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The Effectiveness of a Classroom-Based Antenatal Yoga Program in Reducing Pregnancy Discomfort Scores

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Abstract

Pregnancy-related discomfort may affect maternal physical and psychological well-being and reduce quality of life during pregnancy. Antenatal yoga has been recognized as a complementary non-pharmacological intervention to improve maternal comfort; however, evidence regarding classroom-based antenatal yoga programs in Indonesian settings remains limited. This study aimed to evaluate the effectiveness of a classroom-based antenatal yoga program in reducing discomfort scores during pregnancy. A quasi-experimental pretest-posttest control-group design was conducted with 44 pregnant women in Tangerang City, Indonesia. Participants were assigned to an intervention group (n = 22) and a control group (n = 22). The intervention group received classroom-based antenatal yoga twice weekly for 3 months, comprising 15-minute sessions including breathing exercises, stretching, pregnancy-adapted yoga postures, and relaxation techniques, while the control group received routine antenatal care. Pregnancy discomfort scores in the intervention group decreased from 11.00 ± 6.37 to 6.00 ± 3.59, whereas the control group showed minimal change from 9.59 ± 4.77 to 9.64 ± 4.79. Post-intervention scores were significantly lower in the intervention group (p = 0.007). Classroom-based antenatal yoga effectively reduced pregnancy discomfort and may be integrated into antenatal care services.

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Introduction

Pregnancy is a physiological condition accompanied by substantial anatomical, hormonal, and psychological changes that frequently lead to discomfort among pregnant women. Common complaints include lower back pain, fatigue, leg cramps, sleep disturbances, shortness of breath, and emotional instability. These discomforts may negatively affect maternal quality of life, daily functioning, sleep quality, and psychological well-being during pregnancy (Mørkved et al., 2014; Okun et al., 2011). Pregnancy-related discomfort may negatively affect maternal daily functioning, sleep quality, physical well-being, and overall quality of life during pregnancy (Chuntharapat et al., 2008; Kwon et al., 2020). Pregnancy-related discomfort may not only affect physical functioning but may also be associated with psychological vulnerability during pregnancy. Psychological symptoms during pregnancy require attention because anxiety disorders are relatively common during pregnancy and the postpartum period, and may affect maternal adaptation and quality of life (Fawcett

et al., 2019). Therefore, interventions that combine physical movement, breathing regulation, relaxation, and psychosocial support may be relevant in improving maternal comfort during pregnancy.

Management of pregnancy-related discomfort is often pharmacological; however, excessive medication use during pregnancy may increase maternal and fetal risks. Consequently, non-pharmacological and complementary interventions have gained considerable attention in maternal healthcare services. Since antenatal yoga combines gentle physical activity, breathing regulation, and relaxation, it can be understood as part of broader antenatal exercise approaches that may support maternal health outcomes during pregnancy (Sui et al., 2012). Mind-body interventions during pregnancy, including yoga, breathing exercises, relaxation, and meditation, have been widely recognized as supportive non-pharmacological approaches to improve maternal physical and psychological well-being (Beddoe et al., 2008). Previous randomized evidence also suggests that yoga intervention during pregnancy may contribute to favorable pregnancy outcomes and improve maternal health status (Harandi et al., 2018). One intervention increasingly applied in antenatal care is antenatal yoga. Antenatal yoga combines physical movement (asana), breathing exercises (pranayama), stretching, relaxation, and mindfulness techniques specifically adapted for pregnant women (Field, 2012).

Previous studies have demonstrated that antenatal yoga improves maternal physical comfort, emotional well-being, and sleep quality, and reduces musculoskeletal discomfort during pregnancy (Babbar & Shyken, 2016; Liu et al., 2020; Corrigan et al., 2022). Several studies have demonstrated the positive effects of antenatal yoga on maternal health outcomes. A systematic review by Gong et al. (2022) reported that prenatal yoga significantly reduces physical discomfort, anxiety, stress, and depressive symptoms during pregnancy. Similarly, Newham et al. (2014) found that regular yoga practice improved maternal well-being and reduced musculoskeletal complaints among pregnant women. Other studies have also shown improvements in sleep quality, emotional regulation, and stress reduction following prenatal yoga interventions (Curtis et al., 2012; Kusaka et al., 2016). Pregnancy-related discomfort may not only affect physical functioning but may also be associated with psychological vulnerability during pregnancy. Psychological symptoms during pregnancy also deserve attention, as anxiety and depression are commonly reported among pregnant women and may affect maternal well-being and pregnancy experience (Zhang et al., 2021). In addition to physical outcomes, prenatal yoga has also been explored as a supportive intervention for maternal psychological well-being, including depressive symptoms during pregnancy (Uebelacker et al., 2016).

In addition to the intervention itself, the delivery method may influence program effectiveness. Classroom-based interventions provide opportunities for peer support, increased motivation, interactive learning, and better adherence to scheduled activities. Group-based antenatal programs have been associated with improved maternal psychological adaptation and increased participation in health-promoting behaviors during pregnancy (Guardino et al., 2014).

Despite growing evidence regarding prenatal yoga, several gaps remain in the existing literature. First, many previous studies have focused predominantly on psychological outcomes such as anxiety and depression, while fewer studies have specifically evaluated multidimensional pregnancy discomfort. Second, evidence regarding classroom-based antenatal yoga programs in Indonesian maternal healthcare settings remains limited. Third, limited studies have evaluated structured antenatal yoga programs integrated into routine antenatal services at the community level.

Therefore, this study aimed to analyze the effectiveness of a classroom-based antenatal yoga program in reducing pregnancy discomfort scores among pregnant women in Tangerang City, Indonesia. The findings of this study are expected to contribute to evidence-based complementary interventions in antenatal care and support the integration of safe non-pharmacological therapies into maternal healthcare services.

Materials and Methods

This study employed a quasi-experimental design using a pretest–posttest control group approach to evaluate the effectiveness of a classroom-based antenatal yoga program in reducing pregnancy discomfort scores among pregnant women in Tangerang City. A quasi-experimental design was selected because random allocation was not feasible in the community service setting, where participants voluntarily enrolled in antenatal classes. To minimize selection bias, baseline maternal characteristics were assessed and compared across groups prior to the intervention.

The study population comprised pregnant women receiving antenatal care services at selected maternal health facilities in Tangerang City. The sample comprised 44 pregnant women, divided equally into an

intervention group (n = 22) and a control group (n = 22). Participants were recruited using purposive sampling based on predefined eligibility criteria. Inclusion criteria included pregnant women with singleton pregnancies, willingness to participate in the study, ability to perform mild physical activity, and absence of pregnancy complications that contraindicated physical exercise. Participants who had severe obstetric complications or were unable to attend intervention sessions regularly were excluded.

The intervention group participated in a classroom-based antenatal yoga program conducted by a certified prenatal yoga instructor and supervised by trained midwives. The intervention was implemented over three months, with sessions held twice weekly, lasting approximately 15 minutes each. The yoga sessions included breathing exercises (pranayama), stretching, pregnancy-adapted yoga postures (asana), and relaxation techniques to improve maternal comfort and reduce pregnancy-related discomfort. The inclusion of relaxation techniques was supported by evidence indicating that relaxation-based interventions may help improve pain management and maternal coping during childbirth-related conditions (Smith et al., 2018). Participant adherence was monitored using attendance records during the intervention period. The control group received routine antenatal care without participation in the yoga program.

The independent variable in this study was participation in the classroom-based antenatal yoga program, while the dependent variable was pregnancy discomfort score. Pregnancy discomfort was measured using a structured questionnaire adapted from maternal discomfort assessment tools, comprising indicators of common pregnancy discomfort, such as back pain, fatigue, sleep disturbances, muscle cramps, and emotional discomfort. Each item was assessed on a 4-point linear scale (0 = none, 1 = mild, 2 = moderate, and 3 = severe), with higher total scores indicating greater discomfort. Prior to data collection, the questionnaire underwent content validation by maternal health experts and reliability testing. The reliability analysis demonstrated good internal consistency, with a Cronbach's alpha coefficient of 0.85, indicating that the instrument was sufficiently reliable for measuring pregnancy discomfort.

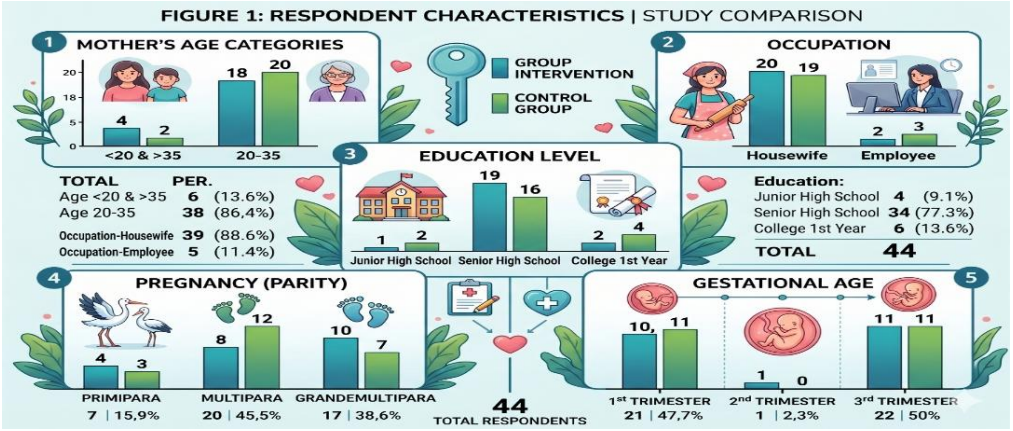
Data collection was conducted in two phases: pretest and posttest. Baseline measurements were obtained before the intervention, including maternal demographic characteristics such as age, occupation, education level, parity, and gestational age to identify potential confounding factors. Posttest measurements were conducted after the intervention period, using the same instrument in both groups.

Data analysis was performed using statistical software. Descriptive statistics were used to summarize respondent characteristics and pregnancy discomfort scores. The normality of the data distribution was assessed using the Shapiro–Wilk test. For normally distributed data, paired t-tests were used to compare pretest and posttest discomfort scores within groups, and independent-samples t-tests were used to compare differences between the intervention and control groups. For non-normally distributed data, the Wilcoxon signed-rank test and Mann–Whitney U test were applied. Statistical significance was determined at a 95% confidence level ($p < 0.05$). All respondents received an explanation regarding the study objectives and signed informed consent prior to participation.

Results and Discussions

Results

Figure 1. *Respondent Characteristics*

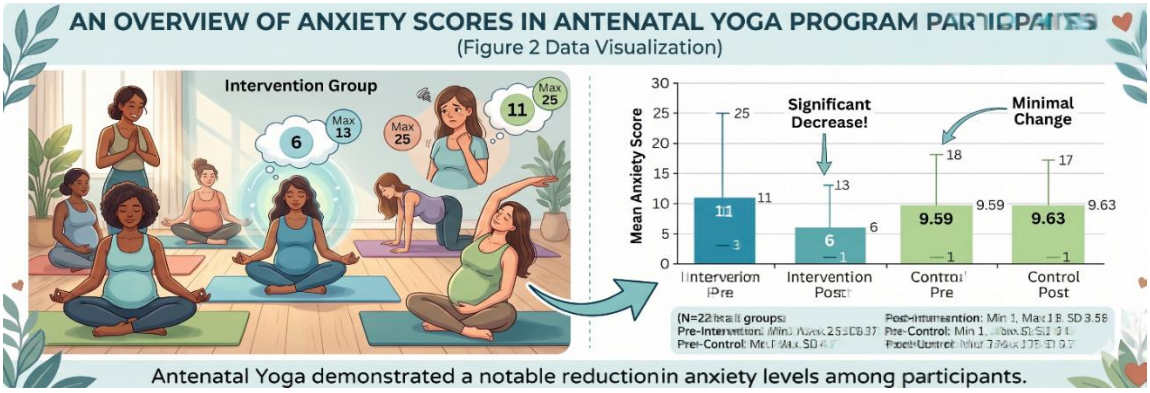


A total of 44 pregnant women participated in this study, with 22 in the intervention group and 22 in the control group. Most participants were aged 20–35 years (86.4%), while 13.6% were classified as being at a higher reproductive risk age (<20 or >35 years). In terms of occupation, most respondents were homemakers (88.6%), whereas only 11.4% were employed.

Based on educational background, most respondents had completed senior high school (77.3%), followed by bachelor 's-level education (13.6%) and junior high school (9.1%). Regarding parity, multiparous mothers constituted the largest proportion (45.5%), followed by grand multiparous (38.6%) and primiparous women (15.9%). Gestational age was predominantly distributed in the third trimester (50.0%) and first trimester (47.7%), while only one respondent (2.3%) was in the second trimester.

Overall, maternal demographic characteristics between the intervention and control groups were relatively comparable, reducing the likelihood that major baseline differences influenced the observed outcomes.

Figure 2. *An Overview of Pregnancy Discomfort Scores Among Pregnant Women Participating in a Classroom-Based Antenatal Yoga Program*

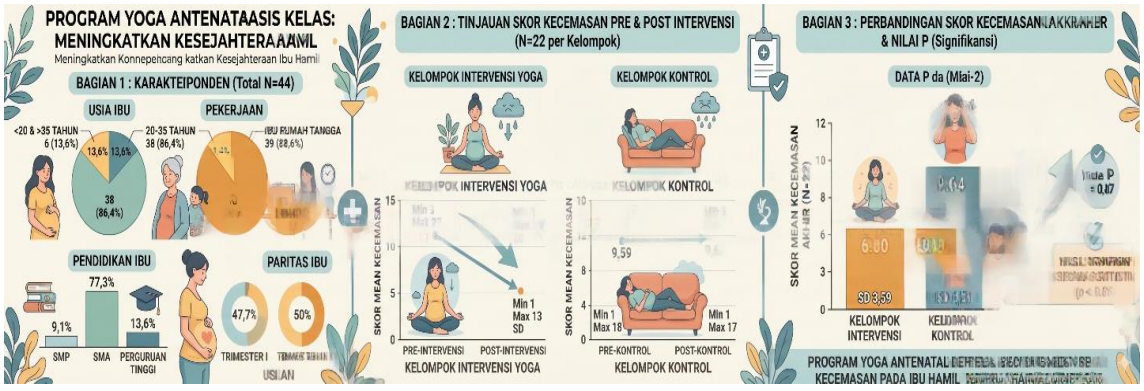


changes in pregnancy discomfort scores before and after intervention in both groups. In the intervention group, the mean discomfort score decreased from 11.00 (SD = 6.37) before the intervention to 6.00 (SD = 3.59) after participation in the classroom-based antenatal yoga program, indicating a reduction of five points.

In contrast, the control group showed minimal change during the same period. The mean discomfort score was 9.59 (SD = 4.77) at baseline and 9.63 (SD = 4.79) after observation.

Post-intervention comparison showed that respondents in the intervention group had lower pregnancy discomfort scores than those in the control group (mean = 6.00 vs. 9.64). The independent samples t-test demonstrated a statistically significant difference between groups (p = 0.007), suggesting that participation in the classroom-based antenatal yoga program was associated with lower pregnancy discomfort scores.

Figure 3. *A Classroom-Based Antenatal Yoga Program for Reducing Pregnancy Discomfort Scores*



The intervention group showed lower mean pregnancy discomfort scores than the control group after the intervention period. The mean discomfort score in the intervention group was 6.00 (SD = 3.59), whereas the control group recorded a mean score of 9.64 (SD = 4.79). Statistical analysis using the independent-samples t-test yielded a p-value of 0.007, indicating a statistically significant difference between the groups.

These findings indicate that pregnant women who participated in the classroom-based antenatal yoga program experienced lower discomfort scores than those receiving routine antenatal care alone.

Discussion

This study found that pregnant women who participated in a classroom-based antenatal yoga program experienced lower pregnancy discomfort scores than those in the control group. The intervention group demonstrated a reduction in mean discomfort scores from 11.00 before intervention to 6.00 after intervention, whereas the control group showed relatively stable discomfort scores. Statistical analysis indicated a significant difference between groups (p = 0.007), suggesting that classroom-based antenatal yoga may help reduce pregnancy-related discomfort.

The physiological effects of prenatal yoga may explain the reduction in discomfort. Antenatal yoga combines stretching movements, breathing exercises (*pranayama*), and relaxation techniques that may improve flexibility, posture, blood circulation, and muscular relaxation. These mechanisms may help reduce musculoskeletal discomfort commonly experienced during pregnancy, particularly lower back pain, pelvic discomfort, fatigue, and sleep disturbances. Previous research has shown that prenatal yoga improves maternal comfort and reduces physical complaints during pregnancy (Chuntharapat et al., 2008; Kusaka et al., 2016).

These findings are supported by recent systematic reviews indicating that antenatal yoga improves maternal comfort and pregnancy outcomes (Yuan et al., 2023; Corrigan et al., 2022). reported that prenatal yoga interventions improved maternal outcomes and reduced pregnancy-related discomfort. Similarly, Kwon et al. (2020) found that antenatal yoga improved physical health and maternal quality of life by reducing discomfort and stress-related symptoms during pregnancy.

The present findings also align with evidence from Indonesia, which emphasizes the benefits of prenatal yoga as a complementary intervention during pregnancy. A study by Dewi Susanti and Wisudawati (2021) found that prenatal yoga significantly reduced anxiety levels among pregnant women in South Tangerang. Although anxiety was not the primary outcome in the present study, both findings suggest that prenatal yoga may enhance maternal well-being during pregnancy. Indonesian maternal health research has increasingly recognized non-pharmacological interventions, including prenatal exercise and relaxation programs, as supportive strategies to improve maternal comfort and pregnancy experience.

The classroom-based format used in this study may have contributed to the intervention outcomes. Group-based antenatal yoga sessions may encourage regular participation, facilitate peer interaction, and provide emotional support among pregnant women. Social support during pregnancy has been associated with improved maternal adaptation and coping capacity (Dennis, 2010). The supportive classroom-based format may also be relevant from a psychosocial perspective, as psychological and support interventions during pregnancy have been reported to help reduce stress, anxiety, and depressive symptoms in vulnerable maternal populations (Campillo et al., 2017). Previous evidence also suggests that prenatal yoga interventions may enhance maternal comfort, body awareness, and positive pregnancy experiences, particularly when delivered in structured, supportive environments (Green et al., 2021). However, psychosocial support and adherence quality were not measured directly in this study; therefore, this explanation should be interpreted cautiously. Group-based antenatal interventions may strengthen maternal coping and psychosocial adaptation (Zinsser et al., 2020).

Several limitations should be acknowledged. First, the quasi-experimental design without randomization limits causal inference and may introduce selection bias. Second, the relatively small sample size limits generalizability to broader populations. Third, several potential confounding variables, including maternal psychological status, nutritional status, and physical activity outside the intervention, were not controlled. Future studies are recommended to use randomized controlled trial designs with larger sample sizes and longer follow-up periods to evaluate the effectiveness of antenatal yoga interventions better.

Overall, the findings suggest that classroom-based antenatal yoga may be a useful complementary intervention for reducing pregnancy discomfort and could be considered as part of antenatal care services.

Conclusion

This study found that pregnant women who participated in a classroom-based antenatal yoga program had lower pregnancy discomfort scores than those receiving routine antenatal care alone. A statistically significant difference in discomfort scores was observed between the intervention and control groups (p = 0.007), suggesting that participation in antenatal yoga may improve maternal comfort during pregnancy.

These findings support the potential role of classroom-based antenatal yoga as a complementary non-pharmacological intervention in antenatal care services. However, given the quasi-experimental design and relatively small sample size, further studies using randomized controlled designs with larger populations are recommended to strengthen the evidence regarding its effectiveness.

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