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Effect of Prenatal Yoga on Blood Pressure Among Pregnant Women: A Pre-Experimental Study at Grogol Primary Health Center

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Abstract

Pregnancy is a critical period that presents various physical and psychological challenges for women. One common issue encountered during pregnancy, particularly in the first and third trimesters, is sleep disturbance. Hormonal changes during pregnancy are one of the primary factors contributing to poor sleep quality. Inadequate sleep in pregnant women may also lead to elevated blood pressure (preeclampsia) in subsequent trimesters. One non- pharmacological intervention to address these issues is physical activity, such as prenatal yoga. Methods: This research is a quantitative study with a pre-experimental research design using the One Group Pretest-Postest method. The sample size for this study was 37 pregnant women in their second and third trimesters. Purposive sampling was used. The instruments used were an observation sheet to measure blood pressure. Data analysis was conducted using the Wilcoxon Signed-Rank Test. Results: Prior to the prenatal yoga intervention, the majority of participants experienced elevated blood pressure-19 respondents (51,4%) with high diastolic pressure. Following the prenatal yoga sessions, significant improvements were observed in both blood pressure, with a p-value of 0.000 (<0.05). Conclution : Prenatal yoga has a significant effect on reducing blood pressure in pregnant women at the Grogol Public Health Center

Keywords: *prenatal yoga, blood pressure, pregnancy*

INTRODUCTION

Hypertensive disorders of pregnancy remain a major global health issue, affecting approximately 5–10% of all pregnancies and contributing significantly to maternal and perinatal morbidity and mortality worldwide (Countouris et al., 2025). Globally, the prevalence of hypertensive disorders in pregnancy is estimated to range between 10% and 22%, with an increasing trend due to advanced maternal age and rising metabolic risk factors (Sun et al., 2025). Hypertensive disorders, including preeclampsia, account for around 16% of maternal deaths globally, representing a substantial burden in maternal health, especially in low- and middle-income countries (World Health Organization, 2025). In many developing countries, including Indonesia, hypertensive disorders such as preeclampsia remain a leading contributor to maternal mortality and adverse pregnancy outcomes (Global Health Science Group, 2024).

Despite the growing burden of hypertension in pregnancy, the prevalence of prenatal yoga as a non-pharmacological intervention remains relatively limited and inconsistently reported across populations (Gong et al., 2022). Current evidence suggests that prenatal yoga interventions are not yet widely implemented at the population level, particularly in low-resource settings, despite their potential benefits in improving maternal cardiovascular outcomes (Kwon et al., 2021).

Pregnancy is a period that is not easy for a mother to face. During pregnancy, mothers will face the problem of discomfort during sleep in the first or third trimester of pregnancy. One cause of sleep problems during pregnancy is changes in hormone levels. Increased progesterone levels can cause excessive sleepiness, a condition where a person feels tired and wants to sleep. Hormonal changes experienced by pregnant women can also inhibit muscle function and increase blood pressure, causing pregnant women to wake up frequently to use the bathroom, especially at night (Handayani et al., 2020). Sleep disturbances in pregnant women also include increased fetal weight, shortness of breath, fetal movement, frequent urination, and back pain. Many factors contribute to poor sleep quality in pregnant women (Ismiyati & Faruq, 2020).

One complementary alternative that can be used to address these issues is yoga. Yoga is believed to reduce discomfort during pregnancy, such as sleep disturbances and changes in blood pressure. One way pregnant women can overcome these discomforts is by doing light exercise, particularly yoga for pregnant women. Yoga is a mind-body practice that includes a system of postures (asanas), deep breathing (pranayama), and meditation. More than 36 million Americans practice yoga, and the majority are women of childbearing age. The literature supporting this practice is still limited, although it is growing. One type of yoga that pregnant women can do is prenatal yoga, which has been shown to be beneficial for women or mothers, especially those suffering from depression, anxiety, back pain, stress, and sleep disorders. Research

shows that yoga is proven safe during pregnancy and for the fetus (Babbar et al., 2016).

One yoga practice specifically for pregnant women is pranayama. Prenatal yoga is a type of yoga designed for pregnant women, menstruating women, and menopausal women. Practicing yoga during pregnancy can increase fetal weight and reduce premature birth and childbirth complications such as preeclampsia. The government's efforts to raise awareness about preeclampsia and its life-threatening warning signs are reflected in World Preeclampsia Day, which is celebrated annually on May 22nd. One of the complications of pregnancy is preeclampsia, which is characterized by high pressure in pregnant women. This condition usually occurs when the pregnancy reaches 20 weeks. To prevent this from happening, the Governor of East Java, Khofifah Indar Parawansa, urged all pregnant women to be vigilant and maintain their health to prevent preeclampsia and complications by regularly undergoing screening. She emphasized that examinations and screenings are mandatory, especially for high-risk pregnancies. "Pregnant women must diligently and routinely undergo regular pregnancy check-ups with midwives or the nearest community health center.

Although previous studies and meta-analyses have demonstrated that prenatal yoga can significantly reduce systolic and diastolic blood pressure in pregnant women with hypertension, most evidence is still derived from small-scale or short-duration trials, limiting the strength of clinical generalization (Geiger et al., 2025). Furthermore, existing systematic reviews highlight substantial heterogeneity in yoga protocols, including differences in duration, intensity, and components (asanas, pranayama, meditation), making it difficult to standardize prenatal yoga as a clinical intervention for blood pressure management (Posadzki et al., 2014). Finally although preliminary evidence suggests that prenatal yoga may also reduce stress-related physiological responses linked to hypertension, high-quality randomized controlled trials focusing specifically on hypertensive disorders of pregnancy remain limited, especially in low- and middle-income countries (Gong et al., 2022)

Based on this data, researchers sought to analyze the discomfort experienced by pregnant women, such as increased blood pressure during pregnancy, through prenatal yoga. Therefore, the researchers were interested in developing and selecting the title "The Effect of Prenatal Yoga on Blood Pressure of Pregnant Women at the Grogol Community Health Center."

METHODS

This research is a quantitative research type with one group pretest-posttest. This study analyzes the effect of prenatal yoga on blood pressure of pregnant women. The location of this research was conducted at the Grogol Community Health Center, Kediri Regency, with the research time taking place in February-

March 2025. The population in this study were all pregnant women in the working area of the Grogol Community Health Center, Kediri Regency, totaling 212 pregnant women. The sample in this study were pregnant women who met the inclusion and exclusion criteria totaling 37 respondents using sampling techniques. The inclusion criteria for this study were pregnant women in their second and third trimesters (weeks 13–38), pregnant women with anxiety, pregnant women who could read and write. The exclusion criteria for this study were pregnant women with a history of complications,such as heart disease and diabetes mellitus, pregnant women with a history of preeclampsia and eclampsia.

Independent variable in this study is the prenatal yoga, uses the Standard Operating Procedure (SOP) for prenatal yoga techniques. Prenatal yoga will be guided by a prenatal yoga facilitator from the Grogol Community Health Center. Meanwhile, the dependent variables is blood pressure. Blood pressure was measured using a calibrated digital sphygmomanometer. Data analysis included editing, coding, scoring, and tabulation before being tested using univariate and bivariate analyses. The Wilcoxon statistical test was used to examine the relationship between the independent and dependent variables with a 95% significance level ($p < 0.05$). If the results show a p value < 0.05, then there is an effect of prenatal yoga on maternal blood pressure and sleep quality. pregnant, whereas if $p > 0.05$, then there is no significant relationship. This research procedure has undergone an ethical review and has been declared appropriate by the Research Ethics Committee of Bhakti Wiyata Institute of Health Sciences (Number: 569/FIK/EP/II/2025). Subjects were approached after obtaining written informed consent, guaranteeing data confidentiality and the right to withdraw at any time

Table 1. Frequency Distribution of Respondent Characteristics Age

Mother's Age Category	Frequency	Percentage
15-30 years	27	73
31-45 years	10	27
Total	37	100

Source: Primary Data, 2025

The research results explain that of the 37 respondents, the minority of pregnant women were aged 31-45 years (27%), and the majority of pregnant women were aged 15-30 years (73%).

Table 2. Frequency Distribution of Respondent Characteristics by Gestational Age

Pregnancy Age Category	Frequency	Percentage
TM II	20	54.1
TM III	17	45.9
Total	37	100

Source: Primary Data, 2025

The research results explain that of the 37 respondents, the majority of pregnant women's gestational age is Trimester II, namely 20 respondents (54%).

Table 3. Frequency Distribution of Blood Pressure of Pregnant Women Before Prenatal Yoga

Blood Pressure	Frequency	Percentage
Low	1	2.7
Normal	17	45.9
High	19	51.4
Total	37	100

Source: Primary Data, 2025

The research results explain that the majority of pregnant women in this study experienced high blood pressure before doing prenatal yoga, namely 19 respondents (51.4%).

Table 4. Effect of Prenatal Yoga on Blood Pressure at Grogol Community Health Center

Blood Pressure	Frequency	Percentage	p-value
Low	17	45,9	<0,001
Normal	20	54,1	
High	0	0	
Total	37	100	

Source: Primary Data, 2025

The results of the statistical analysis of the effect of prenatal yoga on blood pressure showed that the majority (54.1%) had normal blood pressure and the minority (45.9%) had low blood pressure. The next test to determine the effect of prenatal yoga on blood pressure used the test wilcoxon, from the results of the Wilcoxon test, the p value was 0.001 < 0.05, so it can be concluded that Prenatal Yoga has an effect on the Blood Pressure of Pregnant Women at the Grogol Health Center.

FINDINGS AND DISCUSSION

1. Blood Pressure Before Prenatal Yoga

The results of this study show that of the 37 respondents, the minority of pregnant women were aged 31-45 years (27%), and the majority of pregnant women were aged 15-30 years (73%). Based on the research results of Hidayah et al., (2023) maternal age below 20 years or above 35 years is associated with an increased risk of hypertension during pregnancy. Maternal age is important risk factor influencing the occurrence of hypertension in pregnancy (Zolekhah et al., 2024)

Research Results: The majority of pregnant women's gestational age was in the second trimester, namely 20 respondents (54%). Based on Ratnawati et al (2024) Hypertension in pregnancy is the presence of blood pressure of more than 140/90 mmHg, which is significant Each blood pressure measurement is related to gestational age, and generally, the earlier hypertension occurs in pregnancy, the greater the likelihood of it becoming chronic. Chronic hypertension is hypertension known before pregnancy or an increase in blood pressure of 140/90 mmHg before 20 weeks' gestation and persisting for up to 6 weeks after delivery. Advancing gestational age, particularly during the second and third trimesters, leads to physiological changes

that can affect maternal blood pressure (Arini, 2021) Increased blood volume and vascular resistance during pregnancy contribute to changes in maternal blood pressure (Jasmine et al., 2021). Maternal age and pregnancy conditions together can increase the risk of hypertension during pregnancy (Suharaini et al., 2024).

According to ACOG et al (2020) Gestational hypertension is a maternal blood pressure increase of >140/90 mmHg after the 20th week of pregnancy in women known to be normotensive, accompanied by proteinuria, and reported to return to normal after delivery. According to Rosmadewi and Rudiyanti (2018), prenatal yoga should be done starting in the 20th week of pregnancy and done 2-3 times a week. It is known that the majority of pregnant women in this study, 19 respondents (51.4%) experienced high blood pressure before prenatal yoga. According to research conducted by Wicaksana & Rachman (2018), regular prenatal yoga can effectively reduce the incidence of preeclampsia.

This research is also the same as the research of Ananda et al (2019) which discusses the relationship between prenatal yoga and blood pressure in pregnant women with hypertension in pregnancy which contains that prenatal yoga suppresses the performance of the sympathetic system. According to Hans & Ariwibowo (2020), one non-pharmacological technique that can easily be done at home is prenatal yoga. To lower blood pressure, prenatal yoga is an alternative therapy for pregnant women. Prenatal yoga movements have a relaxing effect that can stabilize the emotions of pregnant women. The research results explain that prenatal yoga can lower blood pressure in pregnant women in the second and third trimesters. This benefit is achieved through gentle movements, including various relaxation and breathing techniques, which can reduce blood pressure experienced by pregnant women throughout pregnancy

2. Blood Pressure After Exercise Prenatal Yoga

The results of the statistical analysis of the effect of prenatal yoga on blood pressure above the normal majority (54.1%) and low minority (45.9%) of pregnant women who had no effect on blood pressure. Based on the results of the study by Cohen et al (2016), Yoga exercise has become an alternative treatment approach that is able to lower blood pressure, both in patients with mild and moderate hypertension compared to the use of drugs. In the study conducted, a small decrease with an average of 2 mmHg can reduce 7-10% of deaths are due to ischemic heart disease.

According to research by Zhu et al (2022), a Randomized Controlled Trial study stated that doing prenatal yoga on pregnant women who were experiencing increased blood pressure provided a comfortable, calm, and safe effect in dealing with physical changes and was able to lower blood pressure. Another result of doing prenatal yoga is that it can increase blood flow to the placenta, reduce stress hormones from the mother so that it can prevent premature birth. Prenatal yoga is done in a calm and relaxed manner.

Prenatal yoga has been shown to lower blood pressure by enhancing parasympathetic nervous system activity, which promotes relaxation and improves cardiovascular regulation (Telles et al., 2019). The practice of prenatal yoga contributes to reduced cortisol levels, thereby decreasing stress-related physiological responses that are associated with elevated blood pressure (Field, 2020). Activation of the parasympathetic system through breathing and mindfulness components of prenatal yoga plays a key role in stabilizing maternal hemodynamics (Kwon et al., 2021). A major strength of prenatal yoga is its non-pharmacological approach, making it a safe and accessible intervention for managing blood pressure during pregnancy (Babbar et al., 2016). However, limitations of prenatal yoga include variability in intervention protocols and limited large-scale randomized controlled trials, which may affect the generalizability of findings (Gong et al., 2022).

This research aligns with research by Nurhidayah & Khotimah (2020), which states that prenatal yoga can lower blood pressure, strengthen physical and psychological well-being during childbirth, and reduce physical complaints. The researchers also stated that prenatal yoga can help reduce blood pressure, improve memory, and improve memory had a statistically significant effect on lowering blood pressure. However, prenatal yoga can significantly reduce systolic blood pressure but not diastolic blood pressure. Based on the results of this study, it can be concluded that prenatal yoga can lower blood pressure in pregnant women in the second and third trimesters. obtained through gentle movements, including various relaxation techniques and breathing regulation, so as to reduce the blood pressure of pregnant women during pregnancy.

CONCLUSIONS

Based on the results of research and discussion on the effect of prenatal yoga on blood pressure of pregnant women at the Grogol Community Health Center. The research was conducted on 37 pregnant women respondents, then an analysis was carried out. data, then the following conclusions can be drawn: (1) Blood Pressure of Pregnant Women Before Prenatal Yoga in this study, the majority experienced high blood pressure, namely 19 respondents (51.4%) ; (2) The results of the statistical analysis of the effect of prenatal yoga on blood pressure. The majority of normal (54.1%) and low minority (45.9%) pregnant women who had no effect on blood pressure; (3)The results of the analysis show a significant relationship between prenatal yoga and blood pressure, with a p value of 0.001

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