Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 16s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Effectiveness of Warm Compress on Labour Pain Relief in Primiparturients During the First Stage of Labour: Quasi-Experimental Study

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Cite this paper as: Ms Shital Patel, Dr Anita Prakasam, Dr vruti Patel, Ms Shivani, Ms Sharon, (2025) Effectiveness of Warm Compress on Labour Pain Relief in Primiparturients During the First Stage of Labour: Quasi-Experimental Study. *Journal of Neonatal Surgery*, 14 (16s), 362-368.

ABSTRACT

Labour pain is one of the most intense forms of pain experienced by women, particularly during the first stage of labour, which includes the latent and active phases. Effective pain management is a crucial aspect of obstetric care. While pharmacological methods are commonly used, there is a growing preference for non-pharmacological interventions that offer relief without medical side effects. Warm compress therapy, involving the application of heat to specific areas such as the lumbar and sacral regions, has been recognized for its potential to reduce pain and enhance comfort during labour.Objective: The present study aimed to evaluate the effectiveness of warm compresses in reducing labour pain in the lumbar and sacral areas during the first stage of labour among periparturient admitted to a selected hospital in Vadodara.Methods: A quantitative approach with a quasi-experimental design was adopted. The study included 60 primiparturients selected through non-probability convenience sampling. The participants were divided into experimental and control groups, and pain levels were assessed using the Numerical Pain Intensity Scale before and after the intervention. The experimental group received warm compress therapy, while the control group received standard care. Results: Pre-test findings indicated no statistically significant difference in pain levels between the experimental (mean = 7.93±1.08) and control groups (mean = 7.86±0.97) (t=0.251, p=0.803). However, post-test results showed a significant reduction in pain in the experimental group (mean = 6.50±1.08) compared to the control group (mean = 8.06±0.73) with a mean difference of 1.57 (t=6.861, p=0.001), indicating a statistically significant effect of the warm compress intervention.Conclusion: The study concludes that warm compress therapy is an effective non-pharmacological method for reducing labour pain in the lumbar and sacral regions during the first stage of labour. Its integration into routine obstetric care may improve the childbirth experience for primiparturients.

Keywords: *Evaluate, Effectiveness, Warm Compress, Lumbar and Sacral Area, Labour Pain, First Stage of Labour, Primiparturients*

1. INTRODUCTION

Labour is a natural physiological process, but it is often accompanied by intense pain, particularly during the first stage, which includes both the latent and active phases. Pain during labour is a complex phenomenon influenced by physiological, psychological, and cultural factors and is frequently described as one of the most severe forms of pain experienced by women **(Lowe, 2002).** For primiparturients—women giving birth for the first time—the experience can be especially challenging due to anxiety, fear, and unfamiliarity with the birthing process.

Effective management of labour pain is a vital aspect of maternal care to ensure a positive childbirth experience. While pharmacological interventions such as epidural analgesia and opioids are commonly used, they may have potential side effects for both the mother and fetus. Consequently, there is an increasing interest in non-pharmacological pain relief methods that are safe, simple, cost-effective, and promote a sense of control and comfort for the birthing mother **(Simkin & Bolding, 2004).**

One such method is the use of warm compress therapy. A warm compress involves the application of heat to specific body areas, which helps in reducing muscle tension, improving blood flow, and providing a soothing effect. In the context of labour, applying warm compresses to the lumbar and sacral regions has shown promise in alleviating pain during uterine contractions, especially in the first stage of labour **(McIntosh et al., 2004).** The warmth can help in modulating pain perception by stimulating thermoreceptors and blocking pain signals through the gate control mechanism.

This study aims to evaluate the effectiveness of warm compress application on labour pain in the lumbar and sacral areas during the first stage of labour among primiparturients at a selected hospital in Vadodara, thereby contributing to the body of evidence supporting non-pharmacological pain management strategies in obstetric practice.

Background of study:

Labour pain is universally recognized as one of the most intense and distressing forms of pain experienced by women, especially during the first stage of labour, which includes both latent and active phases marked by cervical dilation and uterine contractions. This pain is typically localized in the lower back, lumbar, and sacral regions due to pressure on pelvic structures and stretching of the cervix (Lowe, 2002). For primiparturients, who are experiencing labour for the first time, the unfamiliarity and fear of childbirth can further exacerbate pain perception and emotional stress (Simkin & Bolding, 2004).

Pain management during labour is a crucial component of maternal healthcare. While pharmacological methods such as epidural analgesia and opioids are effective, they are often associated with side effects such as hypotension, motor blockade, nausea, and respiratory depression, and may also impact fetal outcomes (Anim-Somuah, Smyth, & Cyna, 2011). These concerns have led to a growing preference for non-pharmacological approaches that are safe, accessible, and empower women to manage labour pain naturally.

One such method is the use of warm compresses. The application of heat to the lumbar and sacral areas during labour is believed to reduce pain by relaxing muscles, enhancing blood circulation, and interfering with pain signal transmission through the gate control theory (Melzack & Wall, 1965). Warm compresses are simple to use, cost-effective, and do not interfere with the physiological process of labour or fetal well-being. Research has demonstrated that warm compress therapy can significantly reduce pain intensity and improve the comfort level of women in labour (Dabiri & Shahi, 2014).

abuse treatment.

2. METHODOLOGY

Research Approach

The present study adopted a quantitative evaluative research approach to assess the effectiveness of warm compress application in reducing labour pain in the lumbar and sacral areas during the first stage of labour among primiparturients.

Research Design

A quasi-experimental design was employed with two groups: an experimental group receiving the intervention and a control group without intervention. The design involved a pre-test and post-test assessment for both groups, as shown in Table 1. Quasi experimental design was used in this study.

Group	Pre- test(X_1)	Intervention(O)	Posttest(X_2)
Experimental	X_1	O	X_2
Control	X_1	-	X_2

Table 1: Schematic presentation of research design

Research Setting

The study was conducted in the labour rooms of a selected hospital in Vadodara, Gujarat.

Population and Sample

The study population comprised primiparturient women aged between 18 and 35 years, admitted in active labour and expected to undergo normal vaginal delivery.

Sample Size: 60 primiparturients

Sampling Technique: Non-probability convenience sampling was used to recruit participants.

Inclusion Criteria

- Primiparturients aged 18–35 years.
- Gestational age between 35–40 weeks.
- Singleton pregnancy.
- Admitted in active labour.

Exclusion Criteria

- High-risk pregnancies.
- Gestational age below 35 weeks.
- Women with medical conditions such as cardiopulmonary disease, diabetes mellitus, skin disorders, pregnancy-induced hypertension.
- Discomfort or contraindications to warm compress therapy.

Variables

- **Independent Variable:** Application of warm compress (temperature maintained between 38°C and 44°C).
- **Dependent Variable:** Level of labour pain in the lumbar and sacral areas.

Data Collection Tools

1. **Demographic Profile:**A structured questionnaire was used to collect demographic data including age, education, occupation, type of family, monthly income, and weeks of gestation.
2. **Numerical Pain Intensity Scale:**Labour pain was measured using the **Numerical Pain Rating Scale (McCaffery & Beebe, 1993)** ranging from 0 to 10:
    - 0: No pain
    - 1–3: Mild pain
    - 4–6: Moderate pain
    - 7–9: Severe pain
    - 10: Worst possible pain

Validity and Reliability of the Tool

- **Content Validity:**The tools were validated by a panel of **five nursing experts**, who evaluated the clarity, relevance, and content alignment of the tool. Suggestions were incorporated to enhance the tool's effectiveness. The finalized tool was translated from English to **Hindi and Gujarati** for better comprehension.
- **Reliability:**The reliability of the **Numerical Pain Rating Scale** has been established in previous studies, showing high consistency in pain measurement across diverse patient populations.

Data Analysis and Interpretation

Collected data were coded and entered into **SPSS software** for statistical analysis. Descriptive statistics (mean, standard deviation, frequency, percentage) were used to summarize demographic data and pain scores. **Inferential statistics**, including the independent t-test, were used to compare the pre-test and post-test scores between the experimental and control groups. A **p-value < 0.05** was considered statistically significant.

Findings:

Table 2: Frequency and Percentage Distribution of Socio-Demographic Variables in Experimental and Control Groups

N = 60 (Experimental Group = 30; Control Group = 30)

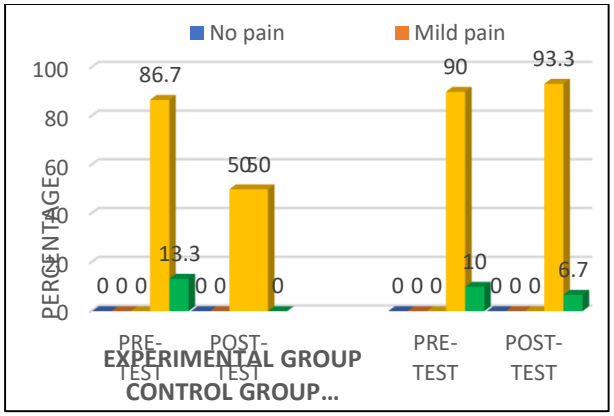
S. No	Socio-Demographic variables	Experimental group (n=30)		Control Group (n=30)	
		f	%	F	%

1	Age in years				
	a. Below 18 years	0	0	0	0
	b. 18-25 years	22	73.3	24	80
	c. 26-35 years	8	26.7	6	20
	d. Above 35 years	0	0	0	0
2	Occupation				
	a. Employed	9	30	8	26.7
	b. Unemployed	21	70	22	73.3
3	Type of family				
	a. Nuclear	12	40	18	60
	b. Joint	18	60	12	40
4	Education				
	a. No formal education	7	23.3	5	16.7
	b. Secondary education	9	30	8	26.7
	c. Higher Secondary education	11	36.7	16	53.3
	d. Graduate	3	10	1	3.3
5	Monthly income				
	a. Below ₹3000	0	0	0	0
	b. ₹ 4000-₹6000	10	33.3	7	23.3
	c. ₹ 7000-₹9000	15	50	20	66.7
	d. Above ₹9000	5	16.7	3	10
6	Week of gestation				
	a. Less than 35 weeks	1	3.3	0	0
	b. 35-37 weeks	2	6.7	3	10
	c. 38-39 weeks	8	26.7	10	33.3
	d. 40 weeks	19	63.3	17	56.7

Table 3: Distribution of Labour Pain Levels Among Primiparturients During First Stage of Labour in Experimental and Control Groups

N = 60 (Experimental Group = 30; Control Group = 30)

Level of pain	**Experimental Group (N=30)**				**Control Group (N=30)**			
	Pre-test		**Post-test**		**Pre-test**		**Post-test**	
	f	**%**	**F**	**%**	**f**	**%**	**f**	**%**
No pain	0	0	0	0	0	0	0	0
Mild pain	0	0	0	0	0	0	0	0
Moderate pain	0	0	15	50	0	0	0	0
Severe pain	26	86.7	15	50	27	90	28	93.3
Worst pain	4	13.3	0	0	3	10	2	6.7



Distribution of level of labour pain among primiparturients during 1st stage of labour in experimental and control group. In experimental group during pre-test majority 26(86.7%) had severe pain and 4(13.3%) had worst pain and in post-test half 15(50%) had moderate pain and 15(50%) had severe pain. In control group during pre-test majority 27(90%) had severe pain and 3(10%) had worst pain and in post-test maximum 28(93.3%) had severe pain and 2(6.7%) had worst pain.

Fig:1 Distribution of level of labour pain among primiparturients during 1st stage of labour in experimental and control group.

Table 4: Effectiveness of Warm Compress in Lumbar and Sacral Area on Labour Pain During First Stage of Labour Among Primiparturients in the Experimental Group

N = 30

Comparison	Pre-test	Post-test	Mean D	t value	Df	p value
Pre-test	7.93±1.08	6.50±1.08	1.43	8.394	29	0.001*

***P<0.05 level of significance** **NS-Non significance**

Table 5: Comparison of Labour Pain During First Stage of Labour Among Primiparturients Between Experimental and Control Groups

N = 60 (Experimental Group = 30; Control Group = 30)

Comparison	Experimental Group	Control Group	Mean D	t value	df	p value
Pre-test	7.93±1.08	7.86±0.97	0.07	0.251	58	0.803^{NS}
Post-test	6.50±1.08	8.06±0.73	1.57	6.861	58	**0.001***

***P<0.05 level of significance** **NS-Non significance**

The comparison of pre-test pain levels between the experimental and control groups showed no significant difference (t = 0.251, df = 58, p = 0.803), suggesting similar pain intensity levels at baseline. However, post-test results revealed a significant reduction in pain in the experimental group (mean = 6.50 ± 1.08) compared to the control group (mean = 8.06 ± 0.73), with a mean difference of 1.57 and a t-value of 6.861 (p = 0.001), highlighting the effectiveness of the warm compress intervention.

Table 6: Association Between the Pre-test Level of Labour Pain Among Primiparturients and Selected Demographic Variables in the Experimental Group

N = 30

Demographic variables	**Experimental Group**		**χ2 value**	**df**	**p value**
	Severe	**Worst**			
Age in years					
a. Below 18 years	--	--	5.514	1	0.018*
b. 18-25 years	21	1			
c. 26-35 years	5	3			
d. Above 35 years	--	--			
Occupation					
a. Employed	7	2	0.879	1	0.348^{NS}
b. Unemployed	19	2			
Type of family					
a. Nuclear	10	2	0.192	1	0.661^{NS}
b. Joint	16	2			
Education					
a. No formal education	7	0	2.378	3	0.498^{NS}
b. Secondary education	8	1			
c. Higher Secondary education	9	2			
d. Graduate	2	1			
Monthly income					
a. Below ₹3000	--	--	0.288	2	0.866^{NS}
b. ₹ 4000-₹6000	9	1			
c. ₹ 7000-₹9000	13	2			
d. Above ₹9000	4	1			
Week of gestation					
a. Less than 35 weeks	0	1	8.138	3	0.043*
b. 35-37 weeks	2	0			
c. 38-39 weeks	8	0			
d. 40 weeks	16	3			

Implications for study/ Implications for Practice

- **Clinical Implications:** Warm compress therapy effectively reduces labour pain in the lumbar and sacral areas, providing a non-pharmacological option for pain relief during the first stage of labour. It is a safe, simple, and cost-effective intervention that can enhance patient comfort and satisfaction.**Educational Implications:** Healthcare providers should be trained in the application of warm compresses, and expectant mothers should be informed about this non-pharmacological pain management option during prenatal care.**Policy Implications:**Hospitals may consider incorporating warm compress therapy into their labour pain management protocols, especially for primiparturients. **Research Implications:** Further studies with larger sample sizes are needed to validate these findings and explore combined pain management techniques.

Study Limitations and Recommendations for Future Research

- The sample size was small (N=60), limiting the generalizability of the findings.
- The study was conducted at a single hospital, which may not represent diverse healthcare settings.
- The study focused only on primiparturients, excluding multigravidas and women with high-risk pregnancies.

3. CONCLUSION

The study demonstrates that warm compress therapy is an effective non-pharmacological intervention for reducing labour pain, particularly in the lumbar and sacral areas, during the first stage of labour. The results show a significant reduction in pain intensity in the experimental group compared to the control group. Given its simplicity, safety, and cost-effectiveness, warm compress therapy can be incorporated into clinical practice to enhance patient comfort during childbirth. Further research with larger sample sizes is recommended to confirm the findings and explore additional pain management strategies.

Declaration of Conflicting Interests

- The author(s) declare that there is no conflict of interest with respect to the research, authorship, and publication of this article.

Funding

The author(s) received no financial support for the research, authorship, or publication of this article.

Human Subjects Review Details

This study was approved by the Institutional Review Board (IRB) of Sumandeep University. All participants provided informed consent prior to participation. The study adhered to ethical guidelines for research involving human subjects, ensuring confidentiality, voluntary participation, and the right to withdraw at any time without consequence.

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