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Effect of Massage Effleurage on The Intensity of Labor Pain During Phase 1 of Active Phase

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ABSTRACT

Purpose: This study aimed to determine the effect of effleurage massage on the intensity of labor pain during the first active phase among mothers giving birth at Sunan Kudus Islamic Hospital. It was hypothesized that the application of effleurage massage would significantly reduce the intensity of labor pain.

Research Method: This study used a pre-experimental one-group pretest-posttest design. A total of 46 mothers in the first active phase of labor were selected using purposive sampling. Pain intensity was measured before and after the intervention using the Numeric Rating Scale (NRS). Data were analyzed using univariate analysis and the Wilcoxon test after the Shapiro-Wilk normality test indicated a non-normal distribution.

Results and Discussion: The mean pain score decreased from 3.59 before the intervention to 2.74 after the intervention. The Wilcoxon test result showed $p = 0.000$ ($p < 0.05$), indicating a significant effect of effleurage massage on reducing labor pain intensity. These findings suggest that effleurage massage is an effective, safe, and simple non-pharmacological intervention for improving maternal comfort during labor.

Implications: The findings support integrating effleurage massage into routine midwifery care. Further studies with control groups and larger sample sizes are recommended to strengthen evidence of its clinical effectiveness.

Keywords: effleurage massage; labor pain; active phase; non-pharmacological intervention; childbirth; midwifery care.

1. Introduction

Childbirth is the birth of a pregnancy at the age of 37 weeks to 42 weeks, in a natural way, with the lowest part of the back of the head, taking a maximum of 18 hours, and there are no complicating problems for both the mother and the fetus. This process begins with the onset of actual labor contractions, characterized by changes in the portion that thins and opens and ends with the birth of the placenta (Nor Asiyah et al, 2023).

According to the World Health Organization (WHO), as many as 99% of maternal deaths due to childbirth problems occur in developing countries. Long-term partus in the world causes maternal mortality by 8% while in Indonesia it is 9%. From the results of the survey, it is known that long partus is the 5th most common cause of maternal death in Indonesia in 2022. Based on the Indonesian Ministry of Health in 2012, the cause of maternal death is still dominated by classic causes, namely bleeding 35%, hypertension 22%, and others (indirect causes) are quite large, including non-obstetric causes of 32%.

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Meanwhile, based on the 2012 population census, the cause of maternal death was due to bleeding in 20%, hypertension 32% and postpartum complications 31%. The presence of unadvanced labor causes the intensity of pain experienced by the patient for longer so that it causes discomfort and fear in the mother. (Afrianti & Silviana, 2023).

Based on the 2023 Indonesian Health Survey (SKI) conducted by the Central Statistics Agency (BPS) in collaboration with the Indonesian Ministry of Health, it is known that the majority of mothers in Indonesia give birth by normal delivery method (73.2%), while 25.9% give birth by cesarean section, and 1% use other delivery methods. This data shows that most mothers in Indonesia still choose the natural delivery process. However, the normal labor process is often followed by a high intensity of pain, especially in the first period of labor, which can affect the comfort and smoothness of the childbirth process (Central Statistics Agency, 2023)

According to data from the Kudus Regency Health Office in 2024, the number of births was recorded at 12,261 cases, consisting of 8,051 vaginal deliveries and 4,210 deliveries via sectio caesarea (SC). This figure reflects the high activity of midwifery services in the Kudus Regency area. In addition, the Maternal Mortality Rate (AKI) is still recorded at 32.75% and the Infant Mortality Rate (AKB) is 6.76%, which shows that maternal and neonatal health problems are still a serious challenge in the area. This condition indicates that the childbirth process is a very crucial phase and requires special attention in an effort to improve the quality of maternal and infant health. The high maternal and infant mortality rate can be caused by various factors, including complications during pregnancy and childbirth, as well as suboptimal pain management during the delivery process (Kudus Health Office, 2023). This condition indicates that reducing maternal mortality is not enough with medical approaches alone, but also needs to be strengthened through promotive and preventive interventions that are non-pharmacological and can be easily applied in primary health facilities.

Labor pain is caused by uterine contractions, cervical stretching, oxytocin release, and pressure and pull on the tissues around the uterus and pelvic floor. Childbirth is an active process characterized by uterine contractions with pain that increases in frequency and intensity. Labor pain consists of visceral and somatic components, with the main role of the cervix in the first and second stages of labor (Fania et al., 2017). The intensity of labor pain is influenced by physical factors, such as age, parity, fetal size, contractions, cervical opening, fetal position, pelvic shape, and fatigue level. In addition, psychological factors such as culture, anxiety, knowledge, previous experience, childbirth readiness, and social support also play an important role. (Ambarita & Ulfah, 2022).

Massage Effleurage is one of the non-pharmacological techniques in the management of labor pain which is carried out through gentle and rhythmic rubs on the surface of the skin. This technique works by improving blood circulation, reducing muscle tension, and stimulating the mother's physical and psychological relaxation so that it can reduce the perception of pain (Ratna et al., 2025). In addition to being effective, this method is also safe, simple, does not cause side effects, and can be applied independently or with the help of a companion (Bohari et al., 2023).

The research conducted by (Bohari et al., 2023) in the working area of the Ponre Health Center used a quasi-experimental design of two groups pretest-posttest with a total sample of 34 mothers giving birth during the first active phase. Pain measurement using the Visual Analog Scale (VAS) showed that the average pain score decreased from 3.29 before the intervention to 2.09 after massage effleurage. The results of the Wilcoxon test obtained $p = 0.000$ (<0.05), which means that there is a significant difference in pain intensity before and after treatment. These findings are in line with other studies that state that massage, both back and effleurage techniques, is effective in stimulating nerve

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receptors, activating gate control mechanisms, and increasing the comfort of maternal mothers so that they can be used as a safe and useful non-pharmacological alternative.

The research conducted by (Putri et al., 2022) used a quasi-experimental design with a One Group Pretest-Posttest Design approach on 18 primipara maternity mothers at the Dzahira Medika Clinic, Empat Lawang. Samples were selected using purposive sampling techniques, and data were analyzed univariate and bivariate with the Wilcoxon test. The results showed a value of p = 0.000 (<0.05), so it was concluded that there was a significant influence of massage effleurage in reducing the intensity of labor pain.

The research was conducted by (Analisa et al., 2024) using a pre-experimental quantitative design using the One Group Pretest-Posttest Design method on 33 maternity mothers. Data analysis was carried out using the Wilcoxon test. The results showed that before the intervention, most of the respondents (75%) experienced moderate pain, while after being given massage effleurage, the majority (72.7%) only experienced mild pain. The statistical test obtained a value of p = 0.000 (<0.05), which indicates that there is a significant difference in pain intensity before and after treatment. Thus, massage effleurage has been proven to be effective in reducing pain during phase I in active maternity mothers.

Based on an initial survey conducted at Sunan Kudus Islamic Hospital in September 2025, there were 52 mothers who gave birth normally, most of whom complained of labor pain, especially in phase I. Some mothers even exhibit screaming, holding breath, or straining prematurely, which risks worsening labor conditions and causing fatigue during the active phase. In addition, the results of observations also show that the management of labor pain in these places is still limited, especially in the use of non-pharmacological methods such as massage effleurage, breathing techniques, and relaxation, which have been proven to help reduce pain perception. This shows that the lack of appropriate pain management interventions and lack of education for mothers and families can be factors that affect the quality of the childbirth experience. Therefore, targeted and measurable interventions are needed to reduce labor pain, one of which is through the application of non-pharmacological techniques such as massage effelurage, which is safe, effective, and can improve maternal comfort during the labor process.

Based on the background and initial survey that has been carried out, the researcher is interested in researching "The Effect of the Application of Massage Effleurage in Reducing the Intensity of Labor Pain in the 1st Active Phase".

2. Literature Review and Hypothesis Development

The International Association for the Study of Pain (IASP) defines pain as an unpleasant sensory and emotional experience, which relates to or resembles actual and potential tissue damage. Labor pain is a feeling of pain due to uterine contractions and is accepted as part of the labor process. Labor pain always haunts pregnant women, especially in primipara. Pain can be subjective and influenced by many factors (Rohmah et al., 2025). Another definition from Potter and Perry states that pain is a single sensation caused by a specific stimulus, is subjective, and differs between individuals because it is influenced by a person's psychosocial, cultural, and endorphin factors, so that the person feels pain more (Potter, 2009, in Sri Rezeki, 2020).

Childbirth is an important experience for a woman's life. Every woman wants a safe and comfortable delivery, most women want a natural delivery, but labor pain causes fear. Fear, anxiety can increase the severity of pain during labor. Women who are well prepared during pregnancy are more likely to have realistic expectations of labor pain Interventions to reduce pain, anxiety and discomfort

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during labor are a major part of modern obstetric care in nursing mothers. Labor pain can have an impact on the labor process. High perception of pain in childbirth and anxiety can cause a stress response resulting in an increase in catecholamine hormones which leads to an increase in the frequency of respiration, heart rate, reduced energy and fatigue (Fania Nurul Khoirunnisa, 2017) Massage Effleurage

Massage is a soft tissue manipulation technique with the aim of muscle relaxation, improved blood circulation, improved flexibility with a reduction in pain in an effort to help speed up the healing process of several diseases. Massage has specific goals/targets related to problems with muscles and the impact of suboptimal muscle function (Almanika et al., 2022).

According to (Indah & Dwi, 2017) Effluerage is a massage technique in the form of soft, slow, and long or non-intermittent strokes. This technique has a relaxing effect. In childbirth, effluerage is carried out using fingertips that are pressed gently and lightly. Apply a light and non-vigorous rubbing with both palms and fingers on the back of the maternity mother at cervical height 7 outwards towards the side of the ribs for 30 minutes with a frequency of 40 rubs per minute, but try not to leave the surface of the skin

3. Research Method

This research stage begins with the preparation stage, namely the researcher takes care of research permits from the home institution and submits a permit application to the Sunan Kudus Islamic Hospital (RSI) as the research location. After the permit is obtained, the researcher identifies and determines the respondents in accordance with the inclusion and exclusion criteria that have been set. The researcher then provides an explanation to the prospective respondents about the objectives, procedures, benefits, and risks of the research, as well as ensuring the confidentiality of the respondents' data. Respondents who are willing to participate are asked to sign an informed consent form. The next stage is the implementation of the research, which is to measure the intensity of labor pain during the first active phase before the intervention using the Numeric Rating Scale (NRS) as a pre-test. After that, respondents were given an intervention in the form of massage effleurage on the back area for approximately 10 minutes according to the procedure that had been set. After the intervention was completed, the researchers again measured the intensity of pain using the same scale as the post-test. All measurement results are recorded in the observation sheet that has been prepared. The final stage of the study is data processing and analysis, which includes editing, coding, tabulation, and univariate and bivariate analysis to determine the effect of massage effleurage on the intensity of labor pain.

4. Results and Discussion

4.1 Analysis Results

4.1.1 Univariate Analysis

This analysis was carried out to obtain the scale of pain before and after being given massage effleurage at RSI Sunan Kudus in 2025. The results of the analysis are as follows:

Table 1. Average Score of Labor Pain Before Massage Effleurage

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Labor Pain	n	Red	Standard Deviation	Median
Pretest	46	3.59	0.498	7

Source: *Primary Data (2025)*

Based on Table 1, it is known that from a total of 46 respondents, the average pain scale of the mother during the 1st active phase before massage effleurage was 7 (Severe pain) with a standard deviation of 0.498.

Table 2. Average Score of Labor Pain After Massage Effleurage

Labor Pain	n	Red	Standard Deviation	Median
Posttest	46	2.74	0.444	5

Source: *Primary Data (2025)*

Based on Table 2. It is known that from a total of 46 respondents, the average pain scale of inpartu mothers during the 1st active phase after massage effleurage was 5 (Moderate Pain) with a standard deviation of 0.444.

4.1.2 Bivariate Analysis

Bivariate analysis was conducted to assess the effectiveness of Massage Effleurage on the intensity of labor pain during the first active phase at Sunan Kudus Islamic Hospital in 2025 through appropriate statistical testing. Before the bivariate statistical test was carried out, a data normality test was first carried out. Because the number of samples in this study < 50 respondents, the Shapiro-Wilk test was used to conduct a normality test. The results of the data normality test can be seen in the table as follows:

Table 3. Normality Test Results with Shapiro-Wilk

	Shapiro-Wilk		
	Statistic	df	Sig.
Pretest Pain Scale	.548	46	.000
Posttest Pain Scale	626	46	.000

Source: *Primary Data (2025)*

Based on the table 3, it can be seen that all data are declared abnormal, because the acquisition of sig values. Shapiro-Wilk is 0.000 or 0.000 < 0.05. So the next test uses the non-parametric Wilcoxon test.

Table 4. Observation Data

	n	Red	Std. Deviation	P View
Pain Preetest Massage Effleurage	6	3,59	0.498	0.000
Posttest Pain Massage Effleurage	6	2,74	0.444	

Source: *Primary Data (2025)*

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Based on the table 4, it can be seen that the value of Asymp. Sig. (2-tailed) pretest with posttest pain of 0.000 or 0.000 < 0.05, so that there is an effect of the Massage Effleurage Technique on the reduction of intense labor pain in women in Phase 1 Active phase.

4.2 Discussion

4.2.1 Univariate Analysis

The results of the univariate analysis in this study show an overview of the intensity of labor pain in maternity mothers during the first active phase before and after being given massage effleurage intervention at Sunan Kudus Islamic Hospital in 2025. Based on the results of the pretest, most of the respondents experienced severe labor pain, namely 27 respondents (58.7%), while the remaining 19 respondents (41.3%) were in the moderate pain category. These findings show that before the intervention, the majority of mothers experienced high-intensity pain.

Labor Pain occurs due to the process of cervical dilatation accompanied by an increase in the intensity and frequency of uterine contractions, with the peak of pain at the 1st active phase during the opening of 4-10 cm. Untreated pain can lead to uncoordinated uterine contractions, increasing the risk of prolonged labor and disorders in the mother and fetus. The intensity of pain is influenced by physiological factors such as contraction strength, cervical elasticity, and fetal position, as well as psychological factors such as anxiety, stress, and lack of childbirth experience (Febriyanti et al., 2025).

After being given massage effleurage intervention, the posttest results showed a change in the distribution of intensity of labor pain. The majority of respondents were in the moderate pain category as many as 34 respondents (73.9%), and some others experienced mild pain as many as 12 respondents (26.1%). No more respondents were found with severe pain categories after massage effleurage. This shows that massage effleurage has a positive impact on reducing the intensity of labor pain in women in childbirth during the first active phase.

Theoretically, massage effleurage is a light, rhythmic touch technique on the surface of the skin that aims to provide a sense of comfort and relaxation. This technique works through a theoretical mechanism gate control of pain, where tactile stimuli on the skin can inhibit the transmission of pain impulses to the central nervous system. In addition, massage effleurage can stimulate the release of endorphins as a natural analgesic of the body, thus being able to reduce pain perception and increase maternal tolerance to uterine contractions. The resulting relaxation also helps reduce muscle tension and anxiety, which indirectly plays a role in lowering the intensity of labor pain (Rohmah et al., 2025).

4.2.2 Bivariate Analysis

4.2.2.1 Pain Scale Before and After Effleurage Massage at Sunan Kudus Hospital

Based on the results of a study on maternity mothers during the first active phase at Sunan Kudus Islamic Hospital in 2025, it is known that before being given massage effleurage intervention, most of the respondents experienced labor pain in the severe pain category. This was shown by as many as 27 respondents (58.7%), while 19 respondents (41.3%) were in the category of moderate pain. This condition illustrates that in the active phase I, the intensity of labor pain tends to increase along with the increase in the strength and frequency of uterine contractions and the progress of cervical opening.

After the massage effleurage, there is a change in the distribution of the level of labor pain. The majority of respondents experienced pain in the moderate category, namely 34 respondents (73.9%),

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and some others experienced mild pain as many as 12 respondents (26.1%). No more respondents with severe pain categories were found in the measurements after the intervention. This change shows that massage effleurage is able to reduce the level of labor pain from severe to moderate and clinically mild.

This is in line with research Puspitasari & Astuti, (2017) Pain during labor is caused by cervical dilatation, stretching of the lower segment of the uterus, as well as pulling and injury to the muscle tissue and supporting ligaments, and can be reduced through back massage techniques. The results showed a decrease in pain from severe to moderate and mild, with the number of mothers experiencing severe pain reduced from 12 respondents (57.1%) to 1 respondent (4.8%) after the intervention, and a score was obtained p = 0.000 which indicates that back massage has a significant effect on reducing labor pain during the first active phase.

According to researcher Maghfirah, effleurage is an effective non-pharmacological method in reducing labor pain through the manipulation of soft tissues such as muscles and skin so as to cause relaxation, stimulate the release of endorphin hormones, and provide a sense of comfort without side effects for the mother and baby. Giving massage effleurage on the back for 3–10 minutes was shown to reduce pain intensity, which was shown by the average pain in the treatment group of 4.00, lower than in the control group of 6.25, with a value of p = 0.031 (p ≤ 0.05), thus showing a significant difference in the intensity of stage I labor pain between the two groups.

Eneliti Soleha & Puspitasari, stated that massage effleurage is a gentle massage with repeated circular movements in the sacrum and vertebral areas accompanied by breathing regulation to increase the relaxation of the maternal mother. Pain measurement using a numerical scale of 0–10 and analyzed with the Wilcoxon test showed a value of p = 0.000 (< 0.05), which indicates a significant difference in the level of labor pain during the active phase I between the massage effleurage group and the control group.

According to researchers, massage effleurage is a massage technique with gentle, rhythmic, and continuous movements on the surface of the skin that aims to provide relaxation and reduce pain. In women in childbirth, massage effleurage works by stimulating the release of endorphin hormones as natural pain relievers, improving blood circulation, and reducing muscle tension and anxiety, thereby helping mothers be more comfortable and able to adapt to labor pain, especially during the first active phase.

4.2.2.2 Effectiveness of Massage Effleurage on Pain Reduction in Phase I Active Phase

Based on the results of the bivariate analysis that has been carried out, it is known that there is a significant difference between the intensity of labor pain before and after giving massage effleurage in maternity mothers during the active phase I. The results of the Wilcoxon Signed Ranks Test show an Asymp score. Sig. (2-tailed) was 0.000 (p < 0.05), which indicates that the administration of massage effleurage had a significant effect on reducing the intensity of labor pain.

After the intervention, the number of mothers who experienced severe pain decreased, while those who experienced mild and moderate pain increased. This shows that massage effleurage really helps mothers reduce pain during childbirth, not only numerically but also in real terms.

The same thing is shown by research Effendi (2023) which states that massage effleurage is effective in reducing labor pain during the active phase I through gentle and rhythmic strokes that provide relaxation and stimulate the release of endorphins. The average pain score decreased from 5.06 to 3.06 after the intervention with a p = 0.000 value, thus confirming the effectiveness of massage effleurage in reducing labor pain.

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According to researchers Karlinah (2022) Giving light massage during childbirth can stimulate the tactile fibers of the skin which play a role in inhibiting the transmission of pain impulses, while providing comfort and attention to the mother so that the focus on contractions is reduced. The results of the Wilcoxon Rank Test showed a value of p = 0.002 (p < 0.05), which indicates that massage effleurage has a significant effect in reducing the level of labor pain during the active phase I.

Supported by researchers Happy (2020) at the Halmahera Health Center, Semarang City, showed that massage effleurage had a significant effect in reducing labor pain during the first active phase, with a value of p = 0.000 (p < 0.05). These results confirm that massage effleurage is a safe and effective nonpharmacological intervention to improve maternal comfort.

According to the researcher, most of the respondents are housewives, who generally have a lower level of work stress than mothers who work full-time, This condition makes mothers more cooperative and responsive to tactile stimulation and relaxation through massage effleurage, so this intervention is effective in helping to reduce labor pain during the first active phase in obstetric practice.

5. Concluding Remarks and Recommendation

Pain Intensity before massage effleurage intervention Before being given the intervention, most of the mothers experienced severe (58.7%) and moderate pain (41.3%) during childbirth. This shows that labor pain during the active phase I is a significant condition and requires proper treatment.

Pain Intensity after Effleurage Massage Intervention. After massage effleurage, there was a decrease in the intensity of labor pain, characterized by no more severe category pain. The majority of respondents were in the category of moderate pain (73.9%) and some others were mild pain (26.1%) Effectiveness of Massage effleurage against labor pain. The results of the Wilcoxon test showed a value of p = 0.000 (p < 0.05), indicating a significant difference between pain before and after massage effleurage, so that this technique was effective in reducing the intensity of labor pain during the first active phase in maternity at Sunan Kudus Islamic Hospital.

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