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SCOPING REVIEW ARTICLE

Perineal Protection Techniques for Women in Labor: A Scoping Review on the Reduction of Perineal Tears During Vaginal Birth

Técnicas de Proteção Perineal em Parturientes: Scoping Review sobre a Redução de Lacerações no Parto Vaginal

Técnicas de Protección Perineal en Parturientas: Revisión Exploratoria sobre la Reducción de Laceraciones en el Parto Vaginal

Micaela de Fátima Batista Sousa Costa [1, 2]
https://orcid.org/0009-0009-6855-5508

Paula Alexandra Cordeiro Damásio Correia [1, 2]
https://orcid.org/0009-0004-7628-5847

Maria Bonito Furtado [1, 2]
https://orcid.org/0009-0009-9574-9674

Márcio Filipe Moniz Tavares [1]
https://orcid.org/0000-0002-2820-5660

[1] University of the Azores, Health School, Nursing Department, Ponta Delgada, Azores, Portugal

[2] Divino Espírito Santo Hospital, Nursing Department, Ponta Delgada, Azores, Portugal

Corresponding author
Micaela de Fátima Batista Sousa Costa
E-mail: mfbscosta0@gmail.com

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Abstract

Background: Perineal tears are a common complication of vaginal delivery. They are associated with pain, bleeding, and pelvic floor dysfunction. Perineal massages, the application of warm compresses, and the hands-on and hands-off techniques are used to prevent perineal tears. However, evidence of their effectiveness is limited.
Objective: To map the evidence on the effectiveness of perineal protection techniques in reducing perineal tears during vaginal deliveries.
Methodology: A scoping review was conducted according to the JBI and PRISMA-ScR guidelines. Primary quantitative studies (2014–2024) written in Portuguese, English, or Spanish that evaluated perineal tears as the primary outcome were included. The PCC mnemonic device was used to define the population, concept, and context. Secondary and qualitative studies were excluded. Two reviewers performed selection, extraction, and analysis.
Results: Eleven studies were included and grouped into the following four categories: Perineal protection techniques and respective clinical outcomes; Maternal factors and impact on tears; Intrapartum interventions and respective outcomes; and Preventive strategies and clinical efficacy.
Conclusion: Perineal protection techniques have the potential to reduce perineal tears. However, the variability of results underscores the need for further investigation. Future multicenter studies with robust methodologies are essential to standardizing practices and reinforcing evidence-based obstetric care.

Keywords: perineal tears; massage; perineum; thermotherapy; natural childbirth; scoping review

Resumo

Enquadramento: Lacerações perineais são complicações frequentes no parto vaginal, associadas a dor, hemorragia e disfunção do pavimento pélvico. Técnicas como massagem perineal, compressas mornas, *hands-on* e *hands-off* são usadas para preveni-las, mas a evidência da eficácia é limitada.
Objetivo: Mapear a evidência da eficácia de técnicas de proteção perineal na redução de lacerações perineais em partos vaginais.
Metodologia: *Scoping review* segundo JBI e PRISMA-ScR. Incluíram-se estudos quantitativos primários (2014–2024), em português, inglês e espanhol, que avaliaram lacerações como desfecho primário. Aplicou-se a mnemónica PCC para definir população, conceito e contexto. Excluíram-se estudos secundários e qualitativos. Seleção, extração e análise realizadas por dois revisores.
Resultados: Incluídos 11 estudos, agrupados em técnicas de proteção perineal e desfechos clínicos; Fatores maternos e impacto nas lacerações; Intervenções intraparto e desfechos; Estratégias preventivas e eficácia clínica.
Conclusão: Técnicas de proteção perineal mostram potencial para reduzir lacerações, mas a variabilidade dos resultados evidencia necessidade de investigação adicional. Futuros estudos multicêntricos com metodologias robustas são fundamentais para padronizar práticas e reforçar cuidados obstétricos baseados em evidência.

Palavras-chave: lacerações perineais; massagem; períneo; termoterapia; parto natural; revisão de escopo

Resumen

Marco contextual: Las laceraciones perineales son complicaciones frecuentes en el parto vaginal, asociadas con dolor, hemorragia y disfunción del suelo pélvico. Se utilizan técnicas como el masaje perineal, las compresas tibias, las *hands-on* y *hands-off* para prevenirlas, pero la evidencia de su eficacia es limitada.
Objetivo: Mapear la evidencia de la eficacia de las técnicas de protección perineal en la reducción de las laceraciones perineales en los partos vaginales.
Metodología: Revisión de alcance según JBI y PRISMA-ScR. Se incluyeron estudios cuantitativos primarios (2014-2024), en portugués, inglés y español, que evaluaron las laceraciones como resultado primario. Se aplicó la mnemotécnica PCC para definir la población, el concepto y el contexto. Se excluyeron los estudios secundarios y cualitativos. Selección, extracción y análisis realizados por dos revisores.
Resultados: Se incluyeron 11 estudios, agrupados en técnicas de protección perineal y resultados clínicos; factores maternos e impacto en las laceraciones; intervenciones intraparto y resultados; estrategias preventivas y eficacia clínica.
Conclusión: Las técnicas de protección perineal muestran potencial para reducir las laceraciones, pero la variabilidad de los resultados pone de manifiesto la necesidad de realizar más investigaciones. Es fundamental llevar a cabo futuros estudios multicéntricos con metodologías sólidas para estandarizar las prácticas y reforzar la atención obstétrica basada en la evidencia.

Palabras clave: laceración perineal; masaje; perineo; termoterapia; parto natural; revisión del alcance

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Introduction

Vaginal delivery is a fundamental event in the physiological process of human reproduction. It marks the end of pregnancy and the beginning of the newborn's life outside the uterus (World Health Organization, 2018). However, complications are possible, and the most frequent are perineal tears. These injuries can be superficial or involve the anal sphincter and rectal mucosa, causing bleeding, persistent pain, infections, pelvic floor dysfunction, and negative effects on sexual and psychological well-being (Okeahialam et al., 2024; Silva et al., 2024; Yin et al., 2024). Perineal protection techniques are interventions applied during the expulsive stage of labor to reduce the incidence and severity of such tears. Perineal massage, which involves manually manipulating the perineal tissues to enhance elasticity, has been linked to a lower risk of trauma, a shorter second stage of labor, and reduced pain intensity (Marcos-Rodríguez et al., 2023; Nnabuchi et al., 2025; Yin et al., 2024). Warm compresses involve applying moist heat to the perineum during crowning to promote muscle relaxation, vasodilation, and tissue flexibility. This increases the likelihood of an intact perineum and reduces postpartum discomfort. The hands-on technique involves manually supporting the perineum and guiding the fetal head, while the hands-off (poised) approach allows for spontaneous fetal head expulsion without manual intervention (Pierce-Williams et al., 2021). However, evidence regarding the benefits of manual support compared with expectant perineal protection remains inconsistent and heterogeneous (Borján, 2024). Due to the high prevalence of perineal tears and their negative physical and psychological consequences, identifying effective preventive strategies is essential. However, despite the frequent use of perineal protection techniques, the evidence regarding their effectiveness is inconclusive, hindering the standardization of clinical recommendations (Marcos-Rodríguez et al., 2023; Pierce-Williams et al., 2021). International organizations, such as the International Confederation of Midwives (ICM, 2024) and the World Health Organization (WHO, 2018), advocate for evidence-based practices that respect the physiology of childbirth. Given the heterogeneity of the literature, conducting a scoping review is therefore justified. Although relevant primary studies exist, the methodological designs, populations, and evaluated outcomes (e.g., tear degree, overall perineal trauma, pain, and pelvic floor dysfunction) vary widely. This diversity prevents robust quantitative meta-analyses and, consequently, systematic reviews with strong conclusions. According to the Joanna Briggs Institute (JBI) guidelines (Peters et al., 2020), scoping reviews are recommended when the available evidence is heterogeneous, emerging, or insufficiently consolidated. Thus, this approach is the most suitable for the present study. Before conducting the review, exploratory research was performed in major international databases (MEDLINE/PubMed, Cochrane Library, CINAHL, and Scopus) to identify existing systematic reviews, meta-analyses, and scoping reviews on perineal protection. Studies focusing on specific techniques, such as perineal massage (Li et al., 2023), warm compresses (Rodrigues et al., 2023), and manual perineal support (hands-on versus hands-off) (Rasmussen et al., 2021), were identified. However, prior reviews addressed interventions in isolation and focused on randomized clinical trials without providing an integrated analysis of multiple perineal protection strategies across different research designs and clinical contexts. This scoping review makes an original contribution by comparatively mapping various perineal protection techniques. Furthermore, it complements previous reviews and addresses the following research question: "*How effective are perineal massages, warm compresses, and manual approaches in protecting the perineum and reducing the incidence of perineal tears in vaginal deliveries?*" Thus, the objective of this study was to map the available evidence on the effectiveness of these techniques in preventing perineal trauma.

Methodology

This scoping review followed the methodological recommendations of the JBI (Aromataris et al., 2024) guidelines and the PRISMA-ScR checklist (Tricco et al., 2018). The PCC mnemonic device was used to define the population (women in labor), the concept (perineal protection approaches, such as perineal massages, warm compresses, and hands-on and hands-off techniques), and the context (hospital delivery). The review was registered in the Open Science Framework (OSF) under the DOI identifier: https://doi.org/10.17605/OSF.IO/529HP

Inclusion and exclusion criteria

Primary quantitative studies published between 2014 and 2024 in Portuguese, English, or Spanish that assessed the reduction of perineal tears in hospital-based vaginal deliveries using specified techniques were included. While the JBI recommends including diverse study types in scoping reviews, this review focused on quantitative studies to objectively measure the effectiveness of interventions. Qualitative and mixed-methods studies were excluded because they do not allow for an objective evaluation of intervention outcomes. Nevertheless, the potential contribution of qualitative approaches to exploring maternal experiences and subjective aspects of perineal care is acknowledged. The exclusion criteria encompassed qualitative or mixed-methods studies, reviews, case reports, opinion papers, and research conducted in nonhospital or home settings. The 2014–2024 timeframe was selected to capture contemporary practices and methodological advances and to promote comparability among studies. Older literature was excluded to prevent redundancy, as prior reviews had already compiled earlier findings. Only hospital-based studies were considered to ensure comparability among clinical contexts and avoid biases associated with home births, which involve different care dynamics.

Research strategy and identification of information sources

The literature search was performed in October 2024, including only peer-reviewed studies and excluding gray literature. The databases consulted were EBSCOhost (CINAHL Complete, MEDLINE Complete, Cochrane Central Register of Controlled Trials, Cochrane Database

of Systematic Reviews, Cochrane Methodology Register, MedicLatina, and Library & Information Science & Technology Abstracts), B-on (Complementary Index, Gale In Context: Science, MEDLINE, SciELO, Directory of Open Access Journals), Web of Science, and Scopus. Controlled descriptors from MeSH (Medical Subject Headings) and DeCS (Descriptors in Health Sciences), such as *Perineal Lacerations, Massage, Perineum, Thermotherapy, and Natural Childbirth*, were applied. To ensure broader coverage and higher search sensitivity, synonyms and equivalent free-text terms in English were also included because many studies are not formally indexed or have controlled descriptors. Examples of search formulas included: Scopus (TITLE--ABS-KEY): ("perineal laceration" OR "perineal trauma" OR "perineal injury" OR "perineal tear" OR "perineum injuries" OR "obstetric labor complication") AND ("perineal protection" OR "perineal protection techniques" OR "perineal massage" OR "warm compress" OR "perineal stretching" OR "hands-on" OR "hands-off") AND ("vaginal birth" OR "childbirth" OR "labor" OR "obstetric labor"); Web of Science (TS): ("perineal laceration" OR "perineal trauma" OR "perineal injury" OR "perineal tear" OR "perineum injuries" OR "obstetric labor complication") AND ("perineal protection" OR "perineal protection techniques" OR "perineal massage" OR "warm compress" OR "hands-on" OR "hands-off") AND ("vaginal birth" OR "childbirth" OR "labor" OR "obstetric labor").

Information source selection process

Two reviewers screened the titles, abstracts, and full texts of studies independently using the Rayyan Systematic Review Platform. Disagreements were resolved by consensus. The selection process followed the PRISMA-ScR checklist (Figure 1)

Data extraction

Data were extracted using a JBI-adapted instrument that included the following: authors, year, country, PCC elements, objectives, interventions, and analyzed outcomes.

Data synthesis

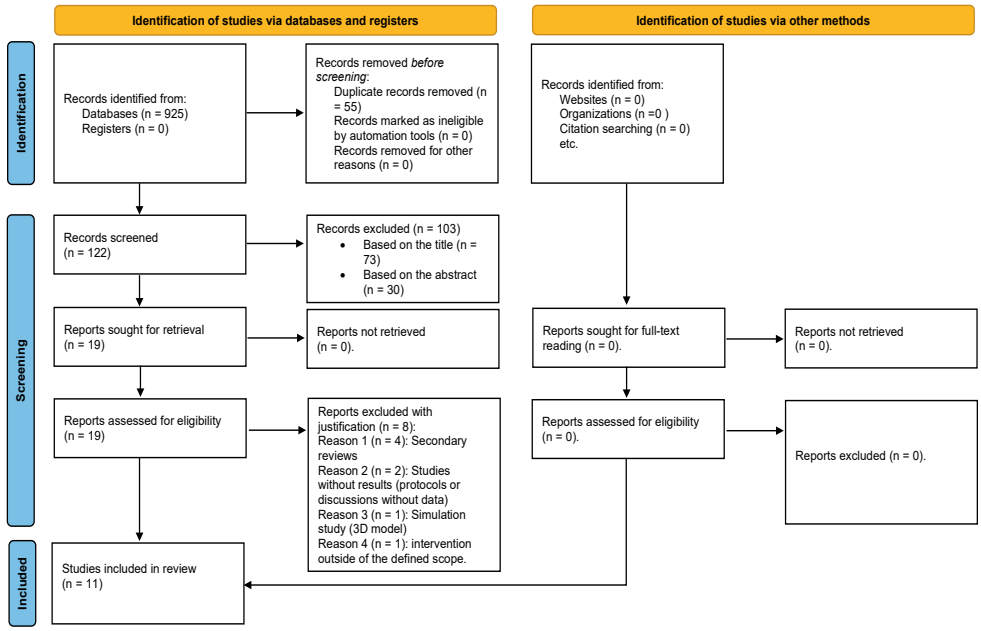
The extracted data were organized into tables to facilitate cross-study comparisons. The data were analyzed through narrative synthesis by categorizing the findings by perineal protection technique and corresponding effects.

Results

A total of 925 references were identified. After filtering (n = 177) and removal of duplicates (n = 55), 122 articles were screened by title and abstract, resulting in 19 full-text evaluations. Of these, eight studies were excluded for failing to meet the inclusion criteria, leaving 11 final articles for analysis (Figure 1). The included studies, which were published between 2014 and 2024, were conducted in countries such as Indonesia, Egypt, the United Arab Emirates (Dubai), Denmark, Portugal, Türkiye, Malaysia, and Iran. These studies analyzed techniques such as perineal massages, warm compresses, and manual approaches and demonstrated evidence of reduced incidence and severity of tears. A full characterization of these studies is presented in Table 1.

Figure 1

Study Selection Process - PRISMA Flow Diagram (Adapted)



Note. Adapted from *The PRISMA 2020 statement: An updated guideline for reporting systematic reviews*, by M. J., Page, J. E., McKenzie, P. M., Bossuyt, I., Boutron, T. C., Hoffmann, C. D., Mulrow, L., Shamseer, J. M., Tetzlaff, E. A., Akl, S. E., Brennan, R., Chou, J., Glanville, J. M., Grimshaw, A., Hróbjartsson, M. M., Lalu, T., Li, E. W., Loder, E., Mayo-Wilson, S., McDonald, … D., Moher, 2021, BMJ, 372, n71 (https://doi.org/10.1136/bmj.n71).

Table 1

Characteristics of the Selected Studies

Authors	Title	Year	Country	Methodology	Participants
Arafah, S., Lotisna, D., & Tiro, E.	Perineal Massage during Second Stage of Labor to the Perineal Tear Degree in Primigravida	2016	Indonesia	Quantitative, Non-randomized clinical trial	182 primigravidae
Demirel, G., & Golbasi, Z.	Effect of perineal massage on the rate of episiotomy and perineal tearing	2015	Türkiye	Quantitative, Randomized clinical trial	284 parturient women
Yaşar Yetiş mí Ş, H., & Aksoy Derya, Y.	The Effects of Perineal Massage Performed During Labor on Childbirth Comfort, Perineal Pain, and Trauma in Nulliparous Women: A Quasi-Experimental Study	2023	Türkiye	Quantitative, Quasi-experimental study with control group	182 nulliparous women
El-Sayed, M. L. M., Lashin, M. A. E.-B., Mohammed, A. S. A.-A., & Abo El-Fath, A. M.	Perineal Management Techniques to Reduce Perineal Trauma During The Second Stage of Labor	2022	Egypt	Quantitative, Randomized clinical trial	69 women
Faraz, S., Vasudevan, V., Ahmed, H. M. A., Varghese, D., Augustine, N., Pillai, U. V., Ammar, A., & Aftab, N.	The Effect of Warm Compress and Proper Perineal Support Technique on Prevention of Severe Perineal Trauma	2022	United Arab Emirates (Dubai)	Quantitative, Quasi-experimental study (quasi-	192 primiparous women
Goh, Y. P., Tan, P. C., Hong, J. G. S., Sulaiman, S., & Omar, S. Z.	Combined massage and warm compress to the perineum during active second stage of labor in nulliparas: A randomized trial	2021	Malaysia	Quantitative, Randomized clinical trial	156 nulliparous women
Hong, J. G. S., Abdullah, N., Rajaratnam, R. K., Ahmad Shukri, S., Tan, S. P., Hamdan, M., & Lim, B. K.	Combined perineal massage and warm compress compared to massage alone during active second stage of labour in nulliparas: A randomised trial	2022	Malaysia	Quantitative, Randomized clinical trial	281 nulliparous women
Rasmussen, O. B., Yding, A., Andersen, C. S., Boris, J., & Lauszus, F. F.	Which elements were significant in reducing obstetric anal sphincter injury? A prospective follow-up study	2021	Denmark	Quantitative, Prospective cohort study	10,383 parturient women
Rodrigues, P., Silva, M. C., & Almeida, S. T.	Perineal massage and warm compresses – Randomised controlled trial for reduce perineal trauma during labor	2023	Portugal	Quantitative, Randomized clinical trial	848 primiparous women
Shahoei, R., Zaheri, F., Hashemi Nasab, L., & Ranaei, F.	The effect of perineal massage during the second stage of birth on nulliparous women perineal: A randomization clinical trial	2017	Iran	Quantitative, Randomized clinical trial	195 primiparous women
Rezaei, R., Saatsaz, S., Chan, Y. H., & Nia, H. S.	A Comparison of the "Hands-Off" and "Hands-On" Methods to Reduce Perineal Tears: A Randomised Clinical Trial	2014	Iran	Quantitative, Randomized clinical trial	600 primiparous women

The studies were grouped into four categories. Regarding perineal massages, the findings showed that applying this technique during the second stage of labor was linked to a lower rate of severe tears and a lower need for episiotomy (Arafah et al., 2016; Demirel & Golbasi, 2015; Goh et al., 2021; Rodrigues et al., 2023). Warm compresses were also beneficial, reducing the rate of severe perineal tears and providing greater maternal comfort (El-Sayed et al., 2022; Faraz et al., 2022). The analysis of maternal factors revealed that nulliparity, fetal weight greater than 4,000 grams, and a prolonged second stage of labor increased the likelihood of severe tears (Goh et al., 2021; Rodrigues et al., 2023; YetiŞmiŞ & Derya, 2023). Some studies reported that perineal massages and warm compresses are associated with a shorter second stage of labor, a more positive maternal experience, and less perineal pain in the postpartum period (Goh et al., 2021; Shahoei et al., 2017). The findings also suggested that a combination of techniques, such as warm compresses and perineal massages, may be more effective in preserving perineal integrity than the use of a single technique (Hong et al., 2022). A hands-on approach was shown to reduce severe tears, while a hands-off approach was associated with lower episiotomy rates and a higher occurrence of minor tears, though there was no evidence of significant maternal harm (Rasmussen et al., 2021; Rezaei et al., 2014). Of the 11 included studies, most were randomized controlled trials, followed by quasi-experimental and prospective cohort designs. Sample sizes ranged from 69 to 10,383 participants. The analyzed outcomes included the incidence of perineal tears (degrees 1–4), episiotomy rates, postpartum perineal pain, expulsive period duration, and maternal outcomes. Table 2 summarizes these findings and presents the categories of the results, linking perineal protection techniques and factors associated with the respective clinical outcomes (tears, episiotomy, pain, comfort, delivery time, and satisfaction).

Table 2

Categories Emerging from the Results of the Selected Studies

Categories	**Results**
Category 1 - Perineal protection techniques and respective clinical outcomes	Perineal massage reduces severe tears, improves comfort, and reduces perineal pain in the postpartum period (Arafah et al., 2016; Demirel & Golbasi, 2015; Goh et al., 2021; Hong et al., 2022; Rodrigues et al., 2023; Shahoei et al., 2017; YetiŞmiŞ & Derya, 2023). Warm compresses reduce the need for perineal sutures and the incidence of severe tears (El-Sayed et al., 2022; Faraz et al., 2022; Goh et al., 2021; Rodrigues et al., 2023). The hands-off technique reduces episiotomy rates but increases periurethral tears (Rezaei et al., 2014). Use of the hands-on technique and "perineal support" reduces obstetric anal sphincter injury ([OASI] Rasmussen et al., 2021).
Category 2 - Maternal factors and impact on tears	Higher incidence of perineal tears in nulliparous women (Goh et al., 2021; YetiŞmiŞ & Derya, 2023).
Category 3 - Intrapartum interventions and respective outcomes	Interventions such as perineal massage and warm compresses are associated with shorter second stage of labor (Goh et al., 2021; YetiŞmiŞ & Derya, 2023). Perineal techniques can improve the maternal experience and satisfaction with childbirth (Goh et al., 2021).
Category 4 - Preventive strategies and clinical efficacy	The combination of massage and warm compresses has a positive effect, but without statistically significant differences in some studies (Hong et al., 2022). Hands-on and hands-off techniques have distinct advantages and disadvantages (Rezaei et al., 2014). Combined techniques increase the rate of intact perineum and reduce episiotomies (Rodrigues et al., 2023).

Discussion

Perineal tears are common in vaginal deliveries and can significantly affect maternal recovery and quality of life (Okeahialam et al., 2024). This scoping review mapped recent evidence showing that perineal protection techniques reduce the incidence and severity of perineal injuries (El-Sayed et al., 2022; Faraz et al., 2022; YetiŞmiŞ & Derya, 2023), aligning with WHO and ICM guidelines that promote evidence-based intrapartum care to prevent perineal complications and support physiological childbirth (ICM, 2024; WHO, 2018). Similar findings have been reported in recent studies addressing postpartum pain and complications (Barroso et al., 2024; Silva et al., 2024). The National Institute for Health and Care Excellence (2025) recommends the use of warm compresses during the second stage of labor and supports perineal protection techniques (hands-on or hands-off) adapted to context and maternal preference. Likewise, the WHO (2018) recognizes perineal massage as an effective strategy to reduce perineal trauma. These recommendations reinforce the clinical applicability of this review's findings across diverse healthcare contexts. In Portugal, the Regulation of the Competencies of Nurse-Midwives (EESMO — *Enfermeiro Especialista em Saúde Materna e Obstétrica*) acknowledges the nurse-midwife's role in clinical surveillance during labor, promoting perineal integrity, preventing complications, and monitoring key indicators, such as severe perineal tears and episiotomy (Regulamento nº 391/2019 da Ordem dos Enfermeiros, 2019). This requires the implementation of local protocols that include training, the provision of appropriate materials, documentation of the techniques used, and securing informed consent.

Perineal massages have been associated with lower rates of episiotomy and fewer severe tears, although they may cause discomfort during application, which underscores the importance of prenatal education (Demirel & Golbasi, 2015; Shahoei et al., 2017; YetiŞmiŞ & Derya, 2023). Warm compresses have been shown to reduce severe tears and enhance maternal comfort, which supports their systematic incorporation into clinical practice (El-Sayed et al., 2022; Faraz et al., 2022). The hands-on and hands-off techniques differ in their mechanisms and outcomes: the hands-on technique offers better protection of the anal sphincter but is more invasive, whereas the hands-off method is less intrusive but associated with a higher risk of minor tears (Rasmussen et al., 2021; Rezaei et al., 2014). The choice of technique should therefore consider maternal preferences and the clinician's experience, and staff training is essential for effective implementation (Pierce-Williams et al., 2021). Beyond the techniques themselves, several risk factors influence the likelihood of severe tears, including nulliparity, fetal weight >4,000 g, and prolonged second stage of labor (Goh et al., 2021; Hong et al., 2022; Rodrigues et al., 2023). Operative vaginal deliveries (vacuum-assisted and forceps deliveries) also increase this risk, emphasizing the need to avoid unnecessary interventions (Pierce-Williams et al., 2021). Perineal massage and warm compresses are associated with reduced postpartum pain and greater satisfaction, improving women's physical and emotional recovery (Shahoei et al., 2017). Active maternal participation in decision-making enhances the acceptance of these strategies and increases satisfaction (YetiŞmiŞ & Derya, 2023). Thus, adopting a woman-centered care model, as advocated by the ICM and WHO, is crucial to ensuring safe childbirth that respects the individual needs of women (World Health Organization, 2018). However, methodological heterogeneity among studies limits comparability and generalizability. Differences in outcome definitions (degree of tear vs. overall trauma, inclusion of OASI), clinical assessment methods (risk of underdiagnosis when rectal examination is not systematically performed), and intervention protocols (temperature and duration of compresses, massage procedures, and definitions of hands-on/hands-off techniques) contribute to inconsistent findings. Additional limitations include the heterogeneity of samples and healthcare services (e.g., differences in parity, episiotomy rates, analgesia use, instrument use, delivery position, and type of health professional), as well as design constraints such as small samples, single-center studies, and lack of blinding or control for confounding factors. These limitations increase the risk of bias and reduce the robustness of comparisons. As a scoping review, this study did not assess methodological quality or establish causal relationships, emphasizing the need for multicenter trials with standardized protocols. The exclusion of non-indexed literature may also have resulted in missed relevant studies. Nevertheless, the results highlight the importance of systematically implementing perineal protection techniques, supported by structured training, indicator monitoring, and regular audits, consistent with national and international recommendations.

Conclusion

This scoping review mapped evidence on the effectiveness of perineal massages, warm compresses, and manual approaches in reducing perineal tears during vaginal delivery. The results indicate that these techniques contribute to preventing severe tears and reducing the need for episiotomy, thereby promoting safer delivery and better maternal recovery. However, methodological heterogeneity and the lack of standardized clinical guidelines underscore the need for more rigorous research. Despite progress in implementing these techniques, variability in evaluation and execution criteria hinders comparability and the establishment of consistent recommendations. The limited number of long-term multicenter studies and the small sample sizes constrain the generalization of findings. Systematic adoption of these interventions can enhance obstetric care and foster a more positive childbirth experience. Continued investment in professional training and the development of evidence-based guidelines is recommended. Future studies should compare different approaches, include multicenter clinical trials, and assess long-term effects, thereby strengthening the knowledge base and contributing to the humanization of childbirth and improvement of maternal and neonatal outcomes.

Author contributions

Conceptualization: Costa, M. F.
Data curation: Costa, M. F., Tavares, M. F.
Formal analysis: Costa, M. F., Tavares, M. F.
Investigation: Costa, M. F., Correia, P. A., Furtado, M. B., Tavares, M. F.
Methodology: Costa, M. F., Tavares, M. F.
Project administration: Costa, M. F.
Resources: Costa, M. F.
Supervision: Costa, M. F., Tavares, M. F.
Validation: Costa, M. F., Correia, P. A., Furtado, M. B., Tavares, M. F.
Writing - Original draft: Costa, M. F., Furtado, M. B., Tavares, M. F.
Writing - Review& editing: Costa, M. F., Correia, P. A., Furtado, M. B., Tavares, M. F.

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