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*by Yenny Puspitasari, Reni Nurhidayah Katmini*

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**Submission date:** 06-Jan-2023 03:24AM (UTC-0800)

**Submission ID:** 1989165333

**File name:** 17.\_JK\_VOL\_14\_NO\_1\_Maret\_2022\_hal\_157-162\_Yenny\_Puspitasari.pdf (281.24K)

**Word count:** 2750

**Character count:** 14398



## EFFECTIVENESS OF AROMATHERAPY ON LOWERING BLOOD PRESSURE OF PREECLAMPSIA MOTHER DURING CONSERVATIVE TREATMENT

Yenny Puspitasari<sup>1\*</sup>, Reni Nurhidayah<sup>2</sup>, Katm<sup>2</sup>

<sup>1</sup>Nursing and Midwifery Faculty, Institut Ilmu Kesehatan STRADA Indonesia, Jl. Manila No.37, Tosaren, Kec. Pesantren, Kota Kediri, Jawa Timur 64133, Indonesia

<sup>2</sup>Health Science Faculty, Institut Ilmu Kesehatan STRADA Indonesia, Jl. Manila No.37, Tosaren, Kec. Pesantren, Kota Kediri, Jawa Timur 64133, Indonesia

<sup>3</sup>Postgraduate Programme, Institut Ilmu Kesehatan STRADA Indonesia, Jl. Manila No.37, Tosaren, Kec. Pesantren, Kota Kediri, Jawa Timur 64133, Indonesia

\*[yennypuspita8@gmail.com](mailto:yennypuspita8@gmail.com)

### ABSTRACT

Preeclampsia is still a pregnancy complication that causes the third-highest maternal mortality in Indonesia. The focus of conservative care is to maintain blood pressure to delay termination of pregnancy as optimally as possible. Aromatherapy has the potential to lower blood pressure and improve sleep quality in preeclampsia. The purpose of this study was to determine the effect of aromatherapy on reducing blood pressure and improving sleep quality. The design used in this study is a quasi-experimental study with a pretest-posttest control group design. Respondents in this study were 60 preeclampsia mothers in the treatment room of RSUD dr. Soetomo during the months of February to September that randomly assigned to the treatment and control groups. The sampling technique used is purposive sampling. Aromatherapy (lavender, ylang-ylang, and bergamot) was conducted for three consecutive days. A sphygmomanometer was used to measure blood pressure. Paired sample and unpaired sample t-test were used for data analysis. There was a significant difference in systolic and diastolic blood pressure between the intervention and control groups with systolic p-value = 0.010 and diastolic p-value = 0.021. There is an effect of lavender, ylang-ylang, and bergamot aromatherapy on reducing blood pressure in preeclamptic mothers during conservative treatment.

Keywords: aromatherapy; bergamot; blood pressure; lavender; preeclampsia; ylang-ylang

### INTRODUCTION

Preeclampsia is one of the complications of pregnancy that accounts for the largest maternal mortality rate after bleeding. Preeclampsia is characterized by the development of hypertension and proteinuria after 20 weeks of gestation. Preeclampsia is the most common complication of pregnancy, with an increasing incidence worldwide, and is associated with maternal morbidity and mortality and recorded deaths of around 50,000 worldwide or occurring in 2-8% of pregnancies. In developing countries, preeclampsia causes maternal mortality (15-20%) and maternal morbidity (short term and long term), perinatal death, premature birth, and fetal growth retardation in utero (Costa, 2015; Osol et al., 2017; Roberts et al., 2017).

Conservative treatment of preeclampsia focuses on blood pressure management. Blood pressure control is a key factor in the treatment of preeclampsia because, with controlled blood pressure, blood circulation to the fetus will be better. This condition is linear with an increase in fetal well-being due to a good supply of oxygen and nutrients. With controlled blood pressure, maternal and infant mortality will decrease (Azimian et al., 2017; Cubro et al., 2018). However, conservative treatment of preeclampsia also often triggers physical and psychological stress on the mother during the treatment process. Physical and psychological stress experienced by PE patients can cause serious problems, ranging from discomfort to hemodynamic disturbances. Physical stress damages the patient's physical and physiological endurance. While psychological stress causes psychological distress that is responded to by nerves and endocrine, which can have a negative impact on the patient. Psychological distress triggers the

hypothalamus to secrete Corticotropin-Releasing Factor (CRF), which CRF induces the sympathetic nerves leading to the adrenal medulla, in this case, chromaffin cells, to secrete catecholamines. Furthermore, catecholamines are captured by and adrenoceptors in the heart and blood vessels, causing an increase in ventricular contraction and heart rate, as well as vasoconstriction of blood vessels. this will exacerbate preeclampsia because it triggers an increase in blood pressure (Kim et al., 2004; Osol et al., 2017).

Pregnant women with preeclampsia who are treated in conservative treatment rooms need complementary therapy to reduce physical and psychological stress which can have a direct effect on lowering blood pressure. Aromatherapy lavender, ylang-ylang, and bergamot have effects including improving blood circulation and widening blood vessels in the tissue. The given stimulus results in increased cell activity (11) reduced pain, so it has the potential to reduce blood pressure in mothers with preeclampsia. The purpose of this study was to determine the effect of giving aromatherapy (lavender, ylang-ylang, and bergamot) in lowering blood pressure in pregnant women with preeclampsia in a conservative treatment room (Kianpour et al., 2018; Maisi et al., 2017; Rambod et al., 2020).

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## METHOD

The research design was quasi-experimental with a pre-test post-test design with a control group. The study was conducted on 60 pregnant women with preeclampsia who were undergoing conservative treatment at dr. Seotomo hospital. Respondents were randomly divided into control and treatment groups. Aromatherapy was given for 3 days with 10-15 minutes every day. Aromatherapy lavender was given on the first day, ylang-ylang was given on the second day, and bergamot on the third day (10). Blood pressure was measured before and after treatment using a sphygmomanometer. Data analysis was performed using paired sample t-test to determine differences in blood pressure before and after therapy in each group. To compare the average blood pressure in the control and experimental groups, the unpaired sample t-test was used.

## RESULTS

Table 1 shows that most of the respondents are over 35 years old in all groups 32 respondents (53.3%), having a secondary education level (SMA or equivalent) which is 33 respondents (55.0%). The majority of respondents have income 44 respondents (73.3%), working as housewives 46 respondents (76.7%). Most of the respondents did not have a history of miscarriage 45 respondents (75.0%). Most of the respondents were in the multiparous category 42 respondents (70.0%), had no history of multiple pregnancies 53 respondents (88.3%), no history of disease during pregnancy 45 respondents (75.0%), and no history of preeclampsia. Previously, there were 42 respondents (70.0%). Most of the respondents fall into the category of obesity II 18 respondents (30.0%) and most of the respondents have a pregnancy interval of 3-5 years 31 respondents (51.7%).

Table 2 showed a decrease in blood pressure in the control group with systolic p-value (9) = 0.012 and diastolic p-value = 0.015. Meanwhile, the intervention group showed systolic p-value = 0.00 and diastolic p-value = 0.00.

Table 3 shows us there was a significant difference in systolic and diastolic blood pressure between the intervention and control groups with systolic p-value = 0.010 and diastolic p-value = 0.021.

Table 1.  
Characteristics of Respondents

Variable	Sub Variable	Treatment Group		Control Group		Total	
		f	%	f	%	f	%
Age	< 20	0	0	0	0	0	0
	20-35	15	25,0	13	21,7	28	46,7
	> 35	15	25,0	17	28,3	32	53,3
Level of education	Primary school	8	13,3	12	20,0	20	33,3
	High School	17	28,3	16	26,7	33	55,0
	University	5	8,3	2	3,3	7	11,7
Income	Yes	20	33,3	24	40,0	44	73,3
	No	10	16,7	6	10,0	16	26,7
Job	Housewife	22	36,7	24	40,0	46	76,7
	Private employees	2	3,3	4	6,7	6	10,0
	Entrepreneur	3	5,0	1	1,7	4	6,7
	Employee	1	1,7	0	0	1	1,7
	Freelancer	1	1,7	0	0	1	1,7
	Government employees	1	1,7	0	0	1	1,7
	Farmer	0	0	1	1,7	1	1,7
Miscarriage history	No	21	35,0	24	40,0	45	75,0
	Yes	9	15,0	6	10,0	15	25,0
Number of pregnancies	Primipara	6	10,0	9	15,0	15	25,0
	Multipara	23	38,3	19	31,7	42	70,0
	Grandmultipara	1	1,7	2	3,3	3	5,0
History of twin pregnancy	No	26	43,3	27	45,0	53	88,3
	Yes	4	6,7	3	5,0	7	11,7
History of pregnancy complication	No	22	36,7	23	38,3	45	75,0
	Yes	8	13,3	7	11,7	15	25,0
History of preeclampsia	No	20	33,3	22	36,7	42	70,0
	Yes	10	16,7	8	13,3	18	30,0
Mother's BMI during pregnancy	Underweight	2	3,3	4	6,7	6	10,0
	Normal	5	8,3	9	15,0	14	23,3
	Overweight	1	1,7	9	15,0	10	16,7
	Obesitas I	9	15,0	3	5,0	12	20,0
Pregnancy interval	Obesitas II	13	21,7	5	8,3	18	30,0
	3-5 years	20	33,3	11	18,3	31	51,7
	<3 years	3	5,0	10	16,7	13	21,7
	>5 years	7	11,7	9	15,0	16	26,7



Table 2.  
Paired Sample T-Test

Group	Blood pressure	Mean	Min Max	P-value
Control group	Systolic Pre	180,70	160-200	0,012
	Systolic Post	160,40	140-182	
	Diastolic Pre	100,20	90-128	0,015
	Diastolic Post	98,60	80-102	
Intervention Group	Systolic Pre	180,60	159-201	0,00
	Systolic Post	141,30	129-167	
	Diastolic Pre	100,30	90-129	0,00
	Diastolic Post	84,80	72-98	

Table 3  
Unpaired Sample T-Test

Variable	Group	Mean	Min	Max	P-value
Systolic Difference	Control	3,62	2	12	0,010
	Treatment	7,83	2	16	
Diastolic Difference	Control	2,77	1	11	0,021
	Treatment	3,42	3	11	

## DISCUSSION

One of the risk factors for the occurrence of preeclampsia is the level of maternal stress during pregnancy. Stress will activate the hypothalamus, resulting in the release of adrenaline and non-adrenaline hormones in the body. After that followed by the release of the hormone cortisol. If the stress period is prolonged, the body will psychologically activate the hormones adrenaline and cortisol (Costa, 2015). Stress in pregnancy can be caused by a history of previous childbirth. Research shows that mothers who have experienced trauma in previous deliveries have a higher risk of stress levels. In addition, the social environment, economics, and geographical conditions can affect the mother's stress level depending on the mother's ability to deal with these stressors. The consequences experienced by pregnant women have an impact on delivery outcomes (Thombre et al., 2015).

One of the outcomes caused by stress levels is preterm delivery. Research shows that a risk factor that affects preterm delivery is the level of maternal stress during pregnancy (Abedian et al., 2015). Activities for pregnant women with the aim of increasing knowledge about a pregnancy until the puerperium and care for newborns to complications during this time period. Pregnant women will interact and exchange experiences between pregnant women and pregnant women and pregnant women with health workers, especially midwives.

Aromatherapy can neutralize physical conditions in enabling pregnant women with preeclampsia to help mothers feel relaxed and more comfortable. Aromatherapy lavender has effects including improving blood circulation and dilation of blood vessels in the tissue. The given stimulus results in increased cell activity and reduced pain (Maisi et al., 2017). Preeclampsia treatment places more emphasis on controlling maternal blood pressure. By controlling the mother's blood pressure, it is hoped that the welfare of the mother and the fetus will increase so that it can prevent the early termination of pregnancy. To reduce blood pressure for pregnant women with hypertension, various researches on complementary therapies have been carried out, one of which is aromatherapy. Lavender, bergamot and ylang-ylang oil

aromatherapy has been shown to lower blood pressure, increase comfort, and sleep well (Kianpour et al., 2018; Rambod et al., 2020; Silalahi et al., 2020).

The aroma of this unveiled essential oil has a direct effect on the human brain. These aromas are picked up by receptors in the nose which then send further information to areas of the brain that control and relate to mood, emotions, memory and provide information to the hypothalamus which is the regulator of the body's internal systems, including the body's temperature and heart rate. Inhaling lavender aromatherapy will increase alpha waves in the brain and these waves create a feeling of relaxation which can lead to a decrease in blood pressure (Cuti et al., 2021).

Lavender essential oil is extracted from lavender flowers. Lavender has both relaxing and antidepressant effects. Lavender aromatherapy will help increase blood circulation and oxygen levels in pregnant women so that the blood flow for the brain and fetus will be maximized. So that it can reduce clinical symptoms felt by the mother and increase fetal well-being (Kianpour et al., 2018). Aromatherapy lavender, ylang-ylang, and bergamot will provide a relaxing, calming, and uplifting effect so that the mother will be more comfortable. This aromatherapy will reduce the stress response and help reduce the hormone cortisol, so that blood pressure can be decreased and controlled (Kianpour et al., 2018; Rambod et al., 2020; Silalahi et al., 2020).

## CONCLUSION

There is an effect of lavender, ylang-ylang, and bergamot aromatherapy on reducing blood pressure in preeclamptic mothers during conservative treatment.

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