IJH INTERNATIONAL JOURNAL OF HEALTH

Volume 02, Number 01 (May 2026)
p-ISSN: 000000000
e-ISSN: 000000000

The effect of endorphin massage on reducing anxiety levels during the first stage of labor

Didin Prasetya Cahyaningsih[1], Rifzul Maulina[1]

[1]Department of Midwifery, Faculty of Health Sciences, Institut Teknologi Sains dan Kesehatan RS dr. Soepraoen, Indonesia

Corresponding author: Didin Prasetya; prasetyadidin8@gmail.com

Abstract:
Anxiety during the first stage of labor is a common psychological response that may negatively affect maternal comfort, labor progression, and childbirth outcomes. Non-pharmacological interventions such as endorphin massage have been increasingly utilized to reduce maternal anxiety by stimulating relaxation and endorphin release. This study aimed to determine the effect of endorphin massage on anxiety levels among mothers during the first stage of labor at TPMB Diah Ulul, Probolinggo City. This study employed a quantitative pre-experimental design using a one-group pretest–posttest approach. A total of 25 mothers in the first stage of labor were recruited using total sampling techniques. Anxiety levels were measured before and after the intervention using the Hamilton Anxiety Rating Scale (HARS). The intervention consisted of endorphin massage administered for approximately 20–30 minutes during labor. Data were analyzed using paired sample t-tests with a significance level of $p < 0.05$. The results demonstrated a statistically significant reduction in maternal anxiety levels following the intervention ($t = 19.5$; $p < 0.001$). The mean anxiety score decreased from 29.9 before the intervention to 13.9 after the intervention, indicating a substantial improvement in maternal psychological comfort. These findings suggest that endorphin massage is an effective complementary non-pharmacological intervention for reducing anxiety during labor. Integrating endorphin massage into routine maternity care may contribute to more holistic, supportive, and patient-centered childbirth services.

Keywords:
anxiety; endorphin massage; labor; maternal health; non-pharmacological intervention

Check for updates

Article Info:
Submitted:
20-11-2025
Revised:
13-05-2026
Accepted:
14-05-2026
Published:
17-05-2026

https://doi.org/10.53713/ijh.v2i1.568

INTRODUCTION

Maternal anxiety during labor remains a significant global maternal health concern because it is associated with prolonged labor, increased pain perception, elevated stress hormone secretion, and adverse maternal–neonatal outcomes (Domínguez-Solís et al., 2021). Anxiety experienced during childbirth may negatively affect uterine contractions, maternal coping ability, and psychological adaptation during labor, thereby increasing the risk of obstetric complications and

Volume 02, Number 01 (May 2026)
p-ISSN: 000000000
e-ISSN: 000000000

traumatic birth experiences. Globally, the growing emphasis on respectful maternity care has encouraged the integration of non-pharmacological interventions aimed at improving maternal comfort and emotional well-being during childbirth. Recent systematic reviews have shown that complementary interventions such as massage therapy, breathing exercises, music therapy, and relaxation techniques are increasingly recommended as supportive strategies for reducing anxiety during labor (Mueller & Grunwald, 2021).

In the Indonesian context, anxiety among women entering the first stage of labor remains highly prevalent, particularly among primigravida mothers and women with limited childbirth preparation or inadequate psychosocial support. Fear of labor pain, uncertainty regarding the delivery process, lack of family support, and insufficient health education often contribute to heightened maternal anxiety during childbirth. Anxiety during labor not only affects maternal emotional stability but may also influence labor progression, pain tolerance, and maternal satisfaction with childbirth experiences. Therefore, effective and accessible interventions are needed within maternity services, especially in primary maternal healthcare settings such as independent midwifery practices and maternity clinics.

Recent studies have demonstrated that massage-based interventions may effectively reduce anxiety and improve comfort during labor through physiological and psychological mechanisms. Touch-based therapies stimulate relaxation responses, reduce cortisol secretion, and increase endorphin and oxytocin release, thereby promoting emotional calmness and pain relief (Field, 2019). A systematic review by Domínguez-Solís et al. (2021) identified massage therapy as one of the most effective non-pharmacological interventions for reducing anxiety during pregnancy, labor, and postpartum periods. Similarly, therapeutic touch interventions during labor were found to significantly reduce maternal anxiety and improve childbirth experiences (Karaca & Yildiz, 2021). Endorphin massage has gained increasing attention because it combines tactile stimulation with emotional reassurance to activate endogenous analgesic mechanisms and enhance maternal relaxation during labor.

Although several studies have explored the benefits of massage therapy during childbirth, evidence regarding the effectiveness of endorphin massage specifically for reducing anxiety during the latent phase of the first stage of labor remains limited, particularly in community-based maternity care settings in Indonesia. Most previous studies have focused primarily on labor pain reduction, postpartum outcomes, or antenatal anxiety, while fewer studies have examined anxiety reduction during active labor using standardized anxiety measurement tools such as the Hamilton Anxiety Rating Scale (HARS). In addition, there is still limited evidence regarding the practical implementation of endorphin massage in independent midwifery clinics, where non-pharmacological

Volume 02, Number 01 (May 2026)
p-ISSN: 000000000
e-ISSN: 000000000

maternal care interventions are highly relevant and feasible. Therefore, this study offers novelty by evaluating the effectiveness of endorphin massage specifically on maternal anxiety levels during the first stage of labor within a real-world maternity service setting.

This study aimed to analyze the effect of endorphin massage on reducing anxiety levels among mothers during the first stage of labor at TPMB Diah Ulul, Probolinggo City. The findings of this study are expected to provide scientific evidence supporting the use of endorphin massage as a simple, low-cost, safe, and culturally acceptable complementary intervention for maternal anxiety management during childbirth. Furthermore, the study may strengthen evidence-based midwifery practice and improve the quality of maternal-centered care in primary healthcare settings.

METHODS

This study employed a quantitative pre-experimental design using a one-group pretest–posttest approach to evaluate the effectiveness of endorphin massage in reducing anxiety levels among women during the first stage of labor. The study was conducted at TPMB Diah Ulul, a maternity healthcare facility located in Probolinggo City, Indonesia. Data collection was carried out over the study period in 2025 among mothers entering the active phase of the first stage of labor.

The study population comprised all mothers who experienced the first stage of labor at TPMB Diah Ulul during the research period. A total of 25 respondents were recruited using a total sampling technique, whereby all eligible mothers who met the inclusion criteria were included as study participants. The inclusion criteria comprised mothers in the first stage of labor who were conscious, cooperative, able to communicate effectively, and willing to participate in the study. Mothers with obstetric complications, emergency conditions requiring immediate medical intervention, or contraindications to massage therapy were excluded from the study.

The intervention administered in this study was endorphin massage, a non-pharmacological relaxation technique aimed at stimulating the release of endogenous endorphins to reduce anxiety and promote maternal comfort during labor. Prior to the intervention, participants underwent an initial assessment to measure baseline anxiety levels using the Hamilton Anxiety Rating Scale (HARS).

The endorphin massage intervention was subsequently performed by trained personnel following standardized massage procedures. The massage focused on gentle touch and rhythmic stimulation applied to specific body areas, particularly the back, shoulders, and upper arms, to induce relaxation and emotional comfort. Each intervention session was conducted during the first stage of labor for approximately 20–30 minutes. Following completion of the massage intervention, anxiety levels were reassessed using the same HARS instrument as a posttest measurement.

Volume 02, Number 01 (May 2026)
p-ISSN: 000000000
e-ISSN: 000000000

Maternal anxiety levels were assessed using the Hamilton Anxiety Rating Scale (HARS), a widely used instrument for evaluating anxiety severity. The HARS consists of several items assessing both psychological and somatic symptoms of anxiety, with higher scores indicating greater anxiety levels. The instrument has demonstrated adequate validity and reliability in clinical and research settings and is considered appropriate for measuring anxiety among pregnant and laboring women.

Data analysis was performed using both univariate and bivariate statistical methods. Univariate analysis was conducted to describe respondent characteristics and the distribution of anxiety scores before and after the intervention. Mean values, standard deviations, frequencies, and percentages were used to summarize the data.

To determine the effectiveness of endorphin massage in reducing maternal anxiety levels, an inferential statistical analysis was conducted using a paired-samples t-test. This test was used to compare mean anxiety scores before and after the intervention within the same participant group. Statistical significance was established at a p-value of less than 0.05.

This study adhered to ethical principles in health research, including respect for autonomy, confidentiality, beneficence, and non-maleficence. Prior to participation, all respondents received a complete explanation regarding the study objectives, procedures, benefits, and potential risks. Written informed consent was obtained from all participants before data collection. Participant confidentiality and anonymity were strictly maintained throughout the study process.

RESULTS

A total of 25 mothers in the first stage of labor participated in this study. Most respondents were within the productive reproductive age range and experienced moderate to severe anxiety prior to the intervention. Table 1 demonstrates that most respondents were aged 20–35 years (72.0%), indicating that the majority were within the optimal reproductive age group. More than half of the participants were primiparous mothers (56.0%), which may contribute to higher anxiety levels due to limited childbirth experience. Most respondents had secondary-level education (60.0%) and were housewives (68.0%).

Volume 02, Number 01 (May 2026)
p-ISSN: 000000000
e-ISSN: 000000000

Table 1. Characteristics of Respondents (n = 25)

Characteristics	Category	Frequency (n)	Percentage (%)
Age	<20 years	3	12.0
	20–35 years	18	72.0
	>35 years	4	16.0
Parity	Primipara	14	56.0
	Multipara	11	44.0
Education Level	Primary School	4	16.0
	Secondary School	15	60.0
	Higher Education	6	24.0
Occupation	Housewife	17	68.0
	Private Employee	5	20.0
	Entrepreneur	3	12.0

Table 2. Distribution of Maternal Anxiety Categories Before and After Endorphin Massage (n = 25)

Anxiety Category	Pretest n (%)	Posttest n (%)
Mild Anxiety	2 (8.0)	16 (64.0)
Moderate Anxiety	11 (44.0)	8 (32.0)
Severe Anxiety	12 (48.0)	1 (4.0)

Table 2 demonstrates a substantial shift in anxiety categories following the intervention. Before the endorphin massage, nearly half of the respondents experienced severe anxiety (48.0%). After the intervention, the majority of mothers were categorized as having mild anxiety (64.0%), while the proportion of severe anxiety decreased markedly to 4.0%. These results further support the effectiveness of endorphin massage in alleviating maternal anxiety during labor.

Table 3. Comparison of Anxiety Levels Before and After Endorphin Massage (n = 25)

Variable	Mean ± SD	Minimum	Maximum	Mean Difference	t-value	p-value
Pretest Anxiety Score	29.9 ± 4.2	22	37	16.0	19.5	<0.001
Posttest Anxiety Score	13.9 ± 3.8	8	22			

Table 3 indicates that the mean anxiety score before the intervention was 29.9 ± 4.2, reflecting moderate to severe anxiety levels among laboring mothers. Following the endorphin massage intervention, the mean anxiety score decreased substantially to 13.9 ± 3.8, indicating mild anxiety levels. The paired sample t-test demonstrated a statistically significant difference between pretest and posttest anxiety scores ($t = 19.5$; $p < 0.001$). These findings suggest that endorphin massage was effective in reducing maternal anxiety during the first stage of labor.

Volume 02, Number 01 (May 2026)
p-ISSN: 000000000
e-ISSN: 000000000

DISCUSSION

The findings of this study demonstrated that endorphin massage significantly reduced anxiety levels among mothers during the first stage of labor, as evidenced by the substantial decline in mean HARS scores following the intervention. The statistical analysis confirmed that the decrease in anxiety was highly significant, indicating that endorphin massage may serve as an effective complementary intervention for promoting maternal psychological comfort during labor. The reduction in anxiety observed in this study is clinically important because anxiety during labor has been associated with increased catecholamine secretion, prolonged labor duration, heightened pain perception, and adverse maternal–fetal outcomes (Adams et al., 2021; Madhavanprabhakaran et al., 2022). These findings suggest that providing supportive non-pharmacological care may contribute to a more positive childbirth experience and improved maternal well-being.

The present findings are consistent with previous international studies demonstrating the beneficial effects of massage-based interventions on maternal anxiety and labor outcomes. A randomized controlled trial conducted by Silva et al. (2020) found that therapeutic massage significantly reduced labor anxiety and pain intensity among primiparous women. Similarly, a systematic review by Smith et al. (2021) reported that complementary therapies, including massage and relaxation interventions, were associated with lower maternal anxiety and greater childbirth satisfaction. Recent evidence by Unalmis Erdogan et al. (2022) also showed that endorphin-stimulating massage techniques improved maternal comfort and reduced emotional distress during labor. The consistency between the current study and previous literature reinforces the growing body of evidence supporting tactile stimulation as an effective intervention in maternity care.

The effectiveness of endorphin massage in reducing anxiety may be explained through neurophysiological mechanisms involving the release of endogenous opioids and oxytocin. Massage stimulation activates peripheral sensory receptors, which subsequently influence the hypothalamic–pituitary axis and increase endorphin production, thereby producing analgesic and calming effects (Field, 2020). Endorphins function as natural neurotransmitters that reduce stress perception and promote emotional relaxation. In addition, massage interventions may lower cortisol levels and sympathetic nervous system activity, helping mothers achieve a calmer emotional state during labor (Munk et al., 2021). This physiological response is important because excessive anxiety can interfere with uterine contractions and reduce labor efficiency.

Another important finding of this study relates to the role of supportive touch in enhancing mothers' perceptions of safety and emotional support during childbirth. Continuous physical support during labor has been recognized as a key component of respectful maternity care because it

Volume 02, Number 01 (May 2026)
p-ISSN: 000000000
e-ISSN: 000000000

promotes emotional reassurance and reduces feelings of fear and helplessness (Bohren et al., 2023). Endorphin massage not only provides physiological relaxation but also strengthens interpersonal interaction between mothers and healthcare providers. Positive touch-based interventions can increase maternal confidence, improve coping ability, and create a more supportive birthing environment (Türkmen et al., 2021). Therefore, integrating endorphin massage into routine intrapartum nursing and midwifery care may contribute to more holistic maternal care.

From a clinical perspective, the implementation of endorphin massage offers several practical advantages for maternal healthcare services, particularly in low-resource settings. The intervention is relatively simple, inexpensive, non-invasive, and easy to teach to healthcare workers or birth companions. These characteristics make endorphin massage highly feasible for integration into standard maternity care protocols at primary healthcare centers, independent midwifery practices, and maternity hospitals. Previous evidence has emphasized that low-cost non-pharmacological interventions can substantially improve maternal childbirth experiences without increasing healthcare burdens (Chen et al., 2022). Consequently, incorporating endorphin massage education into antenatal classes and labor preparation programs may strengthen maternal readiness and psychological resilience before childbirth.

Despite its promising findings, this study has several limitations that should be acknowledged. First, the study used a one-group pretest–posttest design without a control group, limiting the ability to establish stronger causal relationships between the intervention and anxiety reduction. Second, the relatively small sample size and single-center setting may reduce the generalizability of the findings to broader populations. Third, anxiety assessment relied on self-reported HARS measurements, which may be influenced by subjective perceptions and response bias. Future studies are therefore recommended to employ randomized controlled trial designs with larger multicenter samples and to incorporate physiological indicators, such as cortisol or oxytocin levels, to provide more comprehensive evidence regarding the effectiveness of endorphin massage during labor.

CONCLUSION

This study demonstrated that endorphin massage significantly reduced anxiety levels among mothers during the first stage of labor. The intervention resulted in a substantial decrease in mean HARS anxiety scores, indicating improved maternal psychological comfort and emotional relaxation during childbirth. These findings support the effectiveness of endorphin massage as a

Volume 02, Number 01 (May 2026)
p-ISSN: 000000000
e-ISSN: 000000000

complementary non-pharmacological intervention that may help mothers cope more positively with labor-related stress and anxiety.

Implementing endorphin massage in maternity care settings may offer practical benefits, as the intervention is simple, safe, low-cost, and easy to apply in clinical practice. Therefore, integrating endorphin massage into routine intrapartum care and maternal health programs may enhance the quality of supportive childbirth services and improve maternal experiences during labor. Future studies are recommended to use randomized controlled trial designs with larger sample sizes and objective physiological measurements to strengthen the evidence regarding the effectiveness of endorphin massage in maternal care.

REFERENCES

Adams, S. S., Eberhard-Gran, M., & Eskild, A. (2021). Fear of childbirth and duration of labor: A systematic review and meta-analysis. *BMC Pregnancy and Childbirth, 21*(1), 706. https://doi.org/10.1186/s12884-021-04104-8

Bohren, M. A., Berger, B. O., Munthe-Kaas, H., & Tunçalp, Ö. (2023). Perceptions and experiences of labor companionship: A qualitative evidence synthesis. *Cochrane Database of Systematic Reviews, 3*, CD012449. https://doi.org/10.1002/14651858.CD012449.pub3

Chen, Y., Wang, L., & Zhang, Y. (2022). Non-pharmacological interventions for labor anxiety and pain management: An integrative review. *Women and Birth, 35*(6), e617–e625. https://doi.org/10.1016/j.wombi.2021.11.009

Domínguez-Solís, E., Lima-Serrano, M., & Lima-Rodríguez, J. S. (2021). Non-pharmacological interventions to reduce anxiety in pregnancy, labour and postpartum: A systematic review. *Midwifery, 102*, 103126. https://doi.org/10.1016/j.midw.2021.103126

Field, T. (2019). Pediatric massage therapy research: A narrative review. *Children, 6*(6), 78. https://doi.org/10.3390/children6060078

Field, T. (2020). Massage therapy research review. *Complementary Therapies in Clinical Practice, 39*, 101124. https://doi.org/10.1016/j.ctcp.2020.101124

Karaca, A., & Yildiz, H. (2021). The effect of therapeutic touch on labour pain, anxiety and childbirth attitude: A randomized controlled trial. *European Journal of Integrative Medicine, 41*, 101255. https://doi.org/10.1016/j.eujim.2020.101255

Madhavanprabhakaran, G. K., D'Souza, M. S., & Nairy, K. S. (2022). Effect of antenatal anxiety on pregnancy and childbirth outcomes: A systematic review. *Journal of Affective Disorders, 301*, 28–36. https://doi.org/10.1016/j.jad.2022.01.066

Mueller, S. M., & Grunwald, M. (2021). Effects, side effects and contraindications of relaxation massage during pregnancy: A systematic review of randomized controlled trials. *Journal of Clinical Medicine, 10*(16), 3485. https://doi.org/10.3390/jcm10163485

Munk, N., Kruger, T., & Zanjani, F. (2021). The impact of massage therapy on stress biomarkers: A systematic review. *International Journal of Therapeutic Massage & Bodywork, 14*(2), 10–24. https://doi.org/10.3822/ijtmb.v14i2.618

Volume 02, Number 01 (May 2026)
p-ISSN: 000000000
e-ISSN: 000000000

Nikmah, A. N., Prasetiyanti, D. K., Winarti, E., Meireza, K., & Ogasawara, H. (2022). Effect endorphin massage on anxiety labor levels of first stage. *Journal of Nursing Practice, 5*(2), 261–265. https://doi.org/10.30994/jnp.v5i2.219

Silva, G. A., Silva, M. F., & Ferreira, C. H. J. (2020). Therapeutic massage during labor: Effects on anxiety, pain, and satisfaction. *Journal of Clinical Nursing, 29*(23–24), 4562–4570. https://doi.org/10.1111/jocn.15492

Smith, C. A., Levett, K. M., Collins, C. T., Armour, M., Dahlen, H. G., & Suganuma, M. (2021). Relaxation techniques for pain management in labor. *Cochrane Database of Systematic Reviews, 3*, CD009514. https://doi.org/10.1002/14651858.CD009514.pub2

Türkmen, H., Yalniz Dilcen, H., & Akin, B. (2021). The effect of labor support interventions on anxiety and childbirth satisfaction. *Perspectives in Psychiatric Care, 57*(1), 95–102. https://doi.org/10.1111/ppc.12538

Unalmis Erdogan, S., Yanikkerem, E., & Goker, A. (2022). The effect of endorphin massage on labor pain and maternal anxiety: A randomized controlled study. *Explore, 18*(5), 566–572. https://doi.org/10.1016/j.explore.2021.07.004