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Exploring Infrared Lamp Therapy for Episiotomy Recovery: A Systematic Review of Postnatal Wound Healing Outcomes

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Abstract

Episiotomy wound healing is an important component of postpartum recovery, as perineal pain and delayed healing may affect maternal comfort and daily activities. Infrared lamp therapy has been investigated as a non-pharmacological intervention to improve wound healing and relieve pain. This systematic review aimed to evaluate the effectiveness of infrared lamp therapy in promoting episiotomy wound healing and reducing pain among postnatal mothers. The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. PubMed, Scopus, CINAHL, the Cochrane Library, and Google Scholar were searched for studies published between January 2010 and April 2025. Randomized controlled trials and quasi-experimental studies involving postnatal mothers with episiotomy wounds were eligible for inclusion. Twenty studies met the eligibility criteria. Data were synthesized thematically because of heterogeneity in study designs, intervention protocols, and outcome measures. Methodological quality was assessed using the Cochrane Risk of Bias Tool and the Newcastle-Ottawa Scale. Of the 20 included studies, 18 reported improvements in episiotomy wound healing, generally reflected in reductions in REEDA (Redness, Edema, Ecchymosis, Discharge, and Approximation) scores within 3-5 days of treatment. Seventeen studies reported reductions in postpartum pain measured using the Visual Analog Scale or Numeric Pain Rating Scale. However, comparative findings were not entirely consistent: although several studies favored infrared lamp therapy over routine care or alternative interventions, some reported better wound-healing outcomes with sitz baths. No adverse events were reported in the included studies; however, the absence of such events does not establish definitive safety. Overall, the findings suggest that infrared lamp therapy may improve episiotomy wound healing and alleviate postpartum pain. However, variability in study methods and intervention protocols, together with the predominance of positive findings, limits the certainty and generalizability of the evidence. Further well-designed, adequately powered randomized controlled trials using standardized treatment protocols and outcome measures are needed before firm conclusions can be drawn regarding its routine clinical use.

Categories: Obstetrics/Gynecology
Keywords: episiotomy wound healing, infrared lamp therapy, perineal pain relief, postnatal mothers, reeda scale, visual analog scale (vas)

Introduction And Background

Episiotomy is commonly done during the second stage of labor to facilitate childbirth, particularly in primiparous women. This procedure can reduce the risk of perineal tears and fetal distress. However, this procedure can lead to maternal morbidity in the postpartum period. Episiotomy wounds often result in pain, inflammation, delayed healing, infection, and discomfort, which may interfere with the new mother's ability to care for her newborn, initiate breastfeeding, and resume daily activities. Proper management of episiotomy wounds is therefore essential to enhance maternal recovery, reduce complications, and ensure positive childbirth experiences. In this context, various non-pharmacological and pharmacological approaches have been explored to support the healing of perineal wounds. Among them, infrared lamp therapy has garnered attention as a promising, cost-effective, and safe alternative [1,2].

Infrared lamp therapy involves applying dry heat via infrared radiation to the affected area, stimulating local blood circulation, promoting tissue oxygenation, and accelerating cell repair. It is believed to facilitate the absorption of inflammatory exudate, relieve pain through muscle relaxation, and reduce the risk of infection by keeping the wound area dry. Unlike moist heat therapies such as sitz baths, infrared therapy does not require immersion in water, thus reducing the risk of cross-contamination and improving patient compliance. Infrared therapy is non-invasive and has no adverse effects, making it a suitable intervention for wound healing. Therefore, including this therapy in postpartum care can improve maternal outcomes [3,4].

The complications associated with episiotomy have been a global concern. However, they have a major prevalence in countries where such a procedure is used on a wide scale in vaginal delivery of a primiparous

woman. Reports have shown that this intervention has remained in use even in some regions of Asia and the Middle East, where the rates of episiotomy performed among first-time mothers continue to range between 60% and 80%. Prevalence is rather high in India, attributed mainly to institutional expectations and a lack of national standards that favor restrictive use. Sadly, this high application of episiotomy results in postnatal infections, long-term pain in the perineal region, and the inability to heal quickly being frequent occurrences, most of the time causing the increased length of hospital stays, less maternal satisfaction after birth, and even postpartum mental health deterioration [5,6].

Infrared lamp therapy is a common approach because it is non-invasive, cheap, and easy to administer. Its role in speeding up the healing of episiotomy wounds in various healthcare facilities has been studied and observed in a burgeoning body of research. The majority of research indicates that infrared therapy may decrease pain significantly and accelerate the healing process as opposed to regular treatment or other home-based interventions such as sitz baths or dry heat. Common outcome-measuring tools include the REEDA (Redness, Edema, Ecchymosis, Discharge, and Approximation) step scale for wound healing [7] and the Visual Analog Scale (VAS) for measuring pain intensity [8]. Nonetheless, the evidence is somewhat inconsistent, despite encouraging results. The limitations, which pertain to the methodology, are common, including small sample sizes, the lack of a control group, and insufficient control over confounding factors such as nutritional status or mode of delivery. Due to inconsistencies in study designs and reports, practitioners cannot draw concrete conclusions or reliably use infrared therapy as part of standard postpartum care. Also, there is a lack of studies that provide direct comparisons of infrared therapy with other non-pharmacological interventions, which would still be needed to conclude on the relative efficacy and usefulness of infrared therapy in clinical practice [9,10].

Numerous literature reviews on episiotomy care mentioned earlier either have been too broad in scope regarding perineal management or have tested the results of numerous interventions without isolating the effect of infrared therapy. Systematic synthesis is still wanting regarding a specific focus on the assessment of the effectiveness of infrared therapy in the healing of episiotomy wounds among women who deliver. Also, no review has fully compared interventions across various healthcare contexts, cultural procedures, and wound care procedures. Existing evidence also has methodological weaknesses, including outcome heterogeneity and infrequent reporting of adverse effects, which further limit its applicability. These gaps underscore the need for a systematic, critical analysis of the available evidence to demonstrate the clinical utility, safety, and efficacy of infrared therapy in the postpartum setting [11-13].

The purpose of this systematic review is to systematically appraise and synthesize the state of the art of research on the efficacy of infrared therapy in the healing of episiotomy wounds. In particular, it touches upon how this non-invasive intervention affects wound healing, pain reduction, and comfort of the mother in the postpartum stage, explores more about the therapeutic potential of infrared therapy and its variable use in clinical practice by studying patterns and consistencies in various literature, presents the possibilities of maximum consideration based on evidence to integrate the usage of infrared lamp therapy at a routine postpartum, and highlights the research needed in the literature at present.

This systematic review aimed to evaluate the available evidence on the effectiveness of infrared lamp therapy for episiotomy wound healing and postpartum pain relief among postnatal mothers. The review considered wound-healing outcomes, pain-related outcomes, and reported adverse events in studies comparing infrared lamp therapy with routine postpartum care or other comparators. The findings were synthesized to assess the direction and consistency of the reported effects and to identify limitations in the available evidence.

The primary aim of this review was to determine the impact of infrared lamp therapy on episiotomy wound healing, as assessed using standardized clinical measures, including the REEDA scale [7]. The review was structured around the following research question, formulated using the PICO framework: What is the effect of infrared lamp therapy on episiotomy wound healing among postnatal mothers compared with routine postpartum care or other non-pharmacological interventions? The population comprised postnatal mothers with episiotomy wounds; the intervention was infrared lamp therapy; the comparison included routine postpartum care, sitz bath, or no additional intervention; and the outcomes of interest were wound healing and pain relief.

Review

Methodology

Study Design

The present systematic review adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 framework for reporting and methodological transparency. The primary objective of this review was to evaluate the efficacy of infrared lamp therapy on episiotomy wound healing among postpartum mothers. The methodology was guided by systematic review protocols to ensure transparency, reproducibility, and scientific rigor. The electronic databases and sources searched were PubMed, Scopus, CINAHL, the Cochrane Library, and Google Scholar. The review considered eligible studies published

between January 2010 and April 2025.

Eligibility Criteria (*PICO Framework*)

The population included in this review comprised postnatal mothers who had undergone episiotomy during vaginal delivery. The intervention assessed was infrared lamp therapy applied to the episiotomy wound site. The comparison was made against standard postpartum care, sitz baths, dry heat application, or no additional intervention. The outcomes of interest were wound healing, assessed using standardized tools such as the REEDA scale [7]; pain relief, measured using the VAS [8]; and overall maternal recovery indicators, such as comfort and infection incidence. Studies were eligible for inclusion if they were randomized controlled trials or quasi-experimental studies, published in English, and available in full-text format. The publication period was restricted to studies published between January 2010 and April 2025. Articles were excluded if they were review papers, editorials, letters to the editor, case reports, conference abstracts, or non-English publications.

Information Sources

A comprehensive literature search was performed across five key electronic databases: PubMed, Scopus, the Cochrane Library, CINAHL, and Google Scholar. To enhance the breadth of the review, reference lists from the selected studies were manually screened, and relevant grey literature was also explored. This approach ensured the inclusion of potentially overlooked studies not captured through database searches alone.

Search Strategy

A comprehensive Boolean search strategy was used to capture relevant literature across all selected databases. The search terms included the following: ("postnatal women" OR "postnatal mothers" OR "postpartum women" OR "puerperal women" OR "puerperium") AND ("episiotomy" OR "episiotomy wound" OR "perineal wound") AND ("infrared therapy" OR "infrared lamp" OR "infrared radiation" OR "infrared phototherapy" "infrared heat lamp") AND ("wound healing" OR "healing outcome" OR "wound recovery" OR "healing rate" OR "REEDA scale" OR "redness edema ecchymosis discharge approximation" OR "inflammation" OR "infection"). This search string was applied across databases, including PubMed, Scopus, CINAHL, and the Cochrane Library, to retrieve studies focusing on the efficacy of infrared therapy for episiotomy wound healing among postpartum women. Searches were limited to studies published in English between January 2010 and April 2025.

Selection Process and Search Outcome

The screening process for this systematic review was carried out in three structured stages: title screening, abstract evaluation, and full-text review. An initial total of 2,200 records were retrieved from five major databases, PubMed, Scopus, the Cochrane Library, CINAHL, and Google Scholar, as well as from manual searches of reference lists. After eliminating 458 duplicate entries using both reference management software and manual cross-checking, 1,742 records were retained for title and abstract screening. Two independent reviewers assessed these records, leading to the exclusion of 1,527 studies that did not meet the predefined eligibility criteria. The remaining 215 full-text articles were then examined in detail. Of these, 195 were excluded for various reasons, including lack of relevance to the intervention or outcomes, inadequate methodological rigor, absence of required outcome measures, or non-English language. Finally, 20 studies fulfilled all inclusion criteria and were selected for the final analysis. Throughout the process, all screening steps were performed independently by two reviewers, with any discrepancies resolved through mutual discussion or consultation with a third reviewer. The screening and selection process is illustrated in the PRISMA 2020 flow diagram (Figure *1*).

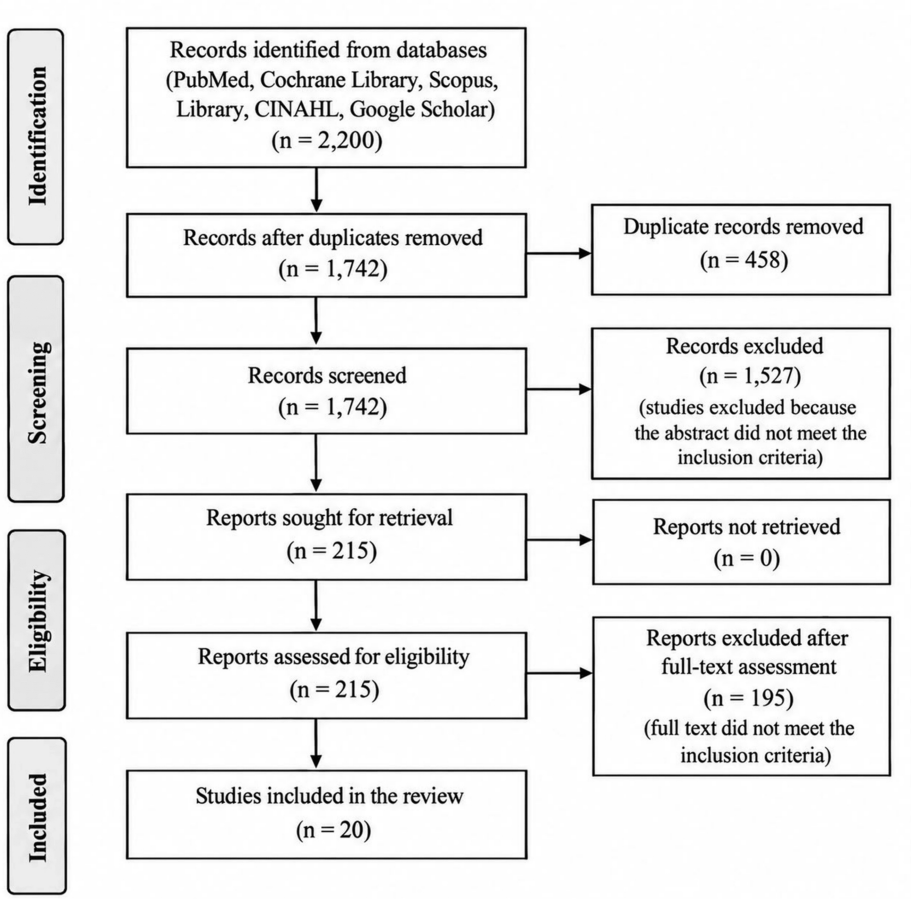


FIGURE 1: PRISMA flowchart

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

Data Items

The data extracted for this review included key study details such as the author, year of publication, country where the research was conducted, study design, and sample size. Particular attention was given to the specifics of the intervention, namely, the type of infrared lamp used, how often and for how long it was applied, and the method of application. To assess outcomes, the review focused primarily on wound healing, measured with standardized tools such as the REEDA scale [7], and on pain relief, evaluated using the VAS [8]. Additional outcomes included qualitative descriptions of maternal comfort, signs of tissue recovery, and clinical observations noted during the postpartum period. Whenever available, numerical data such as mean scores, standard deviations, confidence intervals, and p-values were also recorded to deepen the analysis and support the identification of key themes across studies.

Risk of Bias Assessment

Two independent reviewers carefully assessed the quality and potential risk of bias in the included studies. For randomized controlled trials, the Cochrane Risk of Bias Tool was used [14], and for quasi-experimental studies, the Newcastle-Ottawa Scale [15] was applied. All studies were reviewed for methodological validity, including randomization, etc., or, in other words, blinding, group comparability, outcome measurement clarity, and consistency. In case of any disagreement between the evaluators, it was discussed and resolved so that the final assessments were reached by consensus of both evaluators.

Synthesis Methods

A thematic synthesis approach was adopted to analyze the findings from the included studies, following the six-phase method outlined by Braun and Clarke [13]. Given the methodological heterogeneity across studies, varying in design, sample size, and outcome reporting, a meta-analysis was not feasible. Instead, thematic analysis enabled the systematic identification, organization, and interpretation of patterns in the data. First, all extracted data were thoroughly read to familiarize ourselves. Next, initial codes were generated to capture meaningful features relevant to the research objectives. These codes were then collated into

potential themes reflecting recurring concepts across studies. Themes were reviewed, refined, and defined in an iterative process to ensure internal homogeneity and external heterogeneity. This interpretive analysis was rooted in the methodical and flexible framework proposed by Braun and Clarke [13], which supports both descriptive and interpretative synthesis in health research.

Reporting Bias Assessment

Because thematic analysis is primarily qualitative and the included studies varied widely in design and outcomes, statistical tests for publication bias (like funnel plots or Egger's test) were not appropriate. Instead, the risk of reporting bias was evaluated descriptively. This involved reviewing a variety of publications, checking for grey literature, and assessing whether the results consistently favored the intervention. Although many studies reported positive outcomes, their diverse origins and methods helped reduce concerns about publication bias. Thus, bias was considered narratively rather than through statistical modeling.

Results

Study Characteristics

The final 20 studies published between January 2010 and April 2025 were conducted in diverse geographical settings, including India, Egypt, Indonesia, and Taiwan. The studies represented a mix of low- and middle-income countries where access to cost-effective postpartum care is particularly crucial [16-35]. Study designs included randomized controlled trials, quasi-experimental studies, non-randomized controlled trials, and comparative studies. The populations studied consisted predominantly of postnatal mothers who had undergone vaginal delivery with episiotomy. Some studies specifically focused on primiparous women, while others included a broader postpartum population. Most studies adopted purposive or convenience sampling, while a few utilized systematic or simple random sampling techniques. The majority of interventions were implemented in hospital settings, predominantly in maternity wards or postnatal units (Table *1*).

Author	Year	Country	Study design	Sampling and sample size	Instruments used	Intervention	Key findings	Quality score	Risk of bias
Huang et al. [23]	2019	Taiwan	RCT	40 women (18 FIR, 22 control)	VAS	FIR 40-minute sessions every 12 hours × 2 days + 1 session at 1 week	Pain and sexual function improved but not statistically significant; safe	8 (high)	Low (Cochrane ROB)
Supriya [16]	2024	India	Pre-experimental	60 mothers; purposive sampling	REEDA scale	Infrared 10 minutes twice daily for 3 days	Significant REEDA score improvement; no infections	6 (moderate)	Moderate (Newcastle-Ottawa Scale)
Chacko et al. [17]	2013	India	RCT (single-blind)	120 mothers	VAS, REEDA scale	Infrared 10 minutes twice daily	Significant pain and inflammation reduction	9 (high)	Low (Cochrane ROB)
Venkadalakshmi et al. [29]	2010	India	Quasi-experimental	60 mothers; systematic sampling	NPRS, REEDA scale	Infrared 10 minutes twice daily for 3 days	Significant wound healing and pain reduction; no infections	8 (high)	Low (Newcastle-Ottawa Scale)
Salvi et al. [18]	2024	India	RCT	120 mothers; randomized	Modified REEDA, VAS	Infrared 15 minutes twice daily + standard care	Better healing and pain relief vs routine care	8 (high)	Low (Cochrane ROB)
Dewi and Assyaidah [24]	2025	Indonesia	Quasi-experimental	64 mothers; total sampling	REEDA scale	Sitz bath vs infrared for 3 days	Sitz bath more effective than infrared in healing	7 (moderate)	Moderate (Newcastle-Ottawa Scale)
Ramesh et al. [26]	2024	India	RCT	208 mothers (104 FIR, 104 sitz bath)	REEDA, VAS, MOS	FIR vs sitz bath for 20 minutes	FIR showed slightly better healing, pain relief, and compliance	9 (high)	Low (Cochrane ROB)
Kaur et al. [30]	2019	India	Quasi-experimental	60 mothers (30 experimental, 30 control)	REEDA scale	Infrared 5 minutes thrice daily for 3 days	Significant REEDA score improvement in the experimental group	8 (high)	Low (Newcastle-Ottawa Scale)

Kaur et al. [31]	2014	India	Quasi-experimental	60 mothers (30 per group)	REEDA scale	Infrared 15-20 minutes twice daily for 3 days	80% healing in the experimental group vs 50% in control	7 (moderate)	Moderate (Newcastle-Ottawa Scale)
Nethravathi et al. [19]	2015	India	RCT	464 mothers (231 experimental, 233 control)	REEDA scale	Infrared twice daily for 3 days	92.64% healing in the experimental group vs 0% in control	9 (high)	Low (Cochrane ROB)
Kaur [25]	2014	India	Comparative experimental	60 mothers (30 per group)	REEDA scale, NPRS	Infrared vs sitz bath	Sitz bath more effective in wound healing; both reduced pain	7 (moderate)	Moderate (Newcastle-Ottawa Scale)
Ismail and Ghatta [22]	2019	Egypt	Quasi-experimental	80 mothers (40 per group)	REEDA, NPRS	Infrared vs sitz bath standardized	Infrared significantly better in pain and healing	8 (high)	Low (Newcastle-Ottawa Scale)
Kaur et al. [32]	2015	India	Quasi-experimental	60 mothers (30 experimental, 30 control)	NPRS, Modified REEDA	Infrared daily for 3 days	Significant decrease in pain and REEDA scores	8 (high)	Low (Newcastle-Ottawa Scale)
Sahoo and Tripathy [21]	2013	India	Quasi-experimental	40 mothers (20 per group)	Custom pain/comfort scale, REEDA	Infrared vs placebo (saline)	90% had no pain on day 7 in the infrared group; healing significantly better	7 (moderate)	Moderate (Newcastle-Ottawa Scale)
Boddupalli [20]	2021	India	Quasi-experimental	30 mothers; random allocation	10-point pain scale	Infrared 10-15 minutes twice daily at 45 cm	Pain dropped from 6.53 to 0.5 by day 4; statistically significant	8 (high)	Low (Newcastle-Ottawa Scale)
Dewi and Ayuningtyas [27]	2015	Indonesia	Quasi-experimental	30 mothers (15 per group)	REEDA scale	Infrared vs iodine, 10 minutes daily for 6 days	Infrared more effective in early healing (31.7% vs 15%)	7 (moderate)	Moderate (Newcastle-Ottawa Scale)
Rani [33]	2018	India	Quasi-experimental	60 mothers (30 per group)	NRS, REEDA scale	Infrared to the perineum	Pain reduced (7.5→2.8); REEDA dropped (12.6→3.6); highly significant	8 (high)	Low (Newcastle-Ottawa Scale)
Shukla et al. [34]	2019	India	Quasi-experimental	60 mothers (30 per group)	Modified NPRS, REEDA scale	Infrared twice daily for 10 minutes over 3 days	Pain and REEDA scores improved significantly compared to control	8 (high)	Low (Newcastle-Ottawa Scale)
Mary et al. [28]	2022	India	Quasi-experimental	60 mothers (30 per group)	REEDA scale	Infrared 15-20 minutes twice daily for 3 days	REEDA scores dropped from 12.43 to 0.96; healing associated with parity, suture, and care	8 (high)	Low (Newcastle-Ottawa Scale)
El-Lassy and Madian [35]	2019	Egypt	Non-RCT	80 mothers (40 per group)	REEDA, NPRS, structured interview	Infrared 10-15 minutes twice daily for 4 days	Pain dropped to 0.2 by day 4; REEDA scores improved significantly	8 (high)	Low (Newcastle-Ottawa Scale)

TABLE 1: Summary of the literature studied and quality

RCT: randomized controlled trial; FIR: far-infrared radiation; VAS: Visual Analog Scale; REEDA: Redness, Edema, Ecchymosis, Discharge, Approximation; MOS: medical outcome study; NPRS: Numeric Pain Rating Scale; NRS: Numeric Rating Scale; ROB: Risk of Bias

Thematic analysis

Theme 1: Acceleration of Episiotomy Wound Healing

A dominant finding across the reviewed studies was the significant improvement in wound healing facilitated by infrared lamp therapy. Both randomized trials and quasi-experimental studies consistently reported measurable improvements in REEDA scores within 3-5 days of initiating therapy. Supriya [16], Chacko et al. [17], Salvi et al. [18], and Nethravathi et al. [19] provided strong quantitative evidence demonstrating reductions in REEDA issues post-intervention. Many studies have reported a statistically significant decline in REEDA scores in intervention groups compared with controls, supporting the efficacy of infrared therapy in promoting tissue repair. These results indicate that infrared therapy accelerates physiological healing processes, likely by improving local blood circulation and oxygenation at the wound site.

Theme 2: Effective Pain Management

Pain relief emerged as another key theme and a consistent benefit reported in nearly all included studies. Interventions using infrared therapy significantly reduced pain scores, often within the first 48-72 hours of treatment. Tools such as the VAS [8], NPRS [36], and custom pain and comfort scales were used to assess outcomes. Boddupalli [20] showed a dramatic reduction in pain scores from 6.53 to 0.5 within four days, while Sahoo and Tripathy [21] reported that 90% of the infrared group reported no pain by the seventh day. Ismail and Ghatta [22] found a significant reduction in pain scores from 8.4 to 1.9 in the infrared group, compared with less improvement in the sitz bath group. These findings suggest that infrared therapy serves as an effective, non-pharmacological intervention for alleviating perineal pain, enhancing maternal comfort during the early postpartum period.

Theme 3: Safety and Tolerability of Infrared Therapy

In all the reviewed studies, infrared lamp therapy also emerged as a low-risk treatment method that patients tolerated well for postnatal wound healing. None of the trials reported adverse effects, skin irritation, or burns. Huang et al. [23] and Supriya [16] particularly mentioned that this approach is safe, particularly in low-resource settings where the risk must be carefully monitored. The treatment's penetrating, non-invasive nature, owing to its gentle heat-based mechanism, made it simple to perform and did not require bulky equipment or specialized expertise. Its feasibility and ease of adaptation as a regular postpartum care intervention were widely noted, and some studies confirmed its appropriateness for use alongside other maternal care practices.

Theme 4: Comparative Effectiveness of Infrared vs Other Therapies

Several studies compared the outcomes of infrared therapy with alternative interventions, such as sitz baths and iodine applications. Dewi and Assyaidah [24] and Kaur [25] found slight differences when comparing sitz baths and exploring their effectiveness in wound healing. On the other hand, Ramesh et al. [26] and Ismail and Ghatta [22] reported improved compliance, analgesic effect, and wound healing with infrared therapy. Dewi and Ayuningtyas [27] conducted a study that showed that infrared was more effective than iodine in promoting the recovery of perineal wounds. Although the results were slightly inconsistent, infrared therapy consistently equaled or outperformed alternative approaches in both non-responder rates and acceptability, making it a good candidate to be a staple of post-delivery care.

Theme 5: Role of Nursing Care and Clinical Integration

The role of nurses in implementing infrared lamp therapy was a recurring subtheme. Studies by Supriya [16], Mary et al. [28], and Chacko et al. [17] emphasized that nurses played a critical role in administering the intervention and monitoring patient outcomes. The simplicity, affordability, and non-pharmacological nature of the therapy make it especially suited for nurse-led care, particularly in settings where access to advanced medical technologies may be limited. Many researchers have recommended integrating infrared lamp therapy into routine nursing protocols as a cost-effective tool to support maternal recovery, shorten hospital stays, and prevent wound-related complications (Table *2*).

Outcome	No. of studies	Study design	Certainty assessment	Effect	Certainty (GRADE)
Wound healing (REEDA scale)	20	RCTs and quasi-experimental	Risk of bias: low to moderate. Inconsistency: moderate due to intervention variation. Indirectness: low. Imprecision: low. Publication bias: possible	Most studies showed significant REEDA score reduction (e.g., from 12 to <2 in 3-5 days)	High
Pain relief (VAS/NPRS)	20	RCTs and quasi-experimental	Risk of bias: low to moderate. Inconsistency: moderate. Indirectness: low. Imprecision: low. Publication bias: possible	VAS/NPRS scores reduced from 6-8 to <1 in most studies; clinically meaningful difference	Moderate
Adverse events (safety)	20	All included studies	Risk of bias: low. Inconsistency: none. Indirectness: low. Imprecision: low. Publication bias: unlikely	No adverse effects reported; therapy was well tolerated in all studies	High

TABLE 2: GRADE summary of findings

GRADE: Grading of Recommendations Assessment, Development, and Evaluation; REEDA: Redness, Edema, Ecchymosis, Discharge, and Approximation; VAS: Visual Analog Scale; NPRS: Numeric Pain Rating Scale; RCTs: randomized controlled trials

Discussion

This systematic review examined the reported effects of infrared lamp therapy on episiotomy wound healing and postpartum pain relief among postnatal mothers. The thematic synthesis of 20 included studies identified recurring findings related to wound healing, pain relief, comparisons with alternative interventions, tolerability, potential integration into nursing care, and methodological variation. The current review reports that 18 studies observed improvements in wound-healing outcomes, including reductions in REEDA scores. In comparison, 17 studies reported reductions in pain measured using instruments such as the VAS and NPRS. Some studies described improvements within 3-5 days of treatment. However, the magnitude and clinical importance of these changes should be interpreted in the context of individual study findings, comparison groups, assessment time points, and methodological quality. The absence of reported adverse events should also be interpreted with caution, as the available information does not establish whether safety outcomes were assessed consistently across all included studies.

The findings generally align with previous research investigating infrared radiation and other heat-based interventions for episiotomy wound management and postpartum perineal pain. Infrared therapy has been proposed to support local circulation and tissue recovery. However, the extent to which these mechanisms explain the observed clinical outcomes cannot be established by this review alone. Among the included studies, Chacko et al. [17] reported reductions in REEDA scores and pain levels by the third day of treatment. Studies by Kaur et al. [30] and Rani [33] also reported improvements in pain and wound-related outcomes following infrared therapy. These findings suggest that infrared lamp therapy may have a beneficial role in postpartum recovery. Nevertheless, similarities in the direction of reported findings across studies do not necessarily establish a consistent treatment effect, particularly when study designs, sample sizes, intervention protocols, and outcome-assessment methods differ.

Pain relief was another important outcome across the included literature. Infrared radiation has been proposed to influence local blood flow and thermal sensory responses, potentially contributing to changes in pain perception [5]. Boddupalli [20] and Choudhari et al. [1] reported reductions in pain measured using VAS or NPRS, while other studies have examined similar thermotherapeutic approaches for postpartum perineal discomfort [11]. These findings indicate that infrared lamp therapy may help reduce pain for some postnatal mothers. However, the clinical interpretation of pain-score changes requires consideration of baseline scores, between-group differences, the timing of assessments, and the magnitude of change. Within-group improvement alone cannot establish that infrared therapy is more effective than routine care or another intervention. Further, comparisons with pharmacological approaches should be made cautiously because the included studies do not necessarily provide direct evidence of comparative effectiveness or differences in adverse effects.

The findings were not uniform across studies comparing infrared therapy with alternative interventions, particularly sitz baths. Dewi and Assyaidah [24] reported more favorable wound-healing outcomes with sitz baths than with infrared therapy, whereas Ismail and Ghatta [22] reported findings favoring infrared lamp therapy. Kaur [25] also compared infrared therapy and sitz baths, highlighting the importance of considering alternative approaches when interpreting the evidence. Differences in treatment duration, lamp distance, intervention procedures, perineal hygiene practices, comparator protocols, and outcome-assessment methods may contribute to variation between studies. However, these factors should be considered possible explanations unless they were directly examined in the original research. The available findings therefore do

not establish that infrared therapy is consistently superior to sitz baths or other forms of postpartum care. Instead, they highlight the need for well-designed comparative studies using standardized intervention protocols and outcome measures.

Existing reviews of postpartum pain management have examined pharmacological and complementary approaches, including non-pharmacological interventions for perineal discomfort [6]. The present review focuses on infrared lamp therapy for episiotomy recovery and synthesizes findings from studies with diverse designs and clinical settings. This focused synthesis may help identify areas where the evidence is encouraging and where further investigation is required. Nevertheless, the findings should not be interpreted as definitive confirmation of efficacy or safety. Although no adverse events were reported in the current review's synthesis, a lack of reported events does not necessarily indicate that adverse events were systematically monitored or that uncommon complications could be excluded. This distinction is particularly important when considering an intervention that involves applying heat to a sensitive postpartum area. Future research should document treatment parameters, monitoring procedures, adverse events, and follow-up duration more consistently.

The potential relevance of infrared lamp therapy to nursing practice should also be considered in light of the limitations of the available evidence. Singh et al. [2] discussed patterns of episiotomy use and associated complications in Indian tertiary care hospitals, highlighting the importance of appropriate postpartum care. Infrared therapy may be a non-pharmacological option to consider alongside established approaches to wound assessment, hygiene, pain management, and maternal support. However, the present review does not independently establish its cost-effectiveness, feasibility across all healthcare settings, or suitability for universal adoption. Decisions about clinical use should consider the quality of the evidence, local clinical guidance, appropriate precautions for heat exposure, patient preferences, and the availability of suitable equipment and monitoring. The findings support further evaluation of infrared therapy as a possible adjunct to postpartum care rather than an established replacement for routine management.

The findings may also be considered in relation to Wiedenbach's Helping Art of Clinical Nursing Theory, which emphasizes individualized care that responds to patients' needs [28]. Supporting comfort and recovery after childbirth is consistent with the broader principles of individualized nursing care. Nevertheless, the theoretical relevance of infrared therapy should not be interpreted as independent evidence of its effectiveness. Its role in practice should be guided by clinical evidence and appropriate assessment of each patient's needs, preferences, and response to treatment.

Overall, the included studies provide encouraging evidence that infrared lamp therapy may improve episiotomy wound-healing measures and reduce postpartum pain. However, differences in study design, intervention protocols, comparator groups, outcome measures, and reporting limit the certainty and generalizability of these findings. The reported benefits should therefore be interpreted cautiously, particularly when making claims about comparative effectiveness, safety, affordability, or routine implementation. Further adequately powered randomized controlled trials with standardized treatment protocols, clinically relevant outcome measures, appropriate comparison groups, and systematic monitoring of adverse events are needed to establish the effectiveness, safety, and appropriate clinical role of infrared lamp therapy in postpartum care.

Implications

The consistent benefits of infrared lamp therapy underscore its relevance for integration into routine postnatal care. Nurses and midwives can adopt this modality as a non-invasive, cost-effective strategy for promoting episiotomy wound healing and maternal comfort. Infrared therapy can be safely administered in both hospital and community settings with minimal training. Given its acceptability and clinical outcomes, it should be considered for incorporation into standard postpartum protocols. Education programs for nursing staff should include guidelines on the application of infrared, assessment of wound healing using REEDA, and monitoring maternal comfort and safety.

Methodological strengths and limitations

This review adhered strictly to the PRISMA 2020 guidelines, ensuring methodological transparency and reproducibility. A comprehensive search strategy covered five databases and included grey literature, enhancing the scope and depth of findings. Thematic analysis followed Braun and Clarke's framework [13], allowing for a nuanced understanding of recurring patterns. Dual independent review and data extraction ensured rigor and minimized selection bias. The use of standardized tools such as REEDA and VAS across studies improved the consistency of outcome comparisons. However, this review has a few limitations. Only studies published in English were included, potentially omitting relevant non-English research. Heterogeneity in study designs, sample sizes, intervention protocols, and outcome measures limited the feasibility of a meta-analysis. A few studies employed pre-experimental designs or convenience sampling, which may reduce generalizability. Potential publication bias cannot be ruled out, particularly as studies reported overwhelmingly positive results.

Recommendations for future research

Future studies should focus on large-scale, multicenter randomized controlled trials with standardized protocols for infrared application, including lamp wattage, distance, and exposure time. More rigorous blinding and the use of control groups will strengthen the quality of the evidence. Long-term follow-up studies are needed to assess sustained healing and maternal well-being. Research should also explore the cost-effectiveness of integrating infrared therapy into maternal health services. Investigations into barriers to implementation in rural or low-resource settings will further aid scale-up.

Conclusions

This systematic review found that infrared lamp therapy was associated with improvements in episiotomy wound-healing measures and reductions in postpartum pain in many of the included studies. However, variation in study design, intervention protocols, outcome measures, and reporting limits the certainty and generalizability of these findings. Although no adverse events were reported in the current synthesis, the available information does not establish definitive safety. Infrared lamp therapy may have potential as an adjunct to postpartum care. Still, the current evidence does not support adopting it universally as routine care. Further well-designed studies using standardized protocols, clinically relevant outcomes, and systematic safety monitoring are required to clarify its effectiveness, safety, and appropriate role in clinical practice.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Victoria Sarvand, Komala HK

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