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The Effect of Reflexology on Blood Pressure in Pregnant Women with Hypertension

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ABSTRACT

Nearly 95% of all maternal deaths occurred in low and lower-middle-class countries in 2020, and most were preventable. The direct causes of maternal death were 33.07% of hypertension disorders, 27.03% of obstetric bleeding, 15.7% of non-obstetric complications, 12.04% of other obstetric complications, 6.06% of infections in pregnancy, and 4.81% of other causes. This study aimed to explore the effect of reflexology on blood pressure in pregnant mothers with hypertension. A quasi-experimental design with a non-randomized pretest-posttest design was carried out in this study. The results showed that there was a statistically significant difference in the systolic blood pressure of hypertensive pregnant women before ($147.30 \pm 16,458$) and after ($130.55 \pm 14,095$) given reflexology massage therapy (p-value = 0.0001 ($\alpha < 0.05$); with a difference in pressure reduction up to 16.75 mmHg). In line with systolic blood pressure, Table 3 also shows that there is a statistically significant difference in the diastolic blood pressure of hypertensive pregnant women before (90.75 ± 8.571) and after (82.05 ± 8.912) given reflexology massage therapy (p-value = 0.001 ($\alpha < 0.05$); with a difference in pressure drop of up to 8.7 mmHg). Reflexology massage can be used as an alternative solution to lower blood pressure in pregnant women with hypertension. However, further research needs to be done on how reflexology massage can be applied properly to pregnant women to determine its impact on the mother and unborn baby.

Keywords: Hypertension, Reflexology; Pregnant

Introduction

The maternal mortality rate is very high. Approximately 287,000 women died during and after pregnancy and childbirth in 2020. Nearly 95% of all maternal deaths occurred in low and lower-middle-income countries in 2020, and the majority were preventable[1].

The Maternal Mortality Rate (MMR) is still in the range of 305 per 1000 Live Births (KH) to 183 per 1000 KH in 2024[2]. MMR in Indonesia in 2017 was 177 deaths per 100,000 live births. MMR in Indonesia has experienced a gradual decline from 207 per 100,000 live births in 2013 to 177 per 100,000 live births in 2017[3]. Data in Indonesia shows a gradual decreasing trend but has not yet reached the SDGs target of less than 70 per 100,000 live births[4]. Research and development of science in the health sector is very necessary in sustainable efforts to reduce MMR combined with scientific research.

The direct causes of maternal death were 33.07% of hypertension, 27.03% of obstetric bleeding, 15.7% of non-obstetric complications, 12.04% of other obstetric complications, 6.06% of infection during pregnancy and 4.81% of other causes[5]. This cause of maternal death shows that maternal death can be prevented if service coverage is accompanied by good service quality[1].

Hypertensive disorders of pregnancy, including chronic hypertension, with or without preeclampsia/eclampsia, gestational hypertension, HELLP syndrome, preeclampsia with or without severe symptoms, or eclampsia pose a significant risk of morbidity for the mother and fetus. Although appropriate prenatal care with close observation to detect signs of preeclampsia and prompt delivery to reduce or avoid side effects have resulted in reduced morbidity and mortality, it still persists. Although hypertension itself is a cause for concern during pregnancy, the adverse effects of progression to preeclampsia/eclampsia are a major concern[6]–[8].

Preeclampsia prevention can be done primary, secondary or tertiary. Primary prevention includes avoiding pregnancy in women at high risk of developing PE, changing lifestyle or increasing nutritional intake in the entire population to reduce the incidence of this disease. Therefore, it is likely that most cases of PE cannot be prevented. Secondary prevention is based on stopping the known pathophysiological mechanisms of the disease before the onset of the disease. Current efforts focus on selecting high-risk women and proposing effective interventions, as early as possible, to avoid the disease or its severe complications. Tertiary prevention relies on the use of treatment to avoid complications of PE. Magnesium sulfate, for example, is the drug of choice to reduce eclampsia rates, but at least 71 women need to be treated to prevent one case of eclampsia. Therefore, tertiary prevention may be difficult to achieve without exposing many people to potentially unnecessary risks. In light of the above, this paper aims to review the current evidence regarding primary and secondary prevention of preeclampsia[9].

Although there are various pharmacological treatment options for this condition, many patients fail to comply, making non-pharmacological options an attractive alternative. Foot reflexology massage has been proven to reduce blood pressure (BP). A randomized clinical trial was conducted to test the effectiveness of foot reflexology massage in reducing blood pressure and heart rate (HR). The result is that foot reflexology massage is effective in reducing heart rate in stage-2 HT patients and is partially effective in reducing blood pressure[10].

Another study conducted in Bali showed that the average difference in blood pressure before and after foot reflexology intervention in the treatment group was 10.39 mmHg and the average difference in the control group was 0.94 mmHg (p-value of

0.000 ($p < 0.05$)). So it can be concluded that there is an effect of foot reflexology massage on blood pressure in hypertension sufferers[11]. The results of other studies showed a decrease in systolic blood pressure by 24.54 mmHg and diastolic blood pressure by 9.75 mmHg after foot reflexology massage[12]. This study aimed to analyze the effectiveness of reflexology therapy on the blood pressure of pregnant women.

Methods

The type of research carried out was quasi-experimental with a non-randomized pretest-posttest design. The population in this study were all pregnant women with a gestational age of 24 – 42 weeks at the Sei Durian Community Health Center, Kubu Raya Regency who had systolic blood pressure ≥ 120 mmHg and/or diastole ≥ 80 mmHg. The research was conducted in June 2020 – January 2021. The number of samples used in this research was 20 respondents. Blood pressure is measured using a digital blood pressure meter.

The inclusion criteria in this study were a history of pregnancy hypertension, no history of infectious/chronic diseases, second and third trimester pregnant women, primary and multiple pregnant women and no anemia. Meanwhile, pregnant women with a history of malaria, history of abortion, history of essential hypertension and history of placental abruption were excluded from this study. To guarantee the rights and obligations of researchers and respondents, this research has received ethical approval from the Health Research Ethics Commission (KEPK) of the Pontianak Ministry of Health Polytechnic No. 024/KEPK-PK.PKP/II/2021.

The collected data was analyzed using the SPSS application to compare the average systolic and diastolic blood pressure before and after reflexology massage.

Results and Discussion

Table 1.
Characteristics of Respondents

Characteristics	n	%
Age (years old)		
<20 dan >35	16	80
20 – 35	4	20
Parity		
Primigravida	6	30
Multigravida	9	45
Grande multigravida	5	25
Gestational Age		
Trimester II	6	30
Trimester III	14	70

Table 2.
Difference in average systolic blood pressure of pregnant women before and after reflexology massage

Sistole	Mean±SD	Median	Min	Max	p-value
Before	147.30±16.458	140.00	139	191	0.0001*
After	130.55±14.095	130.00	105	171	

*Uji Wilcoxon

Table 3.
The difference in average diastolic blood pressure of pregnant women before and after a reflexology massage

Diastole	Mean±SD	Median	Min	Max	p-value
Before	90.75±8.571	90.00	78	113	0.0001*
After	82.05±8.912	80.00	69	106	

*Uji Wilcoxon

Based on Table 1, it shows that the majority of respondents were <20 and >35 years old (80%), multigravida (45%), and gestational age in the third trimester (70%). Many researchers have identified young age as a risk factor for hypertension during pregnancy, as was the case in this study. Other studies report that higher age is also an important risk factor for hypertension in pregnancy, especially in developing countries. In a study reported in 2011, women who had at least two previous births represented 15.1% vs. 13% when comparing hypertensive and non-hypertensive women. Previous research found multiparity as a risk factor for hypertension in pregnancy but reported an increased risk in nulliparous women having different partners[13].

Based on Table 2, it can be seen that there is a statistically significant difference in the systolic blood pressure of hypertensive pregnant women before (147.30 ± 16,458) and after (130.55 ± 14,095) given reflexology massage therapy (p-value = 0.0001 ($\alpha < 0.05$); with a difference pressure drop up to 16.75 mmHg). In line with systolic blood

pressure, Table 3 also shows that there is a statistically significant difference in the diastolic blood pressure of hypertensive pregnant women before (90.75 ± 8.571) and after (82.05 ± 8.912) given reflexology massage therapy (p-value = 0.001 ($\alpha < 0.05$); with a pressure drop difference of up to 8.7 mmHg).

This study has results that are in accordance with previous research which showed a significant difference in blood pressure reduction in pregnant women with preeclampsia after foot massage treatment. The treatment group showed that there was a significant difference in mean systolic blood pressure between the pre-test and post-test on the seventh to the twelfth day (p < 0.05). Meanwhile, a significant difference in mean diastolic blood pressure between pre-test and post-test was found in the eighth to twelfth treatment period (p < 0.05)[14].

A study reported in Egypt in 2016 showed that there was a statistically significant reduction in systolic blood pressure, diastolic blood pressure, and edema volume in the treatment and control groups after 6 weeks of treatment. In addition, there were statistically significant differences between

the two groups after treatment in systolic blood pressure, diastolic blood pressure, and edema volume, which were more decreased in the reflexology group[15].

The results of other research showed that there was a decrease in systolic blood pressure in experimental group patients by 6.29 mmHg and a decrease in diastolic blood pressure by 3.44 mmHg. The statistical test results showed a significant decrease in the experimental group with a p-value of 0.000 ($p < 0.05$). The results of this study show that foot reflexology massage therapy can reduce the patient's blood pressure even though the patient is still in the hypertension category[16].

Reflexology is a specialist massage where controlled pressure is applied to specific points, known as reflexes, mainly on the feet, but also on the ears, face, hands and back. Each reflex is believed to be associated with a particular body structure or organ. By applying pressure to these points, the reflexologist aims to improve homeostasis and, as a result, restore and maintain physiological and psychological health and well-being. The exact mechanism of action of reflexology is unknown; Currently, modulation of the autonomic nervous system and release of endorphins after reflexology are the most popular hypotheses. However, due to the lack of a model underlying the theory and physiology of reflexology, many health professionals continue to question its credibility. Nevertheless, increasing evidence suggests that stimulation of certain reflexes can activate the relevant parts of the brain. Reflexology may be a valuable tool as studies have reported positive effects on quality of life, stress levels, and pain levels[17].

Conclusion

Reflexology massage is effective for reducing systolic and diastolic blood pressure in pregnant women with hypertension. Reflexology massage can be used as an alternative solution to lower blood pressure in pregnant women with hypertension. However, further studies need to be carried out on how reflexology massage can be applied properly to pregnant women to determine its impact on the mother and unborn baby.

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