Effectiveness of Prenatal Gentle Yoga and Effleurage Massage in Low Back Pain Third Trimester Pregnant Women

Yasi Anggasari[*1], Ika Mardiyanti[2], Ratna Ariesta Dwi Andriani[3], Nanik Handayani[4]

[1234]*Department of Midwifery, Faculty of Nursing and Midwifery, Universitas Nahdlatul Ulama Surabaya, 60237 Surabaya, East Java, Indonesia. Email: *yasi@unusa.ac.id, ika_mardiyanti@unusa.ac.id, ratnariesta@unusa.ac.id, nanik_handayani@unusa.ac.id*

KEYWORDS

Effleurage, Prenatal Yoga, Low backpain

ABSTRACT

Background: Pregnant women often complain of low back pain, typically becoming more intense as pregnancy progresses due to changes in posture, such as increased lordosis and a shift in the center of gravity. If not addressed, this pain can negatively impact the quality of life by interfering with daily activities. However, Prenatal gentle yoga and effleurage massage are effective ways to avoid back pain. Objective: To examine how women in their third trimester of pregnancy might manage their lower back discomfort using effleurage massage and gentle yoga. Methods: In the quasi-experimental design of this research, selective sampling approaches are used. Additionally, a two-group pretest-posttest design is utilized, and there is no control group provided. The research was conducted in the PMB Ika Winoto area, and forty expectant mothers with back pain who were in the third trimester were among them. The Effleurage treatment consisted of a 30-minute massage session, with each movement performed for about 10 minutes, administered twice to each participant. Prenatal yoga sessions were also conducted twice a week, with each session lasting 60 minutes. A numerical rating scale, also known as the NRS, was used to assess the amount of back pain that the patient was experiencing). To fully examine the data, a Wilcoxon Signed Rank Test was used. Results: P-values for the Effleurage massage group and the Prenatal Gentle Yoga group were 0.000 and 0.005, respectively, according to the analysis findings. The average reduction in low back pain intensity was 9.86 for the Effleurage massage group and 6.87 for the Prenatal Gentle Yoga group. Conclusion: Both pregnancy gentle yoga and effleurage massage work well to relieve low back pain. Regarding how pregnant women who are still in the third trimester of their pregnancy should be treated for low back pain, the effleurage massage method works better than prenatal yoga. Therefore, for expectant mothers who are suffering from low back discomfort, these techniques represent effective alternative medicines that are simple to use and have few adverse effects.

1. Introduction

It is common for women to experience pain throughout the third trimester of pregnancy due to the bodily changes that occur during this time. Possible modifications may include sleeplessness, frequent urination, lower back discomfort, constipation, varicose veins, tiredness, leg muscle spasms, and ankle edema are some of the symptoms that may be experienced in the perineum. Low back pain is a prevalent issue among pregnant women, increasing lordosis and a change in the center of gravity, which usually become worse as gestational age increases. Low back pain may raise the likelihood of postpartum back pain, cause long-term problems, and contribute to chronic pain that is more difficult to manage if it is not treated right away. This can negatively affect the quality of life by disrupting daily physical activities (Rahmawan et al., 2023). An initial investigation conducted at PMB W Sidoarjo found that among forty women who were in their third trimester of pregnancy, 80% reported experiencing low back pain, while 20% reported frequent urination. The expanding uterus and developing baby lead to a forward shift in the body's center of gravity, resulting in lower back discomfort. The tension on the back's muscles and ligaments is the source of the pain. To keep their balance, pregnant women need to modify their posture, leading to increased curvature of the lower spine (lordosis) and shortening of the spinal muscles. Additionally, the pelvic joints (sacroiliac, sacrococcygeal, and pubic symphysis) expand in anticipation of delivery due to the pregnancy-related increase in the hormone relaxin [28]. This stretching increases the likelihood of discomfort by tensing the muscles in the thighs and back. The treatment of low back pain encompasses both pharmaceutical and complementary methods. Analgesics, steroids, muscle relaxants, NSAIDs, and antidepressants are examples of medical therapy (Mansouri, 2023).

Interventions that are not medical include transcutaneous electrical nerve stimulation (TENS), massage, yoga, traction, exercise, counseling, manual therapy, and orthotic devices. Using the palms of the hands, effleurage massage is a technique used on the sacrum or back region (Poornima & Surulinathi, (2019). Endorphins are naturally occurring compounds that increase relaxation both mentally and physically, improve blood circulation, apply pressure, and warm up the muscles in the abdomen. This technique encourages the release of endorphins. Exercise has the potential to reduce inflammation, strengthen the immune system, and control inflammatory mediators, according to Halim

et al. (2023). Exercise may help cure chronic low back pain (LBP) by lowering discomfort, enhancing function, and minimizing recovery time, according to research. Exercises including personalized strengthening and stretching under close supervision are the most successful when done as prescribed. Exercises of this kind are essential for managing LBP. Prenatal yoga, designed specifically for pregnant women, involves simpler and more accessible movements compared to traditional yoga, tailored to accommodate the conditions of pregnancy. Regular and intensive practice of prenatal yoga can enhance awareness among pregnant women.

2. Methodology

Materials

In the PMB Ika Winoto area, 40 pregnant women in their third trimester who were having low back discomfort participated in this research. The independent variables are Effleurage massage and Prenatal Gentle Yoga, while the dependent variable is the severity of these women's lower back pain. Research is being done on the possible benefits of effleurage massage and the reduction of low back pain in pregnant women in their third trimester via the use of prenatal gentle yoga.

Data collection procedures

Using a two-group pretest-posttest methodology and no control group, this research used a quasi-experimental design. Through purposive sampling, participants were chosen by predetermined inclusion criteria: the subject must be a pregnant woman in her 28th to 36th week experiencing low back pain, willing to undergo the prescribed therapies by signing informed consent, with normal blood pressure ranging from 90/80 mmHg to 120/80 mmHg, and have a physiological pregnancy. In summary, the data collection process was organized as follows: Subjects were divided into two interventions groups one for Effleurage massage and one for Prenatal Gentle Yoga. The Effleurage massage was administered for 30 minutes, every subject had two sessions of each exercise, lasting around ten minutes each. First, a preliminary assessment was conducted to measure the intensity of the lower back pain. The Prenatal Gentle Yoga sessions were conducted twice a week, with each session lasting 60 minutes. Researchers accompanied participants twice a week for both prenatal yoga and Effleurage massage sessions. Participants were provided with guidelines for both practices. After the final session, to determine how severe the low back pain was, a reevaluation was done. The Numeric Rating Scale (NRS) was used to assess the degree of low back pain severity. The following is a scale used to classify pain levels: Within the range of the scale, a score of 1 to 3 indicates minimal pain, a score of 4 to 6 indicates moderate pain and a score of 7 to 10 indicates severe pain. The following characteristics apply to each degree of pain: neither pain (as reported by the client), just slight pain (as reported by the client), moderate pain (the client may show signs of discomfort, can locate and describe the pain, and can follow instructions), and severe pain (the client may struggle to follow instructions, can pinpoint the pain location but cannot describe it, and does not find relief through position changes, deep breaths, or distraction).

Data analysis

This research used the Wilcoxon Signed Rank Test to assess the impact of interventions on the variability of third-trimester low back pain levels among pregnant women, both before and after treatment. SPSS will be used to examine all of the data that has been gathered.

3. Results and discussion

Table 1. Characteristics of respondents

Characteristics of Respondents	**Massage Effleurage**		**Prenatal Yoga**	
	(F)	**(%)**	**(F)**	**(%)**
Age				
20-35 years (Healthy reproduction)	18	90	17	85
>35 years	2	10	3	15

(Reproduction at risk)				
Total	**20**	**100**	**20**	**100**
IMT				
Normal	6	30	9	45
overweight	14	70	11	55
obesity	0	0		
Total	**20**	**100**	**20**	**100**
Parity				
Primigravida	5	25	9	45
Multigravida	15	75	11	55
Total	**20**	**100**	**20**	**100**

Nearly all the participants in the Prenatal Gentle Yoga and Effleurage massage groups were between the ages of 20 and 35, according to Table 1. Additionally, most participants in both groups were classified as overweight based on their BMI, and the majority were multiparous.

Table 2: Pre- and Post-Test Low Backpain Massage Therapy Distribution in PMB Winoto Ika

No	Category	Intensity of Low Backpain Pre-Massage Effleurage	%	Intensity of Low Backpain Post-Massage Effleurage	%
1	Mild	5	25	16	80
2	Moderate	11	55	4	20
3	Severe	4	20	0	0
	Total	20	100	20	100

Source: Primary Data, 2023

According to the table, among the 20 respondents who had lower back pain prior to the majority (55%) of those getting an effleurage massage were categorized as experiencing moderate pain. After receiving the treatment, nearly all respondents (80%) were categorized as having mild pain.

Table 3. Distribution of Gentle Prenatal Yoga Treatment with Low Backpain Intensity Before and After Tests in PMB Winoto Ika

No.	Category	Nausea Vomiting *Pre-Prenatal* Gentle Yoga	%	Intensity of Nausea Vomiting *Post-* Prenatal Gentle Yoga	%
1	Mild	4	20	11	55
2	Moderate	13	65	9	45
3	Severe	3	15	0	0
	Total	20	100	20	100

Source: Primary Data, 2023

According to the table, the majority of responders (65%) with lower back pain out of 20 who had Prenatal Gentle Yoga therapy were classified as having moderate discomfort. After undergoing the Prenatal Gentle Yoga treatment, most respondents (55%) were categorized as experiencing mild pain.

Table 4. Disparities between PMB Ika Winoto's low back pain severity before and after massage therapy

massage effleurage	n	Mean	mean change	SD	SE	P value
Pre	20	2.80	1.27	0,532	0.161	0,000
Post	20	1.53		0.426	0.123	

Source: Primary Data, 2023

The following table provides an illustration of the normal level of back pain that a person has both before and after having an Effleurage massage. The mean intensity decreased from 2.80 before the treatment to 1.53 after the treatment, given the predefined significance level of 0.05, the p-value of 0.00 indicates that it is less. Effleurage massage has a notable impact in diminishing the severity of

low back pain.

Table 5: Differences in the intensity of low back pain among expectant mothers with PMB like Winoto before and after doing mild yoga

Prenatal Gentle Yoga	n	mean	mean Perub	SD	SE	P value
Pre	20	3.65		.521	0.15	0,005
Post	20	3.03	0.62	.710	0.22	

Source: Primary Data 2023

The table demonstrates that the average intensity of low back pain decreased from 3.65 before the Prenatal Gentle Yoga treatment to 3.03 after the treatment, the p-value of 0.005 is statistically significant since it is below the predetermined significance threshold of 0.05. The results suggest that participating in gentle prenatal yoga movements has a significant effect on reducing the severity of lower back pain.

Table 6. The impact of gentle yoga poses and massage techniques on the severity of low back pain in pregnant women Winoto Ika

Group	n	Pre		Post		mean	p-value
		mean	SD	mean	SD	Rank	
massage effleurage	20	21.33	0,532	19.21	0.426	9.86	0,000
Prenatal Gentle Yoga	20	17.83	.521	13.17	.710	6,87	0,025

Source: Primary Data 2023

The table shows that Effleurage massage therapy and Prenatal Gentle Yoga had different mean ratings (Gökhan et al., 2023). Compared to the Prenatal Gentle Yoga group (6.87), the Effleurage massage group's mean rank (9.86) is higher, indicating a better decrease in the severity of low back discomfort. This suggests that massage with effleurage is more efficient than Prenatal Gentle Yoga in alleviating low back pain. Pregnant women in their third trimester often experience lower back discomfort extending from the last thoracic vertebra (T12) to the first sacral vertebra (S1). This pain arises because the body's center of gravity shifts forward, placing additional weight on the pelvis, which causes it to tilt forward and increases the curvature of the lower back. According to Table 1, in the Effleurage massage group (70%) and the Prenatal Gentle Yoga group (55%), a considerable portion of participants had a BMI that was overweight. This higher body weight puts more pressure on the muscles and joints and increases muscular tension. This aligns with Gharaibeh's 2018 study, discovered that having a high BMI is a statistically significant risk factor for having back pain symptoms during pregnancy. The study was named "Prevalence of Low Back Pain in Pregnant Women and Associated Risk Factors". In both the Prenatal Gentle Yoga group (85%) and the Effleurage massage group (90%) almost all of the participants were in the 20–35 age range. According to Sukksi, low back pain typically starts in pregnant women between the ages of 20 and 24 and tends to peak after the age of 40.

Parity can contribute to low back pain, as indicated by Table 1, which shows that most respondents are multigravidas. Researchers have noted that women who are multigravida or grandemulti are at more likely than primigravidas to have back pain. This increased risk is due to weaker abdominal muscles, which fail to adequately support the expanding uterus, leading to increased inward arching of the back. The study that Fiana conducted in 2022, on the other hand, discovered that the back pain pregnant women suffer is unrelated to their parity. Pregnant women with low back discomfort might benefit from non-pharmacological approaches such as effleurage massage and prenatal gentle yoga. For instance, among 20 respondents, most (55%) were categorized as having moderate pain before receiving Effleurage massage treatment. After the treatment, nearly all respondents reported mild pain (80%). The Wilcoxon Signed Rank Test results shown in Table 4 indicate a p-value of 0.00, which is less than 0.05, proving the substantial influence of Effleurage massage on the severity of low back

pain. The average pain level decreased from 2.80 before to the therapy to 1.53 after the Effleurage massage, indicating a significant change in average pain intensity between the two periods. This finding aligns with Yunizar's 2021 study titled "Effect of Effleurage Massage on Lower Back Pain Intensity in Third Trimester Pregnant Women." Additionally, Wulandari's study provides evidence that Effleurage massage is useful in diminishing the intensity of back discomfort in pregnant women during the third trimester. There are opiate receptors in the brain and spinal cord, which is the theory behind the Endogenous Opiate Theory, which suggests that naturally occurring compounds that resemble morphine, lends credence to this study, such as endorphins and enkephalins, in response to pain. Peripheral sensory nerve terminals contain these endogenous opiates, which may be activated by skin stimulation via massage and other methods. Setiawati noted that Effleurage massage stimulates tactile fibers in the skin, sending signals through A-delta fibers that transmit pain rapidly. This process helps to close the pain gates, preventing the cerebral cortex from receiving pain signals and thereby reducing pain intensity. Among the participants in the Prenatal Gentle Yoga group, the majority (65%) of the 20 responders who had lower back discomfort before the yoga sessions were classified as experiencing moderate pain. The majority (55%) experienced only a little pain after the Prenatal Gentle Yoga session. Prenatal Gentle Yoga considerably reduces the severity of low back pain, as shown by the Wilcoxon Signed Rank Test, which produced a p-value of 0.005, which is less than 0.05.

The average pain intensity decreased from a mean of 3.65 before the yoga sessions to 3.03 afterward. This is consistent with earlier studies that indicate yoga can alleviate lower back pain in pregnant women during the third trimester. Rahmawati found that practicing yoga for 45-60 minutes, 1-2 times a week, positively impacts the decrease of pregnant women's lower back discomfort. A further factor that contributes to the reduction of lower back pain is the frequency of yoga practice, according to a 2017 article published in the official, with the study involving yoga sessions twice a week over a period of 3 weeks. Regular practice of prenatal yoga can condition muscles, strengthen bones, enhance joint flexibility, and stimulate the release of endorphins, leading to a sense of well-being that promotes physical, mental, and spiritual health. Holden et al. reported that their research successfully developed, implemented, and shown the safety and efficacy of prenatal yoga by testing a customized program for treating back pain during pregnancy. Similarly, patricia's 2017 research discovered that yoga-based treatments and physical exercise may benefit pregnant women with low back discomfort.

In comparison to the Prenatal Gentle Yoga group, the group that received massage effleurage had a higher mean rank (9.86) than the group that received Yoga (6.87) when the mean differences in low back pain intensity between the two groups are evaluated using analysis. This suggests that the severity of low back pain may be reduced more effectively with massage effleurage, suggesting that it has a greater impact than Prenatal Gentle Yoga in alleviating low back pain in pregnant women during the third trimester. A 2019 Fitriana research discovered that exercise massaging relieves back pain in pregnant women in their third trimester more effectively than deep breathing exercises. For non-pharmacological treatment of low back discomfort during pregnancy, effleurage massage and moderate yoga are advised. Handayani et al. (2018) highlight that effleurage massage not only promotes relaxation and has a sedative effect but also helps calm nerves, simple tension headaches, lower stress and tension, and avoid restlessness. Additionally, enhance blood circulation, boost lymph flow, warm the body, activate the central nervous system, help eliminate waste and toxins, and promote healthy skin with effleurage massage. Effleurage Massage has benefits over aromatherapy in that it involves physical touch, which can enhance the mother's comfort, is accessible to everyone, and does not require any special equipment or cost. In contrast, Prenatal Gentle Yoga, while also beneficial, requires equipment and cannot be practiced independently as it necessitates guidance from a trained instructor.

4. Conclusion and future scope

Pregnant women who have lower back pain may reduce its intensity with exercise massaging and mild prenatal yoga. In the third trimester of pregnancy, exercise massaging is superior to prenatal yoga in terms of helping pregnant women with back pain. Consequently, these two methods serve as practical

alternative therapies with minimal side effects for managing low back pain in pregnant women.

Acknowledgment
The University of Nahdlatul Ulama Surabaya has been a great assistance to the writers throughout this study, for which they are thankful.

Ethical approval
The Chakra Brahmanda Lentera Institution's ethics committee has sent a letter to the research procedure with decision number No.090/010/VII/EC/KEP/LCBL/2023.

Conflict of interest
The study's authors disclose that they have no conflicts of interest

References

[1] Bobak D. Textbook of Maternity Nursing. 4th ed. Jakarta: EGC; 2012. katonis. Pregnancy-related low back pain. Hippokratia. 2011;15(3):205–10.
[2] Yunizar A, Yansartika, Susilawati E, Wati Fajar M. The Effect Of Effleurage Massage On The Pain IntensityOf Lower Back In Pregnant Women Of Third Trimester. Fem J Kebidanan. 2021;1(1):25–9.
[3] Pratignyo T. Yoga for Pregnant Women. Jakarta; 2014.
[4] Uzlifatin Y, Andriana RAM, Wardhani IL, Subadi I, Sugianto P, Melaniani S. The impact of transcutaneous auricular vagus nerve stimulation on C-reactive protein in patients with chronic low back pain. Bali Med J. 2023;12(1):477–82.
[5] Gökhan, N. U. R., BARIŞ, B. N., Levent, B., SAZAKLIOĞLU, B. S., & Elvan, A. K. (2023). BUSER Transcutaneous Electric Nerve Stimulator Device Design. Natural and Engineering Sciences, 8(1), 18-30.
[6] Halim MJE, Subadi I, Pawana IPA, Arfianti L, Satyawati R, Melaniani S. The effect of added Transcutaneous Vagus Nerve Stimulation (tVNS) on quality of life in patients with chronic low back pain: a randomized controlled trial study. Bali Med J. 2023;12(1):1069–74.
[7] Rejeki ST, Fitriani Y. The Influence of Prenatal Yoga on Back Pain in Trimedter II and III Pregnant Women D I L IA A ZZAHRA M OM & B ABY. J Midwifery. 2019;3(2):67–72.
[8] Sugianti T, Obstetrics Wiyata Mitra Husada Nganjuk A. Combination of Provision of Compresses and Relaxation of Fingers in Labor Pain i n f o a r t i k e l. J Midwifery. 2020;9(1):7–12.
[9] Indria GA, Retnowati M. The Effectiveness of Effleurage Massage and Petrissage Massage in Third Trimester Pregnant Women with Low Back Pain. J Midwife Prada. 2022;13(2):51–9.
[10] Rahmawan, S., Tandiyo, R., Sugiharto & Heny, S. (2023). Software Development Tools with Android Base for Skills Data Collection in Physical Education. Journal of Internet Services and Information Security, 13(1), 22-33.
[11] Gozali W, Astini NAD, Permadi MR. Intervention of Back Pain in Pregnant Women in the village of Pengalatan. Int J Nat Sci Eng. 2020;4(3):134–9.
[12] Tyastuti S. Midwifery Care for Pregnancy. Jakarta: RI Ministry of Health; 2016.
[13] Gharaibeh A, A AW, E Q, Khadrawi M, A AS, Y Q. Prevalence of Low Back Pain in Pregnant Women and the Associated Risk Factors Journal of Orthopedics & Bone Disorders. Ncbi [Internet]. 2018;1–7. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3306025/
[14] Sukeksi NT, Kostania G, Suryani E. The Effect of Acupressure Techniques on Back Pain in Pregnant Women at the Jogonalan I Health Center in Klaten. J Midwifery and Traditional Health. 2018;3(1):1–7.
[15] Mansouri, S. (2023). Application of Neural Networks in the Medical Field. Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications, 14(1), 69-81.
[16] Fiana DN, Nisa K, Rahmayani F. Correlation of Pain Intensity with Pregnancy Parity in Pregnant Women Experiencing Lower Back Pain at Kedaton Health Center, Bandar Lampung. J Kedokt Unila. 2022;6:84–8.
[17] Wulandari Diah Ayu AY. Effectiveness Of Effleurage Massage To Reduce Back Pain In Trimester III Pregnant Women At RB Ci Semarang. J Health Science and Technology. 2019;10(1).
[18] Aryani Y, Masrul M, Evareny L. The Effect of Back Massage on Pain Intensity During the I Latent Phase of Normal Labor through Increasing Endorphin Levels. J Health Andalas. 2015;4(1):70–7.
[19] Setiawati I. The Effectiveness of Effleurage Massage Techniques and Relaxation Techniques for Back Pain in Third Trimester Pregnant Women. Seminar Pros of Nas Poltekkes by Husada Yogyakarta [Internet]. 2019;2. Available from: http://jurnal.poltekkeskhjogja.ac.id/index.php/PSN/article/view/351
[20] Poornima, A., & Surulinathi, M. (2019). Yoga Research Output in India: A Scientometric Study. Indian Journal of Information Sources and Services, 9(2), 85–90.
[21] Mu'alimah M. The Effect of Prenatal Yoga on Back Pain in Trimester III Pregnant Women the Effect of Prenatal Yoga on Back Pain in Third Trimester of Pregnant Women i n f o a r t i k e l Abstract. J Midwifery. 2021;10(1):12–6.
[22] Rahmawati NA, Ma'arij R, Yulianti A, Rahim AF, Marufa SA. Prenatal Yoga Effectively Reduces Lower Back Pain in Pregnant Women. Physiother Heal Sci. 2021;3(1):18–21.
[23] DC Official, Saputro SH, Runjati. The Effect of Yoga on Lower Back Pain in Third Trimester Pregnant Women at

the Kalikajar I Health Center, Wonosobo Regency. J Health Sciences. 2017;8(1):1–10.
[24] Holden SC, Manor B, Zhou J, Zera C, Davis RB, Yeh GY. Prenatal Yoga for Back Pain, Balance, and Maternal Wellness: A Randomized, Controlled Pilot Study. Glob Adv Heal Med. 2019;8:1–11.
[25] Patricia Anne Kinser, Jena Pauli, Nancy Jallo, Mary Shall, Kailee Karst, Michelle Hoekstra AS. Physical Activity and Yoga-Based Approaches for Pregnancy-Related Low Back and Pelvic Pain. J Obstet Gynecol Neonatal Nurs. 2017;46(3):334–46.
[26] Fitriana LB, Vidayanti V. The Effect of Effleurage Massage and Deep Breathing Relaxation on Back Pain in Trimester III Pregnant Women. Mother Edu-Midwifery J. 2019;1–6.
[27] Handayani. Comparison of the Effects of Rose Aromatherapy and Effleurage Massage on Labor Pain During the Active Phase I. J Bidan "Midwife Journal." 2018;4(02):66–72.
[28] Jothiaruna, N. (2022). SSDMNV2-FPN: A cardiac disorder classification from 12 lead ECG images using deep neural network. *Microprocessors and Microsystems*, *93*, 104627. https://doi.org/10.1016/j.micpro.2022.104627