

THE EFFECT OF ANTEPARTUM YOGA SEQUENCES ON ANXIETY LEVELS, VITAL SIGN VALUES, AND FETAL HEART RATE IN THIRD-TRIMESTER PRIMIGRAVIDA

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ABSTRACT

Anxiety in the third-trimester pregnancy can affect the physical and psychological aspects of the mother and fetus. Until now, there has been no study comparing yoga sequences that are effective in reducing anxiety levels in third-trimester primigravida. The yoga sequence will cause the heart rate to return to normal after finishing exercising, and the body will feel more comfortable. This study aims to determine the effect of antepartum yoga sequences on anxiety levels, vital sign values, and fetal heart rate in third-trimester primigravida. This study was quasi experiments with a pretest posttest control group design conducted in January-April 2022. The sampling technique used cluster sampling to determine the intervention group and control group. The intervention group was given antepartum yoga sequences for six sessions with a duration of 60 minutes, consisting of 18 respondents in A group model and 18 respondents in B group model. The control group consisting of 18 respondents, received pregnancy exercise for six sessions with a duration of 60 minutes. Data analysis using T-test. The results showed differences in the control group for anxiety (p-value = 0.042), pulse (p-value = 0.021) and respiratory frequency (0.032). In the intervention group model A, there were differences in anxiety, diastolic blood pressure, pulse, and respiratory rate with p-values of 0.032, 0.005, 0.005, and 0.005, respectively. While in the intervention group model B, there were significant differences in anxiety, systolic blood pressure, diastolic blood pressure, pulse, respiratory rate, and fetal heart rate, namely p-values of 0.005, 0.002, 0.004, 0.005, 0.005, 0.005. The results of this study can be used by midwifery service providers as one of the complementary treatments for reducing anxiety experienced by third-trimester primigravida mothers, namely by giving antepartum yoga, which is done for 60 minutes.

Keywords: antepartum yoga sequences, anxiety, vital sign, fetal heart rate, primigravida

ABSTRAK

Kecemasan pada kehamilan trimester ketiga dapat mempengaruhi aspek fisik dan psikologis ibu dan janin. Hingga saat ini, belum ada penelitian yang membandingkan urutan yoga untuk menurunkan tingkat kecemasan pada primigravida trimester ketiga. Urutan yoga akan menyebabkan detak jantung kembali normal setelah selesai berolahraga dan tubuh terasa lebih nyaman. Tujuan penelitian untuk mengetahui pengaruh urutan antepartum yoga terhadap tingkat kecemasan, nilai tanda vital, dan denyut jantung janin pada primigravida trimester ketiga. Penelitian ini merupakan quasi eksperimen dengan desain pretest posttest control group yang dilakukan bulan Januari-April 2022. Sampel penelitian sejumlah 54 responden. Teknik pengambilan sampel menggunakan cluster sampling untuk menentukan kelompok perlakuan dan kontrol. Kelompok perlakuan diberikan sekuens yoga antepartum selama 6 kali, durasi 60 menit. Kelompok model A berjumlah 18 responden dan kelompok model B berjumlah 18 responden. Kelompok kontrol berjumlah 18 responden, mendapatkan senam hamil selama 6 kali, durasi 60 menit. Analisis data menggunakan uji-T. Hasil penelitian menunjukkan perbedaan kecemasan pada kelompok kontrol (p-value = 0,042), nadi (p-value = 0,021) dan frekuensi pernafasan (0,032). Pada kelompok intervensi model A terdapat perbedaan kecemasan, tekanan darah diastolik, nadi, dan frekuensi pernafasan dengan p-value masing-masing sebesar 0,032, 0,005, 0,005, 0,005. Pada kelompok intervensi model B terdapat perbedaan yang signifikan pada kecemasan, tekanan darah sistolik, tekanan darah diastolik, denyut nadi, frekuensi pernafasan, dan detak jantung janin yaitu p-value 0,005, 0,002, 0,004, 0,005, 0,005, 0,005. Hasil penelitian dapat digunakan oleh pemberi pelayanan kebidanan sebagai salah satu pengobatan komplementer dalam mengurangi kecemasan pada primigravida trimester ketiga dengan memberikan antepartum yoga selama 60 menit.

Kata kunci: sekuens yoga antepartum, kecemasan, tanda vital, denyut jantung janin, primigravida

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Received : July 3, 2022 Accepted : August 2, 2022 Published: September 1, 2022

Introduction

Pregnant women in the third-trimester and on the eve of delivery will experience emotional changes caused by feelings of worry, anxiety, and fear of the condition of pregnancy before delivery.¹In addition, the period leading up to delivery is a condition with a high stressor, due to physical discomfort in adjustment and childbirth. Physical conditions such as fatigue are related to the mother's fear of childbirth due to feelings of worry, anxiety, and fear of the condition of pregnancy before delivery.^{2,3}Physical and psychic stressors can result in anxiety that will affect the hypothalamic axis of the adrenal pituitary (HPA axis) thereby stimulating the formation of the hormone cortisol. This increase in activity, if it continues to occur, will cause the production of cortisol to increase, which can damage neuron cells in the hypothalamus so that hypothalamic atrophy occurs and as a result, can give rise to cognitive disorders, for example anxiety.^{4,5}

Anxiety in pregnant women in the third trimester needs to be treated because it can influence the physical and psychic of the mother and fetus. Anxiety can affect the hypothalamus to stimulate the endocrine glands that regulate the pituitary gland so that it will cause an increase in the production of stress hormones including Adreno Corticotropin Hormone (ACTH), cortisol, catecholamines, β -Endorphins, Growth Hormone (GH), prolactin and Luteinizing Hormone (LH) / Follicle Stimulating Hormone (FSH).^{6,7} The release of these stress hormones results in systemic vasoconstriction, including the constriction of the placenta utero vasa which disrupts blood flow in the uterus, so that the delivery of oxygen into the myometrium is disturbed and results in weak contraction of the uterine muscles which can cause old prolonged labor so that the fetus can experience fetal distress.^{5,8}The results showed that a total of 31.2% of primigravida experienced moderate anxiety and a number of 68.8% experienced mild anxiety while anxiety in multigravida amounted to 6.6% in the category of moderate anxiety with a value of $p < 0.005$.²One of the efforts to reduce anxiety in pregnant women is by giving antepartum yoga in the third trimester of pregnancy. Research about yoga showed anxiety levels in the intervention group ($t=7.56$, $p=0.005$)before and after the intervention, and there was a significant difference in the anxiety levels after the intervention between the intervention and control group ($t=-9.289$, $p=0.005$).⁹ Antepartum yoga can lower anxiety improving quality of life as well as improving sleep patterns in pregnant women in the third trimester.^{10,11} Antepartum yoga is part of non-pharmacological therapy that can overcome pregnancy discomfort. Antepartum yoga is a modification of hatha yoga adapted to the condition of pregnant women. Yoga antepartum is a specific exercise for pregnant women, using gentle movements, and simpler also easier practices. The principle of antepartum yoga is not pressing, stretching, and twisting the abdominal space.^{10,12,13}

Research on antepartum yoga to reduce anxiety in third-trimester pregnant women has been widely carried out, but there have been no studies comparing yoga sequences that are effective in lowering anxiety levels in third-trimester pregnant women. Yoga sequences are sequences in a yoga practice that makes it easier for pregnant women to practice antepartum yoga so that pregnant women are easier to prepare themselves, mind, and learn yoga movements, and after finishing the exercise, the heart rate can return to normal.¹²Antepartum yoga sequences include centering, pranayama, warming up, kneeling, standing, kneeling, sitting, lying pose, and relaxation.^{12,14} The existence of a yoga sequence in the yoga antepartum will make it easier for pregnant women to practice yoga so that the practice will flow and be regular from the beginning of one movement to the next. Yoga sequences will cause the heart rate to return to normal after finishing the exercise, and the body will feel more comfortable because the movements are done according to the stages. This study aims to influence antepartum yoga sequences on anxiety levels, vital sign values, and fetal heart rate in the third-trimester primigravida.

Method

This research is a type of quasi experiments with control group design. The research was carried out in the Pranggang Health Center area, Plosoklaten District, Kediri Regency. The population of this study was all pregnant women with a gestational age of 28-40 weeks who checked their pregnancy in the Pranggang Health Center area in January-April 2022. The sampling technique of this study used cluster sampling, which looked for villages with more primigravida pregnant women than multigravida. Then the researcher determined based on the location of adjacent villages into model group A, consisting of 3 villages, 3 villages in model group B, and 3 villages in a control group. Inclusion criteria in this study include: 1). Pregnant women have no contraindications to yoga; 2). Live in the same house with your husband; 3). The mother is in good health and is not anemic; 4). Upper arm circumference > 23.5 cm; 5). BMI between 18.50-24.99; 6). Mother has made ANC visits at least 1 time in the first trimester and 1 time in the second trimester; 7). Mothers take classes for pregnant women.

The sample required for each group was 16with a possible drop out of 10%, so the sample obtained for each group was 18 pregnant women. The study sample of 54 respondents was divided into 3 groups includes: 1). Intervention group A, namely pregnant women who received antepartum yoga sequence A includes: centering, pranayama (nadisodhana), warming up, asana (vrksasana, trikonasana, virabhadrasana 2, table pose, cat-cow pose, child pose, anahatasana, hugging baby), relaxation (savasana); 2). Intervention group B, namely pregnant women who get antepartum yoga sequence B includes: centering, pranayama (nadisodhana), warming up, asana (table pose, adhomukhavirasana, tadasana, utkatasana, dandasana, baddhakonasana, uppavistakonasana), relaxation (savasana); 3). control group, namely pregnant women who are members of the pregnant

women class. The intervention group received yoga treatment given six times in yoga classes for six weeks, while the control group was given pregnant gymnastics in the pregnant women class. The implementation of antepartum yoga in this study was carried out for six sessions ($p < 0.001$) with a duration of 60 minutes which was statistically significant on anxiety ($p = 0.007$).⁽¹⁵⁾The control group was given pregnant exercise with a duration of 60 minutes, six times in the pregnant women's class.

This research instrument uses the Pregnancy Outcome Questionnaire (POQ) developed by Theut, Pederson, Zaslow, and Rabinovich in 1988. The POQ consists of 15 statements using the Likert scale with a score of 1: never; 2: sometimes; 3: often; and 4: always, with a range of values of 15-60.¹⁶ POQ instruments were given at the beginning of the treatment as a pretest and the end of the treatment documented as a posttest result. In this study, measurements of anxiety, blood pressure, pulse rate, respiratory rate, and fetal heart rate were carried out. Measurement of the intervention group was carried out every time before and after the yoga treatment; in the control group, the measurements were carried out before and after the implementation of the class of pregnant women. Data analysis used T tests to determine the effect of level anxiety, vital sign values, and counts of fetal heart rate in pre and post intervention.

This research has received a certificate of ethics from the ethics committee of STIKES Karya Husada Kediri, reference number 376/EC/ LPPM/STIKES/ KH/XII/2021

Results

As shown in the table 1, the majority of socio-demographic characteristics of respondents in the intervention and control groups were aged 22-24, gestational age 34-35 weeks, upper arm circumference 24 cm, and BMI in prenatal 21 kg/m². The normality of the data was evaluated using the Kolmogorov Smirnov test. Based on results of Kolmogorov Smirnov test, data distribution was normal ($p > 0.05$).

Table 1. Socio-demographic characteristics of Respondents

Socio-demographic	Control group	Model A	Model B
Age (year)			
Mean \pm SD	22.61 \pm 3.056	24.08 \pm 3.620	22.38 \pm 3.468
Min-Max	18-27	18-29	18-31
Gestasional Age (week)			
Mean \pm SD	34.736 \pm 4.8473	34.133 \pm 5.272 28.0-	35.854 \pm 4.1717
Min-Max	28.1-38.5	39.4	39-39
Upper Arm Circumference			
Mean \pm SD	24.554 \pm 2.115	24.854 \pm 3.1717	24.274 \pm 2.6827
Min-Max	22-25	22-24	22-25
BMI			
Mean \pm SD	21.73 \pm 3.7129	21.78 \pm 4.333	21.64 \pm 2.635
Min-Max	16.33-29.24	17.22-32.36	17.24-25.77

Table 2 shows the difference between pre and post interventions in the control group for anxiety (p value = 0.042), pulse (p value = 0.021) and respiratory rate (0.032). In the model A

intervention group, there were differences between pre and post-intervention, including anxiety, diastolic blood pressure, pulse rate and respiratory rate with p-values of 0.032, 0.005, 0.005, 0.005, respectively. While in the model B intervention group there were significant differences pre and post-intervention in anxiety, systolic blood pressure, diastolic blood pressure, pulse rate, respiratory rate and fetal heart rate namely p-values 0.005, 0.002, 0.004, 0.005, 0.005, 0.005.

Table 2 The Comparison of Control Group, Model A and Model B Intervention on Anxiety, Vital Sign and Fetal Heart Rate Before and After Test

Variable	Control Group					T-test p-value		Model A					T-test p-value		Model B					T-test p-value	
	Pre		Post			Mean ± SD	Min- Max	Pre		Post			Mean ± SD	Min- Max	Pre		Post			Mean ± SD	Min- Max
	Mean ± SD	Min- Max	Mean ± SD	Min- SD	Max			Mean ± SD	Min- SD	Max	Mean ± SD	Min- SD			Max	Mean ± SD	Min- SD	Max			
Anxiety Level	31.15± 11.678	20-53	31.15± 12.037	19-45	2.547	0.042	31.86 ± 10.982	21-45	30.00± 8.781	21-41	2.789	0.032	31.86± 8.982	20-45	25.67± 8.372	17-40	2.765	0.005			
Systolic Blood Pressure	155.31± 27.765	130-240	150.06± 36.092	130-245	3.588	0.076	146.88± 13.679	130-170	126.88± 13.795	106-160	4.789	0.036	146.88± 13.679	130-170	123.88± 12.795	106-160	4.765	0.002			
Diastolic Blood Pressure	95.5± 15.455	80-140	95.5± 15.875	80-40	2.545	0.065	95.5± 15.845	80-100	81.88± 12.120	60-100	2.789	0.005	95.5± 15.563	80-100	81.45± 12.354	60-96	2.760	0.004			
Pulse Rate	91.25± 10.717	76-110	88.50± 8.675	72-116	3.567	0.021	92.25± 10.236	76-100	84.69± 10.254	70-98	4.769	0.005	92.25± 10.345	76-100	84.69± 10.345	70-98	4.765	0.005			
Respiratory Rate	24.06± 3.141	18-30	23.38± 3.337	16-30	2.545	0.032	24.50± 3.675	18-30	18.69± 3.378	16-25	3.787	0.005	24.50± 3.876	18-30	18.69± 3.126	16-25	3.776	0.005			
Fetal Heart Rate	141.94± 9.356	128-155	141.38± 8.219	130-152	2.547	0.073	143.81± 12.781	115-160	132.50± 8.123	110-150	2.789	0.061	143.81± 12.788	115-155	132.50± 8.890	110-145	2.765	0.005			

Significant level (<0.05)

Table 3. The Difference between Model A and Model B Intervention on Anxiety, Vital Sign and Fetal Heart Rate

Variable	Mean	p-value
Anxiety Level		
Model A	1.86	0.000
Model B	6.19	0.000
Systolic Blood Pressure Value		
Model A	20.00	0.001
Model B	23.00	0.000
Diastolic Blood Pressure Value		
Model A	13.62	0.000
Model B	14.05	0.000
Pulse Rate		
Model A	7.56	0.000
Model B	8.23	0.000
Respiratory Rate		
Model A	5.81	0.000
Model B	6.4	0.000
Fetal Heart Rate		
Model A	10.31	0.001
Model B	11.31	0.000

A post hoc test was used to compare the strength of each model's intervention's impact on the intervention group. Table 3 shown there were a significant difference between model A intervention and model B intervention. Model B intervention has a decreased level of anxiety, systolic blood pressure, diastolic blood pressure, pulse rate, respiratory rate and fetal heart rate with each p-value 0.000.

Discussion

In this study, there were 3 groups: the control group, the model A antepartum yoga intervention group, and the model B antepartum yoga intervention group. The control group in this study was given pregnant gymnastics with a duration of 60 minutes, six times in the pregnant women's class whose movements were adjusted for gestational age because in third trimester pregnant gymnastics aims to prepare the muscles so that they can function optimally in normal delivery.^{17,18} The movement of pregnant gymnastics is more focused on preparing and training the muscles so that it helps in normal labor. The results of this study are in accordance with the research which states that there is a significant effect of prenatal yoga on anxiety levels in primigravida mothers.¹⁹ In the control group, there were differences of anxiety, pulse rate, and respiration rate. In this study, pregnant exercise was done with different movements according to gestational age. It may be one of the reasons there is no difference in blood pressure and fetal heart rate. Antepartum yoga in this study includes A model and B model and used a fixed yoga sequence, making it easier for pregnant women to learn the movements.

Antepartum yoga has an important role in lowering the level of maternal anxiety in pregnant in the third trimester. Antepartum yoga is an exercise and movement program that helps to improve mental, physical, emotional, and spiritual relationships. Model A intervention in this study, namely pregnant women who received antepartum yoga sequence A, includes: centering, pranayama (nadisodhana), warming up, asana (vrksasana, trikonasana, virabhadrasana 2, table pose, cat-cow pose, child pose, anahatasana, hugging baby), relaksasi (savasana). In the model A intervention group there were differences between pre and post-intervention, including anxiety, diastolic blood pressure, pulse rate, and respiratory rate, with p values of 0.032, 0.005, 0.005, and 0.005, respectively. The researcher assumes that there is no difference in systolic blood pressure and fetal heart because the asana pose in model A uses more standing and crawling poses so that pregnant women may feel tired. Fatigue in pregnant women can increase blood pressure and fetal heart rate. This assumption is reinforced by research that states related to a reduction in the effects of gravity in standing poses.²⁰

In this study, model B intervention has a decreased level of anxiety, systolic blood pressure, diastolic blood pressure, pulse rate, respiratory rate, and fetal heart rate with each p-value 0.000 (table 3) where compare to model A intervention.^{20,21} Model B intervention consists of centering,

pranayama (nadisodhana), warming up, asana (table pose, adhomukhavirasana, tadasana, utkatasana, dandasana, baddhakonasana, uppavistakonasana), relaxation (savasana) helps pregnant women carry out antepartum yoga more flowing, preparing the body, heart, and mind gradually from one movement to the next from the beginning to the end of the exercise session. Asana in model B antepartum yoga decreases the performance of the hypothalamus in the release of neuropeptides, thereby stimulating the pituitary gland in the release of ACTH, which has an effect on cortisol production. The decrease in cortisol levels reduces the symptoms of anxiety, which is one of the causes of depression.^{22,23} Anxiety can be controlled through yoga breathing techniques (pranayama)²⁴ and asana poses²⁵ in antepartum yoga. The relaxation that can calm down effect and reduce anxiety by increasing the inner bond with the baby. Concentration and feelings are used as one object of the extra focus that becomes deepens the feeling of love and comfort, as a self-help to cope with fears, fears or when the attention is scattered.^{10,26} The relaxation condition with savasana in model B intervention causes a stimulus of the reticular activator system in the brain, causing a neural autonomy response, including pulse rate, blood pressure and decreased respiratory rate.²⁷

The results of this study showed a significant influence of antepartum yoga on systolic and diastolic blood pressure, pulse rate, and respiration rate. Antepartum yoga has benefits to improving physical health, blood flow, oxygen and nutrient, supply to be smooth, and the lungs and heart muscles get stronger. Pranayama in antepartum yoga can increase the capacity of the lungs to attract oxygen so that it can be optimally spread and absorbed by the body.^{28,29} The movement of asanas in yoga antepartum can increase vagal stimulation and activate parasympathetic so that there is an emphasis on the sympathetic nervous system resulting in inhibition of adrenal medulla stimulation in the release of catecholamines.^{5,10} Decreased catecholamines cause blood vessels in the kidneys and visceral organs to occur vasodilation which results in a decrease in blood pressure.^{19,27}

The results of this study showed a significant influence of antepartum yoga on fetal heart rate. The final stage of yoga is relaxation. The relaxation condition caused by antepartum yoga can cause the mother to be relaxed and calm. Relaxed and calm conditions will cause the heartbeat to be regular and not too fast, this will also be felt by the fetus. One of the fetal responses is a regular and stable heartbeat that can be monitored from the fetal heart rate.^{27,30} The movement of antepartum yoga, namely Adho Mukha Virasana can cause blood circulation to be smooth, the capacity of the lungs to attract oxygen and nutrients more optimally so that the organ can deliver oxygen and nutrients to the fetus, and cause normal fetal heart rate.

The strength of this study is to reveal antepartum yoga sequences that can be applied to third trimester pregnant women so that they can reduce anxiety levels, vital sign values, and fetal heart rate in third-trimester primigravida. The weakness of this study is that it has not considered confounding factors in the form of rest patterns and social support. Future researchers are expected to be able to reveal confounding factors and develop other yoga sequences tailored to complaints in third-trimester pregnant women.

Conclusion

There is a statistically significant influence of antepartum yoga model B on anxiety levels, vital sign values, and fetal heart rate in the third-trimester primigravida. The results of this study can be used by midwives as an alternative to complementary treatments in the form of antepartum yoga for 60 minutes with centering sequences, pranayama (nadisodhana), warming up, asana (table poses, adhomukhavirasana, tadasana, utkatasana, dandasana, baddhakonasana, uppavistakonasana), relaxation (savasana) so as to reduce the anxiety experienced by primigravida mothers in the third trimester. The results of this study can also be used by public health centers to reduce the anxiety of third trimesters pregnant women when carrying out integrated antenatal care. Third-trimester pregnant women are advised to do antepartum yoga so that anxiety before childbirth is reduced and mothers are more prepared in the labor process. It is also recommended for health workers to practice yoga sequences according to the conditions and complaints experienced by pregnant women in the third-trimesters.

Acknowledgement

The authors wish to thank the pregnant women who participated in this study for their time and dedication.

Funding

There is no funding for this research.

Conflict of Interest

The authors declare that they have no conflict of interest in this research.

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