



The Effect of Oxytocin Massage on Labor Pain Intensity in Mothers at Manado Medical Center Hospital

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Abstract: Labor pain is a significant challenge faced by in-partum mothers, with a prevalence of 70% in Indonesia, and 40% of women reporting severe pain (Central Statistics Agency, 2022). Conventional pharmacological methods often do not provide optimal results and can cause side effects. As a non-pharmacological alternative, oxytocin massage has shown promise in reducing labor pain intensity by stimulating the endogenous production of oxytocin, a natural analgesic hormone. This study aimed to assess the effect of oxytocin massage on labor pain intensity in in-partum mothers at Manado Medical Center Hospital. A pre-experimental design with a one-group pre-test post-test approach was used. The sample consisted of 30 in-partum mothers who met the inclusion criteria. Pain intensity was measured using the Numeric Rating Scale (NRS) before and after a 30-minute oxytocin massage administered by trained health workers. Data were analyzed using a paired *t*-test. The results showed a significant reduction in pain intensity from an average of 7.23 (SD=1.08) before the massage to 4.63 (SD=1.11) afterward, with a decrease of 2.6 points. The proportion of mothers experiencing severe pain decreased from 50% to 20%, while mild pain increased from 16.7% to 46.7%. The paired *t*-test revealed a highly significant difference with $t=10.274$ ($df=29$), $p=0.000$ ($p<0.05$). In conclusion, oxytocin massage is an effective non-pharmacological intervention that can significantly reduce labor pain and improve the birth experience. It can be incorporated into standard maternity nursing protocols to enhance maternal care.

Keywords: Labor Pain; Mothers in Labor; Oxytocin Massage; Pain Intensity; Pain Management.

1. INTRODUCTION

Childbirth is a natural process experienced by every pregnant woman. This process is generally accompanied by significant discomfort. According to information released by the World Health Organization (WHO), more than 300,000 women die each year as a result of various complications related to pregnancy and childbirth. The discomfort experienced during childbirth is one of the elements that significantly impacts the quality of a mother's experience during labor (WHO, 2021).

In Indonesia, management of discomfort during labor is generally achieved through conventional pain relief. However, this pharmacological approach does not always provide optimal results and in some cases can trigger adverse reactions. This situation highlights the importance of exploring alternative methods that offer a higher level of safety and greater effectiveness in reducing discomfort during labor.

Oxytocin massage is an alternative approach that is gaining attention in the field of managing discomfort during labor. Oxytocin, popularly known as the "love hormone," plays a crucial role in the birthing process and can impact the mother's comfort level throughout the process. A 2021 study by Hsu and colleagues showed that oxytocin massage can increase

oxytocin levels in the body, potentially reducing the intensity of discomfort during labor. This approach is expected to lead to a more positive birth experience for expectant mothers and reduce the need for medical intervention.

According to data published by the Central Statistics Agency (BPS) in 2022, the prevalence of discomfort during labor reported by pregnant women in Indonesia reached 70%, with 40% reporting very severe discomfort. This fact indicates that discomfort during labor is a significant health issue and requires serious treatment.

Furthermore, research conducted by Kurniawan and his team in 2023 found that the use of non-pharmacological methods, such as oxytocin massage techniques, has the potential to reduce anxiety and increase maternal satisfaction throughout labor. This non-pharmacological approach offers a safer alternative by minimizing the risk of side effects that may arise from medication use.

Therefore, it is crucial to further explore the impact of oxytocin massage techniques on the intensity of discomfort during labor. This research aims to provide empirical evidence to support the use of oxytocin massage techniques as an effective non-pharmacological intervention in managing discomfort during labor. With increasing awareness of the importance of a holistic approach to maternal care, this study is expected to make a significant contribution to midwifery practice in Indonesia, particularly in developing more comprehensive and mother-centered care methods.

Discomfort during labor can be triggered by a variety of factors, including uterine contractions, pressure on the cervix, and psychological factors such as anxiety and fear. Research conducted by Rahmawati and her collaborators in 2022 showed that mothers who experienced high levels of anxiety tended to report higher levels of discomfort throughout labor.

In this context, oxytocin massage techniques have the potential to be an effective solution for reducing anxiety levels and, consequently, reducing the intensity of uncomfortable sensations. Oxytocin massage techniques work by stimulating the production of the hormone oxytocin, which can increase feelings of comfort and reduce pain.

Research conducted by Ananda and her team in 2021 showed that administering oxytocin massage techniques during the active phase of labor can reduce the need for pain medication and increase the positive experience experienced by mothers during labor. By comprehensively understanding this cause-and-effect relationship, we can develop better strategies to help pregnant women cope with the discomfort of labor, thus ensuring a smoother and more positive birth experience for the mother.

As a solution to discomfort during labor, oxytocin massage offers a more natural approach with minimal side effects compared to pharmacological medications. This method focuses not only on reducing discomfort but also on improving the mother's emotional and psychological experience during labor.

Research conducted by Sari and colleagues in 2023 showed that mothers who received oxytocin massage techniques reported higher levels of satisfaction with their labor experience compared to mothers who did not receive massage. This indicates that oxytocin massage techniques provide not only physical but also significant psychological benefits.

Implementing oxytocin massage techniques in obstetric practice requires specialized training for healthcare workers to ensure the technique is appropriate and effective. Furthermore, it is important to educate pregnant women about the various benefits of oxytocin massage techniques so they can choose this method as an alternative to manage discomfort during labor. Thus, oxytocin massage techniques can become an integral part of comprehensive antenatal and intranatal care, ultimately improving the quality of maternal and infant health services.

This research is expected to provide more robust and relevant data to support improved midwifery practices. By involving pregnant women as research subjects, it is hoped that deeper insights into their experiences with oxytocin massage techniques and their impact on discomfort during labor can be gained.

The results of this study will not only contribute to the scientific literature but also serve as a basis for developing better health policies for managing discomfort during childbirth in Indonesia. Furthermore, this research can serve as a reference for other health institutions adopting similar methods to improve the quality of maternal healthcare services.

2. RESEARCH METHOD

This study employed a pre-experimental design with a one-group pre-test post-test design. This design was used to evaluate the impact of oxytocin massage therapy on pain levels experienced by women giving birth at Manado Medical Center General Hospital. Researchers measured pain levels twice, before and after the intervention, to identify changes resulting from the treatment.

The study subjects included all mothers undergoing labor at Manado Medical Center General Hospital. The sample was selected using a purposive sampling method, selecting 30 participants who met the established criteria. These requirements included: pregnant women in active labor and providing informed consent to participate in the study. Women with specific

health conditions that could potentially affect how they experience pain, such as a history of mental health problems or taking painkillers that can alter the intensity of pain, were excluded.

After the sample was selected, baseline pain levels were measured using a numerical rating scale (NRS) before the oxytocin massage therapy began. The oxytocin massage procedure was performed by specially trained healthcare workers and lasted 30 minutes, following a standardized protocol. Post-intervention, pain levels were remeasured using the same NRS instrument to determine any changes.

Data processing used appropriate statistical methods, namely a paired t-test, to compare the mean pain levels before and after treatment. All collected data were statistically analyzed to determine the significance of the impact of oxytocin massage on reducing labor pain. The findings of this analysis are expected to comprehensively describe the effectiveness of oxytocin massage in reducing labor pain and contribute to the development of maternal nursing practices at Manado Medical Center General Hospital.

3. RESULTS AND DISCUSSION

The research results and subsequent discussions will explore in detail the research findings based on the characteristics of respondents and analysis of pain levels before and after the intervention, by integrating relevant theories and comparing them with the results of previous studies to provide a comprehensive and meaningful interpretation for the development of maternity midwifery science and practice.

General Data

Table 1. General Data Distribution.

Characteristics	Number	%
Age:		
• <20 years	6	20.0
• 20–35 years	18	60.0
• >35 years old	6	20.0
Parity		
• Primipara	14	46.7
• Multipara	11	36.7
• Grandemultipara	5	16.6
Education		
	5	16.7

• Elementary School	7	23.3
• JUNIOR HIGH SCHOOL	12	40.0
• High School/Vocational School	6	20.0
• College		
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Types of Delivery		
• Normal	25	83.3
• SC	5	16.7

This study involved 30 mothers undergoing labor at Manado Medical Center General Hospital. Age distribution analysis revealed an interesting pattern, with the majority of respondents between the ages of 20 and 35, comprising 18 individuals, or 60.0% of the total sample. The under-20 and over-35 age groups were each represented by six respondents, or 20.0% of each category.

These findings indicate that the majority of mothers who gave birth at these health facilities were within the optimal reproductive age range. In its 2021 guidelines, the World Health Organization (WHO) emphasized that the age range between 20 and 35 is the ideal time for pregnancy and childbirth, given that a woman's physical condition and biological readiness are at their peak during this time.

The significance of this age distribution cannot be overlooked in the context of childbirth and pain management. Maternal age is strongly correlated with various aspects of the birth process. Research conducted by Smith et al. in 2022 revealed that mothers who are too young at birth are more likely to face various labor complications and experience more severe pain than those in their mature reproductive years. This is related to reproductive organ maturity, psychological readiness, and greater hormonal stability in the 20-35 age group.

In younger age groups, reproductive immaturity and less than optimal mental preparedness can affect the body's response to labor, including pain management. Meanwhile, in the age group over 35, factors such as decreased tissue elasticity and potential age-related complications can contribute to increased pain intensity. Therefore, understanding the age distribution of respondents is fundamental to interpreting the results of oxytocin massage interventions for labor pain management.

Parity analysis showed considerable variation among study respondents. Of the 30 participants, 14, or 46.7%, were primiparas (mothers giving birth for the first time), 11, or 36.7%, were multiparas (mothers who had given birth 2-4 times), and 5, or 16.6%, were grandemultiparas (mothers who had given birth more than 4 times). This parity distribution has important implications for the experience of labor pain. Primiparous mothers generally face greater challenges during labor, particularly during the first stage, which tends to be longer. Research published by Gonzalez et al. in 2023 explained that a longer duration of the first stage of labor in primiparas is associated with increased accumulation of pain sensations.

Psychological factors also play a significant role in the pain experience of primiparas. A comprehensive study conducted by Johnson and Mitchell in 2021 identified that first-time mothers had substantially higher levels of anxiety than multiparas. This anxiety can amplify pain perception, creating a cycle that can potentially worsen the overall birth experience.

Multiparous and grandemultiparous mothers exhibit different conditions, as they generally have prior experience with childbirth. This experience gives them a better understanding of the labor process and pain management strategies, which can reduce anxiety and improve pain coping. However, each birth has its own unique characteristics, and interventions such as oxytocin massage remain relevant for all parity groups in reducing pain intensity.

Respondents' educational backgrounds varied widely. Of the 30 respondents, 12, or 40.0%, had a high school or vocational high school education, making them the largest group. The next group consisted of respondents with a junior high school education (7 respondents, 23.3%), followed by those with a college education (6 respondents, 20.0%), and those with an elementary school education (5 respondents, 16.7%).

Educational level is strongly correlated with a mother's understanding of the physiological process of labor and the various pain management methods available. Research conducted by Anderson et al. in 2022 demonstrated that higher education levels are generally associated with a more comprehensive understanding of the anatomy and physiology of labor, as well as knowledge of various pharmacological and non-pharmacological pain management techniques.

Mothers with adequate education tend to be more receptive to health information and education, including explanations about alternative therapies such as oxytocin massage. A study published by Lee et al. in 2021 revealed that mothers with higher education were more proactive in seeking information about pregnancy and childbirth and were more open to trying various evidence-based pain management techniques.

Data on delivery type indicate that the majority of respondents, 25 (83.3%), delivered vaginally, while 5 (16.7%) underwent cesarean section. This proportion reflects the policy and practice at Manado Medical Center Hospital, which promotes vaginal delivery as the primary option, in line with WHO recommendations on safe delivery practices.

The type of labor has different implications for the characteristics and duration of pain experienced by mothers. According to research conducted by Rojas et al. in 2023, mothers who deliver vaginally experience progressive contraction pain that can last for quite a long period, especially during the active phase of the first to second stages of labor. This pain originates from uterine contractions, cervical dilation, and pressure on the pelvic structures.

In contrast, mothers who undergo cesarean sections experience a different pain pattern. Although they don't experience contractions during the procedure due to anesthesia, post-operative pain can be significant and requires comprehensive pain management. Post-cesarean section pain stems from the surgical incision, tissue manipulation, and wound healing process.

In the context of this study, the oxytocin massage intervention was primarily aimed at managing pain in mothers undergoing vaginal births, given that the majority of respondents fell into this category. Research conducted by Thompson et al. in 2022 showed evidence that massage performed during the active phase of labor can help reduce muscle tension, promote relaxation, and promote the release of the body's natural endorphins, which collectively contribute to decreased pain perception and increased maternal comfort.

Special Data

Table 2. Pain Level.

Characteristics	Number	%
Before Oxytocin Massage	5	16.7
• Light	10	33.3
• Currently	15	50.0
• Heavy		
After Oxytocin Massage	14	46.7
• Light	10	36.7
• Currently	6	16.6
• Heavy		

Initial measurements using a numerical rating scale (NRS) before oxytocin massage revealed that 15 of the 30 respondents, equivalent to 50.0%, experienced severe pain. Meanwhile, 10 respondents, or 33.3%, experienced moderate pain, and 5 respondents, or 16.7%, experienced mild pain. This distribution of pain levels indicates that half of the total respondents experienced intense pain during the active phase of labor.

The high proportion of mothers experiencing severe pain reflects the reality that labor pain is one of the most intense forms of pain a woman can experience. Research conducted by Kim et al. in 2021 explained that labor pain intensity is influenced by a complex of factors, including physiological aspects such as the strength and frequency of uterine contractions, as well as psychological aspects, including anxiety levels, social support, and previous pain experiences.

The increasingly strong and frequent uterine contractions during the active phase of labor cause stretching and pressure on the cervix and surrounding soft tissues, activating pain receptors (nociceptors) and sending pain signals to the central nervous system. Psychological factors such as fear and anxiety can amplify pain perception through neuroendocrine mechanisms, where stress increases cortisol levels and lowers the pain threshold.

Pain levels measured after a 30-minute oxytocin massage showed substantial changes. Data showed that 14 of the 30 respondents, or 46.7%, experienced mild pain, 10 respondents, or 33.3%, remained in the moderate pain category, and 6 respondents, or 20.0%, continued to experience severe pain. This dramatic decrease in the proportion of mothers with severe pain from 50% to 20% is a very positive indicator of the effectiveness of this intervention.

These changes in pain distribution can be explained by the physiological and neurohormonal mechanisms of oxytocin massage. Research published by Zhang et al. in 2022 identified that tactile stimulation through back massage can increase the production and release of endogenous oxytocin. Oxytocin not only functions in uterine contractions but also has an analgesic effect by modulating pain signal transmission in the central nervous system. In addition to hormonal aspects, massage also activates the gate control theory of pain proposed by Melzack and Wall. Stimulation of large-diameter nerve fibers through touch and pressure can "close the gate" on pain transmission in the spinal cord, thereby reducing pain signals reaching the cerebral cortex. The muscle relaxation and tension reduction effects of massage also contribute to a reduced overall pain perception.

Descriptive analysis showed that the average pain score before oxytocin massage was 7.23 with a standard deviation of 1.08. After the intervention, the average pain score decreased

to 4.63 with a standard deviation of 1.11. This average decrease of 2.6 points on the NRS scale represents a clinically significant and meaningful change for the mother's experience.

These findings align with research conducted by Brown et al. in 2023, which conducted a systematic review of various non-pharmacological methods for labor pain management. The study concluded that touch-based interventions such as massage can produce substantial reductions in pain intensity, with the additional effect of increasing maternal satisfaction with the labor experience and reducing the need for pharmacological analgesia.

To test the significance of the difference in pain levels before and after the intervention, a paired t-test was conducted. The analysis results showed a calculated t-value of 10.274 with 29 degrees of freedom and a probability value (p-value) of 0.000. Given that the p-value is <0.05 , it can be concluded that there is a highly statistically significant difference between pain levels before and after oxytocin massage.

These results provide strong empirical evidence for the effectiveness of oxytocin massage as a non-pharmacological intervention in labor pain management at Manado Medical Center Hospital. These findings are consistent with previous studies, including research by Miller et al. (2021) exploring the role of oxytocin in labor pain management, and a meta-analysis by Patel et al. (2022) evaluating the efficacy of massage therapy in reducing labor pain.

The practical implications of these findings are significant for maternity midwifery practice. Oxytocin massage can be integrated into standard labor pain management protocols, offering a safe, non-invasive alternative without pharmacological side effects. This intervention not only provides physical benefits in the form of pain reduction but also contributes to psychosocial aspects by increasing comfort, emotional support, and a more positive overall labor experience.

4. CONCLUSION

This study indicates that oxytocin massage can be an effective, safe, and acceptable alternative non-pharmacological intervention in labor pain management. The diverse characteristics of the respondents in terms of age, parity, education, and type of delivery indicate that this intervention can be applied to various groups of mothers in labor. This study provides important practical implications for the development of maternity nursing service protocols in hospitals, where oxytocin massage can be integrated as part of standard labor care to improve maternal comfort and reduce reliance on pharmacological methods. Thus, oxytocin massage not only contributes to the physical aspects by reducing pain, but also improves the

overall labor experience, provides emotional support, and promotes a more positive and humane birth for mothers in labor.

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