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Effect of Maternity Cooling Gel Pad on Episiotomy Pain Among Postnatal Mothers

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Abstract: ***Background**: Episiotomy is frequently practiced in Indian obstetric settings, especially among primigravida women, often leading to perineal pain that interferes with early recovery. Maternity cooling gel pads offer a safe, non-pharmacological method to manage such pain. **Objectives**: To assess the effectiveness of maternity cooling gel pad application on episiotomy pain among postnatal mothers. **Methods**: A quasi-experimental, non-equivalent control group pre-test/post-test study was conducted on 68 postnatal mothers (34 experimental, 34 control) at a tertiary care hospital. Pain was assessed using the Numerical Pain Rating Scale (NPRS) before and after maternity cooling gel pad application over two days. Data were analyzed with SPSS v22 using t-tests and RMANOVA. **Results**: Pre-test pain scores were similar in both groups. The experimental group showed a significant reduction (Day 1: 5.62 ± 0.74; Day 2: 3.44 ± 0.61) compared to controls (Day 1: 7.38 ± 0.65; Day 2: 6.74 ± 0.75; $p < 0.001$). Intra-group analysis confirmed statistical significance. Conclusion: Maternity cooling gel pad application significantly reduces episiotomy pain and should be included in postnatal care protocols as a cost-effective and safe intervention.*

Keywords: Episiotomy pain, maternity cooling gel pad, postnatal care, nursing intervention, cryotherapy

1. Introduction

Episiotomy, a surgical incision made in the perineum during vaginal delivery, remains widely practiced in India, especially among primigravida women. While intended to prevent severe perineal tears and expedite delivery, this intervention frequently results in localized trauma, swelling, and significant postpartum pain. Pain from episiotomy can impair a mother's ability to sit, walk, breastfeed, and care for her newborn, and may contribute to anxiety, urinary retention, constipation, and even postpartum depression.

India's reported episiotomy rates of 60–70% starkly contrast with the World Health Organization's recommendation for restrictive use, highlighting the need for improved postpartum pain management strategies. Pharmacological analgesics, while effective, may pose systemic side effects and may not be preferred in breastfeeding women. This makes non-pharmacological interventions such as cold therapy particularly appealing.

Maternity cooling gel pads deliver localized cold application with minimal disruption to maternal activities. They reduce inflammation and nociceptive transmission, offering a simple, cost-effective method for pain control. Yet despite promising evidence, their adoption in Indian postnatal wards remains limited, and very few structured studies have been conducted on their efficacy. Guided by Kolcaba's Comfort Theory, which emphasizes relief, ease, and transcendence across physical, psychological, sociocultural, and environmental domains, this study evaluates the application of maternity cooling gel pads as a strategy to manage episiotomy-related pain in postnatal mothers.

Objectives

- **Primary Objective** To assess the effect of maternity cooling gel pad application on the level of pain in episiotomy wounds among postnatal mothers.
- **Secondary Objective** To determine the association between post-test episiotomy pain scores and selected sociodemographic and obstetric variables in the experimental and control groups.

Hypotheses

- **Null Hypothesis (H_0):** There is no significant difference in episiotomy pain scores between the experimental group and control group after application of the maternity cooling gel pad.
- **Alternative Hypothesis (H_1):** There is a significant difference in episiotomy pain scores between the experimental and control group after application of the maternity cooling gel pad.
- **Null Hypothesis** H_0: - There will be no association between post- test pain scores in episiotomy wound with selected demographic and obstetric variables among experimental and control group
- **Alternative Hypothesis** H_{-2}: There will be association between post-test pain scores in episiotomy wound with selected demographic and obstetric variables among experimental and control group.

2. Materials and Methods

Study Design: This study adopted a quasi-experimental, non-equivalent control group pre-test/post-test design.

Setting: Labour room and maternity wards of a selected tertiary care hospital in Western Maharashtra.

Population: Postnatal mothers with mediolateral episiotomy who delivered vaginally during the study period.

Sample Size: 68 participants — 34 in the experimental group and 34 in the control group.

Sampling Technique: Purposive sampling. Participants were enrolled based on set inclusion and exclusion criteria.

Inclusion Criteria:

- Women who had right mediolateral episiotomy
- Delivered vaginally

- Within two hours postpartum
- Willing to participate and provide informed consent

Exclusion Criteria:

- Instrumental/operative deliveries
- Postnatal complications
- Mothers who received epidural analgesia

Intervention

In the experimental group, a maternity cooling gel pad (13.5 cm × 9 cm, chilled at –10 to –15°C) was applied to the episiotomy wound for 15 minutes, three times a day for two consecutive days. Pain scores were recorded 10 minutes after the third application on both Day 1 and Day 2 using the Numerical Pain Rating Scale (NPRS). The control group received routine postnatal care only.

Tool Used:

- Socio-demographic & clinical proforma
- Standardized NPRS (0 = no pain, 10 = worst pain)

Ethical Considerations

- Ethical approval was obtained from the institutional ethics committee.
- Written informed consent was obtained from all participants.
- Participant anonymity and confidentiality were strictly maintained.
- Cold application safety guidelines were followed.

3. Results

Table 1: Socio-demographic data in study groups, n=68

Demographic variables		Experimental (%) (n=34)	Control (%) (n=34)	P-value
Age (Yrs)	<30	24 (70.6)	24 (70.6)	0.999
	30 & above	10 (29.4)	10 (29.4)	
Education	Primary	3 (8.8)	1 (2.9)	0.182
	Middle school	1 (2.9)	4 (11.8)	
	High school	12 (35.3)	17 (50)	
	Graduate & above	18 (52.9)	12 (35.3)	
Occupation	Housewife	33 (97.1)	33 (97.1)	0.999
	Service	1 (2.9)	1 (2.9)	
Socio economic class	Lower middle class	13 (38.2)	9 (26.5)	0.094
	Upper lower class	0	4 (11.8)	
	Upper middle class	21 (61.8)	21 (61.8)	
P-value by Chi-Square test. P-value<0.05 is considered to be statistically significant.				

None of the demographic variables showed statistically significant differences between the experimental and control groups (P-value > 0.05 for all).This suggests that the groups are relatively well-matched in terms of demographic characteristics

Table 2: Obstetrical variables in study groups (data collected from subjects), n =68

Variables		Experimental (%) (n=34)	Control (%) (n=34)	P-value
Birth spacing (Yrs)	Not applicable	19 (55.9)	16 (47.1)	0.738
	<2	6 (17.6)	7 (20.6)	
	2 – 4	5 (14.7)	4 (11.8)	
	>4	4 (11.8)	7 (20.6)	
Antenatal exercise done	Yes	24 (70.6)	20 (58.8)	0.310
	No	10 (29.4)	14 (41.2)	
Child birth classes	Yes	0	3 (8.8)	0.239
	No	34 (100)	31 (91.2)	
info about episiotomy	Yes	14 (41.2)	19 (55.9)	0.225
	No	20 (58.8)	15 (44.1)	
H/0 constipation	Yes	12 (35.3)	15 (44.1)	0.457
	No	22 (64.7)	19 (55.9)	
P-value by Chi-Square test. P-value<0.05 is considered to be statistically significant.				

Table 3: Obstetrical variables in study groups (data collected from medical records), n=68

Variables		Experimental (%) (n=34)	Control (%) (n=34)	P-value
Parity	Primi	19 (55.9)	17 (50.0)	0.627
	Multi	15 (44.1)	17 (50.0)	
Period of GA at delivery (wks)	<37	1 (2.9)	0	0.999
	37 & above	33 (97.1)	34 (100)	
Booked or un booked for antenatal care	Book	34 (100)	34 (100)	0.999
	Unbook	0	0	
Induction of labour	Yes	20 (58.8)	18 (52.9)	0.625
	No	14 (41.2)	16 (47.1)	
Newborn birth weight	2.5 – 3	10 (29.4)	19 (55.9)	0.027*
	>3	24 (70.6)	15 (44.1)	

Pre pregnant BMI	18.5 – 24.99	18 (52.9)	28 (82.4)	0.010**
	25 – 29.99	16 (47.1)	6 (17.6)	
P-value by Chi-Square test. P-value<0.05 is considered to be statistically significant. .				

The clinical data comparison between the experimental and control groups revealed some statistically significant differences, particularly in newborn birth weight and BMI. However, most of the clinical variables showed no statistically significant differences between the two groups.

Table 4.4: Intra-group comparison to study the effect of maternity cooling gel pad application on the mean pain scores in experimental group, n=34

Parameters	Pain scores	
	Mean	SD
Pre test	8.12	0.64
Post test (day 1)	5.62	0.74
Post test (day 2)	3.44	0.61
% change at day 1	30.87%	--
% change at day 2	57.28%	--
P-value (Paired comparisons)		
Pre -test vs Post test (Day 1)	0.001***	
Pre- test vs Post test (Day 2)	0.001***	
P-value by repeated measures analysis of variance (RMANOVA)<0.001 which is statistically significant		

Reduction in pain scores over time within the experimental group indicates effectiveness of maternity cooling gel pad.

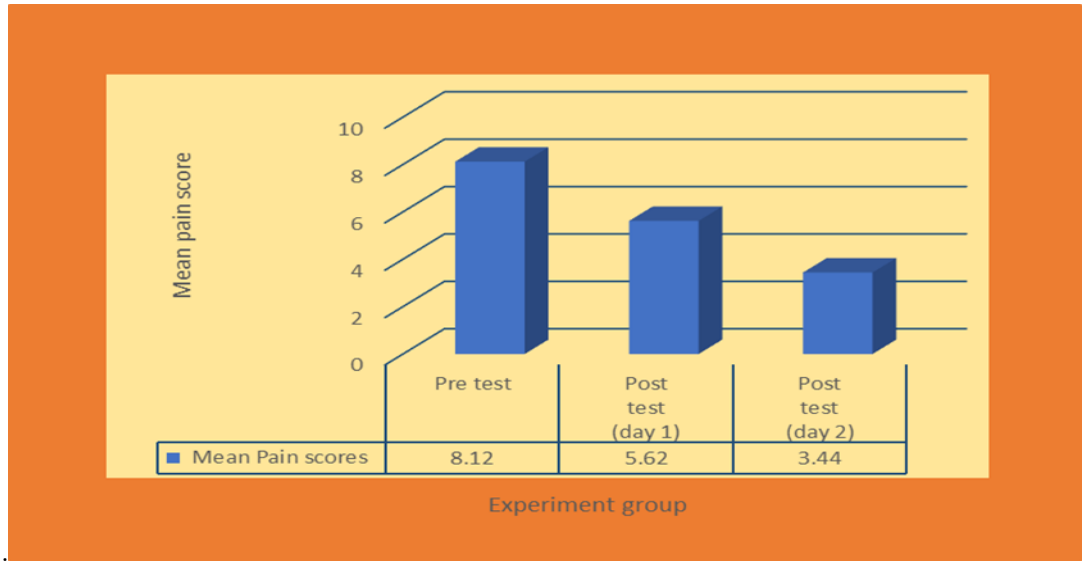

Figure 1: Intra-group comparison to study the effect of maternity cooling gel pad application on the mean pain scores in experimental group

A repeated measures analysis of variance (RMANOVA) was employed to compare the pain scores at different time intervals within the experimental group, the study suggests that the intervention was effective in experimental group in reducing pain scores, with significant decreases observed from pre-test to post-test on both Day 1 and Day 2

Table 4.7: Inter-group comparison of pre- and post- test mean pain scores in episiotomy pain between experimental and control group.

Pain scores	Experimental (n=34)		Control (n=34)		T-Value	P-Value
	Mean	SD	Mean	SD		
Pre test	8.12	0.64	8.09	0.71	0.179	0.858
Post test (day 1)	5.62	0.74	7.38	0.65	10.649	0.001***
Post test (day 2)	3.44	0.61	6.74	0.75	19.818	0.001***
% change at day 1	30.87%	--	8.79%	--	13.322	0.001***
% change at day 2	57.28%	--	16.73%	--	22.586	0.001***
P-value by independent sample t test <0.001 which is statistically significant						

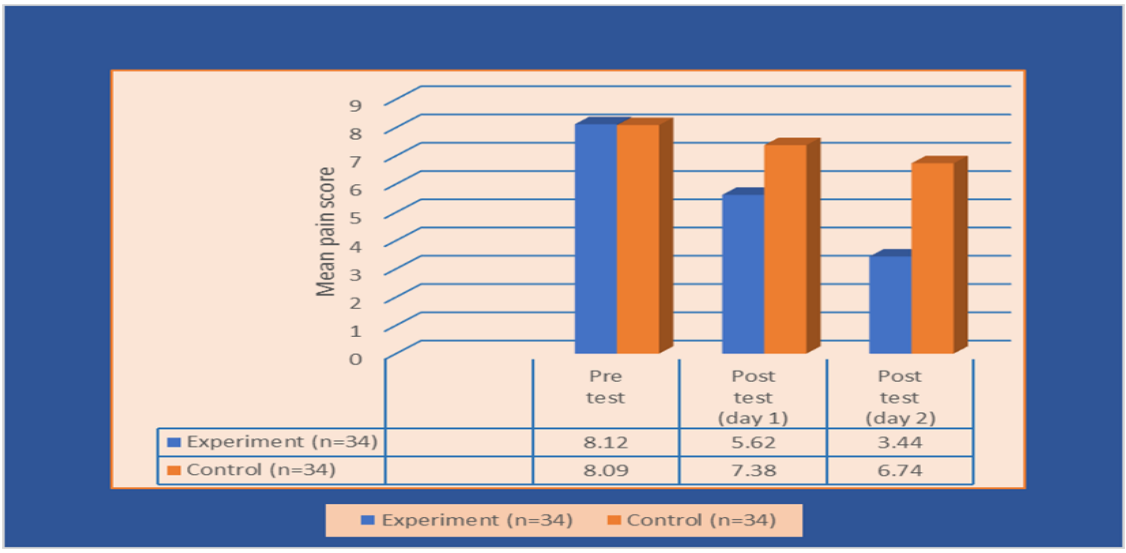

Figure 2: Inter-group comparison of pre- and post- test mean pain scores in episiotomy pain between experimental and control group

The results suggest that the intervention used in the experimental group was effective in reducing pain scores, with significant differences observed compared to the control group on both Day 1 and Day 2.

4. Discussion

This study aimed to evaluate the effectiveness of maternity cooling gel pad application in reducing episiotomy pain among postnatal mothers. The results demonstrated a statistically significant decrease in pain scores in the experimental group compared to the control, supporting the study's hypothesis and aligning with previous evidence.

At baseline, both groups reported similar levels of pain. Following three applications of the maternity cooling gel pad over 24 hours, the experimental group experienced a 30.87% reduction in pain, and by Day 2, a 57.28% reduction. This suggests a strong cumulative effect. In contrast, the control group exhibited only marginal reductions of 8.79% and 16.73% over the same period.

These findings are consistent with studies by Senol and Aslan (2017) and Mohamed et al. (2024), both of which reported significant decreases in perineal pain following cold therapy. Kırca et al. (2022) further reinforced these results through a systematic review showing that cold application (including crushed ice, gel pads, and frozen packs) effectively reduced postpartum perineal pain. In the Indian context, Suvarna and Chippala (2023) reported similar outcomes using ice packs. The conceptual foundation of this study was Kolcaba's Comfort Theory, which advocates for interventions that relieve discomfort, promote ease, and support transcendence. The use of maternity cooling gel pads satisfies all three dimensions—relieving pain (relief), facilitating mobility and sleep (ease), and enabling maternal roles like breastfeeding and infant bonding (transcendence).

Importantly, this study found that the pain-reducing effect of the gel pad was not significantly influenced by most sociodemographic or clinical variables such as age, parity, or antenatal exercise, except for a notable association with education in the experimental group and BMI in the control group.

These findings support the integration of cooling gel pads into standard nursing care protocols for women with episiotomies, especially in resource-limited settings where access to pharmacologic pain management may be restricted or discouraged during breastfeeding.

5. Conclusion

The maternity cooling gel pad is a safe, practical, and effective non-pharmacological intervention for reducing episiotomy pain in postnatal mothers. Its ease of application, affordability, and absence of side effects make it a favorable addition to routine postpartum care in maternity wards. This study validates its significant impact on pain relief during the crucial early days of recovery and encourages its broader clinical use.

Implications

- **Clinical Practice:** Nurses can integrate maternity cooling gel pads into postnatal care protocols as a frontline intervention for episiotomy pain relief
- E**ducation:** Nursing curriculam should include cold application techniques and their evidence base to promote competency in non-pharmacological pain management.
- **Administration:** Nurse administrators may consider developing standard operating procedures and conducting in-service training on this intervention.
- **Research:** Future studies should explore long-term effects on wound healing, comfort, maternal satisfaction, and daily functioning beyond the 48-hour window.

6. Recommendations

- Include maternity cooling gel pads as standard episiotomy pain management in clinical protocols.
- Conduct large-scale randomized controlled trials across diverse populations.
- Evaluate maternal satisfaction, cost-effectiveness, and ease of self-application at home.

- Explore comparative effectiveness with other non-pharmacological therapies (e.g., sitz baths, infrared light).

7. Limitations

- Small sample size (n = 68) restricts generalization.
- Short follow-up (only 2 days) limits insight into long-term outcomes.
- Purposive sampling introduces selection bias.
- Subjective nature of pain perception may influence NPRS ratings.
- Study conducted in one tertiary hospital setting.

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Conflict of Interest
The author declares no conflicts of interest

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