



The effect of pregnancy yoga exercise on reducing anxiety of pregnant woman third trimester

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ABSTRACT

Background: Physiological changes and fear of facing labor in the third trimester of pregnancy can trigger increased anxiety in pregnant women. One of the interventions to reduce anxiety in third trimester pregnant women is yoga exercise.

Objective: The purpose of this study was to determine the effect of pregnant yoga exercise on reducing anxiety pregnant women in the third trimester.

Methods: This quantitative research uses a pure experimental research design with pre and post-test control group techniques. The number of respondents was 30 and divided into the intervention group and the control group. Data collection using The Pranaya Pregnancy Yoga Exercise Protocol and PASS questionnaire. The pregnancy yoga exercise protocol was used after passing the feasibility test using The Dolphin Yoga Assessment Tool and PASS questionnaire used after passing the validity and reliability test. Bivariate data analysis was performed using the Man-Whitney non-parametric test. The test was carried out after the data passed the normality test using the Shapiro-Wilks test.

Results: This study showed that yoga interventions during pregnancy had a significant effect on reducing anxiety in third trimester pregnant women with a $p < 0.001$.

Conclusions: Health workers need to make innovative interventions that can improve the mental health of pregnant women, for example through the activation of the pregnant women class program.

Keywords: yoga pregnancy exercise; anxiety; pregnancy; third trimester

INTRODUCTION

Pregnancy is a valuable experience for a woman. Pregnancy causes physiological and psychological changes in pregnant women (Bjelica et al., 2018). Pregnant women must be able to adapt to pregnancy. Anxiety is one of the factors that can cause the ability to adapt in pregnancy is not achieved optimally (Glover, 2011). Changes in body physiology in the third trimester of pregnancy and fear of facing labor often exacerbate anxiety in pregnant women. Anxiety in third trimester pregnant women

Nursing and Healthcare Practices

- *Pregnant women experienced anxiety in the last stage of pregnancy*
- *Yoga exercise can be a solution to decrease the anxiety among pregnant women*
- *This intervention can be implemented and recommended for maternity nurses*

requires immediate nursing intervention. Prenatal depression, maternal stress, and maternal anxiety can impact not only the course of a woman's pregnancy, labor, and childbirth experiences, but also the actual physiology and birth outcomes of the developing fetus (Linda Chapman & Roberta Durham, 2013).

Non-pharmacological intervention to reduce the anxiety of pregnant women is yoga pregnancy exercise (Corrigan et al., 2022). Yoga pregnancy exercise is an activity that involves physical movement and breathing regulation. Yoga pregnancy exercise will physically train pregnant women to become stronger and have better breathing control (Yekefallah et al., 2021). Bringing yoga practice into a woman's pregnancy will promote peace and harmony in her life (More, 2017). A small number of women reported taking benzodiazepines or atypical antipsychotic medicines during pregnancy to treat anxiety (Centers for Disease Control and Prevention, 2022). That third trimester pregnant women and mothers who have just given birth can experience mental disorders, trauma, and depression (Chandra & Paul, 2015). 12.1% of women >15 years in Indonesia experienced mental emotional disorders including anxiety (Kementrian Kesehatan Republik Indonesia, 2019). Anxiety is a response to stress that can stimulate the body to be difficult to relax, because the muscles become tense and the heart beats faster.

Bandung City is ranked ninth with the highest number of pregnant women in West Java (2.587 people) (Dinas Kesehatan Kota Bandung, 2021). Pregnant women with comorbid anxiety, depression and obesity are at risk of experiencing gestational hypertension and this can be prevented through dietary patterns and physical activity interventions (Winkel et al., 2015). One of the physical

activity interventions for pregnant women is yoga exercise during pregnancy (Jiang et al., 2015).

Third trimester of pregnancy causes physiological changes in the body of pregnant women. More (2017) explained that in the third trimester a woman might feel extreme fatigue possibly due to the baby going through growth spurts and sleep disruption, able to eat less at one time due to stomach compression, Braxton hicks contraction, increase frequency of urination, as a baby shifts bladder is compressed, less room lungs to expand therefore causing shortness of breath, feet, hands, ankles and wrists might begin to swell, referred to as edema. Physiological changes in the body in the third trimester can increase anxiety (Shahhosseini et al., 2015). Pregnant yoga exercise has the effect of reducing the anxiety level of third trimester pregnant women (Corrigan et al., 2022).

The results of the literature review study revealed that there were 862 appropriate citations and 31 studies that met the inclusion criteria. 29 studies with 2217 pregnant women in 12 or more yoga sessions of long duration (> 60 minutes) had a statistically significant impact on stress perception (Maryati et al., 2021). The benefits of yoga pregnancy exercise are increase relaxation, yoga pregnancy exercise releases endorphins (More, 2017). Women who do yoga pregnancy exercise tend to have better stamina. Yoga can increase lung capacity, focus and connection with the breath allows a woman to take advantage of the rhythm of their body and achieve relaxation (Zope & Zope, 2013). This study aims to determine the effect of yoga pregnancy exercise on anxiety in third trimester pregnant women. The hypothesis in this study is that yoga during pregnancy influences reducing anxiety in third trimester pregnant women.

METHODS

Design

This research is quantitative research with a true experiment research design with pre-test and post-test control group design techniques.

Sample and Setting

The study was conducted in a class of pregnant women at community health center that location is in one of the districts in West Java. The research sample was taken using

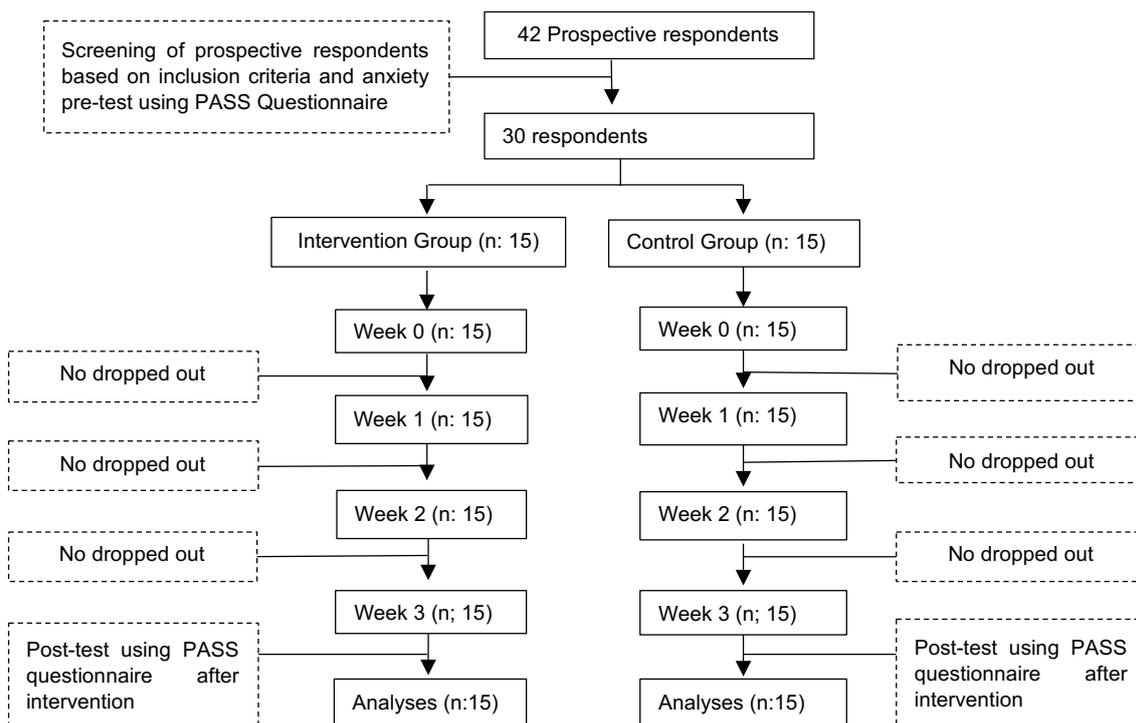


Figure 1. Data collection flow diagram

the consecutive sampling method. In this method, a specified number of samples is selected, the sample is given the opportunity to fill out the PASS questionnaire and only third semester pregnant women with severe and moderate anxiety scores are included as research samples. The number of samples was determined using the sample size formula to test the paired group hypothesis. The sample size in this experiment was 28 respondents. the researcher added the number of respondents by 5% (2 respondents) to anticipate the drop out event and the number of respondents was 30. Respondents were divided into two groups. 15 respondents in the control group and 15 respondents in the intervention group. To avoid bias, the selection of the research sample was carried out based on the inclusion criteria set by the researcher. The inclusion criteria for this study were determined as follows: the respondent was not a high-risk pregnancy, the respondent's gestational age was in the third trimester, the respondent was physically healthy, the respondent did not have a congenital disease and the respondent experienced moderate anxiety or severe anxiety.

The body of pregnant women undergoes tremendous changes during pregnancy and as a result there are several health conditions

that are contraindications to the intervention of pregnancy yoga exercises. Before carrying out the activity, each prospective respondent was given information about the health requirements to be able to take part in the yoga pregnancy exercise as follows: not having heart disease, not having frequent headaches, not having heartburn, not having blurred vision, not having pre-eclampsia, never having had sharp pain in the stomach, abdomen or chest, no intermittent Braxton-Hicks contractions, no changes in body temperature, no signs of edema in the lower extremities, no gestational diabetes, no leg cramps, no carpal tunnel and no varicose veins. This research was conducted by applying four principles of research ethics. Anonymity (maintaining the confidentiality of the respondent's identity), confidentiality (maintaining confidentiality information about respondents), justice (applying the conduct of research fairly all respondents), beneficence (carrying out research that has a great value of benefit to efforts to improve the health status of respondents and minimize or eliminate the effects of research actions on respondents).

Intervention

This study used a pre-test and post-test control group experimental design. The sampling method is done by consecutive sampling.



Figure 2. The pranaya yoga pregnancy exercise

Data on prospective respondents came from the community health center. Prospective respondents were met at the community health center when they were carrying out routine pregnancy examination. At the first meeting with prospective respondents, the researcher shows identity card, conveys the research objectives, research benefits, research procedures and informed consent.

If the prospective respondent agrees to be a research respondent, the researcher gives a PASS anxiety screening questionnaire. The completed PASS questionnaire was collected by the researcher then at that time the questionnaire score was calculated to determine the anxiety experienced by the respondent. Only prospective respondents who experience moderate and severe anxiety can become

respondents. 30 prospective respondents who met the inclusion criteria were given informed consent to find out about their willingness to become respondents in the intervention group or control group. prospective respondents who were willing to join the intervention group were given follow-up questions about the schedule for participating in yoga exercises that they could follow. Prospective respondents who were willing to join the control group were asked follow-up questions about their willingness to take the post-test on the schedule made by the researcher together with the intervention group. The post test will be carried out after the intervention group has participated in pregnancy yoga exercises for three weeks, and this coincided with the 4th pregnancy check-up schedule for the intervention group and the control group. To prevent contamination between the intervention group and the control group, the researcher explained to the respondents that the two groups would receive different treatment from each other. The intervention group will participate in yoga exercises twice a week for three consecutive weeks. While the control group would not receive any yoga intervention at all. the number of respondents divided into 2 groups. 15 respondents were the intervention group, and 15 respondents were the control group.

Pregnancy exercise interventions are given to pregnant women using The Pranaya Yoga Pregnancy Exercise Protocol and the implementation of yoga pregnancy exercises led by experienced yoga instructors. The yoga exercise protocol is designed to have light movement techniques and not pose a risk of physical injury to pregnant women and their fetuses. Injuries that can occur in this activity are leg cramps and uterine contractions due to imperfect stretching. An experienced instructor will be able to handle this incident. Interventions are carried out according to the schedule. The schedule was made according to the agreement between health workers, respondents and researchers. The intervention was carried out in the intervention group three times a week for 3 weeks. The duration of each intervention was 30 minutes. The intervention was carried out in the local sub-district hall. The control group is the group that does not receive the intervention. At the end of the session the researcher conducted a post test on both groups using the PASS questionnaire. Data collection techniques are explained in the form of diagrams in [figure 1](#) and yoga techniques

are explained in [figure 2](#).

Instruments

Instrument 1 is The Pranaya Prenatal Yoga Protocol which consists of 5 main movements named: seated hand on heart movement, cat/cow movement, child's pose movement, downward facing dog movement and cat twist movement. every movement has benefits for the health of the pregnancy and the well-being of the fetus. The movement patterns are described in [figure 2](#). This protocol reference is obtained from a book written by [More \(2017\)](#) entitled Prenatal Vinyasa Yoga: Teacher Training Manual. Before use, each movement is tested for feasibility by using Assessment Yoga Dolphin Tool. Assessment Yoga Dolphin Tool consists of 6 appropriate test questions. The questions in this assessment tool consist of "Does the pose create space?", "Where?", "What is the effect of the pose on the abdominal muscles?," "What kind of stress or load does the pose put on the joints?", "Does this pose cause compression in the belly?", "How stable is the pelvis", "specifically the sacrum & pubic symphysis?", "Could the woman do the pose pre-pregnancy?", "Does it feel good?"

Instrument 2 in this study was the PASS standardized questionnaire which consisted of 31 question items which were proven to be valid and reliable for screening anxiety problems in antenatal mothers. This instrument was designed by King Edward Memorial Hospital of Western Australia through research entitled The Parinatal Anxiety Screening Scale: Development and Preliminary Validation. PASS differentiates between high and low risk anxiety by measuring four domains that address specific anxiety symptoms as they occur in perinatal women. These domains form a subscale which includes 1) Excessive Worry and Specific Fears, 2) Perfectionism, Control and Trauma, 3) Social Anxiety, and 4) Acute Anxiety and Adjustment. The items are on a scale ranging from 0: "not at all" to 3: "almost always". The score of the test results is obtained by adding up all the items marked with a checklist by the respondent. To determine the respondent's level of anxiety, the following severity ranges were used: no symptoms (0-20), mild-moderate signs (21-41), and severe symptoms (42-93). This questionnaire has passed the content validity index and content validity ratio test in the latest research in Persia with values of 0.80 and 0.87 ([Jradi et al., 2020](#)). Even though its validity has been tested, in this

Table 1. Frequency distribution of respondent characteristics: age, education, occupation, gestational age, parity (n=30)

| Characteristics | n | % |
|------------------------|----|------|
| Age | | |
| <20 years old | 2 | 6.7 |
| 20-35 years old | 23 | 76.7 |
| >35 years old | 5 | 16.6 |
| Education | | |
| High Education | 28 | 93.3 |
| Low Education | 2 | 6.7 |
| Occupation | | |
| Laborer | 6 | 20 |
| Employee | 8 | 26.7 |
| Housewife | 16 | 53.3 |
| Gestational Age | | |
| 28-31 week | 12 | 40 |
| 32-35 week | 8 | 26.7 |
| 36-40 week | 10 | 33.3 |
| Parity | | |
| Primipara | 18 | 60 |
| Multipara | 12 | 40 |

Table 2. Frequency distribution of pregnancy yoga exercises (n=30)

| Frequency of Yoga Exercises | Follow Regularly | Do not Follow | n (%) |
|-----------------------------|------------------|---------------|-----------|
| Intervention Group | 15 | 0 | 15 (50%) |
| Control Group | 0 | 15 | 15 (50%) |
| Total | 15 | 15 | 30 (100%) |

study the same test was still carried out due to the process of transferring the language into Indonesian. PASS validity test in this study was conducted on 15 respondents using the r table value of 0.497 at a significance level of 5%. the results of the validity test show that the value of $r > r$ table is 0.760 (> 0.497), after passing the validity and reliability tests, PASS was used in this study.

Data Analysis

Controlling for confounding factors is done by randomization and restriction of research samples. Randomization was carried out by selecting samples using the consecutive sampling method in an affordable population at a time according to the research schedule. Restrictions are carried out by strictly applying inclusion criteria when selecting and determining respondents. The next analysis is

the identification of the normality of the data using the Shapiro Wilks test. if the data is normally distributed with a significance value of $p > 0.05$ then the next test is the bivariate hypothesis test using the Man Whitney non-parametric test.

Ethical Considerations

This research has obtained a certificate of ethical conduct from the health research ethics committee of Institute of Health Science of Dharma Husada College of Health with No. 124/KEPK/SDHB/B/VII/2022.

RESULTS

The respondents in this study were 76.7% aged 20-35 years old, on the last education characteristics 93.3% had a high school education, on the occupation characteristics 53.3% were housewives, on the gestational

Table 3. The effect of pregnancy yoga exercises on reducing respondents' anxiety (n=30)

| Category | Anxiety | | | | Man Whitney | p | | |
|--------------------|--------------------------------|----|--------|----|-------------|-------|---------------------------|-----|
| | Moderate | | Severe | | | | Saphiro-Wilk statistic | Sig |
| | n | % | n | % | | | | |
| Intervention Group | Pre-test before intervention | 0 | 0 | 15 | 100 | 0.697 | <0.001 | |
| | Post-test after intervention | 12 | 80 | 3 | 20 | 0.840 | <0.001 | |
| Control Group | Pre-test without intervention | 1 | 7 | 14 | 93 | 0.801 | <0.001 | |
| | Post-test without intervention | 0 | 0 | 15 | 100 | 0.984 | <0.001 | |

age characteristic 40% have a gestational age of 28-31 weeks and on the parity characteristics 60% of respondents are primipara (Table 1).

The frequency distribution of yoga pregnancy exercise, 100% of the intervention group respondents participated in yoga activities according to schedule and none dropped out and 100% of the control group respondents did not participate in yoga activities and no one dropped out (Table 2).

In the table 3, it is known that in the intervention group, the results of the pre-test before being given the intervention showed 100% of respondents experienced severe anxiety, and the results of the post-test after being given the intervention showed 80% of respondents experienced moderate anxiety. In the control group, the results of the pre-test without intervention 93% of respondents experienced severe anxiety, and in the results of the post-test without intervention 100% of respondents experienced severe anxiety. This shows that most of the intervention group experienced a change in anxiety levels from severe to moderate anxiety after receiving the yoga exercise intervention and in the control group it is known that without the intervention of yoga exercises, all respondents experience severe anxiety at the end of the third trimester. The results of the normality test in the intervention group and the control group using the Shapiro-Wilk show a $p < 0.001$ this means that the data is normally distributed and proceed to hypothesis testing. That the results of testing the hypothesis using the non-parametric Mann-Whitney formula in the intervention group and the control group showed a $p < 0.001$, this means that yoga pregnancy exercise has a significant effect on reducing the anxiety of pregnant women third trimester.

DISCUSSION

Frequency Distribution of Yoga Exercises

Physical exercise and staying active while pregnant is one way to maintain health, maintain physical fitness and prepare for childbirth which is often difficult and challenging. Yoga is a physical activity that is recommended for pregnant women to do regularly. Yoga exercise for pregnant women consists of five training sessions that are carried out simultaneously (Curtis et al., 2012). The five training sessions are yoga physical exercises, breathing

exercises (pranayama), positions (mudras), meditation and deep relaxation. All sessions in yoga exercise aim to improve blood circulation, support the head presentation position and can be delivered spontaneously vaginally and increase relaxation (More, 2017). Yoga practice for pregnant women is known to be beneficial for the health of pregnant women and their fetuses. Yoga exercise experiment carried out for two weeks with a frequency of 2-3 times a week, can improve the quality of sleep of pregnant women (Indrayani & Muhayah, 2020).

Pregnancy yoga that is done regularly will give a better effect than pregnancy yoga that is done irregularly (Deshpande et al., 2013). Information about the benefits of yoga that is done regularly needs to be conveyed to pregnant women. Health information support from health workers for pregnant women can support good health behavior (Dorst et al., 2019). Good health behavior during pregnancy will improve the welfare of pregnant women and their fetuses

The Effect of Pregnancy

Yoga Exercises on Reducing

Respondents' Anxiety

Depression and anxiety during pregnancy need to be treated urgently (Ningrum et al., 2019). This is to prevent labor pain, premature birth, long labor, caesarean delivery, low birth weight babies (LBW), and postpartum depression which can cause developmental delays in children. This situation can occur and accompany life situations and various health problems. The level of anxiety is divided into mild anxiety, moderate anxiety and severe anxiety (Maryati et al., 2021). In this study, it is known that yoga exercise that is done regularly in the intervention group affects the anxiety level of pregnant women in the third trimester. Yoga exercises reduce the anxiety level of pregnant women from severe anxiety to moderate anxiety.

One of the non-pharmacological techniques to reduce anxiety in third trimester pregnant women that is easy, inexpensive and can be done independently by pregnant women is yoga exercise (Davis et al., 2015). Yoga is effective to reduce anxiety in pregnant woman. The results of this study found that pregnant women who received yoga exercise treatment experienced severe anxiety during the pre-test and moderate anxiety during the post-test

(Ningrum et al., 2019). Meanwhile, pregnant women who did not receive treatment were known to experience moderate anxiety at the pre-test and severe anxiety at the post-test. The results in this study indicate that yoga exercise can reduce anxiety in third trimester pregnant women.

Implication and limitations

The pregnancy yoga exercise can be a non-pharmacological intervention to reduce anxiety levels in third trimester pregnant women. The practice of yoga pregnancy exercise that is carried out regularly and with the correct procedures can increase relaxation, reduce anxiety, and encourage adaptation to pregnancy in the third trimester optimally. Pregnancy yoga exercises can be done by pregnant women easily, inexpensive and does not cause pharmacological effects because there are no substances that are inserted into the body. The limitation in applying yoga exercises to pregnant women is the limited number of health workers who have yoga certificates for pregnant women. Yoga exercises for pregnant women need to be done properly assisted by trained instructors. This is done to prevent injury from improper training. the researcher suggests that further research be carried out on a larger sample size so that the research results are more representative of the wider population.

CONCLUSION

Factors that contribute to anxiety in the third trimester of pregnancy are age, education level, occupation, gestational age, and parity. Factors that influence reducing anxiety in the third trimester of pregnancy are yoga pregnancy exercises. Efforts to reduce anxiety in third trimester pregnant women through pregnant women class programs are already available in primary care networks in Indonesia. However, the program is not optimal due to several obstacles, including limited yoga instructors for pregnant women and a lack of awareness for pregnant women to take part in the routine class program for pregnant women. Training for yoga instructors needs to be held to increase the number of instructors and socialization of pregnancy yoga classes needs to be increased so that pregnant women are interested in taking part in pregnancy yoga regularly and have a healthy pregnancy

Declaration of Interest

We certify that there is no actual or potential conflict of interest in relation to this article.

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Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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