

Comparison of Cold Compresses on Reducing Perineal Wound Pain in Postpartum Mothers at TPMB Bdn. Tri Utami Sari, S.SiT

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Abstract: WHO (2019) states that the incidence of perineal rupture in Indonesia is 67.2%, an increase from the previous year, namely 60% in 2019 with an incidence of puerperal infection of 7%. Around 23-24% of postpartum mothers experience pain and discomfort during the 12 days postpartum. One effort to reduce pain due to perineal wounds and uncomfortable conditions after postpartum is the non-pharmacological method of cold compresses, which is simple and easy to do. Applying a cold compress is a form of skin stimulation using temperature. Cold compresses are known to provide an analgesic effect, namely in the form of slowing the speed of nerve conduction so that fewer pain impulses reach the brain. **Purpose:** To determine the comparison of cold compresses to reduce perineal wound pain in postpartum mothers at TPMB Bdn. Tri Utami Sari, S.SiT. **Method:** Simple experimental research with pretest and posttest and using the Numeric Rating Scale (NRS) instrument. The population of this study was all postpartum mothers at TPMB Bdn. Tri Utami Sari, S.SiT, So the results obtained from the calculation of this research sample were 34 respondents. **Result:** The results of the Wilcoxon Signed-Rank Test showed a Z-value of -5.166 and an Asymp. Sig. (2-tailed) value of $0.000 < 0.05$, indicating that there was a significant difference in the reduction of perineal pain in postpartum women between before and after the application of cold compresses at the TPMB Bdn. Tri Utami Sari, S.SiT. **Conclusion:** Cold compresses can be used as an effective alternative treatment to reduce the intensity of perineal pain in postpartum women.

Keywords: cold compress; pain; perineal; post partum; wound

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Introduction

The postnatal period (puerperium) is the period that begins after the baby is born and the placenta is delivered, and ends when the uterine cavity returns to its pre-pregnancy state (WHO, 2022). The postnatal period is the time following the delivery of the placenta and membranes until the woman's reproductive system returns to its pre-pregnancy state. This period lasts around six weeks and is marked by significant changes as the woman transitions from the process of childbirth to the joys and responsibilities of motherhood (WHO, 2022). (NICE, 2021). In 2009, there were 2.7 million cases of perineal lacerations among women giving birth worldwide, with around 50 per cent of these occurring in Asia. In Indonesia, around 75% of women giving birth vaginally experience perineal lacerations. In 2013, out of 1,951 spontaneous vaginal deliveries, 57% of women required perineal sutures, with 28% of these cases resulting from episiotomies and 29% from spontaneous tears (East et al., 2012).

According to the WHO (World Health Organisation) in 2018, the global maternal mortality rate stood at 304,000. The WHO estimates that there are 500,000 maternal deaths worldwide each year. Developing countries account for the largest proportion of maternal deaths, with 280 maternal deaths per 100,000 live births, compared with the maternal mortality rate (MMR) in developed countries, which stands at 14 maternal deaths per 100,000 live births. The global maternal mortality rate has fallen by approximately 44 per cent compared with 2018. Data from the WHO (2019) indicates that the incidence of perineal tears in Indonesia stands at 67.2%, an increase from the previous year's figure of 60 per cent in 2019, with a 7% incidence of puerperal infection (Kim et al., 2020).

According to Kozier and Erb in Rahmawati (2023), pain is described as an emotional experience whose management involves not only physical care but also the use of psychological interventions to alleviate it. Perineal tears can affect the physical and psychological well-being of postpartum mothers; 23-24% of postpartum mothers experience pain and discomfort during the first 12 days postpartum. Any mother who has given birth and sustained a

perineal tear will experience pain, whether the tear was caused by an episiotomy or a spontaneous tear. The discomfort and pain experienced by postpartum mothers as a result of perineal tears often lead to a fear of moving after childbirth (East et al., 2012).

Various methods for managing perineal wound pain can be employed, whether pharmacological or non-pharmacological (East et al., 2012). There are several types of non-pharmacological therapies that can be used to relieve pain, including distraction, biofeedback, self-hypnosis, cutaneous stimulation, cold compresses and massage (Kim et al., 2020). One approach to reducing pain caused by perineal tears and discomfort in postpartum mothers is the simple and easy-to-administer non-pharmacological method of cold compresses. The application of cold compresses is a form of skin stimulation that utilises temperature. Cold compresses offer the advantage of reducing blood flow to the affected area. This helps to minimise the risk of bleeding and oedema. Cold compresses are known to have an analgesic effect, slowing down the speed of nerve transmission so that fewer pain signals reach the brain. (White & Atchan, 2022; Gondim et al., 2025). The results of a preliminary study conducted by Tri Utami Sari, S.SiT., at TPMB Bdn., based on interviews with six patients regarding their knowledge of cold compresses for reducing perineal wound pain, revealed that one patient was already aware of the use of cold compresses for pain relief but had never tried it, whilst five patients were unaware of the use of cold compresses for reducing perineal wound pain. The above background formed the basis for the researcher's interest in conducting a study on 'A Comparison of Cold Compresses for the Relief of Perineal Wound Pain in Postpartum Women'.

Method

This was a pre-experimental study using a one-group pretest-posttest design. The sample comprised 34 respondents, selected using purposive sampling in accordance with pre-defined inclusion criteria. The inclusion criteria used comprised multiparous or primiparous postpartum mothers ≥ 6 hours post-delivery, postpartum mothers with first- or second-degree perineal tears, and postpartum mothers who had not yet been administered analgesic medication. The cold compress intervention was administered for approximately 15 minutes using a small towel, cloth or gauze soaked in cold water, or an ice pack or ice gel applied to the area of the wound. The instrument used to measure pain levels in this study was the Numeric Rating Scale (NRS) form. The data obtained were analysed using univariate analysis in the form of frequency descriptions and bivariate analysis using the non-parametric Wilcoxon test, as the data were not normally distributed. All data analysis for this study was carried out using SPSS version 26.0. This study obtained ethical approval from the Health Research Ethics Committee of the Faculty of Nursing and Health Sciences, Muhammadiyah University of Semarang, under number 813/KE/11/2024.

Results and Discussion

The frequency distribution of characteristics, as shown in Table 1, reveals that the majority of respondents were aged between 20 and 35 years, totalling 34 respondents (100%), in line with the study (Francisco et al., 2018) being aged between 20 and 35 is a factor that influences susceptibility to injury and wound healing. With regard to parity, the majority of respondents were multiparous, totalling 21 respondents (61.8%), in line with the study (Jones et al., 2019) which indicates that perineal tears in multiparous women can be caused by several factors, including the mother's age, parity, interval between births, the elasticity of the perineal muscles or birth canal, the baby's birth weight, the performance of an episiotomy, and the mother's incorrect pushing technique.

The education group, the majority of whom had secondary education (22 respondents, 64.7%), is consistent with Aulia (2016), who showed that educational level can influence perceptions of pain intensity through knowledge and information, which in turn affect mothers' pain responses and behaviour. In the occupational group, the majority of respondents were not in employment, totalling 18 (52.9%) mothers. This is consistent with (Herlina, 2023), who found that employment can influence postpartum mothers' management of perineal pain, with employed mothers having easier access to information compared to those who are not in employment.

The frequency distribution of grade 1 perineal wounds prior to the application of a cold compress, as shown in Table 2, indicates that the majority of respondents (52.9%) experienced moderate pain. This is consistent with a study (Leventhal et al., 2011) which reported that the level of perineal wound pain in the pre-test phase was moderate in 5 respondents (50%). The pain experienced by postpartum women 2 hours after childbirth varies from woman to woman; this constitutes a burden for postpartum women suffering from perineal wound pain. The frequency distribution of grade 1 perineal wounds following the application of a cold compress, as shown in Table 3, indicates that the majority of respondents 12 (70.6%) experienced mild pain. This is consistent with a study by (Francisco et al., 2018) which found that, following the application of a cold compress, 19 respondents (63.3%) experienced mild pain. Cold compresses are a simple and easy method to reduce pain, as they have an analgesic effect that slows down nerve conduction, thereby reducing the number of pain impulses reaching the brain. The frequency distribution of

grade 2 perineal tears prior to the application of a cold compress, as shown in Table 4, indicates that the majority of respondents (58.8%) experienced severe pain. This is consistent with the findings of Yuanita (2020), who also reported that, in her study, 11 respondents (69 per cent) experienced severe pain prior to the application of a cold compress. This was due to the fact that the majority of perineal tears were of grade 2, caused by incorrect pushing techniques.

The frequency distribution of grade 2 perineal wounds following the application of a cold compress, as shown in Table 5, indicates that the majority 9 respondents (52.9%) experienced moderate pain. This is consistent with a study by (Elny, 2023), in which 10 respondents experienced moderate pain following the application of a cold compress. The body's physiological response to cold compresses can affect the body's condition by causing blood vessels to constrict, reducing blood flow to the wound and thereby reducing the risk of bleeding and oedema. The results of the normality test indicated that the data on the reduction in pain associated with grade 1 and grade 2 perineal wounds before and after the application of cold compresses were non-normally distributed. Consequently, the Wilcoxon non-parametric test was used to compare the levels of pain associated with grade 1 and grade 2 perineal wounds following the application of cold compresses. Based on Table 6, for the first-degree variable the calculated z-value is -3.819, whilst for the second-degree variable the calculated z-value is -3.500. When assessed against the hypothesis testing criteria, the z-value for the first-degree variable is -3.819; which is a negative value smaller than the table z-value (-1.645), meaning that H_0 is rejected and H_1 is accepted; and the z-value at the second degree is -3.500, which is a negative value smaller than the table z-value (-1.645), meaning that H_0 is rejected and H_1 is accepted, indicating that cold compresses can reduce the level of perineal wound pain.

For grade 1 variables, a p-value of 0.000 was obtained; for grade 2 variables, a p-value of 0.000 was obtained. These results indicate that there is a significant difference in the effect of cold compresses on the reduction of pain from grade 1 and grade 2 perineal wounds in postpartum women between before and after the application of cold compresses. A cold compress is a process of lowering the temperature of a substance, which serves as a therapeutic treatment to aid healing. Women in the postnatal period will find relief when given a cold compress, as it has an analgesic effect that slows down nerve conduction; this means fewer pain signals reach the brain, thereby reducing pain (Morais et al., 2016). (WHO, 2022). A cold compress can stimulate the skin through temperature. Cold compresses reduce prostaglandin levels and act on pain receptors, halting the inflammatory process and stimulating the release of endorphins. Cold compresses work by numbing the affected area, thereby reducing blood flow to the wound, which in turn reduces the risk of bleeding and oedema, whilst slowing and accelerating nerve transmission so that fewer pain signals reach the brain (Muaddi et al., 2023).

Francisco et al. (2018) demonstrated that cold compresses help to reduce pain associated with perineal wounds. Before the cold compress was applied, patients experienced pain rated at 7 on the pain scale; after the cold compress was applied, their pain decreased to a rating of 3. This indicates that the use of cold compresses can reduce the intensity of pain in perineal wounds. This reduction in pain may occur because cold compresses prevent an inflammatory response and stimulate A-beta and C nerve fibers in the spinal cord to reduce the transmission of pain impulses (Morais et al., 2016). (Augustino et al., 2023).

The findings of this study are supported by research (Morais et al., 2016), which concluded that cold compresses applied to perineal wounds can reduce the level of pain associated with such wounds. This is also explained in a study (Leventhal et al., 2011), which concluded that the application of cold compresses has a significant effect on pain associated with perineal wounds. The findings of the research carried out by the researchers are also supported by a review study conducted (Kim et al., 2020). The results of the study show that the use of cold compresses significantly reduces pain in perineal wounds in postpartum women. As well as relieving pain, cold compresses are also effective at reducing pain during mobilization in the first 12 hours after childbirth. Previous research has also confirmed that mothers feel more satisfied and have a more positive experience of their wound healing after being given cold compresses (Aboyunis et al., 2025). This suggests that cold compresses also have a beneficial effect on wound healing, mediated by their analgesic effect, thereby causing blood vessels to constrict more rapidly (White & Atchan, 2022). (Molyneux et al., 2024).

This study has limitations, including the absence of a control group; consequently, it cannot be fully confirmed that the observed reduction in pain was solely due to the cold compress. Furthermore, the relatively small sample size at a single midwife's private practice limits the generalisability of the results to the wider population of postpartum mothers. Nevertheless, the findings indicate that cold compresses are effective in reducing perineal wound pain, and there is a significant difference between Grade 1 and Grade 2 pain scores before and after the application of cold compresses. Future research is expected to include a control group to confirm the causal attribution of the cold compress effect, and to increase the sample size and include multiple midwifery practice locations to ensure the results are more representative.

Table 1. Frequency Distribution of Respondent Characteristics (N=34)

Characteristic	Frequency	Percentage (%)
Age		
< 20 years and > 35 years	0	0
20-35 years	34	100
Total	34	100
Parity		
Primiparous	13	38,2
Multiparous	21	61,8
Total	34	100
Education		
Primary school	0	0
High school	22	64,7
Higher education (universities)	12	35,3
Total	34	100
Job		
Work	16	47,1
unemployment	18	52,9
Total	34	100

Table 2. Frequency distribution of Grade 1 perineal tears prior to cold compress application

Pain Level	Frequency	%
Painless	0	0
Mild pain	5	29,4
Moderate pain	9	52,9
Severe pain	3	17,6
Total	17	100

Table 3. Frequency distribution of Grade 1 perineal tears following the application of a cold compress

Pain Level	Frequency	%
Painless	4	23,5
Mild pain	12	70,6
Moderate pain	1	5,9
Severe pain	0	0
Total	17	100

Table 4. Frequency Distribution of Grade 2 Perineal Lacerations Before Cold Compress Application

Pain Level	Frequency	%
Painless	0	0
Mild pain	0	0
Moderate pain	7	41,2
Severe pain	10	58,8
Total	17	100

Table 5. Frequency distribution of Grade 2 perineal tears following the application of a cold compress

Pain Level	Frequency	%
Painless	0	0
Mild pain	6	35,3
Moderate pain	9	52,9
Severe pain	2	11,8
Total	17	100

Table 6. Comparison of Pain Relief for Grade 1 and Grade 2 Perineal Lacerations

Variable	Z-Score	p-value
Grade 1 Before and After Applying a Cold Compress	-3,819	0,000
Grade 2 Before and After Applying a Cold Compress	-3,500	0,000

Conclusion

Overall, this study shows that the application of cold compresses to first- and second-degree perineal tears significantly reduces pain intensity in postpartum women. The reduction in pain was more pronounced in first-degree perineal tears, which may be related to their milder severity and individual differences in pain thresholds. These findings reinforce the use of cold compresses as a simple, non-pharmacological method that is easy to implement as an intervention for postpartum perineal pain management.

Declaration of Generative AI

The authors declare that this manuscript was independently written without the use of generative AI or automated content-generation tools.

Authors' Contribution

All authors contributed equally to all research phases, from study design and data analysis to manuscript preparation and approval of the final version.

Conflict of Interests Statement

The authors declare no conflicts of interest regarding the research, authorship, or publication of this article.

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Data Availability

The dataset used during the current study is available from the corresponding author upon reasonable request.

Informed Consent

Written informed consent was obtained from all participants prior to their inclusion in the study.

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