The Effectiveness of Endorphin Massage In Reducing Labor Pain During The Active Phase of The First Stage of Labor At Independent Midwifery Practice (PMB) E, Mustika Jaya, Bekasi (2025–2026)

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Abstract.
Excessive and prolonged labor pain can lead to anxiety, psychological distress, labor complications, and even maternal and neonatal mortality. Therefore, it is necessary to manage labor pain using non-pharmacological methods, such as endorphin massage. This study aims to determine the effectiveness of endorphin massage in reducing labor pain during the active phase of the first stage of labor among women giving birth at PMB E Mustika Jaya, Bekasi. This study employed a quasi-experimental method with a one-group pre-test/post-test design, involving a sample of 30 women in the first stage of labor. The Numeric Rating Scale (NRS) was used to measure pain intensity before and after endorphin massage. Data analysis was conducted using the non-parametric Wilcoxon Signed-Rank test. The analysis yielded a p-value of <0.01 (indicating a value below the 0.05 threshold). Consequently, the null hypothesis (Ho) was rejected and the alternative hypothesis (Ha) was accepted; the mean scores were 5.73 for the pre-test and 3.97 for the post-test, indicating a reduction in pain. The study concludes that endorphin massage is effective in reducing pain intensity during the active phase of the first stage of labor.
Keywords: *Endorphin massage, labor pain and non-pharmacological*.

I. INTRODUCTION

Maternal health initiatives, which align with the Sustainable Development Goals (SDGs), play a crucial role in reducing maternal mortality rates. A key indicator in this context is the Maternal Mortality Ratio (MMR). According to the World Health Organization (WHO), approximately 303,000 maternal deaths occurred worldwide in 2019. Within ASEAN, the maternal mortality ratio reached 235 per 100,000 live births in 2020. Data from the Indonesian Demographic and Health Survey (SDKI) indicates that Indonesia's maternal mortality ratio stood at 300 per 100,000 live births in 2019; furthermore, the absolute number of maternal deaths in the country rose by 300 cases between 2019 and 2020, reaching approximately 4,400 deaths (Indonesian Ministry of Health, 2020).

According to the Indonesian Ministry of Health, West Java recorded the highest number of maternal deaths in 2015, with 823 cases; provincial data shows that 745 maternal deaths occurred in West Java that year, accounting for 16.1% of the national total (Indonesian Ministry of Health, 2015). Data from 2020 for Bekasi City reveals that out of 54,702 births, there were 15 maternal deaths associated with childbirth and 47 infant deaths. This remains a shared concern, as maternal deaths during childbirth

are largely preventable through proper pregnancy planning and prenatal care (Bekasi City Health Office, 2021).

Factors contributing to maternal mortality include hemorrhage, hypertension, infection, prolonged labor, abortion, and other indirect causes. Prolonged labor is known to account for 8% of maternal deaths globally and 9% in Indonesia (Ministry of Health, 2020). One factor that can lead to prolonged labor is the experience of prolonged and unbearable labor pain by the mother. This situation prompts the mother to hasten the delivery process and push before the cervix has fully dilated, which in turn can cause swelling of the cervix and trigger labor dystocia (Alyensi & Arifin, 2017). Labor pain arises from uterine contractions as the body attempts to expel the fetus. During labor, the resulting pain causes stress and excessive anxiety; respiration and pulse rates increase, thereby disrupting the supply of essential nutrients and oxygen from the placenta to the fetus (Dewie & Kaparang, 2020).

Endorphin massage is one non-pharmacological method for alleviating labor pain. It is a form of light touch therapy or massage that is highly beneficial for pregnant women during the period leading up to and throughout childbirth. This is because the massage stimulates the body to release endorphins—compounds that act as natural painkillers and promote a sense of comfort. Endorphins are widely recognized for their numerous benefits (Kuswandi, cited in Tanjung, 2019). This technique is cost-effective and entails no side effects for either the mother or the baby (Harianto, cited in Tanjung, 2019).

The procedure involves applying a gentle, light touch—massaging in a V-shape from the left and right shoulders down toward the tailbone—repeatedly during labor contractions. Research by Antik et al. (2017) indicates that endorphin massage influences pain intensity levels during the active phase of the first stage of labor. These findings are supported by a study by Fitriana and Putri (2018), which demonstrated a significant effect on pain intensity following endorphin massage at both the 5-minute mark (p-value $0.006 < 0.05$) and the 15-minute mark (p-value $0.037 < 0.05$).

A study by Khasanah and Sulistyawati (2020) found that prior to the massage, 18 participants (75%) experienced very severe pain; following the massage, the condition shifted, with 17 participants (70.83%) experiencing moderate pain. In this study, the massage was administered during contractions. Endorphin massage can induce physiological effects on the body; the study yielded a value of P=0.000 post-treatment, demonstrating that endorphin massage has a significant pain-reducing effect on women in the active phase of the first stage of labor.

The goal of endorphin massage is to reduce or alleviate pain in women about to give birth. This technique involves light touch and massage that can normalize heart rate and blood pressure while promoting relaxation in the expectant mother by inducing a sense of comfort through skin stimulation. Research has shown that this technique can increase the release of oxytocin, a hormone that facilitates labor (Karuniawati, 2020)

II. METHODS

This study employs a quasi-experimental design using a one-group pretest-posttest approach to examine differences before and after the administration of an intervention. The study was conducted over a period of approximately three months—from November 2025 to January 2026—at PMB E in Mustika Jaya, Bekasi. The target population consisted of all women giving birth at the facility (N=30), and the study utilized total sampling. Data collection was carried out through observation using a checklist. Data analysis involved the Wilcoxon test, performed using SPSS software, to determine the effectiveness of endorphin massage on pain during the first stage of normal labor.

III. RESULT AND DISCUSSION

Univariate analysis was conducted to examine the distribution of characteristics—specifically frequencies and percentages (%)—regarding respondents' pain levels before and after the endorphin massage intervention for pain during the first stage of labor among women giving birth at Midwife E's practice (PMB Bidan E).

Table 1. Characteristics of Respondents Based on Pain Level Prior to Endorphin Massage at Midwife E's Independent Midwifery Practice (n=30)

Pain Level	Frequency	Presentase (%)
Mild pain	3	10.0
Moderate pain	16	53.3
Controlled severe pain	11	36.7

Based on Table 1, the results regarding the pain levels of women in the first stage of labor prior to endorphin massage show that 3 respondents (10%) experienced mild pain, 16 respondents (53.3%) experienced moderate pain, and 11 respondents (36.7%) experienced controlled severe pain.

Table 2. Characteristics of Respondents Based on Pain Levels After Endorphin Massage at PMB Bidan E (n=30)

Pain Level	Frequency	Presentase (%)
Mild pain	14	46.7
Moderate pain	13	43.3
Controlled severe pain	3	10.0

Based on Table 2, the results regarding the pain levels of women in the first stage of labor following endorphin massage show that 14 respondents (46.7%) experienced mild pain, 13 respondents (43.3%) experienced moderate pain, and 3 respondents (10%) experienced controlled severe pain.

Table 3. Wilcoxon Test Results

	Mean	-	P-*value*	Frekuensi
Pre	5.73	-4.164	.000	30
Post	3.97			

Based on Table 3, the mean pretest score was 5.73 and the mean posttest score was 3.97, indicating a decrease. The p-value was < 0.01, which is below the 0.05

threshold. This suggests that the alternative hypothesis (Ha) is accepted, leading to the conclusion that the administration of endorphin massage is effective in reducing pain during the first stage of normal labor among women giving birth at Midwife E's Independent Midwifery Practice (PMB).

Regarding the characteristics of women in the first stage of labor based on pain levels prior to endorphin massage, the results showed that the pain experienced was quite high, ranging up to severe levels. This aligns with a study conducted at PMB R in Bekasi City, which found that 3 women (30%) experienced moderate pain, 3 (30%) experienced severe pain, and 4 (40%) experienced very severe pain (Pratiwi, 2024). The WHO (2018) noted that a mother's psychological and physiological factors influence labor pain but can also contribute to a more positive childbirth experience (Sulistianingsih & Wijayanti, 2022). Physiological effects of labor pain include increased fear and anxiety, sympathetic nervous system stimulation, and vasoconstriction alongside uterine muscle tone. These factors reduce uterine blood flow and affect blood pressure, uterine contractions, and oxygen consumption, potentially leading to prolonged labor (Haseli et al., 2018).

Labor involves pain caused by uterine contractions; this can prolong the birthing process and impact both the mother and the baby. Furthermore, the pain stems from uterine muscle contractions that cause cervical dilation and thinning, as well as uterine ischemia resulting from the contraction of myometrial arteries. Psychological factors can also contribute to labor pain; excessive anxiety—manifesting as fear and tension—can lead to increased prostaglandin levels and stress. If not managed effectively, stress affects the body's response to pain during labor (Ratna Sari & Triani, 2023).

Research findings regarding the characteristics of women in the first stage of labor—specifically concerning pain levels following massage—indicate a reduction in labor pain after the administration of endorphin massage; these results align with the study conducted by Hajar and Hasanah (2023), which found that after Regarding the effect of endorphin massage on reducing pain intensity during the active phase of the first stage of labor, findings showed that 6 women (27.3%) experienced mild pain, 10 (45.5%) moderate pain, 4 (18.2%) severe pain, and 2 (9.1%) very severe pain. A study conducted at PMB Wati Subagyo and Widuri Clinic in Sleman, Yogyakarta, found that after endorphin massage, 3 women (13.6%) experienced mild pain, 11 (50%) moderate pain, and 8 (36.4%) severe pain (Karuniawati, 2020). The majority of women experience pain during the early stage of active labor, particularly in the lower abdomen. Additionally, up to 30% of women experience lower back pain requiring treatment. Factors such as uterine muscle hypoxia, lactic acidosis, stretching of the lower uterine segment, ligament stretching, pressure on the pelvic bones, and other elements can cause pain during the active phase (Wardani & Nuralpiah, 2024).

A study by Leni (2017) noted that endorphin massage stimulates the body to release endorphins—compounds that act as natural painkillers and induce a sense of well-being (often referred to as "happiness hormones")—while promoting relaxation

by triggering feelings of comfort through skin stimulation. Research results also indicate that endorphin massage can enhance the release of oxytocin, a hormone that aids in the labor process (Hajar & Hasanah, 2023). Endorphin massage is a gentle massage technique administered to women approaching childbirth to stimulate endorphin release, thereby reducing pain and providing a sense of comfort; it serves as a non-pharmacological method for pain management (Karuniawati, 2020). Non-pharmacological pain management can be highly effective and is more cost-efficient than pharmacological interventions. In this context, pharmacological methods may entail side effects, whereas non-pharmacological approaches are simpler, free from adverse effects, and promote a calmer psychological state during labor (Fatimah et al., 2023).

The study results showed that the mean pre-test score was higher than the post-test score, indicating a decrease. Furthermore, the p-value was <0.01 (which is <0.05). This indicates that the null hypothesis (Ho) was rejected and the alternative hypothesis (Ha) was accepted, leading to the conclusion that the administration of endorphin massage is effective in reducing pain during the first stage of normal labor among women giving birth at Midwife E's Independent Midwifery Practice (PMB). These findings align with a study conducted on 26 women giving birth within the service area of the South Denpasar II Community Health Center (Puskesmas) Independent Midwifery Practice; data analysis using the Wilcoxon test revealed that the average labor pain score was 8.38 before endorphin massage and dropped to 4.19 afterward—indicating a decrease—with a p-value of 0.000 ($p < 0.05$). This reinforces the evidence that endorphin massage effectively reduces labor pain intensity among women giving birth in the service area of the South Denpasar II Community Health Center Independent Midwifery Practice (Ayu & Darmayanti, 2022).

A study conducted at the Mampang Prapatan Community Health Center in South Jakarta also yielded results via Wilcoxon test analysis, showing an average score of 8.07 before endorphin massage and 5.60 afterward—indicating a decrease—with a p-value of 0.001 ($p < 0.05$). The study concluded that administering endorphin massage to women in labor reduces pain intensity during active labor. The study also explains that "endorphin" is a combination of "endogenous" and "morphine," referring to a substance within the body—specifically a protein element produced by the human nervous system and body cells. The body can also produce endorphin hormones through deep breathing, light touch or massage, and meditation (Dahlan et al., 2023). Research (Kuswandi et al., 2019) indicates that endorphin massage is a non-pharmacological method for alleviating labor pain. This technique involves massage and light touch, making it highly beneficial for women during the period leading up to childbirth or while in labor. This is because the massage stimulates the body to release endorphins, which act as natural analgesics and pain relievers. Furthermore, a study by Harianto et al. (2019) highlights that endorphin massage is cost-effective and entails no side effects for either the mother or the baby (Nurbaeti et al., 2024).

Research by Kuswandi et al. (2019) indicates that "endorphin massage" is a simple yet crucial technique to employ before and during labor. This is because the massage stimulates the body to release endorphins—compounds that act as natural painkillers and promote healing. Various activities—such as deep breathing, relaxation, and meditation—can also boost endorphin levels in the body. It is particularly beneficial for pregnant women who have reached 36 weeks of gestation to practice endorphin massage, as it stimulates the release of oxytocin, a hormone that can trigger labor (Kundaryanti et al., 2023). Endorphin massage fosters a sense of calm and comfort before and during childbirth by enabling the body to release endorphins, which alleviate pain and induce well-being. Additionally, it helps regulate growth and sex hormones, mitigates persistent pain and discomfort, reduces stress, and boosts the immune system. Beyond endorphin massage, activities such as deep breathing exercises, relaxation techniques, and meditation can also increase the body's endorphin production in expectant and laboring mothers (Dahlan et al., 2023).

IV. CONCLUSION

Regarding the characteristics of women in the first stage of labor based on pain levels prior to endorphin massage, the study found that 3 respondents (10%) experienced mild pain, 16 respondents (53.3%) experienced moderate pain, and 11 respondents (36.7%) experienced controlled severe pain. Regarding the characteristics of women in the first stage of labor based on pain levels following endorphin massage, the study found that 14 respondents (46.7%) experienced mild pain, 13 respondents (43.3%) experienced moderate pain, and 3 respondents (10%) experienced controlled severe pain. The study results showed a mean pre-test score of 5.73 and a mean post-test score of 3.97, indicating a decrease in pain levels. Furthermore, a p-value of <0.01—which satisfies the criterion of being less than 0.05—indicates that the alternative hypothesis (Ha) is accepted; thus, it is concluded that endorphin massage is effective in reducing pain.

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