

RESEARCH ARTICLE

COMBINATION OF COLD COMPRESS THERAPY AND CINNAMON
DECOCTION FOR REDUCING PERINEAL WOUND PAIN IN POSTPARTUM
MOTHERS

(KOMBINASI KOMPRES DINGIN DAN REBUSAN KAYU MANIS UNTUK
MENGURANGI NYERI LUKA PERINEUM IBU NIFAS)

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ABSTRACT

Birth canal tears are common among postpartum mothers and frequently result in perineal pain. This pain is primarily caused by tissue damage and subsequent suturing during childbirth. In Indonesia, approximately 75% of women who deliver vaginally experience perineal wound pain, which may lead to discomfort and dyspareunia. Non-pharmacological methods such as cold compress therapy and cinnamon decoction have been identified as potential interventions to reduce perineal pain. This study aimed to determine the effect of combining cold gel compress therapy and cinnamon decoction on reducing perineal wound pain over an eight-hour period at TPMB Pelly, West Bandung Regency, in 2024. A pre-experimental design using a one-group pretest–posttest approach was employed. The sample consisted of 16 postpartum mothers selected through consecutive sampling. Primary data were collected using the Numerical Rating Scale (NRS 0–10) to assess pain intensity. Data analysis included univariate and bivariate testing using the paired sample t-test. Before the intervention, the majority of participants experienced severe pain, with 19 respondents (65.6%). After receiving the combination therapy, most participants reported moderate pain, with 17 respondents (58.6%). Statistical analysis revealed a significant effect of the combined cold gel compress and cinnamon decoction therapy on reducing perineal wound pain over the eight-hour intervention period, with a p-value of 0.000 ($p < 0.005$). Based on these findings, it is recommended that midwives incorporate the combined use of cold gel compresses and cinnamon decoction as an effective non-pharmacological technique to help reduce perineal wound pain in postpartum mothers.

Keywords: cold gel compress, cinnamon, perineal wound pain

ABSTRAK

Kejadian robekan jalan lahir sering ditemui pada ibu nifas dan menyebabkan rasa nyeri. Nyeri yang dirasakan oleh ibu nifas pada bagian perineum disebabkan oleh luka jahitan pada waktu melahirkan karena adanya jaringan yang terputus. Sebanyak 75% ibu melahirkan pervaginam di Indonesia merasakan nyeri luka perineum. Nyeri luka perineum dapat mengakibatkan rasa

tidak nyaman dan dispareunia. Salah satu metode non farmakologis yang dapat mengurangi nyeri pada luka perineum diantaranya adalah terapi kompres dingin dan rebusan kayu manis. Penelitian ini bertujuan untuk mengetahui pengaruh kombinasi terapi kompres dingin dan rebusan kayu manis terhadap pengurangan nyeri pada luka perineum 8 jam di TPMB Pelly Kabupaten Bandung Barat Tahun 2024. Jenis penelitian ini menggunakan *pre-eksperimental* dengan rancangan *pretest posttest one grup* dengan sampel 16 orang ibu nifas 8 jam di TPMB Pelly Kabupaten Bandung Barat Tahun 2024 dengan teknik pengambilan sampel “menggunakan *Consecutive sampling*. Teknik pengumpulan data dalam penelitian ini adalah data primer dengan menggunakan instrumen nyeri NRS 0-10. Analisis menggunakan analisis univariat dan bivariat dengan *paired sampel t test*. Hasil penelitian sebelum diberikan intervensi lebih dari setengahnya mengalami nyeri berat yaitu 13 responden (81.2%), setelah diberikan intervensi lebih dari setengahnya mengalami nyeri sedang yaitu 11 responden (68.8%). Hasil analisis statistik menunjukkan terdapat pengaruh kombinasi terapi kompres gel dingin dan rebusan kayu manis terhadap pengurangan nyeri pada luka perineum 8 jam dengan P-Value 0.000 ($p < 0.005$). Disarankan kepada bidan dapat menggunakan kombinasi terapi kompres gel dingin dan rebusan kayu manis untuk mengurangi tingkat nyeri nyeri pada luka perineum.

Kata kunci: kompres gel dingin, kayu manis, nyeri luka perineum

INTRODUCTION

The puerperium is the period beginning after the expulsion of the placenta until the reproductive organs return to their pre-pregnancy state, typically lasting six weeks. During this stage, mothers must recover physically while simultaneously caring for their newborns, and any complications may negatively affect infant well-being.¹ Several postpartum complications may arise, including endometritis, peritonitis, mastitis, breast engorgement, postpartum hemorrhage, and birth canal lacerations.² Perineal tears are among the most common conditions experienced after childbirth. More than 50% of spontaneous deliveries result in perineal wounds, and globally, 40% of the 26 million annual births in the United States involve perineal rupture. Asia

accounts for nearly half of global perineal tear cases, with Indonesia reporting perineal injuries in approximately 75% of vaginal births. In West Java, perineal rupture contributes to postpartum bleeding and infection, and is the second leading cause of maternal mortality.³

Perineal wound pain is physiological yet affects maternal mobility, rest, urinary and bowel function, emotional state, daily activities, and newborn care.⁴ Pain intensity varies among women and increases with the degree of laceration. If unmanaged, pain may disrupt basic maternal needs.⁵ Although pharmacological therapy can relieve pain, it may cause adverse effects for mothers and infants.⁶ Non-pharmacological therapies, in contrast, are safer and widely recommended.⁷ Cinnamon has demonstrated analgesic,

anti-inflammatory, and antimicrobial properties due to compounds such as eugenol.⁸ Previous studies show cinnamon decoction can significantly reduce perineal pain, though less effectively than ibuprofen.⁹ Cold gel compresses also reduce pain by inducing vasoconstriction and decreasing nerve conduction.¹⁰

Although both cinnamon decoction and cold gel compress therapy have been proven effective individually, their combined use has not been previously applied to postpartum mothers. TPMB Pelly has not implemented non-pharmacological methods for perineal pain, despite an observed 10% increase in cases. This study aims to determine the effect of combining cold gel compress therapy and cinnamon decoction on reducing perineal wound pain among postpartum mothers at TPMB Pelly, West Bandung Regency, in 2024.¹¹

MATERIALS AND METHODS

This research employed a quantitative approach with a pre-experimental design using a one-group pretest–posttest format. The study population consisted of all postpartum mothers within the first eight hours after delivery who experienced second- degree perineal tears in June 2024 at TPMB Pelly, West Bandung Regency. A consecutive

sampling technique was used to recruit participants who met the inclusion criteria until the target sample size was achieved, resulting in a total of 16 postpartum mothers. The materials and tools utilized in this study were cold gel compresses standard in temperature and size, cinnamon decoction prepared from cinnamon stick d. with controlled boiling method, the Numerical Rating Scale (NRS 0–10) as the main pain assessment tool, as well as data collection sheets to record the pretest and posttest scores. The procedure began with measuring each participant's baseline perineal pain level using the NRS. Participants then received the combined intervention of cold gel compress therapy and cinnamon decoction according to a uniform protocol. Following the intervention, pain levels were reassessed using the same NRS instrument. Data were analyzed through univariate analysis to describe participant characteristics and bivariate analysis using the paired sample t-test to determine the effect of the combined therapy on reducing perineal wound pain.

RESULTS AND DISCUSSION

Analysis Univariate

Based on Table 1, out of 16 respondents, most experienced severe pain, totaling 13 respondents (81.2%).

Table 1 Frequency distribution of perineal wound pain among postpartum mothers 8 hours after delivery before receiving the combined cold gel compress and cinnamon decoction therapy

<i>Pain Category</i>	<i>N</i>	<i>%</i>
<i>No Pain</i>	0	0.0
<i>Mild</i>	0	0.0
<i>Moderate</i>	3	18.8
<i>Severe</i>	13	81.2
<i>Very Severe</i>	0	0.0

Source: Primary Data, 2024

Based on Table 4.2, out of 16 respondents, more than half experienced moderate pain, totaling 11 respondents (68.8%).

Table 2 Frequency distribution of perineal wound pain among postpartum mothers 8 hours after delivery following the combined cold gel compress and cinnamon decoction therapy

<i>Pain Category</i>	<i>N</i>	<i>%</i>
<i>No Pain</i>	0	0.0
<i>Mild</i>	5	31.2
<i>Moderate</i>	11	68.8
<i>Severe</i>	0	0.0
<i>Very Severe</i>	0	0.0

Source: Primary Data, 2024

Bivariate Analysis

Table 3 Effect of the Combination of Cold Gel Compress Therapy and Cinnamon Decoction on Perineal Wound Pain Reduction Among Postpartum Mothers 8 Hours After Delivery at TPMB Pelly, West Bandung Regency, 2024

<i>Variable</i>	<i>Mean</i>	<i>S.D</i>	<i>p-value</i>
Pre-test Pain Score	7.12	0.957	0.000
Post-test Pain Score	4.00	1.154	
Difference	3.12		

Source: Primary Data, 2024

The results in Table 4.3 indicate a significant decrease in perineal wound pain after the combined cold gel compress and cinnamon decoction therapy. The p- value of 0.000 ($p < 0.005$) demonstrates that the

intervention had a statistically significant effect on reducing pain levels.

DISCUSSION

The findings presented in Table 4.1

indicate that before the intervention, most respondents (81.2%) experienced severe perineal wound pain within 8 hours postpartum. Several factors influence perineal pain among postpartum mothers, including age. Older mothers tend to have a higher pain threshold compared to younger women. According to Afritayeni (2017), mothers older than 35 years are 22.667 times more likely to experience severe labor and perineal wound pain compared with those aged 20–35 years. This relationship may be explained by higher psychological stress levels and lower tolerance to nociceptive stimuli in older women. Age therefore plays an important role in how pain is perceived and processed. Consistent with previous studies, respondents aged >35 years in this research reported higher pain intensity than younger respondents.¹²

Parity was also found to be an influential factor. The vast majority of respondents had only given birth to one child (81.2%), while only a small number had given birth to three children (6.2%). Intensity of pain correlates with number of deliveries. Multiparous mothers usually have a larger capacity to manage labor pain and perineal trauma, whereas primiparous mothers often lack prior exposure to labor, leading to heightened anxiety and a more intense perception of pain. It requires more energy to dilate the cervix for a first-time mother, resulting in a more challenging contraction process and

more intense discomfort after childbirth. Previous studies have validated this and have found that mothers who have had several births tend to experience moderate pain, whereas mothers who have had one birth tend to experience pain that is classified as more severe.¹³ Stress and anxiety among primiparous women may further heighten pain perception, whereas previous experience in multiparous women helps reduce fear and enhances coping mechanisms.¹⁴

These results are also aligned with Hasriani (2020), who found that the majority of postpartum mothers experienced severe perineal pain prior to therapeutic intervention.¹⁵ In this study, the high prevalence of severe pain before treatment may be attributed to primiparity, lack of knowledge regarding non-pharmacological pain management, and older maternal age.¹⁶

Perineal Wound Pain After Intervention

Results in Table 4.2 show that after receiving the combined cold gel compress and cinnamon decoction therapy, most respondents (68.8%) experienced moderate pain rather than severe pain. Cold therapy reduces pain by stimulating the skin surface and activating A-beta tactile fibers, which block pain transmission through the gate control mechanism.¹⁷ In addition, cinnamon decoction contains cinnamaldehyde and eugenol, natural compounds with analgesic and anti-inflammatory effects. Eugenol

inhibits prostaglandin synthesis and decreases inflammatory responses by blocking cyclooxygenase-2 (COX-2) activity, thereby reducing nociception.¹

Although some respondents remained in the moderate pain category after the intervention, their numeric pain score showed an improvement of at least two points. This indicates that even when the categorical classification does not change, clinical improvement is still present. Variability in response to treatment may be impacted by previous birth experiences, social support, and psychological preparedness, amongst other elements. Education level was another contributing factor. Most respondents had completed their senior secondary education, which may have improved their ability to follow instructions and complete the intervention.²

The significant decrease of the mean pain score from 7.12 to 4.00 shows the efficacy of the combined therapy. These results parallel Romadhon (2021), who demonstrated the efficacy of cinnamon in pain reduction for perineal wound pain. Likewise, Girsang (2020) and Susilawati & Ilda (2019) reported the efficacy of cold compress in pain reduction of perineal pain of postpartum mothers.^{3,4,5}

The Combined Cold Gel Compress and Cinnamon Decoction Effect

Results of the paired t-test ($p = 0.000$) suggest that the combined use of cold gel

compress and cinnamon decoction had a statistically significant impact on reducing perineal wound pain in postpartum mothers. The intervention was applied 8 hours postpartum. The temperature of the cold gel pack was measured prior to application using a water thermometer to ensure it was at approximately 15°C. The pack was applied to the area for a duration of 20 minutes.⁶

The application of a cold gel pack aids in reducing cellular metabolism and induces vasoconstriction, along with reducing capillary permeability and the provision of an analgesic effect. These physiological changes lead to a reduction in the pain and inflammation. These effects are consistent with 4,9 In addition, cold therapy may help in the reduction of bacteria, promoting a positive effect on the healing of the wound.⁷

The findings of this study demonstrate that the combination of cold gel compress therapy and cinnamon decoction was effective in reducing perineal wound pain among postpartum mothers within the first eight hours after childbirth. The results indicate that mothers who received the combined intervention experienced a greater reduction in pain intensity compared to their pain level before treatment. This suggests that the use of non-pharmacological interventions targeting different pain mechanisms may provide a synergistic effect in relieving postpartum perineal pain.⁸

Perineal pain is one of the most common discomforts experienced by postpartum mothers, particularly those with spontaneous perineal tears or episiotomy wounds. The pain generally occurs due to tissue trauma, inflammation, edema, and the release of inflammatory mediators such as prostaglandins, histamine, and bradykinin during the wound healing process. These mediators stimulate peripheral nociceptors, resulting in pain that may interfere with essential postpartum activities, including breastfeeding, mobilization, urination, defecation, sleeping, and mother–infant bonding. Effective pain management is therefore essential not only to improve maternal comfort but also to facilitate early recovery and prevent complications associated with limited mobility.⁹

Cold therapy has long been recommended as an effective non-pharmacological intervention for acute soft tissue injuries. The application of a cold gel pack to the perineal area produces local vasoconstriction, which decreases blood flow to the injured tissue and limits the inflammatory response. Reduced blood circulation minimizes oedema formation and decreases the release of inflammatory substances that stimulate pain receptors. Furthermore, cold application slows nerve conduction velocity, particularly in sensory nerve fibres responsible for transmitting pain impulses to the central nervous system. As a

result, pain perception is reduced, allowing mothers to feel more comfortable during the early postpartum period.¹⁰

Another important mechanism of cold therapy is its ability to reduce muscle spasm and tissue metabolism. Lower tissue metabolism decreases oxygen demand and limits secondary tissue injury, thereby promoting a more favorable healing environment. In addition, cold stimulation activates the gate control mechanism of pain, in which non-painful sensory input competes with pain signals at the spinal cord level, reducing the transmission of pain impulses to the brain. These physiological effects explain why mothers commonly report immediate pain relief after cold application.¹¹

Unlike conventional towel cold compresses, this study used reusable cold gel packs. Gel packs maintain a stable cold temperature for a longer period, providing more consistent therapeutic effects. They are also easier to apply, conform well to the perineal area, and are more hygienic because they can be disinfected after each use. These advantages may have contributed to the greater reduction in perineal pain observed in this study. In addition to cold gel therapy, participants consumed 200 ml of cinnamon decoction as part of the combined intervention. Cinnamon (*Cinnamomum burmannii*) has been widely recognized as a medicinal plant possessing analgesic, anti-

inflammatory, antioxidant, and antimicrobial properties. The therapeutic effects of cinnamon are primarily attributed to its bioactive compounds, including cinnamaldehyde, eugenol, cinnamic acid, and polyphenols. Among these compounds, eugenol has been extensively studied for its analgesic and anti-inflammatory activities. Eugenol inhibits cyclooxygenase enzymes (COX-1 and COX-2), thereby suppressing prostaglandin synthesis, which plays a central role in pain and inflammation. By reducing prostaglandin production, cinnamon decreases tissue inflammation and ultimately alleviates pain associated with perineal wounds.¹²

Cinnamaldehyde also contributes significantly to pain reduction by inhibiting the production of pro-inflammatory cytokines such as tumor necrosis factor- α (TNF- α), interleukin-1 β (IL-1 β), and interleukin-6 (IL-6). These inflammatory cytokines are known to amplify nociceptive signaling and prolong inflammatory responses after tissue injury. In addition, cinnamon exhibits antioxidant properties that neutralize reactive oxygen species generated during tissue inflammation. Reduced oxidative stress may accelerate tissue repair and improve wound healing, thereby contributing to decreased pain intensity over time.¹³

Another potential benefit of cinnamon is

its antimicrobial activity against several pathogenic bacteria commonly associated with wound infections. Although infection prevention was not directly measured in this study, maintaining a lower bacterial load around the wound may indirectly support faster healing and reduce inflammation-related pain. Therefore, cinnamon may provide multiple therapeutic benefits beyond its analgesic effects.¹⁴

The greater pain reduction observed in this study may be explained by the complementary mechanisms of the two interventions. Cold gel therapy primarily provides immediate local pain relief by reducing nerve conduction, edema, and inflammation at the wound site, whereas cinnamon decoction exerts systemic anti-inflammatory and analgesic effects through biochemical pathways. Together, these interventions address both peripheral and systemic mechanisms involved in pain perception, producing a synergistic effect that may be more effective than either intervention alone. This complementary mechanism supports the concept of multimodal pain management, in which different interventions are combined to enhance analgesic efficacy while minimizing reliance on pharmacological agents.¹⁵

The findings of this study are consistent with previous research. Mariene Wiwin (2019) reported that cold compress therapy

significantly reduced perineal pain among postpartum mothers ($p = 0.001$), while Salsabila (2023) found that cinnamon decoction significantly reduced pain in mothers with perineal sutures ($p = 0.005$). These findings support the effectiveness of each intervention as a non-pharmacological approach to postpartum pain management. However, both studies evaluated only a single intervention. In contrast, the present study combined cold gel compress therapy with cinnamon decoction, which resulted in greater pain reduction, suggesting that the two interventions may provide complementary analgesic and anti-inflammatory effects.¹⁶

Field observations also supported these findings. Participants complied well with the intervention protocol by consuming the cinnamon decoction and using the cold gel pack as instructed. No adverse effects or discomfort were reported during the intervention, indicating that both therapies were safe and well tolerated. Good participant adherence may have contributed to the reduction in pain scores observed after treatment.¹⁷

The combination of cold gel compresses and cinnamon decoction offers practical advantages for postpartum care. Both interventions are simple, inexpensive, non-invasive, and easy to implement in primary healthcare settings. Therefore, this

combination has the potential to be incorporated into routine postpartum care as a complementary method for reducing perineal wound pain and improving maternal comfort during the early postpartum period.¹

Overall, the findings indicate that combining cold gel compress therapy with cinnamon decoction represents a promising complementary approach for postpartum perineal pain management². By integrating local physical therapy with systemic herbal treatment, this intervention effectively reduces pain through multiple physiological pathways. The intervention is practical, safe, cost-effective, and acceptable for postpartum mothers, making it a valuable addition to evidence-based midwifery practice. Incorporating this combination into routine postpartum care has the potential to improve maternal comfort, facilitate early mobilization, enhance breastfeeding performance, and promote faster postpartum recovery.³

CONCLUSION

This research captures the high intensity of perineal wound pain expressed by mothers up to 8 hours after giving birth. Following administration of a combined cold gel compress and cinnamon decoction, pain intensity was significantly reduced, with most participants moving from the severe pain category to the moderate category. The combination of the two non-pharmacological

methods was confirmed by a statistical analysis to significantly reduce perineal wound pain among postpartum mothers at TPMB Pelly in 2024. The results suggest a novel postpartum care strategy combining cold therapy and cinnamon preparation is a useful, safe, and easy to access way to promote maternal comfort and recovery and may be incorporated into postpartum care with little risk. Further studies on larger populations with comparative research design are encouraged to support the evidence needed for broader integration into clinical care.^{4,5}

CONFLITC OF INTEREST

The authors have no conflicts of interest to declare concerning the study.

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