelan therapy is conducted in the morning and evening where the situation and conditions are very supportive due to the quiet atmosphere so that it is easy to stimulate the patient's response. The therapy was administered by researchers for 30 minutes after the pretest blood pressure *measurement.* It provides a positive effect that can calm the mind and heart rate, the body is more relaxed.

Effect of Gamelan Music Therapy on Blood Pressure Reduction in Hypertensive Patients

Bivariate analysis showed that from the results of the *Paired Sample T-Test* it was seen that the average decrease in blood pressure between before and after was 6,500. Can be seen also t count value of 9217 and obtained value ρ *value* = 0.000 < 0.05 then Ho rejected means there is a meaningful

influence between blood pressure in hypertension patients before and after the administration of gamelan music therapy.

This is in line with previous research with the results of the study showing a significant decrease in blood pressure systole and diastole (p-value 0.0001) with the level of error (α) 0.05 ie from 163.25 mmHg to 146.75 mmHg and from 100.50 mmHg to 89.25 mmHg. The conclusion in this study is that the combination of gamelan music with elderly gymnastics influences lowering blood pressure. [10] Previous studies have shown a significant decrease in blood pressure before and after music therapy ($p<0.05$), the patient's pulse also decreases after the administration of music therapy is quite significant with a $p<0.05$ value, but there is no significant change in the oxygen saturation of the patient before and after the administration of music therapy ($p>0.05$). In conclusion from this study is music therapy in particular instrumental music piano sound can help lower the blood pressure and pulse of the patient significantly but not for oxygen saturation. [11]

Other studies obtained results from the Paired Sample T-Test obtained a value of $p= 0,000 <\alpha= 0.05$, which means there is a significant difference between blood pressure before and after the administration of music therapy gamelan java barrel slendro for 7 days in a row. Where it can be concluded that there is an influence of Javanese gamelan music therapy barrel slendro to decrease blood pressure in the elderly in UPT PSTW Magetan. [15]

The implementation of this study was conducted for 30 minutes in listening to the music. With the position of the respondent lying relaxed and calm environmental conditions to focus on receiving therapy and give the expected results. The most important thing is the respondent's ability to enjoy the music he listens to make the respondent feel calm and relaxed which has an impact on the decrease in blood pressure. Music therapy is believed to provide synergy between the self-healing potential that the client has as an individual and the presence of therapeutic relationships that allow the client to acquire extraordinary powers channeled externally through therapy. Therefore healing through music is often associated with the tendency of spiritual practice, rituals, or various procedures against the background of belief (religion) and worship of natural forces. To this day both healing approaches through music are still applied, either with or without modification. [16]

Music can stimulate the parasympathetic nervous system by stretching the body, regulating heart rate, and relaxing the body's organs. [6] Listening to music with a slow rhythm can reduce the ketokolamin out in. blood vessels. which makes the concentration of catecholamines low so that the body becomes relaxed, heart rate is stable and blood pressure decreases. [7]

Listening to music is expected to stimulate and attract sufferers to follow the rhythm grooves that further create a relaxed, joyful atmosphere that ultimately there is a positive change in blood pressure in a person. Giving music with a slow rhythm will reduce the release of catecholamines into the blood vessels so that the concentration of catecholamines in plasma becomes low. [17]

There are several impacts experienced by respondents when hearing gamelan music. The first impact is the increased production of endorphins and dopamine that will stimulate the *limbic system* which is the center of emotional regulation to produce positive emotions that are happy and relaxed, it can stimulate the parasympathetic nerves to disorient blood vessels so that there is a decrease in blood pressure. [19]

There is no definitive recommendation as to how long the optimal duration of music therapy is usually ranging from 25 - 35 minutes, but some are 30 - 45 minutes long for certain health problems. When applying music therapy is expected when listening to it the position of the client lying comfortably accompanied by a slow music tempo and a calm rhythm with beats of 50 - 70 beats/minute. [20]

From the results of the study conducted by researchers and related research results, it can be concluded that there is an influence of music gamelan therapy on the decrease in blood pressure in hypertensive patients because patients have been trained in music gamelan therapy by researchers. Then the patient after a few days of treatment began to focus can follow the activity and have a strong desire so that hypertension can be reduced and controlled. This music therapy makes respondents excited in

obtaining the results and it is expected that respondents enthusiastically repeat doing music therapy themselves. This indicates that music therapy is effectively used as a non-pharmacological alternative to control hypertension of patients when hospitalized or performed when at home.

Conclusion

As a result of research conducted on the influence of music gamelan therapy on blood pressure reduction in hypertensive patients at Dr. Mintohardjo Hospital central Jakarta in 2020. So it can be formulated several conclusions, namely the respondent's blood pressure before being given gamelan music therapy obtained as a large amount of high blood pressure and blood pressure of respondents after being given gamelan music therapy obtained as a large amount of low blood pressure so that there is an influence of gamelan music therapy on the decrease in blood pressure in hypertensive patients at Dr. Mintohardjo Hospital, Central Jakarta. It is expected that after this research, health workers or other medical personnel can apply music gamelan therapy regularly to hypertensive patients.

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