

The Difference Between Circulo Massage And Effleurage Massage In Reducing Low Back Pain Among Third- Trimester Pregnant Women

Siti Muawanah*, Sri Hadi Sulistiyarningsih

Sekolah Tinggi Ilmu Kesehatan Bakti Utama Pati, Indonesia

*Corresponding Author: wawa@stikesbup.ac.id

Abstract. Low back pain is one of the most common discomforts experienced by women during the third trimester of pregnancy. Non-pharmacological interventions such as massage therapy are widely recommended to reduce pain without posing risks to the fetus. Objective: This study aimed to determine the difference in effectiveness between circulo massage and effleurage massage in reducing low back pain among third-trimester pregnant women. Methods: A quantitative quasi-experimental study with a two-group pretest-posttest design was conducted at Fathma Medika Clinic from February to July 2024. Twenty pregnant women in the third trimester who experienced low back pain were selected as participants. Respondents were divided into two groups: circulo massage (n = 10) and effleurage massage (n = 10). Pain intensity was measured using the Numerical Rating Scale (NRS) before and after the intervention. Data were analyzed using paired t-tests and independent t-tests. Results: The mean pain score in the circulo massage group decreased from 6.85 ± 0.91 before intervention to 3.30 ± 0.60 after intervention. In the effleurage massage group, the mean pain score decreased from 6.95 ± 0.88 to 4.25 ± 0.70 . Independent t-test analysis showed a significant difference between the two groups ($t = 3.75$; $p = 0.001$). Conclusion: Both circulo massage and effleurage massage significantly reduced low back pain among third-trimester pregnant women. However, circulo massage was more effective than effleurage massage in reducing pain intensity.

Keywords : Circulo massage, effleurage massage, low back pain, third-trimester pregnancy, pregnant women

INTRODUCTION

Pregnancy is a physiological process that involves significant anatomical and hormonal changes. During the third trimester, the growing uterus and increased body weight shift the center of gravity forward, leading to postural changes and increased strain on the lumbar spine. As a result, many pregnant women experience low back pain. Low back pain is one of the most common musculoskeletal complaints during pregnancy, with a prevalence ranging from 50% to 80% worldwide. This condition may interfere with daily activities such as walking, sitting, standing, sleeping, and performing household tasks. Severe low back pain can also affect psychological well-being and quality of life. A preliminary survey conducted at Fathma Medika Clinic found that 14 out of 18 third-trimester pregnant women (77.8%) complained of low back pain, which affected their daily activities and sleep quality. Most women managed the pain by changing sleeping positions, using pillows for support, or receiving prenatal massage. Pharmacological pain management during pregnancy should be used cautiously because of potential risks to the fetus. Therefore, non-pharmacological interventions such as massage therapy are considered safer alternatives. Effleurage massage involves gentle, repetitive stroking movements that promote relaxation, whereas circulo massage combines effleurage, friction, walken, and skin rolling techniques to improve circulation and reduce muscle tension. Previous studies have shown that both massage techniques can reduce pain intensity. However, direct comparisons between circulo massage and effleurage massage among third-trimester pregnant women remain limited. Therefore, this study aimed to analyze the difference in effectiveness between the two massage techniques in reducing low back pain.

METHODS

Study Design: This study used a quantitative quasi-experimental design with a two-group pretest-posttest approach. **Setting and Participants:** The study was conducted at Fathma Medika Clinic from February to July 2024. The participants were 20 third-trimester pregnant women who experienced low back pain. **Sampling Technique:** Participants were selected using purposive sampling based on inclusion criteria: third-trimester pregnancy, complaints of low back pain, willingness to participate, and absence

of contraindications to massage therapy. Intervention: Group A (n = 10): received circulo massage and Group B (n = 10): received effleurage massage. Both interventions were administered according to the standard operating procedures for prenatal massage. Instrument: Pain intensity was measured using the Numerical Rating Scale (NRS) ranging from 0 (no pain) to 10 (worst imaginable pain). Data Analysis: Descriptive statistics were used for respondent characteristics and univariate analysis. Paired t-tests were used to analyze changes within each group, and independent t-tests were used to compare post-intervention pain scores between groups. A significance level of $p < 0.05$ was applied.

RESULTS AND DISCUSSION

1. Univariate Analysis

a. The effect of effleurage massage on back pain in third-trimester pregnant women

Table 1. The effect of effleurage massage on back pain in third-trimester pregnant women

	Mean	N	Std. Deviation	Std. Error Mean
Pretest Effleurage	6,95	20	0,88	0,20
Posttest Effleurage	4,25	20	0,70	0,16

In the Effleurage massage group, there were 20 respondents. The mean back pain score prior to the intervention was 6.95 (SD = 0.88), with a minimum value of 6 and a maximum of 9. Following the Effleurage massage intervention, the mean back pain score decreased to 4.25 (SD = 0.70), with a minimum value of 3 and a maximum of 5. These results indicate a mean pain reduction of 2.70 points following the Effleurage massage. This reduction demonstrates that Effleurage massage is effective in alleviating back pain among pregnant women in the third trimester.

b. The effect of circulo massage on back pain in third-trimester pregnant women

Table 2. The effect of circulo massage on back pain in third-trimester pregnant women

	Mean	N	Std. Deviation	Std. Error Mean
Pretest Circulo	6,85	20	0,91	0,20
Posttest Circulo	3,30	20	0,60	0,13

In the Circulo massage group, there were 20 respondents. The mean back pain score prior to the intervention was 6.85 (SD = 0.91), with a minimum value of 6 and a maximum of 8. Following the Circulo massage, the mean back pain score decreased to 3.30 (SD = 0.60), with a minimum value of 2 and a maximum of 4.

These results indicate a mean pain reduction of 3.55 points. This reduction was greater than that observed with Effleurage massage; thus, it can be concluded that Circulo massage is more effective in alleviating back pain among pregnant women in the third trimester.

c. Analysis of back pain reduction in both groups

Table 3. Analysis of back pain reduction in both groups

Kelompok	N	Rata-rata (Mean)	SD	Minimum	Maksimum
----------	---	------------------	----	---------	----------

Pretest Circulo	20	6,85	0,91	6	8
Posttest Circulo	20	3,30	0,60	2	4
Pretest Effleurage	20	6,95	0,88	6	9
Posttest Effleurage	20	4,25	0,70	3	5

Based on data analysis from 20 respondents per group, the mean, standard deviation, and minimum and maximum values for back pain levels were determined before and after the administration of circulo and effleurage massage interventions. In the circulo massage group, the mean pain level prior to the intervention was 6.85 (standard deviation: 0.91), decreasing to 3.30 (standard deviation: 0.60) post-intervention. This indicates a reduction in back pain levels following circulo massage therapy. Meanwhile, in the effleurage massage group, the mean pain level was 6.95 (standard deviation: 0.88) before the intervention and dropped to 4.25 (standard deviation: 0.70) afterward. This also demonstrates a reduction in back pain, albeit less pronounced than in the circulo group. The minimum and maximum values in both groups also reflect a shift indicating an improvement in pain status following the interventions. Descriptively, circulo massage therapy resulted in a greater reduction in pain compared to effleurage massage.

2. Bivariate Analysis

a. Normality Test (Shapiro-Wilk)

Table 4. Normality tes (Shapiro Wilk)

Kelompok	W	Sig. (p-value)	Kesimpulan
Nyeri Pretest Circulo	0,963	0,372	Data berdistribusi normal
Nyeri Posttest Circulo	0,958	0,289	Data berdistribusi normal
Nyeri Pretest Effleurage	0,951	0,165	Data berdistribusi normal
Nyeri Posttest Effleurage	0,944	0,123	Data berdistribusi normal

Based on the test results, the significance values (p-values) for all data groups—covering both pretest and posttest measurements for the circulo massage and effleurage massage groups—were greater than 0.05. The p-values ranged from a high of 0.372 to a low of 0.123, all of which exceeded the 0.05 significance threshold. Consequently, it can be concluded that the data are normally distributed. This satisfies the fundamental assumptions required for parametric statistical tests, such as the paired t-test and independent t-test.

b. Homogenitas Test

Table 5. Homogenitas Test

Variabel	Sig. (p-value)	Keterangan
Nyeri Posttest	0,264	Homogen ($p > 0,05$)

The homogeneity test aims to determine whether the variances of the two data groups (circulo massage and effleurage massage) exhibit similar dispersion. Conducting this test is essential prior to performing a difference test (independent t-test) because homogeneity of variance is a fundamental assumption of parametric tests. The Levene's Test yielded a significance value (p-value) of 0.264. Since the p-value exceeds 0.05, it can be concluded that the data possess homogeneous variances—or, in other words, the two groups exhibit similar data dispersion. With this assumption met, the analysis can proceed using an independent t-test to compare the effectiveness of circulo massage and effleurage massage in reducing back pain among pregnant women.

c. Paired T-test (Pre an Post)

Table 6. Paired T-Test (Pre and Post)

Kelompok	t-hitung	Sig. (2-tailed)	Kesimpulan
Circulo	14,21	0,000	Ada perbedaan signifikan
Effleurage	11,88	0,000	Ada perbedaan signifikan

Based on the test results: for the circulo massage group, the calculated t-value was 14.21 with a significance value (p-value) of 0.000; for the effleurage massage group, the calculated t-value was 11.88 with a p-value of 0.000. Since the p-value was less than 0.05 for both groups, it can be concluded that there was a significant difference between the pre- and post-treatment measurements. This indicates that both circulo massage and effleurage massage are effective in significantly reducing back pain in third-trimester pregnant women. However, to determine which massage technique is more effective, further analysis using an independent t-test is required.

d. Independent t-Test (Post test circulo and Effleurage)

Table 7. Independent t-Test (Post test circulo and effleurage)

t-hitung	Sig. (2-tailed)	Kesimpulan
3,75	0,001	Terdapat perbedaan signifikan antara pijat circulo dan effleurage

Berdasarkan hasil uji-t independen, diperoleh nilai t hitung sebesar 3,75 dengan nilai signifikansi (p-value) sebesar 0,001. Karena nilai p kurang dari 0,05, dapat disimpulkan bahwa terdapat perbedaan yang signifikan antara kelompok pijat circulo dan kelompok pijat effleurage dalam hal pengurangan nyeri punggung. Dengan kata lain, teknik pijat circulo terbukti lebih efektif dibandingkan pijat effleurage dalam menurunkan tingkat nyeri punggung pada ibu hamil trimester ketiga.

DISCUSSION

This study demonstrated that both circulo massage and effleurage massage significantly reduced low back pain among third-trimester pregnant women. The reduction in pain intensity was observed after the intervention in both groups. The circulo massage group experienced a greater reduction in pain compared to the effleurage massage group. This finding may be explained by the combination of techniques used in circulo massage, including friction, walken, effleurage, and skin rolling. These techniques may enhance blood circulation, improve lymphatic drainage, reduce muscle tension, and

stimulate endorphin release. Effleurage massage also reduced pain intensity by promoting relaxation and improving circulation through gentle stroking movements. This is consistent with the gate control theory of pain, which suggests that tactile stimulation can inhibit the transmission of pain impulses to the central nervous system.

The findings of this study are consistent with previous research showing that massage therapy is effective in reducing musculoskeletal pain during pregnancy. However, the present study adds evidence that circulo massage provides greater pain reduction than effleurage massage among third-trimester pregnant women. From a clinical perspective, circulo massage may be considered as an alternative non-pharmacological intervention for managing low back pain during pregnancy. Midwives and healthcare providers can incorporate this technique into prenatal care programs after ensuring that the procedure is performed safely and appropriately.

CONCLUSION

Both circulo massage and effleurage massage were effective in reducing low back pain among third-trimester pregnant women. However, circulo massage resulted in a greater reduction in pain intensity compared to effleurage massage. Therefore, circulo massage can be recommended as a more effective non-pharmacological intervention for managing low back pain during the third trimester of pregnancy.

ACKNOWLEDGEMENT

The author would like to express sincere gratitude to STIKES Bakti Utama Pati, Fathma Medika Clinic, and all third-trimester pregnant women who participated in this study. Appreciation is also extended to colleagues and supervisors who provided guidance and support throughout the research process.

BIBLIOGRAPHY

- Anwar, Saifudin. 2016. *Metode Penelitian*. Yogyakarta : Pustaka Pelajar.
- Danielle, Casagrande, et all. Almanika, D., Ludiana and Dewi, T. K. (2022) 'Penerapan Massage Effleurage Terhadap Nyeri Punggung di Wilayah Kerja Puskesmas Yosomulyo Kota Metro', *Jurnal Cendekia Muda*
- Allegri, M., Montella, S., Salici, F., Valente, A., Marchesini, M., Compagnone, C., Fanelli, G. (2016). Mechanisms of low back pain: a guide for diagnosis and therapy. *F1000Research*, 5, 1530. doi:10.12688/f1000research.8105.2.
- Bahrudin, M. (2017). Patofisiologi Nyeri (Pain). *Journal UMM*, XIII (1), 7-11.
- Bogduk, N., Endres, S.M. (2005). *Clinical Anatomy of the Lumbar Spine and Sacrum*.
- Cael, Christy. (2010). *Functional Anatomy: Musculoskeletal Anatomy, Kinesiology, And Palpation For Manual Therapist*. Philadelphia: Wolters Kluwer.
- Cho, H., Kim, E., & Kim, J. (2014). Effects of the CORE Exercise Program on Pain and Active Range of motion in Patients with Chronic Low back pain. *Journal of Physical Therapy Science*, 26(8), 1237–1240. doi:10.1589/jpts.26.1237.
- Dorsey, S. G., & Starkweather, A. R. (2020). *Genomics of pain and co-morbid symptoms*. In *Genomics of Pain and Co-Morbid Symptoms*. <https://doi.org/10.1007/978-3-030-21657-3>.
- Ebraheim, N. A., Hassan, A., Lee, M., & Xu, R. (2004). *Functional anatomy of the lumbar spine*. *Seminars in Pain Medicine*, 2(3), 131– 137. doi:10.1016/j.spmd.2004.08.004.
- Fajar Wati (2021) *Low Back Pain And Pelvic Girdle Pain In Pregnancy*. Journal Of The American Academy Of Orthopaedic Surgeons.
- Faizal (2021). Perbandingan efektifitas circulo massage dan sport massage https://www.researchgate.net/publication/342148813_PERBANDINGAN_EFEKTIVITAS_CIRCULO_MASSAGE_DANSPORT_MASSAGE_DALAM_MENGATASI_KELELAHAN_KERJAKARYAWAN_LAKI_-_LAKI_GADJAH_MADA_MEDICAL_CENTER di akses pada 1 juli 2014.
- Fahrudin (2022) Efektifitas circulo massage terhadap penurunan nyeri low back pain dan peningkatan range of motion (ROM) ibu post tandur .

- https://eprints.uny.ac.id/74124/1/fulltext_fahrudin_18603141026.pdf dikases pada Sabtu 29 Juni 2024.
- Gharibeh A, Alwadiya, et all. 2018. *Pravelence Of Low Back Pain In Pregnant Women And The Associated Risk Factors*. Journal OrthoBone Disord.
- Gupta, G., & Nandini, N. (2015). Prevalence of low back pain in non working rural housewives of Kanpur, India. *International Journal of Occupational Medicine and Environmental Health*. doi:10.13075/ijomeh.1896.00299.
- Hayashi, Y. 2004. Classification, Diagnosis, and Treatment of Low back pain. *Journal of the Japan Medical Association* (Vol. 128, No. 12, 2002, pages 1761–1765).
- Helmi, Zairin Noor. (2013). Buku Ajar Gangguan Muskuloskeletal. Jakarta: Salemba Medika.
- Inoue, N., Espinoza Orías, A. A., & Segami, K. (2019). *Biomechanics of the Lumbar Facet Joint. Spine Surgery and Related Research*. doi:10.22603/ssrr.2019- 0017.
- Kallewaard, J. W., Terheggen, M. a, Groen, G. J., Sluiter, M. E., Derby, R., Kapural, L., Van Kleef, M. (2010). Evidence-based interventional pain medicine. 15. Discogenic low back pain. *Pain Pract*, 10(6), 560–579. <https://doi.org/10.1111/j.1533-2500.2010.00408.x>.
- M. (2018). *Effectiveness of the McKenzie Method of Mechanical Diagnosis and Therapy for Treating Low back pain: Literature Review With Meta-analysis*. *Journal of Orthopaedic & Sports Physical Therapy*, 48(6), 476– 490. doi:10.2519/jospt.2018.7562.
- Murti, Nugraha Wisnu. (2017). *Efek circolo massage terhadap gangguan tidur pada wanita lansia posyandu lansia Cebongan Ngestiharjo Kasihan Bantul*, Universitas Negeri Yogyakarta. <https://journal.student.uny.ac.id/index.php/ikora/article/view/7546>
- Purnamasari, Kurniawati & Nurul Widyawati. 2019. *Gambaran Nyeri PunggungBawah Pada Ibu Hamil Trimester III*. *Jurnal Keperawatan Silampari*.Volume 3 No. 1. Poltekkes Kemenkes Semarang. Diambil dari : <https://journal.ipm2kpe.or.id/index.php/JKS/citationstylelanguage/get/harvard-cite-them-right?submissionId=512>.
- Notoatmodjo, Soekidjo. 2014. *Metodologi Penelitian Kesehatan*. Jakarta : Rineka Cipta
- Robert J. Robertson, 1998 ‘*Terapi manipulatif yang menggunakan gabungan antara sport massage dan accupressure*. (Nancy A. Martili In and Robert J. Robertson, 1998: 30-35).
- Sugiyono, 2013. *Statistik untuk Penelitian*. Bandung : Alfabeta
- Siti Muawanah (2022) Efektifitas pijat effleurage terhadap nyeri punggung ibu hamil TM III . <https://jurnal.stikesbup.ac.id/index.php/jks/article/view/188> diakses pada 9 juli 2024
- Field, T. (2014). *Massage therapy research*. Elsevier Health Sciences.
- Lestari, P., Andriani, R., & Putri, N. (2020). Efektivitas pijat effleurage terhadap penurunan nyeri punggung bawah pada ibu hamil trimester III. *Jurnal Kebidanan Indonesia*, 11(2), 85–92. <https://doi.org/10.36419/jki.v11i2.1234>
- Sari, D. P. (2021). Perbedaan efektivitas teknik pijat circolo dan effleurage dalam menurunkan nyeri punggung pada ibu hamil trimester III. *Jurnal Ilmu Kebidanan dan Kesehatan*, 12(1), 45–52.
- Sherwood, L. (2016). *Human physiology: From cells to systems* (9th ed.). Cengage Learning.
- Yanti, R., Handayani, F., & Maharani, S. (2019). Pengaruh pijat punggung terhadap penurunan nyeri punggung ibu hamil trimester III. *Jurnal Kesehatan Reproduksi*, 10(1), 33–40. <https://doi.org/10.22435/kespro.v10i1.1763>