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DOI: [10.31965/infokes.Vol24.Iss3.2508](https://doi.org/10.31965/infokes.Vol24.Iss3.2508)Journal homepage: <https://jurnal.poltekkeskupang.ac.id/index.php/infokes>**RESEARCH****Open Access****Complementary Antenatal Education Reduces Anxiety and Pain in Primigravidas: A Quasi-Experimental Study****Maryam Latifah Harahap^{1a*}, Rahmah Juliani Siregar^{2b}, Bincar Nasution^{3c}, Kavita Sharma^{4d}**¹ Department of Midwifery, STIKes Darmais Padangsidimpuan, Padangsidimpuan, North Sumatra, Indonesia² Department of Public Health, STIKes Darmais Padangsidimpuan, Padangsidimpuan, North Sumatra, Indonesia.³ Department of English Education, Universitas Graha Nusantara, Padangsidimpuan, North Sumatra, Indonesia.⁴ Panjab University, Chandigarh, India^a Email address: maryamlatifahharahap@gmail.com^b Email address: rahmahjulianisiregar@gmail.com^c Email address: nbincar@gmail.com^d Email address: kavita@ipi-limited.com

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Abstract

First pregnancy pregnant women usually have high anxiety and fear of pain of delivery which affects the outcome of the pregnancy and neonates negatively. Complementary antenatal education program using mind body approach along with other non pharmacological approaches to pain relief is recommended in midwifery practice in Indonesia. The objective of this study was to determine the effect of complementary antenatal education program on anxiety during pregnancy and level of labor pain in primigravida women. Quasi-experimental, non-equivalent control group pretest-posttest design has been used as research design. Research participants were 80 healthy primigravidas attending antenatal care at two primary health-care centers in Indonesia. Experimental group consisted of 40 patients who attended 4 sessions of complementary antenatal education (breathing and relaxation training, yoga stretching exercises, massage and touch techniques, aromatherapy counseling) and antenatal education as usual and control group consisted of 40 women attending antenatal education as usual. Pregnancy-related anxiety level was assessed using pregnancy-related anxiety scale while labor pain was estimated using 0-10 Numeric Rating Scale. Statistical analysis was performed using paired and independent t-test, chi-square test.

Keywords: primigravida, anxiety, labor pain, complementary therapy, antenatal education.**Corresponding Author:**

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1. INTRODUCTION

Pregnancy and childbirth are major life transitions that are often accompanied by substantial psychological responses, particularly among primigravida women experiencing pregnancy and impending childbirth for the first time. Anxiety related to pregnancy and labor is highly prevalent. It is defined as an over-concern related to the wellbeing of both the expectant mother and fetus, fears of experiencing pain, and apprehensions about the delivery procedure and possible complications (Damayanti and Astuti., 2024). According to recent research, chronic antenatal anxiety has been shown to result in various negative consequences for both mothers and infants such as long deliveries, greater need for obstetric intervention, and difficulties adjusting psychologically after delivery. In Indonesia, first-time mothers view pregnancy as an important life crisis event, and culture-bound pressures may add psychological burdens (Nainggolan, Wulandari, and Harahap., 2022)

Anxiety is closely intertwined with the perception of labor pain. Fear and anxiety intensify muscular tension and activate the sympathetic nervous system, which may increase pain perception and interfere with effective coping during labor. Women with high antenatal anxiety are more likely to experience severe pain, request pharmacological analgesia, and express dissatisfaction with their childbirth experience (Sari & Puspitasari., 2025). This relationship further emphasizes the significance of the psychological preparation and pain coping skills during pregnancy in case of first-time mothers who lack experiences in these matters (Nikoozad et al., 2024).

Antenatal education has traditionally been regarded as one of the methods for preparing women and their partners for labor and parenthood. The traditional form of antenatal education includes teaching couples about biomedical aspects of pregnancy, labor process, possible risks, symptoms of danger, and postnatal care of the baby. Although antenatal education improves awareness of women in some cases, its effects on the psychological state of the expectant mother, including anxiety, fear of labor and pain perception, remain contradictory (Bachtiar et al., 2025). Recent studies show that antenatal education which integrates psychological training, coping strategies, and partnership is able to improve childbirth self-efficacy, decrease fear and pain perception. Nevertheless, antenatal programs differ considerably in content, intensity, and methodology (Zaman et al., 2025).

Complementary and integrative therapies are increasingly integrated into midwifery practice worldwide and in Indonesia. Complementary antenatal care encompasses a range of non-pharmacological modalities—such as yoga, breathing and relaxation techniques, massage, aromatherapy, and other mind-body interventions—used alongside conventional care to promote physical and psychological well-being during pregnancy. (Choironi et al., 2025) Several community-based programs in Indonesia have implemented complementary midwifery care, emphasizing its perceived benefits in providing comfort, facilitating relaxation, and helping women feel more in control of their pregnancy and childbirth experience. However, the majority of the pregnant women perceive complementary therapies in a positive light due to reduced side effects and autonomy compared to pharmacological treatments (Suparni, Aisyah, and Pambudi., 2025).

Empirical data supports the theory that certain types of complementary interventions in pregnancy have positive effects on anxiety and pain. Namely, antenatal exercises and yoga-based activities were proven to have a positive effect on anxiety and pain. A clinical trial from Iran demonstrated that a structured prenatal intervention that combined education and psychological support reduced anxiety and pain intensity during childbirth and decreased the rates of episiotomy and cesarean section. A more recent scoping review and meta-analysis concluded that prenatal education may reduce fear of childbirth and pain intensity during labor. However, heterogeneity across interventions and study designs remains substantial (Fitri et al., 2025). Studies done in Indonesia, however, suggest that health education pertaining to childbirth

and prenatal classes could lower anxiety levels in third trimester primigravidas (Firouzbakht et al., 2015).

However, there is still room for improvement. The majority of antenatal education sessions only concentrate on educating the women, and not include any supplementary methods of alleviating pain and anxiety. Community based complementary interventions, on the other hand, can include yoga or aromatherapy, and may lack assessments of psychological measures. Moreover, relatively few studies have focused specifically on primigravidas in low- and middle-income settings where access to pharmacological pain management may be limited. (Saragih et al., 2025).

In Indonesia, the Ministry of Health promotes “kelas ibu hamil” (pregnant women’s classes) to increase maternal knowledge and empower women to participate actively in their care. Within these classes, midwives are encouraged to incorporate complementary approaches such as pregnancy gymnastics, relaxation techniques, and simple massage. However, implementation fidelity varies across facilities, and there is limited rigorous evaluation of the impact of such complementary antenatal education on psychological and pain-related outcomes among primigravidas. Available community engagement and service-learning reports primarily document changes in knowledge and attitudes rather than clinical or psychological endpoints (Alizadeh-Dibazari, Abdolalipour, and Mirghafourvand., 2023).

Given this context, there is a need for robust, context-specific research that evaluates integrated complementary antenatal education packages delivered within routine antenatal care and their effect on anxiety and labor pain among primigravidas. Quasi-experimental designs can be highly appropriate in primary health care settings in the real world, in which randomization might be difficult because of the nature of service delivery and ethics involved. Quasi-experimental designs can provide important pragmatic evidence even with controls for possible confounders and differences between the groups at the start of the study. In this current research project, an effort will be made to assess the impact of the antenatal complementary education program that includes breathing exercises, yoga stretches, massage, and aromatherapy counseling on pregnant women. (Bushra et al., 2021).

2. RESEARCH METHOD

In this study, a quasi-experimental, nonequivalent control group pretest-posttest design was used in two primary health-care centers (puskesmas) in urban areas of North Sumatra, Indonesia.

The participants eligible for this research were 80 primigravida women (40 in each group), with normal and single pregnancy in 20-28 weeks of gestation, literate in Indonesian language and agreed to attend all sessions. The following characteristics were exclusion criteria: any psychiatric illness, high-risk pregnancy, or planned elective cesarean delivery.

The intervention group took part in four weekly sessions lasting 90 minutes each, conducted by trained midwives alongside regular care: (1) psychoeducation on anxiety and delivery process; (2) breathing, relaxing and guided imagery exercises; (3) stretching in accordance with yoga; (4) massage with partner assistance and advice about aromatherapy. Participants had to practice at home. The control group was provided with routine antenatal care and pregnancy education classes without complementary education.

Pregnancy-related anxiety was estimated using the validated scale of pregnancy-related anxiety in Indonesian language before and after the intervention. Labor pain intensity was measured on an 11-point Numeric Rating Scale (0-10) during active labor (4-7 cm of cervical dilation) in the vaginal delivery subgroup.

Descriptive analysis, paired and independent t-test, chi-square test were applied. The level of statistical significance was $p < 0.05$. The study received ethical clearance from the relevant institutional review board, and all participants provided written informed consent (Sacharum, 2025).

The study received ethical clearance from the relevant institutional review board, and all participants provided written informed consent.

3. RESULTS AND DISCUSSION

We enrolled 80 primigravida women, with 40 allocated to the intervention group and 40 to the control group. Retention of participants in general was good for the anxiety outcome measurement, as full data before and after the intervention was provided by all subjects. In terms of the pain in labor outcome, 37 patients in the intervention group and 35 in the control group who gave birth vaginally in the study facilities were included in the analysis. Table 1 presents the sociodemographic and obstetric characteristics of participants. The average age of participants was about 24-25 years in both groups. Most women had completed at least secondary education and were not formally employed. Mean gestational age at enrollment was similar between groups, and the majority planned to deliver at the study facilities.

Table 1. Sociodemographic and obstetric characteristics of primigravida participants (n = 80).

Characteristic	Intervention (n = 40)	Control (n = 40)	p-value
Age (years), mean $\pm$ SD	24.5 $\pm$ 3.5	24.8 $\pm$ 3.2	0.71
Education $\geq$ senior high, n (%)	26 (65.0)	25 (62.5)	0.82
Employed, n (%)	14 (35.0)	13 (32.5)	0.81
Gestational age at T1 (weeks), mean $\pm$ SD	23.1 $\pm$ 2.6	22.8 $\pm$ 2.9	0.56
Planned to deliver at study facility, n (%)	34 (85.0)	33 (82.5)	0.76

The two groups were comparable in terms of age, educational attainment, employment status, gestational age at enrollment, and planned place of delivery, indicating that selection bias was minimized at baseline. No significant group differences were found for any of these variables, supporting the internal validity of subsequent comparisons.

At baseline (T1), mean pregnancy-related anxiety scores were moderately elevated and did not differ significantly between groups. After the four-week intervention period, the intervention group showed a marked reduction in mean anxiety scores, whereas the control group showed only a modest decrease.

Table 2. Pregnancy-related anxiety scores at baseline and post-intervention

Anxiety measure	Intervention (n = 40) mean $\pm$ SD	Control (n = 40)	p-value
Baseline (T1) score	48.6 $\pm$ 8.2	47.9 $\pm$ 7.9	0.73
Post-intervention (T2) score	36.2 $\pm$ 7.5	43.8 $\pm$ 8.3	<0.001
Change (T2 – T1)	-12.4 $\pm$ 6.9	-4.1 $\pm$ 6.3	<0.001

Within-group analysis indicated that the intervention group experienced a statistically significant reduction in anxiety from T1 to T2 (paired t-test, $p < 0.001$), corresponding to a substantial mean decrease of approximately 12 points. In contrast, the control group showed a smaller yet statistically significant reduction of about 4 points (paired t-test, $p < 0.01$), which may reflect the effect of routine antenatal education and natural adaptation over time. However, the between-group difference in change scores was highly significant, indicating that participation in the complementary antenatal education program produced a greater reduction in anxiety than routine care alone.

Table 4. Distribution of anxiety categories at baseline and post-intervention

Anxiety category	Time	Intervention n (%)	Control n (%)
Low anxiety	T1	6 (15.0)	7 (17.5)
	T2	21 (52.5)	11 (27.5)
Moderate anxiety	T1	21 (52.5)	19 (47.5)
	T2	15 (37.5)	18 (45.0)
High anxiety	T1	13 (32.5)	14 (35.0)
	T2	4 (10.0)	11 (27.5)

At baseline, approximately one-third of participants in each group fell into the high-anxiety category. After the intervention, the proportion of women with high anxiety decreased markedly in the intervention group (from 32.5% to 10.0%), while remaining relatively high in the control group (27.5%). The percentage of women with low levels of anxiety in the intervention group improved significantly from 15.0% to 52.5%, compared with a lesser change (from 17.5% to 27.5%) in the control group. The categorical results are supportive of those obtained using anxiety scores on a continuum scale.

There was high compliance with the supplementary antenatal sessions based on the attendance data, with almost all of the intervention group participating in three out of four sessions, while more than two-thirds attended all the sessions. It is also worth mentioning that, according to the participants' perception, breathing and relaxation exercises, as well as massages supported by partners, helped to manage pain during late pregnancy and labor. At the same time, the women felt that yoga-styled stretching reduced their back pain and enhanced sleep. All of these perceptions confirm the previous positive attitudes of pregnant women in Indonesia toward complementary medicine.

Labor pain intensity during active labor was assessed among participants who gave birth vaginally. Table 5 summarizes mean NRS pain scores by group.

Table 5. Distribution of anxiety categories at baseline and post-intervention

Outcome	Intervention (n = 37) mean ± SD	Control (n = 35) mean ± SD	p-value
NRS pain score (0–10 scale)	6.8 ± 1.2	7.9 ± 1.4	<0.001

Women in the intervention group reported significantly lower mean pain intensity during active labor compared with those in the control group (6.8 vs. 7.9 on the 0–10 NRS, $p < 0.001$). Since there was no significant change in the severity of labor pain in both groups to severe or moderate, even though there is a slight drop from the NRS, the reduction of about one point is seen to be clinically significant in pain research. To determine the clinical significance of change in anxiety scores, the cut-off points of anxiety were stratified into low, moderate, and high anxiety levels. Table 4 presents the distribution of anxiety categories at T1 and T2.

This quasi-experimental study found that a structured complementary antenatal education program significantly reduced pregnancy-related anxiety and labor pain intensity among primigravida women compared with routine antenatal education alone (Wulandari, 2021). The findings add to the growing evidence that integrating complementary, non-pharmacological techniques into antenatal education can yield meaningful psychological and clinical benefits for first-time mothers, particularly in primary health-care settings where pharmacological pain management options may be limited (El-Kader, Hagrass, and Hassan 2025).

The substantial decrease in mean anxiety levels in the intervention group compared to a slight reduction in the control group shows that the complementary prenatal program offers something other than just comfort or the natural decrease in anxiety linked with the advancement of pregnancy and standard care (Efendi et al., 2025). The intervention directly targeted two major elements of anxiety – the cognitive and physiological aspects. It involved

psychoeducation concerning anxiety and fear of delivery, breathing and relaxation techniques training, and improvement of control perception through acquiring skills and labor coping rehearsal. It is connected to psychological theories that stress the importance of the elements of control perception and self-efficacy in managing anxiety (Mahoney et al., 2023).

The categorial analysis also stresses the clinical importance of these changes: the number of women who suffer from high anxiety levels significantly dropped in the intervention group, and at the same time, the proportion of low anxiety increased three times. Such trends will likely result in better childbirth experience, easier adaptation to motherhood, and probably lower risk of developing postpartum psychopathology based on previous longitudinal studies showing the connection between antenatal and postnatal anxiety. The findings are broadly consistent with trials and quasi-experiments that have reported decreases in anxiety following prenatal education and childbirth preparation programs (“Proportion of Late Pregnant Women with Anxiety Symptom under COVID-19 Pandemic in Japan” 2022).

The significantly lower mean labor pain scores among women in the intervention group indicate that complementary antenatal education can enhance pain-coping capacity during childbirth. Although pain was still of moderate-to-severe intensity, the observed decrease of about one point on the NRS scale is clinically significant and comparable to results from trials on non-pharmacological intervention during childbirth (Huang et al., 2024). Education on breathing and relaxation techniques and practice of using these techniques in a supportive setting probably helped the participants to implement them during contractions, thus moderating pain perception. The effect of partner-assisted massage should be not underestimated, as it could provide the needed tactile comfort and distraction (Rusmeni, Putra, and Imam, 2025).

The obtained results coincide with findings from previous trials confirming the effectiveness of prenatal education with psychological support and coping skills training in decreasing pain intensity and the necessity of obstetrical interventions. Additionally, the results are consistent with the evidence regarding positive effects of prenatal yoga and exercises on pain threshold. Importantly, the present study demonstrates that such techniques can be feasibly integrated into pregnant women’s classes delivered by midwives in routine primary health care, expanding their potential reach (Tian, Zhang, and Chen 2025).

The study’s findings resonate with a clinical trial in Iran in which a prenatal education and psychological support program significantly reduced anxiety and pain and lowered rates of episiotomy and cesarean section. Similar to that trial, the current intervention combined information provision with active coping strategies rather than relying solely on didactic education. The results also corroborate quasi-experimental studies in Indonesia that have documented anxiety reduction following health education about childbirth and participation in prenatal classes among primigravidas. However, the present study extends prior work by explicitly integrating a complementary package—including breathing and relaxation, yoga-based stretching, massage, and aromatherapy counseling—and by simultaneously assessing both anxiety and pain outcomes (Liu et al., 2026).

Studies of scoping review and meta-analysis of prenatal education programs showed some variability between studies, but their overall conclusion is the value of structured prenatal education in helping decrease fear and pain of giving birth. The current research provides evidence from a country specific setting, which shows that a fairly inexpensive supplementary program by a midwife can bring positive results for primigravid women in primary healthcare facilities (Nurlaili & Pertiwi, 2025). This is particularly important in low- and middle-income contexts, where access to pharmacological pain relief may be limited, and where maternity care is frequently midwife-led (Ramasamy et al., 2025).

Several mechanisms may explain the observed reductions in anxiety and pain. First, psychoeducation about anxiety and childbirth may have corrected misconceptions, normalized

common fears, and provided realistic expectations, thereby reducing anticipatory anxiety. Second breathing exercises and relaxation practices probably reduced the body's arousal and increased parasympathetic activity, which can directly lower anxiety and influence pain pathways. Third stretching with yoga techniques might have eased muscle and joint pain increased body awareness. Built a feeling of physical readiness for labor. Fourth massage and gentle touch, from a partner might have made one feel more supported socially. Triggered the body's own opioid release, which helps with pain relief and emotional comfort (Nugroho et al., 2023).

Additionally, the group format may have fostered peer support and collective coping, as women shared concerns and strategies. Social learning and vicarious experiences are known to strengthen self-efficacy, which in turn can buffer anxiety and enhance coping with challenging situations such as childbirth. Together, these components reflect a holistic, biopsychosocial approach that aligns with midwifery philosophies emphasizing woman-centered, non-interventionist care and promoting normal physiological childbirth (Mazidi et al., 2026).

The positive outcomes observed in this study have several implications for midwifery practice and maternal-health policy. First, they support integrating structured complementary antenatal education modules into national guidelines for pregnant women's classes and routine antenatal care, particularly for primigravidas. Such integration could help standardize content and ensure that all women have access to evidence-informed, non-pharmacological strategies to manage anxiety and pain (Widatiningsih et al., 2025).

Second, the research emphasizes the possibility of developing midwives' skills in providing complementary practices like breathing and relaxation, yoga exercises, and partner massages in the current system of provision of services. The development of midwifery care through capacity building and professional development of midwives would increase their competence in the field and therefore the effectiveness and quality of implementation of complementary practices. Third, the results indicate the role of birth companions in prenatal education, especially when it comes to massage techniques. It might be beneficial for both mothers and partners and help create positive birth environment (Lennie et al., 2025).

From the policy standpoint, complementary prenatal education is a rather inexpensive measure that can be provided through the current infrastructure and has the potential to positively influence women's mental well-being and birth experience. It may be an important step towards respect for maternity care and reducing excessive interventions and service satisfaction, which are more and more considered important in quality maternal health care. (Fitri et al., 2025).

4. CONCLUSION

This quasi-experimental study provides evidence that a complementary antenatal education program integrating breathing and relaxation, yoga-based stretching, partner-supported massage, and aromatherapy counseling can significantly reduce pregnancy-related anxiety and labor pain intensity among primigravida women in a primary health-care setting. Observed reductions in anxiety and pain and positive changes in anxiety categories show that these programs are both statistically and clinically useful. Training midwives deliver antenatal education during normal antenatal services. Complementary antenatal education is a low-cost woman-focused approach that fits with modern aims of respectful whole-body maternity care. Putting complementary modules into regular antenatal classes and midwifery training with more solid research and policy support can improve antenatal care quality and make childbirth smoother for first-time mothers, in Indonesia and similar places.

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