



**INTERVENTIONS TO LOWER HIGH BLOOD PRESSURE  
IN PREGNANT WOMEN: A LITERATURE REVIEW**

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## ABSTRACT

**Background:** One of the problems that often arises in pregnant women is hypertension. Hypertension in pregnancy is caused by changes in the cardiovascular system and blood vessels. Hypertension in pregnancy accounts for 5–15% of pregnancy complications and is one of the three highest causes of maternal mortality and morbidity. The purpose of this study was to determine the various nursing interventions that can be done to reduce high blood pressure in pregnant women. **Methods:** This study uses a literature review system with PRISMA to facilitate the process of finding suitable articles. **Results:** After searching and analyzing, there were 7 articles that were judged to meet the criteria. Of the 7 articles, 6 different interventions have been shown to reduce blood pressure: yoga therapy, TFA diet therapy, mushroom diet therapy, spiritual therapy, Turkish classical music therapy, folic acid supplement therapy, and murrotal therapy. **Conclusion:** Of the 7 interventions that have been studied, 6 have been shown to reduce blood pressure in pregnant women.

**Keywords:** pregnancy, high blood pressure, pre-eclampsia, intervention, nursing treatment

## ABSTAK

Salah satu masalah yang sering muncul pada ibu hamil adalah hipertensi. Hipertensi pada kehamilan diakibatkan oleh perubahan pada sistem kardiovaskuler dan pembuluh darah. Hipertensi dalam kehamilan merupakan 5-15% penyulit kehamilan dan merupakan salah satu dari tiga penyebab tertinggi mortalitas dan morbiditas ibu bersalin. Tujuan penelitian ini adalah untuk mengetahui macam-macam intervensi keperawatan yang dapat dilakukan untuk menurunkan tekanan darah tinggi pada ibu hamil. Penelitian ini menggunakan sistem literature review dengan PRISMA untuk memudahkan proses pencarian artikel yang sesuai. Setelah dilakukan pencarian dan analisis terdapat 8 artikel yang dinilai memenuhi kriteria. Dari 8 artikel tersebut, 7 intervensi berbeda yang terbukti menurunkan tekanan darah yaitu terapi yoga, terapi diet TFA, terapi diet jamur, terapi spiritual, terapi musik klasik turki, terapi suplemen folic acid dan terapi murrotal. Kesimpulan: Dari 8 intervensi yang telah ditelaah, 7 intervensi terbukti dapat menurunkan tekanan darah pada ibu hamil.

**Kata kunci:** pregnancy, high blood pressure, pre-eclampsia, intervention, nursing treatment

## INTRODUCTION

Pregnancy is a physiological state that is a special phase in a woman's life. One of the health problems that often arise in pregnancy is hypertension (Yohanna, Yovita, & Yessica, 2011). One of the causes of hypertension in pregnancy is changes in the cardiovascular system and blood vessels that occur before pregnancy, during pregnancy, or early postpartum. Cardiovascular changes are caused by increased cardiac afterload and decreased cardiac preload, while arteriolar vasoconstriction, systemic vasospasm, and damage to blood vessels occur in blood vessels (Reeder, Martin, & Griffin, 2011).

Systolic blood pressure above 140 mmHg and diastolic blood pressure above 90 mmHg, or an increase in systolic pressure of 30 mmHg or more, or an increase in diastolic pressure of 15 mmHg or more above the baseline value, measured in two circumstances, at least within 6 hours, are considered hypertensive conditions in pregnancy (Reeder et al., 2011). One of the three leading causes of maternal death and morbidity during pregnancy, hypertension accounts for 5–15% of pregnancy problems (Prawirohardjo, 2013).

Based on UNICEF data (2018), the number of deaths of mothers and children every year due to complications of pregnancy and childbirth decreased from 532,000 in 1989 to 303,000 in 2018, and this occurs in almost 99% of developing countries. The main causes of maternal death are complications from pregnancy or childbirth. One of these complications is hypertension in pregnancy, which has contributed to 14% of causes of maternal death in the world (UNICEF, 2018).

Imron Riyanto (2014), in his research entitled Factors associated with the incidence of preeclampsia and eclampsia in mothers giving birth, said that there is a significant relationship between a history of hypertension and the incidence of preeclampsia. Patients who experience hypertension during pregnancy need optimal management, namely by observing to detect symptoms or signs so that the diagnosis can be made immediately and the patient can immediately be given appropriate management, such as consideration for determining the optimal birth time for the safety of the mother and foetus (Roberts et al., 2013).

One way that can be done to find out the possibility of hypertension in pregnancy is by conducting early detection in women who are known to have risk factors. This method is an effort to reduce health problems experienced by pregnant women with hypertension (Reeder et al., 2011).

Chronic hypertension, which is characterised by blood pressure that is more than 140/90 mmHg before 0 weeks of pregnancy or appears more than 20 weeks of gestation and will continue to appear after 12 weeks postpartum, is one of the classifications of pre-eclampsia. (Cunningham, 2015).

Health problems that may occur in pregnant women with hypertension include pain, changes in tissue perfusion, the risk of injury, excess fluid volume, and others. Plans of action that can be taken for pregnant women who show early symptoms of hypertension include monitoring pulse and blood pressure, collaborating in giving anti-hypertensive drugs, and advising mothers to do bed rest in a left oblique position (Mitayani, 2011). In addition, there are still many interventions that pregnant women can do to reduce blood pressure. Based on the background description, the purpose of this research is to find out about various interventions that can reduce blood pressure in pregnant women.

## **METHOD**

Develop A scoping review was the research design employed in this body of material. A scoping review is a technique for locating extensive and in-depth literature relevant to the research issue that has been gathered from a variety of sources using a range of research methodologies. Several actions are done, such as: 1) formulating research questions that are specific to the goals of the study 2) Finding pertinent literary sources from a variety of sources 3) Choosing the available literature in accordance with the subject of the study 4) carrying out mapping and gathering the relevant material; 5) gathering and presenting the findings of the examination of the chosen literature; and 6) conferring with relevant parties.

### **Search Strategy**

In searching the database regarding Interventions to Lower Blood Pressure in Pregnant Women, the researchers used the Science Direct, EBSCO, and PubMed databases using the search terms, namely pregnant women OR pregnant mother OR pregnancy AND

blood pressure intervention OR Blood Pressure Management OR Blood Pressure Nursing Management AND lowering BP OR decreasing Blood Pressure.

### Research Criteria

The research criteria for this literature are full-text articles in English and Indonesian, Randomized Control Trials and quasi-experimental studies, patients with chronic low self-esteem, articles with a maximum year of 5 years (2017–2022), and articles focusing on interventions to lower blood pressure in pregnant women.

### Data Selection Process

This literature was selected using a prism diagram. Article results are selected using keywords, inclusion criteria, and based on the title. Data

### Extraction and Analysis

The process of data extraction and analysis is done manually based on the articles obtained. The data obtained was based on established inclusion criteria, namely full-text articles in English and Indonesian, Randomized Control trials and quasi-experimental studies, patients with chronic low self-esteem, articles with a maximum year of 5 years (2017–2022), and articles focusing on occupational therapy interventions. The prism diagram below illustrates the process of selecting articles based on titles and abstracts so that seven articles met the requirements.

### PRISMA Diagram

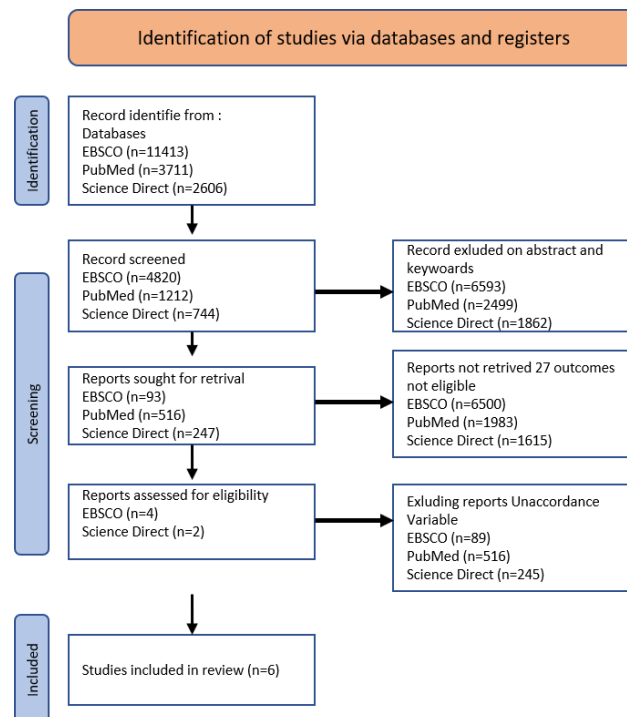


Figure 1. Article Selection Flow

## **RESULTS**

### **Yoga Therapy**

Intervention during yoga practice 20 weeks of exposure to the intervention group was shown to reduce the incidence of hypertension, improve fetal outcomes, and reduce cardiometabolic risk.

### **TFA (Trans-Fatty Acid)**

Diet Therapy There are significant differences in statistics on TFA intake, which means that a low dietary intake of TFA during pregnancy reduces the risk of pre-eclampsia.

### **Mushroom Diet Therapy**

The intervention group significantly decreased the incidence of pre-eclampsia (P 0.014) and hypertension in pregnancy (P 0.023) when compared to the placebo group. The use of mushrooms can lower the risk of PIH and regulate the emergence of new illnesses, such as obesity and gestational diabetes.

### **SBE Therapy (Structured Bed exercise)**

SBE does not significantly reduce blood pressure, but it can reduce fetal risk, eliminate discomfort, and reduce anxiety levels.

### **Spiritual Therapy**

There was a significant difference in blood pressure in the intervention group after 3 months of follow-up.

### **Turkish Classical Music Therapy**

When thinking about The experimental group showed a substantial increase in the number of fetal movements, whereas the fetal heart rate and blood pressure were shown to be minimally affected by music therapy ( $p < 0.05$ ).

### **Folic Acid Supplement Therapy**

The HD group had considerably greater plasma homocysteine (homocysteine) and FA levels than the LD group. When comparing the HD group to the LD group, there was a noticeable decrease in severe gestational hypertension, severe preeclampsia, early-onset preeclampsia (<32 weeks of gestation), and infant Apgar scores <7 at 5 minutes. Furthermore, in the HD group with >50% adherence, pre-eclampsia incidence was decreased.

### **Murottal therapy**

Giving murottal Ar Rahman can reduce ROT (Roll Over Test) and MAP (Mean Arterial Pressure) in pregnant women with preeclampsia.

## **DISCUSSION**

### **Yoga Therapy**

Yoga has been demonstrated in this study to lower high blood pressure, which is a common occurrence in pregnant women. This is consistent with studies by Rodiani et al. (2019), which found that pregnant women can safely engage in prenatal yoga as a physical activity. Systolic blood pressure lowers because prenatal care can strengthen the heart and lungs, increase blood flow, and improve the availability of oxygen and nutrients. Yoga

breathing exercises maximize lung capacity and offer useful posture exercises that improve heart muscle performance..

### **TFA Diet Therapy**

TFA is known to have a negative effect on increasing the risk of PE (Pre-Eclampsia) by affecting endothelial function, the inflammatory response, and insulin resistance. TFA at a level of 1% of total energy intake, and others are replaced with monounsaturated fats (MUFA) and unsaturated fatty acids (PUFA). In dietary patterns, MUFA and PUFA play an important role in preventing chronic metabolic diseases. In addition, MUFA and PUFA in food can reduce the risk of cardiovascular disease by influencing markers of inflammation and insulin resistance.

Pregnant women need to pay attention to their diet, namely by consuming nutritious and balanced foods, reducing salty foods, eating foods with fibre (fruits and vegetables), consuming more drinking water (6–8 glasses) (250 ml), and avoiding alcoholic drinks. alcohol and smoking, and limit capaine consumption (Lowdermilk, 2013).

### **Mushroom Diet Therapy**

Chinese and Japanese people generally eat mushrooms not only as a side dish but also as medicine. Their belief is justified because mushrooms contain many nutrients and phytochemicals. In line with this, many studies state that mushrooms are not only a source of vegetable protein but also have a low calorie content, unsaturated fat, and B-complex vitamins, especially riboflavin, niacin, and pantothenic acid. Besides that, mushrooms can also reduce hypertension because they have a high potassium content and can expel excess sodium, which causes hypertension.

### **SBE therapy**

According to recent research, regular exercise during pregnancy may improve FHR autonomic regulation and variability, which could have positive long-term health implications. modynamics (more particularly, exercise keeps the cerebral-fetal ratio within normal bounds). Consequently, physical activity during pregnancy stimulates the body, raising the heart rate but not the fetal heart responses. Additionally, the two groups of pregnant women who exercised moderately at 13 and 20 weeks of gestation showed no differences in fetal blood flow to the placenta or fetal growth, and their physical fitness in terms of maximum oxygen consumption increased. Pregnancies with medical or obstetric difficulties have not been included in the majority of prior studies on exercise during pregnancy, as indicated by the studies mentioned above. As a result, nothing is known about how exercise affects FHR in difficult pregnancies. These results imply that bed exercise may not raise the risk of fetal cardiovascular responses and may not have a deleterious effect on FHR, variability, accelerations, or decelerations in pregnant patients at high risk in hospitals..

### **Spiritual Therapy**

In the research conducted by Sanaeinasab, H. et al. (2020), an intervention was carried out in the form of spiritually integrated Cognitive Behavioral Therapy (CBT). In this study, participants received an intervention consisting of four 90-minute sessions during 8 weeks. Each group consists of 6–10 people. Sessions included: 1) lectures and discussions about the importance of childbirth and the spiritual benefits felt by mothers individually or socially; 2) information regarding psychological problems during pregnancy and pregnancy complications; 3) spiritual coping strategies to help make peace

with emotions during pregnancy; and 4) accustoming participants to using religious resources to cope in dealing with anxiety, stress, and depression. After 3 months of follow-up, there was a decrease in anxiety, stress, depression, and systolic and diastolic blood pressure in the intervention group (Sanaeinasab, H. et al., 2020). The spiritually integrated CBT intervention allows pregnant women to communicate with fellow pregnant women, who then become a support system for them as one of the coping methods for dealing with emotional problems during pregnancy (Sanaeinasab, H. et al., 2020). This intervention also improves spiritual coping strategies for pregnant women and reduces cortisol levels, thereby reducing emotional and biological problems, namely blood pressure (Sanaeinasab, H. et al., 2020).

### **Turkish Classical Music Therapy**

It is believed that music therapy affects the autonomic and central nervous systems, which have a favorable impact on physiological parameters and account for the effect of music on decreasing blood pressure. Chlan claims that musical stimuli—particularly rhythm and tempo—have a beneficial impact on physiological, psychological, and vital signs and can be utilized to synchronizely alter the body's physiological response—heart rate, breathing, and blood pressure. the wellbeing of a single person. According to study, listening to music can lower blood pressure, which is consistent with our findings.

### **Folic Acid Supplement Therapy**

Oral consumption of FA can lower the incidence of pre-eclampsia, according to a substantial body of research. In one trial, the rate of preterm labor and the time it took for labor to start were dramatically reduced in participants receiving high doses of FA (3–9 mg daily). incipient preeclampsia. Preeclampsia risk was found to be considerably lower in another trial when FA use was continued in the early stages of the second trimester. According to recent research, neither group experienced preeclampsia when pregnant women received high or low doses of FA during their pregnancy, despite differences in homocysteine expression. Giving FA during pregnancy is therefore thought to lower homocysteine levels and avoid preeclampsia.. As for the secondary outcomes, we discovered that the HD group significantly outperformed the LD group in terms of severe fetal hypertension, severe pre-eclampsia, early-onset preeclampsia (<32 weeks of gestation), and infant Apgar scores <7 at 5 minutes. In this investigation, we discovered that giving them large doses of FA gradually reduced their plasma homocysteine levels.

### **Murrotal therapy**

In research conducted by Setiawati (2020), non-pharmacological interventions in the form of Murottal Ar Rahman were combined with pharmacological therapy in the form of administering MgSO<sub>4</sub> to pregnant women with preeclampsia. Listening to Murottal Ar Rahmah is said to affect emotional intelligence, intellectual intelligence, and spiritual intelligence. In addition, listening to Murottal Ar Rahmah can also have a calming and relaxing effect on a person, so it can contribute to reducing blood pressure (Kartini, 2017). In research conducted by Setiawati (2020) in 26 pregnant women with preeclampsia, 13 mothers received pharmacological therapy alone by administering MgSO<sub>4</sub> and 13 other mothers received pharmacological therapy alone and non-pharmacological therapy Murottal Ar Rahmhan. The results of this study found that Murottal Arrohman can reduce ROT and MAP in preeclamptic pregnant women at Irna C. Bangkalan Hospital (Setiawatiawati, 2020). The deficiency in this study was that the researchers did not

include the time or frequency of the non-pharmacological interventions of Murottal Ar Rahman given to the study samples.

According to Rosshal (2014), the drug for mothers with indications of pre-eclampsia is magnesium sulphate (MgSO<sub>4</sub>), which is given intravenously or intramuscularly. This drug works to inhibit conduction and suppress irritability of the neuromuscular system, which will ultimately lower blood pressure, but only temporarily because the function of this drug is to prevent seizures.

## CONCLUSION

From the results of a literature search, various types of interventions were found to be effective in managing blood pressure in pregnant women, including murottal and music therapy, taking folic acid supplements, the mushroom diet, spiritual therapy, yoga therapy, and the TFA diet. Although SBE therapy cannot significantly reduce blood pressure, it is capable of risking the fetus, eliminating discomfort, and reducing anxiety levels in pregnant women.

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