

# Effect of Infrared Light Therapy on Episiotomy Pain and Wound Healing among Postnatal Mothers

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**Abstract:** *Postpartum pain is a universal phenomenon. The present study was aimed at evaluating the effect of Infrared light therapy on episiotomy pain and wound healing among postnatal mothers at a selected tertiary care centre in Thrissur. The study was based on Wiedenbach's Helping Art of clinical nursing theory and two group pretest posttest design was used. The sample consisted of 60 postnatal mothers (30 in control and 30 in experimental group) who had vaginal delivery with RMLE. Standardized tools like NPS and REEDA scale were used after confirming their validity and reliability and statistical analysis was done using RMANOVA. Comparison of mean scores was done using Wilcoxon Sign Rank test. The result was interpreted as infrared light therapy was effective in enhancing the wound healing among postnatal mothers. The study results also revealed that there was a weak positive correlation between episiotomy pain and wound healing.*

**Keywords:** Episiotomy pain, wound healing, infrared light therapy

## 1. Introduction

### Background of the problem

*"I will not cause pain without allowing something new to be born, says the Lord."*

*Isaiah 66:9*

Motherhood is the only act that manifests in human form the cosmic wonder of creation. Imagine a life growing within the body of the mother, nurtured with her life and blood. And then, there is the greatest wonder of all, this vague motion within her womb blooms into two tiny hands reaching out.<sup>1</sup>

Postnatal period is an important part of maternal health care, as serious and life threatening complications can occur in this period. The health of the mother is regarded as the indicator of health of the society, so postnatal care is important for the health of mother and newborn as well. Post natal care is pre – eminently about the provision of supportive environment in which a woman, her baby and the wider family can begin a new life together.<sup>2</sup> Puerperium is a period when great changes take place in a woman's physical and mental set up that may pose a challenge to postnatal women in various ways. This is true, especially when she experiences pain of episiotomy wound after a vaginal delivery. Pain following episiotomy appears to be universal. The mother undergoing episiotomy is characterized by great blood loss during delivery and there is a high risk of improper wound healing during early puerperium. The concern of health personnel during this period should be to provide comfort to her, help her in relieving pain and to prevent infection.<sup>3</sup>

The majority of episiotomy healing takes place within the first 2 weeks, but it may take 4 to 6 months for the episiotomy to heal completely. Puerperal infections are costly in terms of delayed mother infant interaction,

lactation difficulties, prolonged hospital stay or readmission in hospital and increased expenses.<sup>4</sup>

*"Light is the science of healing."*

*--- Greek Proverb*

The episiotomy area may be painful for many days. Various interventions are used to relieve pain, enhance comfort and prevent infection which includes cleanliness, applying ice pack, sitz bath, performance of kegals exercise, perineal care and topical application by dry heat – infrared therapy. The effects of dry heat lasts for a longer time, keeps the wound dry and improves healing.<sup>5</sup> A critical part of solar energy is infrared light, an invisible healing energy emitted from the sun. But infrared light does not damage the skin, but supports healing and repair of cells and tissues. Infrared light, the safest segment of energy that comes from the sun, offers a wide array of therapeutic benefits for health conditions. The healing power of infrared waves was discovered about two decades ago in China by a team of researchers and doctors. The emitted infrared light energy penetrates about three and half inches, and releases nitric oxide into the hemoglobin, stimulating microcirculation, delivering higher levels of oxygen and nutrients to the injured cells, while eliminating toxins and cellular wastes. This begins the healing process and pain is relieved.<sup>6,7</sup>

## 2. Need and Significance

*"As it's said when there is a birth there should be a death too in the same way when*

*There is a Pain there should be a cure too"*

*- Musfira*

A postpartum period is the period beginning immediately after the birth of a child and extending for about six weeks. The WHO describes the postnatal period as the most critical and yet the most neglected phase in the lives of mothers and babies.<sup>8</sup> Bobak and Laundermik, reveal that pain and

discomfort from perineal trauma can dominate the experience of early motherhood. Postnatal period offers nurses a challenging opportunity, to assist women in the achievement of motherhood<sup>9</sup>

Farruel Fosse H, conducted a study to define the most appropriate post-delivery care after episiotomy, the best suited treatment of episiotomy pain and examine the course of repair stitches in Paris. A survey of the literature was done between 1990 and 2005 in Medline and Cochrane library. The results revealed that the pain of episiotomy is a crucial element to treat, and that the treatment must be adapted to each patient depending on her tolerance<sup>10</sup>.

Effects of Infrared light therapy are multifocal. Infrared light therapy causes relief of pain due to the sedative effect on the superficial sensory nerve endings. It also increases the blood circulation and relieves muscle spasm<sup>11</sup>The episiotomy wound care is a neglected aspect in postnatal care both by health personnel and mothers themselves. In this era of advanced modern technology, all mothers are looking hopefully to nurses to help in bringing down the maternal morbidity rate and relieve them from suffering, pain and discomfort after childbirth.<sup>12</sup>

In an experimental study conducted among the postnatal mothers at Lissie Hospital, Ernakulam, it was found that there was significant reduction of pain related to episiotomy wound after infrared radiation in the experimental group. Hence the intervention was very effective in reducing episiotomy pain. Pain, discomfort and healing of episiotomy wound are the common problems in the postnatal mothers which has negative impact on their social, physical and psychological wellbeing.<sup>13</sup>

Based on the review of literature and clinical experience of the investigator, it is found that firstly episiotomy causes pain and discomfort that interferes the mother's normal activities. Secondly, it gives the mother a feeling of inadequacy. Thirdly, it increases the risk of infection, prolongs postnatal recovery<sup>32</sup>. Moreover, the presence of the painful episiotomy sutures makes her sit back farther on her tailbone. This can affect her ability to properly position the baby, which may lead to sore, cracked, bleeding nipples - as well as a slow-growing baby who cries all the time. Altogether, it also affects her ability to take care of her newborn which can cause further emotional trauma to the mother. Hence the investigator rightly felt the need to conduct this study to reduce pain and promote wound healing among postnatal mothers by infrared therapy, for the betterment of the mother and newborn.

### 3. Objectives

- 1) Assess the episiotomy pain among postnatal mothers in the experimental and control group at a selected tertiary care centre in Thrissur
- 2) Assess the wound healing of postnatal mothers in the experimental and control group
- 3) Evaluate the effect of infrared light therapy on episiotomy pain among postnatal mothers
- 4) Determine the effect of infrared light therapy on wound healing among postnatal mothers

- 5) Determine the relationship between episiotomy pain and wound healing among postnatal mothers
- 6) Identify the association between episiotomy pain and selected variables of postnatal mothers
- 7) Find the association between wound healing and selected variables of postnatal mothers

### Hypotheses

(tested at 0.05 level of significance)

**H<sub>1</sub>**. There is a significant difference in the pain score among postnatal mothers in the experimental and control group

**H<sub>2</sub>**. There is a significant difference between episiotomy wound healing among postnatal mothers in the experimental and control group

**H<sub>3</sub>**. There is a significant correlation between episiotomy pain and wound healing score of postnatal mothers

**H<sub>4</sub>**. There is a significant association between episiotomy pain and selected variables of postnatal mothers

**H<sub>5</sub>**. There is a significant association between wound healing and selected variables of postnatal mothers

## 4. Materials and Methods

**Research approach:** Quantitative approach

**Research design:** quasi-experimental design- two group pre-test post-test design

### Variable:

Independent variable- infrared light therapy

Dependent variable- episiotomy pain and wound healing of postnatal mothers

**Setting of the study:** The study was carried out in the postnatal ward of New Medical College Hospital Thrissur, Kerala

**Population:** mothers who had vaginal delivery with episiotomy, admitted in the postnatal wards of New Medical College hospital at Thrissur

**Sample and sampling technique:** sample consisted of 60 postnatal mothers (30 in experimental group and 30 in control group) who had undergone vaginal delivery, who fulfilled the selection criteria. Sampling method adopted for this study was purposive sampling method. The first 30 postnatal mothers were assigned to control group and next 30 were assigned to the experimental group.

### Tools /instruments

The following tools were used for present study

Tool 1:-Performa to assess the socio personal variables of postnatal mothers (interview technique) and clinical data sheet (observation technique)

Tool 2:- Self-reported Numerical Pain Assessment scale

Tool 3:- REEDA scale for wound healing assessment using observation technique

### Data collection process

After the presentation and approval of the pilot study, data collection was started. The data collection period was from 18/01/18 to 28/02/18. Mothers who were shifted to the postnatal wards from the labour room were selected for the

study by purposive sampling. The investigator introduced herself and explained the purpose of the study to the postnatal mothers. Rapport was established, assured maintenance of confidentiality and informed consent was taken. After obtaining the consent, 30 postnatal mothers who had vaginal delivery with episiotomy were selected from the postnatal wards and included in the control group. Pretest for pain assessment was done at 6 to 8 hours after delivery. Posttest was done for these mothers in the morning and evening. This was repeated on next day also for a total of five observations. Wound assessment was done using REEDA scale at the beginning of the first day (after 6 to 8 hours of delivery) and end of third postnatal day (before discharge). The next 30 postnatal mothers were included in the experimental group. Infrared light therapy was applied on the episiotomy sites of the postnatal mothers for a duration of 10 minutes, one session in the morning and other

in the evening, on first three postnatal days, accounting to four sessions in total where the infrared light source is kept at a 45 cm distance from the episiotomy site. Pretest pain score assessment was done in the same fashion as in the control group and posttest was done half an hour after the infrared light therapy sessions in the morning and evening.. Total five scores were obtained. Wound assessment was carried out at the beginning of first postnatal day (6 to 8 hours after delivery) and at the end of third postnatal day (before discharge).

5. Results

Frequency and percentage distribution of episiotomy pain among the postnatal mothers in experimental and control groups before the intervention (n=60)

Level of pain	Control group(n=30)				Experimental group(n=30)				$\chi^2$	p
	f	%	Mean	SD	f	%	Mean	SD		
Mild	04	13.33	5.77	2.40	00	00.00	6.30	1.96	5.12 <sup>ns</sup>	0.07
Moderate	17	56.67			16	53.34				
Severe	09	30.00			14	46.66				

ns- not significant

Frequency and percentage distribution of wound healing based on REEDA score among the postnatal mothers in experimental and control groups before the intervention, (n=60)

Wound healing status	Control group (n=30)				Experimental group (n=30)				p (Mann Whitney)
	f	%	Mean	SD	f	%	Mean	SD	
Good	13	43.33	0.97	1.06	14	46.66	0.87	0.97	0.78 <sup>ns</sup>
Moderate	17	56.67			16	53.34			

ns- not significant

Mean and Standard deviation of episiotomy pain of postnatal mothers (n=60)

Observation	Control group (n=30)		Experimental group (n=30)	
	Mean	SD	Mean	SD
Pretest	5.77	2.40	6.30	1.96
Post test 1	5.43	2.47	5.13	1.71
Post test 2	4.80	2.05	4.20	1.62
Post test 3	4.27	2.06	2.97	1.40
Post test 4	3.70	1.78	1.47	1.36

Posttest 1 – Posttest 2	0.63**	0.00	0.93**	0.00
Posttest 1 – Posttest 3	1.16**	0.00	2.16**	0.00
Posttest 1 – Posttest 4	1.73**	0.00	3.66**	0.00
Posttest 2 – Posttest 3	0.53*	0.02	1.23**	0.00
Posttest 2 – Posttest 4	1.10**	0.00	2.73**	0.00
Posttest 3 – Posttest 4	0.56**	0.00	1.50**	0.00

\*significant at 0.05 level, \*\* significant at 0.01 level

Comparison of mean scores of wound healing of postnatal mothers in the experimental and control groups (n=60)

Wilcoxon sign Rank test

REEDA score	Mean	SD	Min	Max	Percentiles			p
					25 <sup>th</sup>	50 <sup>th</sup> (median)	75 <sup>th</sup>	
Control group Pretest (n=30)	0.97	1.06	0	3	0	1	2	0.03*
Control group Posttest (n=30)	0.70	1.02	0	4	0	0	1	
Experimental group Pretest (n=30)	0.86	0.97	0	3	0	1	1	-----
Experimental group Posttest (n=30)	0.00	0.00	0	0	0	0	0	

\*Significant at 0.05 level

Summary of findings of Repeated Measure ANOVA of episiotomy pain scores of postnatal mothers among experimental and control groups. (n=60)

Source of variation	Sum of Squares	df	Mean Square	F	Significance
Within the group	5816.8	1	5816.80	396.64	0.01*
Between the group	0045.63	1	0045.63	003.11	0.04*
Group x interaction	0064.02	1	0064.02	033.21	0.00*

\*Significant at 0.05 level

Test of Least Significance Difference (LSD) for comparison of mean scores of episiotomy pain in experimental and control groups. (n=60)

Pair wise comparison	Control group (n=30)		Experimental group (n=30)	
	Mean difference	Critical value	Mean difference	Critical value
Pretest – Posttest 1	0.33	1.00	1.16 **	0.00
Pretest – Posttest 2	0.96	0.12	2.10**	0.00
Pretest – Posttest 3	1.50**	0.00	3.33**	0.00
Pretest – Posttest 4	2.06**	0.00	4.83**	0.00

Correlation between episiotomy pain and wound healing of postnatal mothers

Variable	Spearman's correlation Coefficient r	p
Episiotomy Pain	0.46**	0.01
Wound Healing		

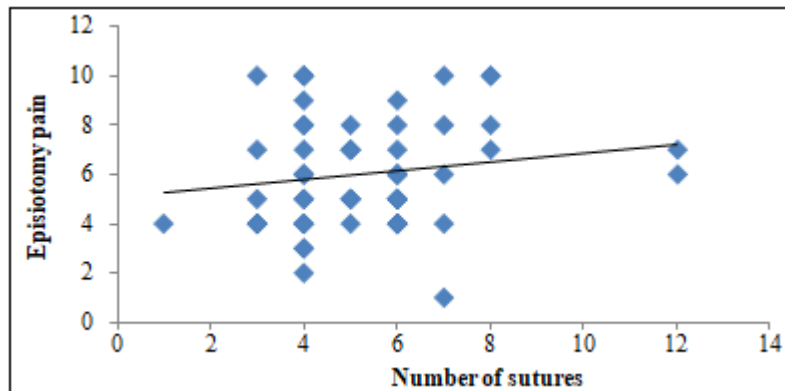
\*\*Significant at 0.01 level

**Association between variables:**

Correlation between episiotomy pain and selected variables

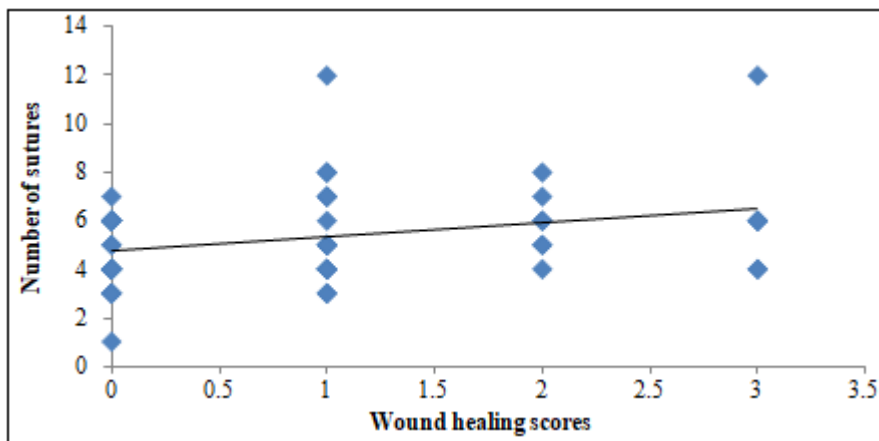
Variable	Spearman's correlation coefficient (r)	p
Age	0.15*	0.25
Birth weight of baby	0.17*	0.19

\*Significant at 0.05 level



Correlation between episiotomy pain and number of episiotomy sutures: there exists a weak positive correlation between episiotomy pain and number of sutures. Hence, as

the number of episiotomy sutures increases, the episiotomy pain also increases.



Correlation between wound healing scores and number of episiotomy sutures: there existed a positive correlation between wound healing status and number of sutures. Hence, it is understood that as the number of sutures increase, the wound healing scores also increase, which means the wound healing is delayed if more episiotomy sutures are present.

In the present study, findings showed that 56.67% mothers in the control group and 70% of the mothers in the experimental group had education above secondary level. This finding is supported by a study conducted by Nethravathi to evaluate the effectiveness of infrared lamp therapy on healing of episiotomy wound among postnatal mothers where 79% mothers in the control group and 93% mothers in the experimental group had education above secondary level.<sup>15</sup> In the present study, of all the subjects having educational status above secondary level, 40% were having higher secondary education, 5% of them had a diploma, 11.7% were graduates and 6.7% were postgraduates. None of the study subjects were illiterate.

No association with other variables were found.

**6. Discussion**

In the present study, the mean age of mothers in the control group was 24.53 + 4.23 and in the experimental group, the mean age was 25.20 + 4.57. This finding is at par with the findings of another study by Hoda Abed where the mean age of postnatal mothers in the control group was 22.2 + 2.943 years while the mean age in the experimental group was 21.8 + 3.18 years.<sup>14</sup> In the present study, only few of the postnatal mothers in the control group (3.33%) and experimental group (10%) belonged to the age group of 33 – 39 years.

In this study, it was found that only 13.33% mothers in the control group and 30% mothers in the experimental group were employed while 86.67% postnatal mothers in the control group and 70% mothers in the experimental group were homemakers. The findings are similar to those in the study findings of Cindiya Wilbert that evaluated the effectiveness of cold gel pad therapy versus infrared light therapy on episiotomy pain and wound healing process among postnatal mothers, which showed that almost 66% of postnatal mothers in the experimental group were employed



while roughly 6% of postnatal mothers in the control group were employed. In both these studies, none of the postnatal mothers were government employees.<sup>16</sup>

In this study, 53.34% of participants in the control group and 26.67% in the experimental group were below poverty line. In Kerala, 15% of the population belongs to BPL. Considering the fact that free treatment and services are available at the Government Medical College, higher numbers of BPL patients are expected here.

Findings of this study shows that 63% of postnatal mothers in the control group and half (50%) of the postnatal mothers in the experimental group belonged to joint family. This is similar to the study findings by Nethravathi which reveals that 40% postnatal mothers in the control group and 37% postnatal mothers in the experimental group belonged to joint family.<sup>17</sup>

In the present study, almost half of the postnatal mothers in the experimental group (53%), and the control group (50%) were primiparas. This finding is supported by a study conducted by Neethu Baby on the effectiveness of infrared radiation on pain, discomfort and healing of episiotomy wound among postnatal mothers revealed that most of the women in the experimental (57%) and control group (57%) were primiparas.<sup>13</sup>

This study findings shows that 10% of postnatal mothers in the control group and 03.33% of postnatal mothers in the experimental group had babies with birth weight more than 3500gm. Around half (50%) of the mothers in the control group and 76% mothers in the experimental group had babies with birth weight between 2500 – 3500 gm. This is supported by the findings of a study conducted in Thanjavoor to assess the effectiveness of hot application on episiotomy wound healing and pain among the postnatal mothers, which revealed that 63% of mothers in the control group and 66% mothers in the experimental group had babies with birth weight between 2500 – 3500 gm.<sup>16</sup>

From this study, it is understood that half (50%) of postnatal mothers in the experimental group had 5 or more episiotomy sutures. At the same time, majority (67%) of postnatal mothers in the control group had 5 or more episiotomy sutures. This finding is contradictory to the findings of Cindiya Wilbert where, only 13% postnatal mothers in the control group had 5 or more episiotomy sutures. But this study had similar findings in case of the experimental group as 79% of postnatal mothers in the experimental group had 5 or more episiotomy sutures.<sup>17</sup>

Findings from this study show that 30% of postnatal mothers in the control group and 46.66% of postnatal mothers in the experimental group had severe pain. At the same time, 53.34% of postnatal mothers in the experimental group had moderate pain while 56.67% of postnatal mothers in the control group had moderate pain. Meanwhile, 13.33% postnatal mothers in the control group had mild pain whereas, none of the mothers in the experimental group had mild pain. This indicates the degree of pain the mothers have to bear during the postnatal period. It is consistent with the findings of the study conducted by East and Sherburn, which

stated that within few hours after birth, 90% of women, reported some amount of perineal pain. Findings by Hoda Abed support this study as the findings reveal that 30% mothers in the control group and 35% mothers in the experimental group had severe pain. 45% postnatal mothers in the control group and another 45% in the experimental group had moderate pain. While, 25% postnatal mothers in the control group and 20% mothers in the experimental group had mild pain.<sup>14</sup>

Findings of the present study revealed that the infrared light therapy was effective in reducing the episiotomy pain of postnatal mothers. This is similar to the study findings of Neethu Baby that infrared light intervention was effective in reducing episiotomy pain.<sup>13</sup> Another study by R. Geetha<sup>18</sup> also supports this finding.

Findings of the present study strongly suggest that the infrared light therapy was effective in enhancing the wound healing of postnatal mothers. This was supported by a study conducted by Nethravathi and Sathish Kakade that infrared lamp therapy is an effective method of treatment on healing of episiotomy wound among postnatal mothers.<sup>15</sup> Another study by Venkadalakshmi V also supports this finding as it states that the infrared therapy reduces episiotomy pain and enhances wound healing in postnatal mothers.<sup>5</sup>

## 7. Conclusion

The following conclusions were derived based on the findings of the study.

- Infrared light therapy was effective in reducing the episiotomy pain of postnatal mothers
- Infrared light therapy was effective in promoting the wound healing of postnatal mothers.

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