

Differences in Back Pain in Pregnant Women in the Third Trimester Before and After Prenatal Yoga at Bumi Sehat Clinic

Kadek Arie Yulisetia Dewi¹, Listina Ade Widya Ningtyas², I Komang Lindayani³

¹²³ Midwifery Department, Poltekkes Kemenkes Denpasar, Bali, Indonesia

* Correspondence e-mail; ArieYulisetia14@gmail.com

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Abstract

Pregnancy can cause physiological changes that lead to discomfort in pregnant women. Lower back pain is one of the most common complaints experienced during pregnancy. This study was conducted at Klinik Bumi Sehat to determine the differences in lower back pain intensity among third-trimester pregnant women before and after a prenatal yoga intervention. This study employed a pre-experimental method with a one-group pretest-posttest design. The study was conducted from March to April 2025. The intervention lasted 60 minutes per session, once a week for four consecutive weeks, at Klinik Bumi Sehat. The sample consisted of 20 respondents. The sampling technique used in this study was random sampling, in which every member of the population had an equal opportunity to be selected as a research participant. The analysis showed that the median intensity of lower back pain among third-trimester pregnant women before prenatal yoga was 6 (moderate pain), whereas after prenatal yoga, the median decreased to 3 (mild pain). The statistical test results showed a p-value of less than 0.001 ($p < 0.05$), indicating a significant difference in lower back pain intensity before and after prenatal yoga. Pregnant women are encouraged to practice prenatal yoga as an effort to help reduce lower back pain.

Keywords

Prenatal Yoga, Low Back Pain, Third-Trimester Pregnant Women, Pain Intensity, NRS Scale



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INTRODUCTION

Pregnancy is a physiological process accompanied by complex changes in a woman's body, both physically and psychologically. During pregnancy, physiological, hormonal, and psychological changes may cause various discomforts. One of the most common complaints experienced by pregnant women is lower back pain, particularly during the second and third trimesters (Handayani, 2026; Wahyuni et al., 2024). This complaint tends to increase with advancing gestational age as a result of biomechanical changes in the body (Ramadani & Mayangsarai, 2026; Nopiyantini et al., 2025). Increased body weight, changes in body posture, and a shift in the center of gravity during pregnancy increase the load on the spine and supporting muscles, thereby contributing to the occurrence of back pain (Handayani,

2026; Rahmawati et al., 2021).

Globally, back pain is one of the most common musculoskeletal problems experienced by pregnant women. A meta-analysis conducted by Salari et al. (2023) showed that back pain has a high prevalence during pregnancy, with approximately 50–70% of pregnant women experiencing this complaint. Although back pain is often considered a normal physiological condition, inadequately managed pain may result in limitations in daily activities, functional impairment, and even long-term disability. In Indonesia, several studies have also reported a relatively high prevalence of back pain among pregnant women, ranging from approximately 50–80%, with varying levels of severity from mild to severe and a tendency to increase during the third trimester (Handayani, 2026; Nopiyantini et al., 2025).

Back pain during pregnancy affects not only physical conditions but also the quality of life of pregnant women. The complaint may interfere with daily activities such as sitting, walking, self-care, and sexual intercourse (Arummega et al., 2022). Persistent pain may also disturb sleep quality and psychological well-being and may continue into the postpartum period (Pratiwi, 2021). Therefore, the management of back pain should be an important component of midwifery care, particularly during the third trimester when physical demands and postural changes become more pronounced. The management of back pain in pregnant women can involve both pharmacological and non-pharmacological approaches. Non-pharmacological approaches are increasingly considered because they are relatively safe, simple, have minimal side effects, and can be incorporated into efforts to improve maternal comfort without excessive medication use during pregnancy (Hairunnisyah, 2019). Several non-pharmacological interventions that may be used to reduce back pain in pregnant women include pregnancy exercise, *prenatal yoga*, acupuncture, and *prenatal massage* (Wahyuni, 2023).

One intervention that can be applied is *prenatal yoga*. *Prenatal yoga* is a modification of conventional yoga adapted to the physiological conditions of pregnant women through gentle, controlled, and safe movements. *Prenatal yoga* may provide several benefits, including promoting relaxation, reducing stress, improving blood circulation, increasing flexibility and muscle strength, and reducing discomfort during pregnancy. In addition to its physical benefits, *prenatal yoga* may also help prepare mothers psychologically for childbirth (Adnyani, 2020). Previous research has demonstrated a significant difference in back pain levels before and after *prenatal yoga* among pregnant women in the third trimester (Wahyuni, 2023). These findings indicate that *prenatal yoga* has the potential to serve as an alternative non-pharmacological intervention for managing back pain during pregnancy. The problem of back pain was also identified through a preliminary study conducted at Bumi Sehat Clinic. Interviews with 15 pregnant women in the third trimester showed that 13 participants experienced moderate to severe back pain. Persistent pain led some pregnant women to use analgesic medication. However, the use of analgesics during pregnancy may raise concerns regarding fetal safety and increase maternal anxiety. Such psychological conditions may subsequently influence pain perception and worsen the discomfort experienced by pregnant

women (Dewi, 2022; Pratiwi, 2021).

Bumi Sehat Clinic has attempted to manage back pain among pregnant women through non-pharmacological approaches, one of which is acupuncture therapy. However, based on the preliminary study, some pregnant women continued to experience back pain after receiving the therapy. This condition indicates the need for alternative non-pharmacological interventions that may help reduce pain while simultaneously providing physical and psychological benefits. *Prenatal yoga* is a relevant alternative because, in addition to addressing physical discomfort, it incorporates breathing exercises, relaxation, and body movements that may support maternal readiness for childbirth. Based on these conditions, research on the effect of *prenatal yoga* on back pain among third-trimester pregnant women is important, particularly at Bumi Sehat Clinic. This study aims to identify the level of back pain experienced by third-trimester pregnant women before and after *prenatal yoga* and to analyze the difference in pain levels before and after the intervention. The findings are expected to provide empirical evidence regarding the use of *prenatal yoga* as an alternative non-pharmacological intervention in midwifery care and to serve as a consideration for healthcare providers in delivering care that promotes maternal comfort and well-being in preparation for childbirth.

METHOD

This study employed a quantitative research approach using a pre-experimental design with a one-group pretest-posttest design. In this design, participants were assessed before and after the intervention to determine changes in lower back pain intensity following *prenatal yoga*. The study was conducted at Bumi Sehat Clinic from December 2025 to May 2026. The study population consisted of 50 third-trimester pregnant women who visited the clinic during December 2025. The unit of analysis was individual third-trimester pregnant women who participated in *prenatal yoga*. The sample consisted of pregnant women who met the inclusion criteria, namely those willing to participate, with a gestational age of 28–34 weeks, experiencing lower back pain, and able to communicate verbally. Women with visual or hearing impairments, hypertension, a history of antepartum hemorrhage, or preeclampsia were excluded. Participants who failed to attend subsequent *prenatal yoga* sessions or did not complete the study were considered dropouts. A total of 18 participants were included in the study, determined through power analysis based on a significance level of 0.05, statistical power of 0.80, and an expected Cohen's *d* effect size of 0.8. Random sampling was used to select participants from the eligible population.

Primary data were collected directly from the participants, particularly measurements of lower back pain intensity before and after the *prenatal yoga* intervention. Pain intensity was assessed using the Numeric Rating Scale (NRS), a 0–10 scale in which 0 indicates no pain, 1–3 mild pain, 4–6 moderate pain, and 7–10 severe pain. Prior to data collection, ethical approval was obtained from the Ethics Committee of Poltekkes Kemenkes Denpasar (No. DP.04.02/F.XXIV.26/263/2026, dated March 10, 2026), followed by research permission from the relevant authorities and Bumi Sehat Clinic. Participants who met the

eligibility criteria were informed about the study procedures and provided written informed consent. Before the intervention, participants underwent an initial assessment, including history taking, blood pressure measurement, fetal heart rate, and fetal movement assessment. Participants then received *prenatal yoga* once a week for four weeks, with each session lasting approximately 60 minutes. The intervention included *prenatal yoga* movements combined with core yoga movements intended to reduce lower back pain. Pain intensity was measured again using the NRS after the fourth intervention session as the posttest.

Data were processed through editing, coding, scoring, data entry, cleaning, and tabulation before statistical analysis. Descriptive analysis was used to describe participant characteristics and lower back pain intensity before and after the intervention. Because the sample consisted of fewer than 50 participants, the Shapiro–Wilk test was used to assess data normality. The normality test indicated that the data were not normally distributed ($p < 0.05$); therefore, the data were presented using the median and minimum–maximum values. To examine differences in lower back pain intensity before and after *prenatal yoga*, the Wilcoxon Signed-Rank Test was used because the pretest and posttest measurements were paired and the data were not normally distributed. Statistical significance was determined at $\alpha < 0.05$, with a p -value ≤ 0.05 interpreted as indicating a significant difference in lower back pain intensity before and after the *prenatal yoga* intervention. Ethical principles applied in the study included informed consent, anonymity, confidentiality, self-determination, beneficence, the right to full disclosure, fair treatment, and privacy.

RESULT AND DISCUSSION

Results

Lower Back Pain Intensity Before the Prenatal Yoga Intervention

The univariate analysis examined the lower back pain intensity of third-trimester pregnant women before and after the *prenatal yoga* intervention. The results of the pretest measurement are presented in Table 3.

Table 3. Lower Back Pain Intensity among Third-Trimester Pregnant Women Before Prenatal Yoga at Bumi Sehat Clinic in 2026

Pain Intensity	n	Median	Standard Deviation	Min	Max
Pretest	20	6	0.686	4	7

Based on Table 3, the median lower back pain intensity among third-trimester pregnant women at Bumi Sehat Clinic before the *prenatal yoga* intervention was 6 on the Numeric Rating Scale (NRS), with a minimum score of 4 and a maximum score of 7. These findings indicate that the participants generally experienced moderate levels of lower back pain before the intervention.

Lower Back Pain Intensity After the Prenatal Yoga Intervention

The measurement of lower back pain intensity after the *prenatal yoga* intervention is presented in Table 4.

Table 4. Lower Back Pain Intensity among Third-Trimester Pregnant Women After

Prenatal Yoga at Bumi Sehat Clinic in 2026

Pain Intensity	n	Median	Standard Deviation	Min	Max
Posttest	20	3	1.119	2	6

Table 4 shows that after the *prenatal yoga* intervention, the median lower back pain intensity decreased to 3, with a minimum score of 2 and a maximum score of 6. This finding indicates that the participants experienced a decrease in pain intensity, with the overall level shifting from moderate pain before the intervention to mild pain after the intervention.

Data Analysis

Before conducting the inferential statistical analysis, a normality test was performed using the Shapiro–Wilk test because the number of participants was fewer than 50. The results are presented in Table 5.

Table 5. Results of the Shapiro–Wilk Normality Test

No.	Variable	n	Median	Standard Deviation	Shapiro–Wilk Statistic (W)	p-value	Min	Max
1	Pain (Pretest)	20	6	0.686	0.829	0.002	4	7
2	Pain (Posttest)	20	3	1.119	0.778	<0.001	2	6

The Shapiro–Wilk test results showed that the pretest lower back pain data had a *p*-value of 0.002 ($p < 0.05$), while the posttest data had a *p*-value of <0.001 ($p < 0.05$). These results indicate that both the pretest and posttest data were not normally distributed. Therefore, a non-parametric statistical test was used to analyze the difference in pain intensity before and after the intervention. The Wilcoxon Signed-Rank Test was subsequently used because the pretest and posttest measurements were paired and the data did not meet the assumption of normality. The results are presented in Table 6.

Table 6. Results of the Wilcoxon Signed-Rank Test

Comparison	Rank	N	Mean Rank	Sum of Ranks	p-value
Posttest – Pretest	Negative Ranks	20 ^a	10.50	210.00	<0.001
	Positive Ranks	0 ^b	0.00	0.00	
	Ties	0 ^c			
	Total	20			

The Wilcoxon Signed-Rank Test produced a *p*-value of <0.001 ($p < 0.05$). This result demonstrates a statistically significant difference in lower back pain intensity among third-trimester pregnant women before and after the *prenatal yoga* intervention at Bumi Sehat Clinic.

Discussion

Lower Back Pain Intensity Before Prenatal Yoga

The findings showed that before the *prenatal yoga* intervention, the median lower back pain intensity among third-trimester pregnant women was 6, which falls within the

moderate pain category. The lowest pain score was 4, while the highest was 7. Participants experiencing moderate pain reported persistent discomfort that interfered with their daily activities and generally improved only when they slept or rested. Objectively, moderate pain could be reflected in responses such as moaning, grimacing, or expressions of discomfort. Nevertheless, the participants were still able to identify and describe the location and characteristics of their pain and follow instructions appropriately. Participants with mild pain generally experienced intermittent discomfort that occurred during particular activities and subsided when they rested or slept.

These findings are consistent with Syntiastutik and Purwanti (2025), who reported that moderate back pain was one of the main complaints experienced by pregnant women before participating in *prenatal yoga*. Similar findings were reported by Laura et al. (2022), who found that the average pain intensity before intervention was generally within the moderate-to-severe range, with average scores above 4 on the pain scale. Research conducted in Indonesia by Isma et al. (2025) also showed that the proportion of pregnant women experiencing moderate pain before *prenatal yoga* was relatively high compared with other pain categories, indicating a substantial level of discomfort during pregnancy. Other research has reported that pain intensity before non-pharmacological interventions such as *prenatal yoga* generally falls within the moderate-to-severe category (Klinik et al., 2026). These findings are also consistent with Nugroho's (2019) explanation that pregnancy-related back pain may occur due to hormonal influences that affect supporting tissues and connective structures, resulting in reduced muscle elasticity and flexibility. Mechanical factors, including changes in static posture and increased body load during pregnancy, may also contribute to stress on the spine.

Lower back pain during the third trimester may be caused by several factors, particularly changes in body posture, increased body weight, hormonal changes, and muscle fatigue. Biomechanical changes during pregnancy, such as the anterior displacement of the center of gravity and increased lumbar lordosis, may increase the load on the spine and contribute to lower back pain (Indrayani et al., 2025; Rahmawati et al., 2021). Increased maternal weight and uterine enlargement may also alter the body structure and cause muscle tension and discomfort in the lumbar region. In addition, inappropriate physical activities, including bending, lifting heavy objects, and maintaining incorrect sitting or standing positions, may aggravate back pain (Wahyuni et al., 2024; Nopiyantini et al., 2025). In the researchers' interpretation, the lower back pain experienced by pregnant women may be associated with uterine enlargement resulting from fetal growth, which contributes to increased lumbar lordosis. This condition places additional pressure on the maternal musculoskeletal system and may cause back pain. Increased maternal body weight may also contribute to back pain because the supporting muscles must work harder, potentially increasing stress on the joints.

Lower Back Pain Intensity After Prenatal Yoga

The results showed that following the *prenatal yoga* intervention, the median lower

back pain intensity decreased to 3, which falls within the mild pain category. The minimum pain score was 2 and the maximum was 6. Thus, the results demonstrate a decrease in the median pain intensity from the moderate category before the intervention to the mild category after the intervention. These findings are consistent with Isma et al. (2025), who found that following *prenatal yoga*, most pregnant women experienced a reduction in back pain intensity to the mild category. Their study demonstrated an increase in the proportion of participants experiencing mild pain after the intervention. Similarly, Rosita et al. (2022) reported that most participants who participated in *prenatal yoga* experienced pain scores of 1–3, corresponding to mild pain. The decrease in pain intensity may occur because *prenatal yoga* helps improve muscle flexibility and reduce tension in the back muscles during pregnancy (Vanisa & Windayanti, 2024).

According to Smeltzer and Bare (2020), back pain during pregnancy can be managed through both pharmacological and non-pharmacological approaches. One non-pharmacological approach is *prenatal yoga*, which is a modified form of conventional yoga adapted to the physiological condition of pregnant women. The intensity of the movements is adjusted to be slower and gentler to minimize the risk of injury and promote comfort and safety during practice (Apsari et al., 2022). *Prenatal yoga* is also categorized as a complementary therapy. Complementary therapies have received increasing attention in various countries because they are perceived as potentially economical and may provide alternatives to pharmacological treatment and its associated adverse effects (Hidayat, 2020).

Recent studies have shown that *prenatal yoga* can contribute to the physical and psychological well-being of pregnant women. Junita et al. (2024) reported that gentle prenatal yoga performed once a week for four weeks was able to reduce anxiety levels among third-trimester pregnant women. Other research has demonstrated that third-trimester pregnant women who participated in *prenatal yoga* experienced reduced back pain compared with their condition before the intervention. This effect may be associated with increased muscle flexibility, improved posture, and reduced tension in the back and pelvic muscles, allowing pregnant women to feel more relaxed and experience less discomfort (Purnamayanti & Utarini, 2020).

The researchers suggest that the reduction in lower back pain observed after *prenatal yoga* may be related to the duration and intensity of the exercises as well as the breathing techniques used during the intervention. Continuous and conscious breathing is an important component of *prenatal yoga* because it creates coordination between body movements and breathing. This integration distinguishes *prenatal yoga* from other forms of physical exercise, such as conventional pregnancy exercise (Aprilia, 2020). In this study, *prenatal yoga* was conducted once a week for four sessions. The movements included centering, *pranayama*, warming-up exercises, Tadasana, Tree Pose, Virabhadrasana II, Urdhva Hastasana, Table Pose, Cat-Cow Pose, Low Lunge, Downward-Facing Dog, Child's Pose, Butterfly Pose, Open Twist, Bridge Pose, and final relaxation. The combination of these movements and breathing techniques may contribute to relaxation and reduction of

musculoskeletal tension during pregnancy.

Difference in Lower Back Pain Intensity Before and After Prenatal Yoga

The Shapiro–Wilk normality test showed that both the pretest and posttest data were not normally distributed, with p -values below 0.05. Therefore, the data were considered non-parametric and the Wilcoxon Signed-Rank Test was used to examine differences in lower back pain intensity before and after the intervention. The analysis produced a p -value of <0.001 ($p < 0.05$), indicating a statistically significant difference in lower back pain intensity before and after *prenatal yoga* among third-trimester pregnant women. The reduction in lower back pain can be explained physiologically by the components of *prenatal yoga*, which combine stretching, muscle strengthening, breathing techniques, and relaxation. These components may reduce tension in the lower back muscles, improve posture, increase flexibility, and enhance blood circulation, thereby reducing pain. In addition, deep breathing techniques used in yoga may reduce sympathetic nervous system activity and promote the release of endorphins, which function as natural analgesics.

The findings are consistent with Wariyah and Khairiah (2023), who found that *prenatal yoga* was effective in reducing back pain among third-trimester pregnant women, with statistically significant results ($p < 0.05$). Sari et al. (2022) also reported that pregnant women who participated in yoga experienced a greater reduction in pain than those in the control group. Putri et al. (2021) found that *prenatal yoga* could improve muscle flexibility and reduce musculoskeletal tension among pregnant women. Similarly, Purnamayanti and Utarini (2020) reported a significant reduction in back pain intensity following *prenatal yoga* among third-trimester pregnant women. Nopiyantini et al. (2025) further demonstrated that *prenatal yoga* produced significant muscle-relaxation effects and improved maternal comfort during pregnancy.

International research by Field (2020) also reported that yoga during pregnancy may reduce back pain and stress and improve sleep quality through neuroendocrine regulation and reductions in cortisol levels. These findings support the view that the effects of *prenatal yoga* are not limited to physical aspects but may also contribute to psychological well-being. Overall, the present findings indicate that *prenatal yoga* may be an effective complementary non-pharmacological intervention for reducing lower back pain among third-trimester pregnant women.

Study Limitations

This study has several limitations. First, the researchers could not fully control the participants' daily activities outside the *prenatal yoga* sessions, including household activities, physical activity, and body posture during daily routines. These factors may have influenced the intensity of lower back pain experienced by the participants. Second, the limited number of respondents may have reduced the statistical power of the study, meaning that the findings may have limited generalizability to a broader population.

CONCLUSION

Based on the results of the study on differences in lower back pain among third-

trimester pregnant women before and after *prenatal yoga* at Bumi Sehat Clinic, it can be concluded that the median lower back pain intensity before the intervention was 6, while after the *prenatal yoga* intervention, the median pain intensity decreased to 3. The Wilcoxon Signed-Rank Test showed a *p*-value of <0.001 ($p < 0.05$), indicating a statistically significant difference in lower back pain intensity before and after the *prenatal yoga* intervention. These findings demonstrate that *prenatal yoga* can be considered a non-pharmacological intervention that may help reduce lower back pain among third-trimester pregnant women.

Bumi Sehat Clinic is expected to maintain and further develop its *prenatal yoga* program as part of antenatal care (ANC), including improvements in scheduling, movement variations, and healthcare professional assistance. Third-trimester pregnant women are encouraged to participate regularly in *prenatal yoga*, maintain proper body posture, avoid excessive physical activity, and apply the breathing and relaxation techniques learned during the sessions. Midwives are expected to strengthen education and provide safe demonstrations of *prenatal yoga* movements while encouraging pregnant women to practice regularly and continuously. Future researchers are encouraged to conduct studies involving larger sample sizes, control groups, and longer intervention periods and to examine other outcomes, such as sleep quality, anxiety levels, and maternal comfort, to obtain more comprehensive findings.

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