ISSN : 2443-4019 | eISSN : 2502-2083
ADI HUSADA Nursing Journal
Jurnal Keperawatan - Sekolah Tinggi Ilmu Kesehatan Adi Husada Surabaya

The Effect of Hydrotherapy : Foot Soak on Lowering Blood Pressure of Preeclampsia Pregnant Women at Aura Syifa Hospital Kediri

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Keywords :
Foot soak, Blood pressure, Preeclampsia

Abstract

Preeclampsia is a condition of pregnant women who tend to be high so they are at greater risk of developing hypertension. This is mostly caused by maternal age and gestational age. Preeclampsia can be treated with nonpharmacological methods, one of which is foot hydrotherapy. The study aims for knowing the influence of hydrotherapy: foot soaks against drop pressure blood on a mother pregnant with preeclampsia at Aura Syifa Hospital Kediri. Type study This use study *Pre Experimental Design* with design research used *One Group Pretest and Posttest Design* with 21 respondents with use *Purposive sampling technique* using sheet research instrument observation and analysis with the Wilcoxon *test.* Pretest and posttest analysis produce a drop in pressure blood on the first day of 0,8. Decrease pressure pre-intervention blood and post-intervention day second of 0,85. whereas descent pressure pre-intervention blood and post-intervention day third of 0,71. with a *value of* 0,000, which means there is an influence of foot hydrotherapy against drop pressure blood on a mother pregnant with preeclampsia at Aura Syifa Hospital Kediri. Hydrotherapy using warm water to soak the feet can dilate blood vessels, and reduce muscle tension so that blood flow becomes smooth.

INTRODUCTION

Pre-eclampsia is a condition that, if left continuously, can pose a greater and more severe risk (Anggreini, 2020). There are factors that can influence the incidence including maternal age factors during pregnancy (<20 and > 35 years), which age is an age that has a high risk that can causing complications in pregnancy, gestational age factors are also the main cause of preeclampsia, It usually comes from an undeveloped placenta that can be caused by disorders of blood vessels (Heriani, 2019)

The World Health Organization (WHO) 2016 states that as many as 75% of the causes of death according to WHO can be due to hypertension in pregnancy, bleeding, infection, and other complications due to childbirth and abortion (Gugun, 2020). The incidence of preeclampsia in the world is 46%, in Indonesia 75%, in African countries 62%, in South Asian countries 24%, in India 17% Singapore 6.6% (Heriani, 2019; Pratiwi, 2018). Based on data from the 2019 East Java Provincial Health Office, there are several causes of death, among causes of death in East Java Province are categorized because there are 3 causes of maternal death in 2019, including the cause of Pre-Eclampsy 31.15% of 162 people, the cause bleeding 24.23% and other causes of 23.1% or 120 people. Related The cause of death in East Java has decreased (metabolic disorders, bleeding disorders), but the cause of infection has increased from year to year, 2018 which is 6.73% or as many as 35 people (Dinas Kesehatan, 2020).

Data from the Kediri Regency Health Office 2019 The largest cause of maternal death is dominated by bleeding causes 28.57%, and pre-eclampsia causes 21.43%. The rest of the comorbidities are the heart and others s 14.29% (Dinas Kesehatan, 2020). Data obtained from Aura Syifa Kediri Hospital from January to October 2022 showed 1,789 pregnant women, with 59 cases of hypertension in pregnancy, 34 pregnant women causing Preeclampsia, and chronic hypertension 8 pregnant women at Aura Syifa Kediri Hospital because have before precaused.

Previous research Liszayanti, 2020 about the Effect of Foot Soak Therapy with Warm Water and Lemongrass on Pregnant Women with Pre-Eclampsia Blood Pressure. Showed the results a significant decrease in blood pressure seen from the difference in average blood pressure before and

after foot soak therapy with warm water The intervention was carried out 3 times or 3 days foot soak pana displacement/Warmth from warm water into the body will cause dilation of vessels and muscle tension affects arterial pressure by baroreceptors in the sinus cortex and aortic arch informing the brain about blood pressure, blood volume and special needs of all organs to the sympathetic nerve center to the medulla so that it will stimulate systolic pressure, Stretching the ventricular muscles will stimulate the ventricles to contract immediately. At diastolic pressure, the state of isovolumic ventricular relaxation when the ventricles relax, the pressure in the ventricles drops dramatically, and blood flows smoothly with the dilation of blood vessels resulting in a decrease in diastolic pressure.

Based on related data and research, the author is interested in conducting research in accordance with the background and problems that have been described, so for this reason researchers are interested in researching the "Effect of Foot Soak on Blood Pressure Reduction in Preeclampsia Pregnant Women at Aura Syifa Hospital Kediri".

RESEARCH METHODS

Research design is a systematic way used to get answers to research questions. The research design contained rules that must be met throughout the entire research process. Broadly the definition of research design includes various things that researchers do starting from problem identification, hypothesis formulation, operational definition, and data collection methods to data analysis Research using Pre Experimental Design research design using One Group Pretest and Post-test Design. The research location was carried out at the gynecology poly of Aura Syifa Hospital Kediri and the Respondent's House door-to-door. Population is a complete set of elements or entire groups of people or objects that attract the attention of researchers The population in this study is 105, The sampling technique used in this study is Non Probability Sampling with the type of sampling using purposive sampling techniques. The number of samples used in this study was 21 respondents, the sample of this study was members of the population who met the inclusion or inclusion criteria. The inclusion criteria are Mild pre-eclampsia pregnant women (Blood pressure >140-149/>90-99 mmHg, urine protein 0.3 gr/lt or +1/ +2 gr/lt,), Pregnant women who are willing to participate in research and sign informed consent Exclusion Criteria: Severe preeclampsia pregnant women (Blood Pressure >160/>110 mmHg, urine protein 5gr/lt.) Pregnant women do not agree to be respondents. Independent variable foot soak. The dependent variable of blood pressure in pregnant women is Preeclampsia. Research is an observation sheet. In this study, the measuring instrument in this study used observation sheets and used an interval scale. The instruments used in this study were observation sheets, SOP sheets for foot hydrotherapy with warm water, water thermometers, digital sphygmomanometers, and stopwatches. The observation sheet in this study contains a format consisting of the respondent code and blood pressure before and after hydrotherapy-soaked feet in warm water in the treatment group. Water thermometers are used to measure temperature on buckets filled with water while digital sphygmomanometers and stethoscopes are used to measure blood pressure before and after soaking feet in warm water. The stages in data processing using data processing applications using editing, editing on this by double-checking the name and completeness of the respondent's identity to avoid data shortages, coding, and scoring, In this study using observation sheets to find out the difference in blood pressure before and after treatment using blood pressure measurements, In this study, all complete data will be processed, namely entering blood pressure entry data before (pre-test) and after treatment (post-test) to find out the difference in values, processing, tabulating, Tabulating in this study is to make a table containing data that has been coded according to the analysis needed with coding,

Analysis of Blood Pressure Level data in preeclampsia pregnant women or pregnant women experiencing hypertension at Aura Syifa Hospital Kediri used the Wilcoxon test to determine the success rate of intervention after warm water foot hydrotherapy on respondents. The reason for choosing foot hydrotherapy therapy aims at testing to lower blood pressure in preeclampsia or hypertensive pregnant women.

RESULT

In this result we will describe the results of a study entitled the effect of foot soaks on lowering blood pressure in preeclampsia pregnant women at Aura Syifa Hospital Kediri which was conducted 3 days in a row a week. The respondents used were preeclampsia pregnant women aged 20-45 years who

were in the gynecology poly of Aura Syifa Hospital Kediri and who met the inclusion and exclusion criteria. Data collection was carried out on pre-test and post-test observation sheets. Pre-test data collection is carried out before preeclampsia pregnant women are given foot baths by measuring blood pressure. Post-test data collection was carried out after foot hydrotherapy was given by measuring blood pressure using a digital sphygmomanometer.

Table 1
Characteristics of Pregnant Women with Preeclampsia in Poly Gynecology Aura Syifa Hospital Kediri, N=21

Characteristic	Frequency	Percentage
Age		
17-25 year	6	28,6
26-35 year	5	23,8
36-45 year	10	47,6
Education Level		
SD/MI	2	9,5
SMP/MTS	6	28,6
SMA/SMK	11	52,4
Diploma	1	4,8
Bachelor	1	4,8
Employment		
Housewives	16	76,2
Private/Self-employed	3	14,3
Trader	2	9,5
Gestational Age		
0-13 Weeks	0	0
14-27 Weeks	9	42,9
28-41 Weeks	12	57,1

Table 1 shows the age of respondents most aged 36-45 years, namely 10 people (47,6%) with an education level of most Senior high school which is 11 people (52,4%), and the majority work as housewives 16 people (76,2%) with gestational age mostly 28-41 weeks as many as 12 people (57,1%).

Table 2
Results of Blood Pressure Check Before and After Hydrotherapy: Foot Soak in Preeclampsia, Pregnant Women

Blood Pressure Before Hydrotherapy: Foot Soak			Blood Pressure After Hydrotherapy: Foot Soak		
Blood Pressure	**Frequency**	**Percentage**	**Blood Pressure**	**Frequency**	**Percentage**
1st Day			**1st Day**		
Preeklamsia mild	2	9,5	Preeklamsia mild	19	90,5
Preeklamsia moderate	19	90,5	Preeklamsia moderate	2	9,5
2nd Day			**2nd Day**		
Preeklamsia mild	2	9,5	Preeklamsia mild	20	95,2
Preeklamsia moderate	19	90,5	Preeklamsia moderate	1	4,8
3rd day			**3rd Day**		
Preeklamsia mild	5	23,8	Preeklamsia mild	20	95,2
Preeklamsia moderate	16	76,2	Preeklamsia moderate	1	4,8

Table 2 shows that blood pressure on the first day before the foot soak was obtained by the majority of 19 people (90,5%) included in moderate preeclampsia and after the foot soak was obtained by the majority of 19 people (90,5%) included in mild preeclampsia. The second day showed blood pressure before the foot soak, the majority of moderate preeclampsia was in 19 people (90,5%) and after the foot soak, the majority of mild preeclampsia was obtained in as many as 20 people (95,2%). The third day showed blood pressure before the foot soak, the majority of moderate preeclampsia was 16 people (76,2%), while after the foot soak, mild preeclampsia was 20 people (95,2%).

Bivariate analysis to test the hypothesis so that the results are present or absent the effect of foot soaks on reducing blood pressure in preeclampsia, pregnant women. The normality test with Shapiro Wilk obtained a significant value (p) on the Shapiro-Wilk test 0.000 ($p < 0.05$), so the data was

not normally distributed then used the Wilcoxon test with a meaning level of 95% or alpha value of 0.05.

Table 3
The Results Of Wilcoxon's Analysis Of The Effect Of Foot Soak On Lowering Blood Pressure In Preeclampsia Pregnant Women At Aura Syifa Hospital Kediri

	Frequency	Mean
Pre Intervensi	21	2,85
Post Intervensi	21	2,06
Total		0,79
Asymp. Sig	$\rho < \alpha$ which is 0,000	

Table 3 shows, the average blood pressure of respondents pre-intervention or before intervention was 2,85. While post-intervention or after-intervention is 2,06. In the table above, it is explained that this treatment has a decrease in pre-intervention and post-intervention Blood Pressure with a decrease of 0,76.

DISCUSSION

Identifying Blood Pressure of Preeclampsia Pregnant Women Before Foot Soak Against Lowering Blood Pressure in Preeclampsia Pregnant Women at Aura Syifa Hospital Kediri

Based on research at the gynecology poly of Aura Syifa Hospital Kediri, the respondents' house for 3 days with the number of respondents 21 blood pressure of preeclampsia pregnant women before being given a foot soaks the average blood pressure results in preeclampsia pregnant women fall into the category of Moderate Preeclampsia. Nadilla (2021) stated that before being given foot soak therapy and red ginger decoction, the majority of moderate preeclampsia results were obtained in as many as 13 people with a percentage of 76,5% (Hafidz, 2021). The results showed that out of 21 respondents showed gestational age of 28-41 weeks, respondents were 12 respondents (57,1%). This study is in accordance with the research of Retno Wulandari (2018) there is a significant relationship between gestational age and the incidence of preeclampsia, with the results of the majority of pregnancy age in the third-trimester percentage (97,73%) (p-value = 0,014) (Wulandari, 2012). This is in accordance with the theory of placental implantation ischemia, at the age of more than 28 weeks of pregnancy, the incidence of preeclampsia increases, it is because gestational age more than 28 weeks fibrinogen levels increase and will increase even more in mothers affected by preeclampsia.

The older the age at the time of pregnancy falls into the category of unhealthy reproductive age (ie < 20 years or > 35 years) it will increase the risk of suffering from pre-eclampsia (Ahmad & Nurdin, 2019). The results of the study obtained results from 21 respondents, the majority of whom were in the age range of 36-45 years, namely as many as 10 respondents (47,6%). This is in line with research according to Widi Sagita (2020) which states that maternal age can indicate the occurrence of preeclampsia, it is proven that most cases of preeclampsia are found at the age of <20 years and >35 years amounting to 45 people (57,7%) (Sagita, 2021).

Also supported by research According to which states the influence of age on the incidence of pre-eclampsia has a p-value of 0,001 which means <0,05 so there is an influence of age on the incidence of pre-eclampsia. Also supported by research According to Ayatullah Harun (2019) which states The results of the study showed that there was a relationship between the gestational age of the mother and the incidence of preeclampsia, with a value of p = 001 then there was also a relationship between a history of hypertension and the incidence of preeclampsia with a value of p = 000 (Harun, 2018).

The results of the study were obtained from 21 respondents, mostly housewives as many as 16 respondents (76,2%). This is in line with Widi Sagita's research (2020) which states the research Results Research based on work can be seen that most cases of preeclampsia are found in mothers who do not work as many as 43 (55,1%) respondents (Sagita, 2021). The results of the bivariate analysis of work are related to the incidence of preeclampsia with a P-Value of 0,029. There is a relationship between work and the incidence of preeclampsia.

According to the results of the data above, researchers concluded that before intervention in the form of foot hydrotherapy, the blood pressure of preeclampsia pregnant women were still classified as preeclampsia, while this was influenced by the age of the mother, gestational age, and the work of pregnant women who experienced preeclampsia.

Identifying Blood Pressure of Preeclampsia Pregnant Women After Foot Hydrotherapy to Reduce Blood Pressure in Preeclampsia Pregnant Women at Aura Syifa Hospital Kediri

Based on the results of research conducted at the gynecology poly of Aura Syifa Hospital Kediri and the respondents' house was carried out for 3 days with a total of 21 respondents' blood pressure of preeclampsia pregnant women after foot hydrotherapy was obtained the average blood pressure results of preeclampsia pregnant women fall into the category of mild preeclampsia.

Foot hydrotherapy in warm water will improve circulation and cause a systemic response due to the dilation of blood vessels (vasodilation) (Arinda & Khayati, 2019). So that it can improve blood circulation, so it is effective in lowering blood pressure for pregnant women when done continuously (Muin, 2021).

This is according to research according to Rahim *et al* (2017) which obtained p-value results of 0,0001 meaning that there is a difference in blood pressure in pregnant women with preeclampsia before and after soaking feet in warm water (Rahim et al., 2017). The results of the study are also supported by Siti Utami Dewi's research (2019) It was found that after three days of the subjects applied foot soak therapy, there was a decrease in blood pressure, the average difference in blood pressure reduction before and after foot soak therapy, which was 10 mmHg (Dewi & Rahmawati, 2019).

Based on these facts and theories, researchers concluded that after an intervention (post-test) in the form of foot hydrotherapy, the post-test results showed that the majority of blood pressure was in the category of Mild Preeclampsia. This is influenced by foot hydrotherapy which can help lower blood pressure in preeclampsia, pregnant women.

Analyzing The Effect of Foot Hydrotherapy on Lowering Blood Pressure in Preeclampsia-Pregnant Women at Aura Syifa Hospital Kediri

Based on the results of research conducted at the gynecology poly of Aura Syifa Hospital Kediri and the respondent's house was carried out for 3 days with a total of 21 respondents. Blood pressure of preeclampsia pregnant women before foot hydrotherapy is obtained the average results of blood pressure in preeclampsia pregnant women fall into the Category: Moderate Preeclampsia, While After being given hydrotherapy, respondents were found to have mild preeclampsia. The results of the study showed that the average blood pressure of the pretest respondents or before intervention was carried out was 2,85. While the post-test or after the intervention was 2,06. It can be explained that this treatment has a decrease in pre-intervention and post-intervention blood pressure by 0,79 with ρ value of 0,000 which means that there is an effect of foot hydrotherapy on reducing blood pressure in preeclampsia pregnant women at Aura Syifa Hospital Kediri.

The results of this study are supported by the results of research conducted by Fety Liszayanti and Sri Rejeki (2019) entitled The Effect of Foot Soak Therapy with Warm Water and Lemongrass on Blood Pressure of Pregnant Women with Pre-Eclampsia The Results of the study stated the results of foot soak therapy with warm water and lemongrass were effective for lowering respondents' blood pressure at systolic p value 0,001 and at diastolic p value 0,00 (Fety & Rejeki, 2019).

The results of the study are also supported by research other research conducted by Siti Fadlilah, et al (2021) showed that combination therapy of foot soak in warm water and lemon aromatherapy is effective in reducing blood pressure in prehypertension (Fadlilah et al., 2020). The intervention group showed an average decrease in systolic and diastolic blood pressure. Based on the results of research data and existing theories, researchers concluded that foot hydrotherapy is effective in lowering blood pressure in preeclampsia pregnant women, which is proven to be a difference between before and after foot hydrotherapy is given to respondents. The blood pressure value of preeclampsia post-test pregnant women are proven to be lower than the pre-test, so preeclampsia pregnant women who experience high blood pressure become calm can lower blood pressure by foot hydrotherapy and do not cause side effects.

Based on these facts and theories, researchers concluded that before the intervention (pre-test) showed blood pressure fell into the category of preeclampsia, and after the intervention (post-test) in

the form of foot hydrotherapy, post-test results showed that the majority of blood pressure was in the category of mild Preeclampsia.

CONCLUSION

Hydrotherapy: foot soak for 3 consecutive days can lower blood pressure in pregnant women with preeclampsia. The warm water used for foot soak can dilate blood vessels, and reduce muscle tension so that blood flow becomes smooth.

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