Review article/Pregledni znanstveni članek

The role of therapeutic massage in alleviating pain during the active phase of labour: An integrative review

Vloga terapevtske masaže pri lajšanju bolečine v aktivni fazi poroda: integrativni pregled literature

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ABSTRACT

Introduction: Labour pain can be managed using pharmacological and non-pharmacological methods. As non-pharmacological methods, such as massage, do not cause side effects, pregnant women are increasingly interested in giving birth without pharmacological interventions. The aim of this integrative literature review was to investigate the effectiveness of therapeutic massage on relieving labour pain during the active phase of labour.

Methods: An integrative literature review was conducted. The PubMed and ScienceDirect databases were searched in March 2023 using the following combination of Boolean operators and keywords: labour, labor, childbirth, pain, effects, massage, active, active stage, active phase. The results were critically evaluated using the MMAT tool.

Results: Eight randomised controlled studies were included in the review. Six studies identified a reduction in labour pain throughout the active phase of labour, and one study found a reduction in labour pain limited to specific phases of labour. Only one study found no effect of massage on labour pain.

Discussion and conclusion: Direct comparison of research results is limited by the diversity of massage techniques employed. Given the positive effects of massage on the course of labour, it would be beneficial to include it in clinical practice. Further research is needed to provide a more comprehensive assessment of the effects of massage on labour.

IZVLEČEK

Uvod: Porodna bolečina se obvladuje s farmakološkimi in nefarmakološkimi metodami. Nefarmakološke metode, kot je masaža, ne povzročajo stranskih učinkov, zato se je povečalo zanimanje porodnic za njihovo uporabo med porodom. Namen integrativnega pregleda literature je raziskati, ali je terapevtska masaža kot metoda lajšanja porodne bolečine v aktivni fazi poroda učinkovita.

Metode: Izveden je bil integrativni pregled literature. Raziskave smo marca 2023 iskali v bazah PubMed in ScienceDirect. Za iskanje smo uporabili kombinacijo Boolovih operatorjev in ključnih besed, in sicer *labour, labor, childbirth, pain, effects, massage, active, active stage, active phase*. Rezultate smo kritično ovrednotili z orodjem MMAT.

Rezultati: V pregled literature je vključenih osem randomiziranih kontroliranih raziskav. Šest raziskav ugotavlja zmanjšanje porodne bolečine v celotni aktivni fazi, ena pa zmanjšanje porodne bolečine le v enem delu aktivne faze. Le ena izmed raziskav ne ugotavlja vpliva masaže na porodno bolečino.

Diskusija in zaključek: Rezultate pregledanih raziskav je zaradi raznolikosti masažnih tehnik težko popolnoma primerjati. Glede na pozitivne učinke masaže na porodne izide bi bilo pomembno, da se jo vključuje v klinično prakso. V prihodnosti je treba izvesti več raziskav o vplivu masaže na porod.

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Introduction

Labour presents a profound psychological and physiological challenge for women, accompanied not only by joy and happiness, but also by fear, anxiety and pain. Labour pain is among the most severe forms of pain a person can experience in a lifetime. Each woman experiences labour pain differently and with varying intensity. The intensity of pain can be influenced by several factors, such as past experiences, cultural background, emotional state, stress management, and immune system functioning (Smith et al., 2018).

There are various methods of pain management, which can be divided into pharmacological and non-pharmacological approaches. Pharmacological methods include different forms of analgesia, such as inhalation analgesia, opioids, non-opioid medications, and epidural injections of anaesthetics or opioids. Non-pharmacological methods include hypnosis, aromatherapy, acupuncture, acupressure, reflexology, manual techniques, transcutaneous electrical nerve stimulation, massage, and other techniques (Jones et al., 2012).

Massage, which involves manual manipulation of soft tissues, is one of the oldest non-pharmacological methods for managing labour pain. During labour, massage reduces uterine cramps and promotes general relaxation (Karaduman & Akköz Çevik, 2020). It also calms the birthing woman, improves blood flow and tissue oxygenation, reduces anxiety, lowers cortisol, and increases serotonin and dopamine levels (Smith et al., 2018). Massage reduces pain on the basis of the gate control theory. During labour, the uterus contracts and sends pain signals through nerve fibres. However, massage activates other nerve fibres, which inhibit the transmission of these same pain signals. As a result, pain is relieved (Gönenç & Terzioğlu, 2020; Shahbazzadegan & Nikjou, 2022).

While pharmacological methods are effective in relieving labour pain, they can cause side effects in the parturient, such as prolongation of the second stage of labour, difficulty breathing, fever, vomiting, nausea, dizziness, and drowsiness. They may also cause side effects in the foetus. In contrast, non-pharmacological methods do not cause side effects (Hu et al., 2021). This has led to increasing interest among pregnant women in giving birth without pharmacological methods. Therefore, it is important to conduct a literature review to examine the effectiveness of massage as a non-pharmacological method for reducing labour pain.

Aims and objectives

The aim of this literature review was to investigate whether therapeutic massage is effective in relieving labour pain during the active phase of labour. Its objectives were to review the literature in this field and to determine the effectiveness of therapeutic massage for relieving labour pain in the active phase. The PICO (people, intervention, comparison, outcome) research question of the study was: Is therapeutic massage effective as a non-pharmacological method for relieving labour pain during the active phase of labour?

Methods

We conducted an integrative literature review – a research method that synthesises different perspectives to develop a more comprehensive understanding of a phenomenon. An integrative literature review is distinguished by its capacity to incorporate qualitative research, quantitative research, and theoretical literature (Kleiner et al., 2023).

Review methods

In our literature review, we followed the methodological framework of Lubbe et al. (2020). This methodological framework includes five steps: (1) research question, (2) literature search, (3) literature collection and critical appraisal, (4) literature analysis, and (5) presentation. We used the PubMed and ScienceDirect databases for our literature search. The databases were reviewed in March 2023. We used a combination of keywords that resulted in the following search string: ("labour" OR "labor" OR "childbirth") AND pain AND effects AND massage AND (active OR "active stage" OR "active phase"). The inclusion and exclusion criteria applied in the literature review are presented in Table 1.

Table 1: *Inclusion and exclusion criteria used in the literature search*

Inclusion criteria	***Exclusion criteria***
English-language literature	Non-English-language literature
Full text	Abstract only
Freely accessible	Not freely accessible
Published from 2012 onwards	Published before 2012
Relevant to the research question	Irrelevant title, abstract, or intervention
Randomised controlled trials	All other study types
Research conducted on humans	

Results of the review

Using the search string and a time filter, 31 records were retrieved from both databases. After removing duplicates, 28 records were identified. Titles and abstracts were screened for eligibility, and 11 records were excluded based on the inclusion and exclusion criteria. In the final step, the remaining 17 full texts were screened, at which point, nine additional records were excluded. Eight studies were therefore included in the detailed literature analysis. To ensure proper reporting, transparency, and reproducibility of the literature review, the search results are detailed using the PRISMA diagram (Figure 1) (Lubbe et al., 2020).

Quality assessment of sources and data processing description

Assessing the quality of sources is important as it enhances the credibility and rigour of the literature review (Kleiner et al., 2023). To evaluate the methodological quality of the sources, the Mixed

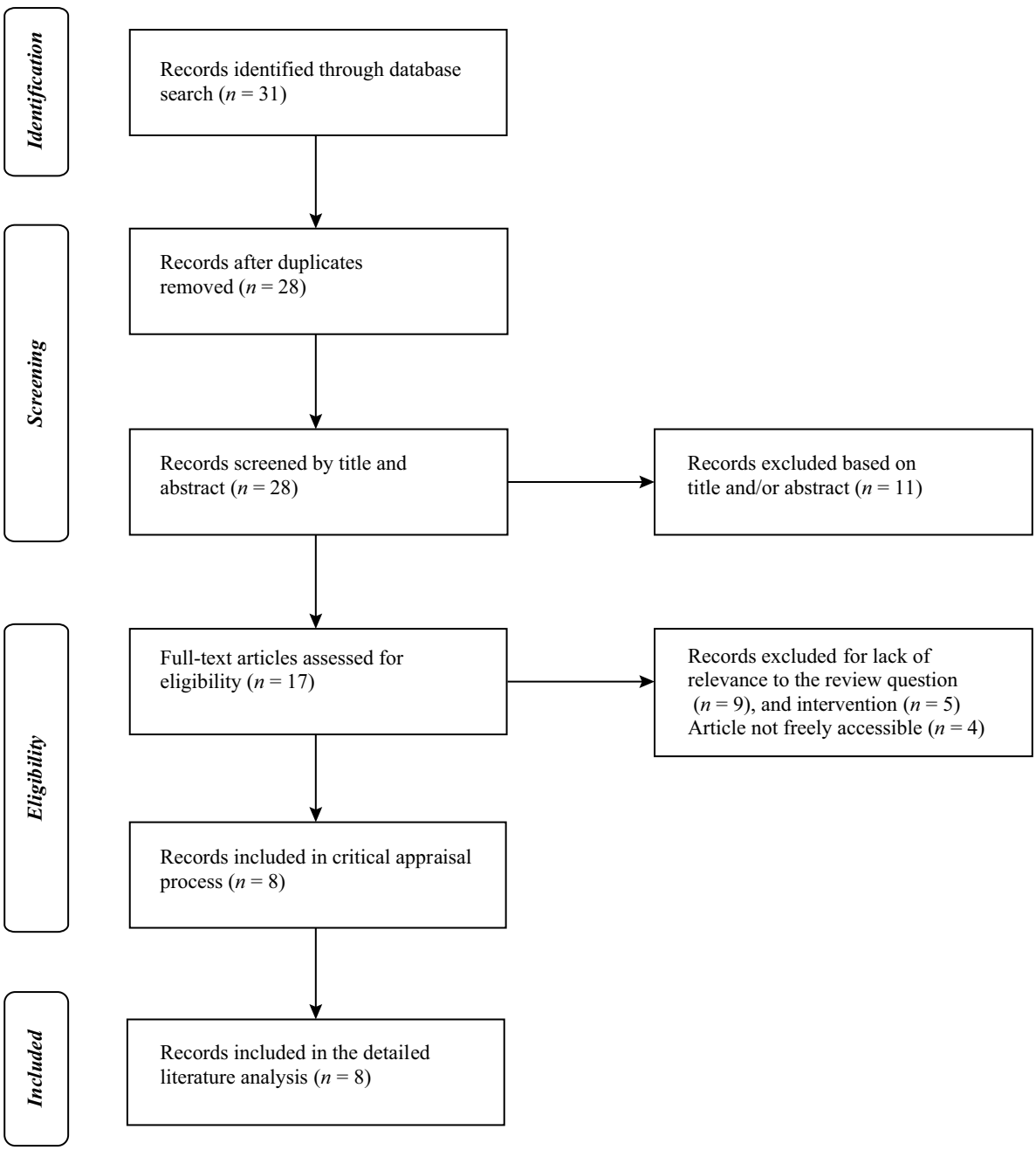

Figure 1: *PRISMA flow diagram (Lubbe et al., 2020)*

Methods Appraisal Tool (MMAT) was used, applying the five criteria listed under the randomised controlled trials category (Hong et al., 2018). The ratings are presented in Table 2. Data were processed by reading the included records in detail and systematically extracting and tabulating the main results and key data by author and year, study purpose, methods, sample, outcomes, and intervention, as shown in Table 2. The results of each study were synthesised, combined, and compared (Lubbe et al., 2020).

Results

We included eight randomised controlled trials in our literature review. The selected studies examined the effects of various types of massage on labour pain. The studies focused on Hoku point ice massage (Dehcheshmeh & Rafiei, 2015), massage (Mortazavi et al., 2012), Court-Type Thai traditional massage (Sananpanichkul et al., 2019), body massage (Gönenc & Terzioğlu, 2020), back massage (Pawale & Salunkhe, 2020), Swedish massage (Eskandari et al., 2022; Maghalian et al., 2022) and Lina Kimber massage protocols (Shahbazzadegan & Nikjou, 2022). Only one study included multiparous women (Sananpanichkul et al., 2019). The studies included pregnant women at a minimum of 37 weeks' gestation (Eskandari et al., 2022; Mortazavi et al., 2012; Sananpanichkul et al., 2019) and at a maximum of 42 weeks' gestation (Dehcheshmeh & Rafiei, 2015; Gönenç & Terzioğlu, 2020; Mortazavi et al., 2012). Other common inclusion criteria were normal pregnancy without medical complications, single-foetus pregnancy, normal foetal development, and initial cervical dilation. However, most studies excluded pregnant women with skin disease or lesions in the treatment area; chronic heart, kidney, or respiratory disease; mental health problems; sensitivity or allergy to the oil used; diabetes; hypertension; high-risk pregnancies; and multiple pregnancies. Dehcheshmeh & Rafiei (2015), Gönenc & Terzioğlu (2020), Maghalian et al. (2022) and Mortazavi et al. (2012) reported excluding participants who gave birth by caesarean section from the analysis. Other studies either included participants who underwent caesarean delivery in the analysis or did not report this information. Two studies excluded participants who required analgesia or other methods of pain relief and labour acceleration (Dehcheshmeh & Rafiei, 2015; Maghalian et al., 2022). Two studies also excluded participants who used pharmacological pain relief methods but allowed the use of oxytocin (Eskandari et al., 2022; Gönenç & Terzioğlu, 2020). Mortazavi et al. (2012) allowed the

Table 2: *Key information on the articles included*

Authors, year, country	*Research design*	*Sample*	*Aim*	*Quality evaluation*
Dehcheshmeh & Rafei, 2015, Iran	Randomised controlled trial	90 women, aged 17–30	To compare the effects of two non-pharmacological methods: music therapy and Hoku point ice massage on labour pain.	***
Eskandari et al., 2022, Iran	Randomised controlled trial	154 women, aged 18–35	To investigate the effects of Swedish massage with and without chamomile oil on labour outcomes.	***
Gönenç & Terzioğlu, 2020, Turkey	Randomised controlled trial	120 women, mean age 23.4	To compare the effects of massage and acupressure on labour pain, labour time, and labour satisfaction.	****
Maghalian et al., 2022, Iran	Randomised controlled trial	90 women, mean age 23.3	To compare the effects of Swedish massage and interferential electrical stimulation on labour pain, labour experience, labour satisfaction, duration of active phase, and side effects.	****
Mortazavi et al., 2012, Iran	Randomised controlled trial	120 women, aged 16–36	To investigate the effects of massage and the birth attendant on pain, anxiety, and labour satisfaction to clarify some aspects of alternative complementary strategy usage.	***
Pawale & Salunkhe, 2020, India	Randomised controlled trial	40 women, aged 18–29	To investigate the effect of back massage on labour pain in the first stage of labour in primiparous women.	****
Sananpanichkul et al., 2019, Thailand	Randomised controlled trial	59 women, most aged 20–34	To investigate the effect of Court-Type Thai traditional massage on the first and second stages of labour and pain in the first stage.	****
Shahbazzadegan & Nikjou, 2022, Iran	Randomised controlled trial	60 women, mean age 23.19±4.86 years in the control group and 24.63±4.08 years in the massage group	To investigate the appropriate cervical dilatation for massage to reduce labour pain and anxiety.	***

*Legend: * – criterion met (one * represents one criterion met; the maximum number of * is five)*

Table 3: *Intervention and results of selected studies*

Authors, year, country	*Intervention (massage-related)*	*Pain measurement tool*	*Findings (effect of massage on pain)*
Dehcheshmeh & Rafei, 2015, Iran	Ice massage at the Hoku point (20 min at cervical dilation of 4, 6 and 8 cm).	VAS	Massage reduces labour pain in the active phase.
Eskandari et al., 2022, Iran	Swedish massage in the active phase (performed every 20 min; each session lasted 10 min).	VAS	Massage reduces labour pain in the active phase. Massage with oil has a significantly greater positive effect on pain reduction than massage without oil.
Gönenç & Terzioğlu, 2020, Turkey	Body massage (30 min at cervical dilation of 3–4, 6–7 and 8–9 cm).	VAS	Massage reduces labour pain in the latent, active and transition phases.
Maghalian et al., 2022, Iran	Swedish massage on T10–L1 and S2–S4 (30–45 min at cervical dilation of 4 and 8–10 cm).	VAS	Massage reduces labour pain in the active phase of labour.
Mortazavi et al., 2012, Iran	Massage (30 min at cervical dilation of 3–4, 5–7 and 8–10 cm).	Self-reported present pain scale	Massage reduces labour pain in the latent, active and deceleration phases.
Pawale & Salunkhe, 2020, India	Back massage (13 massages in the latent phase and 7 massages in the active phase, each lasting 10 min).	VAS	Massage reduces labour pain.
Sananpanichkul et al., 2019, Thailand	Court-Type Thai traditional massage (1 hour in the active phase of labour)	VAS	Massage has no effect on reducing labour pain in the active phase of labour.
Shahbazzadegan & Nikjou, 2022, Iran	Massage according to the Linda Kimber protocol on the T10–S4 area (20 min at cervical dilation of 5, 7 and 9 cm).	Pain ruler	Massage reduces labour pain only at 7 cm of cervical dilatation.

Legend: VAS – visual analogue scale

use of oxytocin, but did not provide information on the use of analgesia. One study allowed the administration of a single dose of pethidine if pain was rated at eight or above on the Visual Analogue Scale (VAS), as well as the administration of oxytocin (Sananpanichkul et al., 2019). Two of the eight studies did not provide data on whether participants who used other methods to relieve labour pain or to augment labour were excluded (Pawale & Salunkhe, 2020; Shahbazzadegan & Nikjou, 2022).

In the study by Mortazavi et al. (2012), participants were divided into two experimental groups and a control group. All groups received conventional treatment during labour. Additionally, the first group received massage, including shoulder massage, back massage, abdominal effleurage, and sacral pressure. The parturients were allowed to choose the massage technique. The authors did not specify whether the massage was administered by a trained professional. In the second experimental group, the intervention consisted of the presence of a caregiver during labour. The findings indicated that, compared to the control group, massage reduced pain in all phases of labour and in the active (cervical dilation of 5–7 cm) and deceleration (cervical dilation of 8–10 cm) phases compared to the second experimental group. The results were statistically significant.

In the study by Dehcheshmeh & Rafiei (2015), participants were divided into two experimental groups and a control group. The first experimental group received music therapy for 30 minutes. The second experimental group received ice massage at the Hoku point. The massage was administered by a researcher with prior experience in this type of massage. After locating the Hoku points on both hands, the massage was performed in a position suitable for the parturient, using ice wrapped in a towel. The intensity of the massage was chosen by the parturient. The control group received conventional treatment during labour. Results showed a statistically significant reduction in labour pain in both experimental groups compared to the control group.

In the study by Sananpanichkul et al. (2019), participants were divided into an experimental and a control group. The experimental group received conventional treatment and Court-Type Thai traditional massage. Massage was administered by a licensed Thai traditional massage practitioner and performed with soft, gentle pressure along specific lines and points on the body, including the leg, back, shoulder, and arm lines. At each point, pressure was held and, after 10–15 seconds, shifted to the next point. The intensity of the massage was adjusted according to muscle resistance. The control group received conventional intrapartum care according to the institutional clinical practice guidelines; however, the authors did not specify which guidelines were followed. The researchers found that pain was not

statistically significantly reduced in the experimental group compared to the control group.

In the study by Gönenç & Terzioğlu (2020), participants were divided into three experimental groups and one control group. The first experimental group received massage of the head, neck, shoulders, arms, back, hands, legs, and feet. The authors did not specify whether the massage was administered by a trained professional. The second experimental group received acupressure using acupressure bands. The third experimental group received both interventions simultaneously, and the control group received conventional treatment during labour. The results showed that the first experimental group experienced a statistically significant reduction in pain compared to the control group in the latent, active, and transition phases. The second experimental group experienced a statistically significant reduction in pain compared to the control group in the active and transition phases.

In the study by Pawale & Salunkhe (2020), the experimental group received back massage using jasmine oil and grape seed oil. The back massage included effleurage and petrissage during the absence of contractions, and obstetrical back rub during contractions. Obstetrical back rub is a massage applied to the area of the back selected by the woman giving birth, using circular movements without lifting the hands from the skin. The researchers did not specify who administered the massage. The control group received only conventional treatment during labour. It was reported that massage had a statistically significant effect on reducing labour pain.

In the study by Eskandari et al. (2022), the first experimental group received Swedish massage with oil, while the second experimental group received Swedish massage without oil. In both groups, the massage was performed by a trained massage therapist. At cervical dilation of 5–8 cm, spinal effleurage and superficial back massage were performed. At cervical dilation of 8–10 cm, petrissage was applied to the lumbar area, back, both sides of the spine, and shoulders, using vibration and pressure on the sacrum. The control group received conventional treatment during labour. The study found that massage statistically significantly reduced pain in the active phase and second stage of labour compared with the control group. The results also showed that massage using chamomile oil had a greater positive effect on labour pain than massage without oil.

In the study by Maghalian et al. (2022), the first experimental group received interferential electrical stimulation during labour. The second experimental group received Swedish massage, including effleurage and petrissage using olive oil. Massage was administered by a researcher with prior massage training. The control group received routine treatment during labour. The results showed that pain was statistically significantly reduced in both experimental groups compared with the control group.

In the study by Shahbazzadegan & Nikjou (2022), the experimental group received massage according to Lind Kimber's protocol. The massage was applied to the T10–S4 area for 20 minutes at a time. The massage was performed without oil, in the position chosen by the mother. It is unclear from the description of the intervention whether the massage was performed by a trained professional. The control group received routine labour management. The results showed that pain was statistically significantly reduced in the experimental group compared to the control group only at cervical dilation of 7 cm.

Discussion

Our integrative literature review included eight randomised controlled trials that primarily examined the effects of massage on labour pain during the active phase of labour. The active phase of labour is defined as starting from cervical dilation of 5 cm (Eskandari et al., 2022). Six of the eight studies concluded that massage is effective for pain relief during the active phase of labour (Dehcheshmeh & Rafei, 2015; Eskandari et al., 2022; Gönenc & Terzioğlu, 2020; Maghalian et al., 2022; Mortazavi et al., 2012; Pawale & Salunkhe, 2020). Shahbazzadegan & Nikjou (2022) concluded that massage reduces pain only at cervical dilation of 7 cm, but not throughout the entire active phase of labour, as reported in other randomised controlled trials. The authors suggest this is due to the characteristics of labour pain, noting no pain reduction at cervical dilation of 5 cm, as this is the early part of labour when pain is milder. They also report no pain reduction at cervical dilation of 9 cm, as this is when pain is more intense during the gradual descent of the foetus. Only the study by Sananpanichkul et al. (2019) found no positive effects of massage on pain. This study was also the only one in which massage was performed as a single, full-hour session, whereas in other studies massage was performed for shorter durations and at multiple intervals. Based on the results of our integrative literature review, we can confirm that massage is effective for pain relief during the active phase of labour. Similar conclusions were reached in a systematic review by Choudhary et al. (2021), which examined the effects of back massage on labour pain. Following a database search that yielded ten articles for inclusion in their literature review, the authors concluded that a reduction in labour pain was reported in nine of the ten articles. A review by Smith et al. (2018) also found significant pain reduction as a result of applying massage during the first stage of labour. However, they note that the evidence was of low quality. On the other hand, the studies included in this review examined different types of massage, making it difficult to directly compare their effects on labour pain, as protocols differed even in factors such as duration and applied pressure. The massage techniques may also have differed in terms of whether the person being

massaged was clothed during the massage (Field, 2016). It is therefore more difficult to confirm with certainty that all types of massage therapy reduce labour pain, or to determine which massage technique is best for reducing labour pain. Nevertheless, the systematic review and meta-analysis by Ranjbaran et al. (2017) compared ten studies that examined the effects of different types of massage, such as effleurage, stroking, superficial stroking, vibration, and ice massage on the Hoku point. They reached a similar conclusion, as their results showed that massage reduces labour pain overall and in the latent, active, and transition phases of labour. One of the selected studies also found that the massage oil used during the massage can have an impact on labour pain (Eskandari et al., 2022). A similar randomised controlled trial examining the difference in labour pain between massage using ginger oil, massage without ginger oil, and a control group also found that massage using ginger oil demonstrated greater positive effects (Azizi et al., 2019). This is due to the calming, relaxing, and analgesic effects of plant oils, which are absorbed through the skin during massage and can relieve pain (Rafii et al., 2020). In particular, massage of the lower back using jasmine, sage, rose, or lavender oil has been found to reduce labour pain (Pawale & Salunkhe, 2020).

This literature review has several limitations, including the above-mentioned difficulty in comparing different types of massage therapy, and the fact that the studies included were mostly conducted in the same country. Additionally, only one study examined the effects of massage on labour pain in multiparous women.

Conclusion

Our integrative literature review demonstrates that massage is effective in relieving labour pain during the active phase of labour. We recommend incorporating massage into clinical practice during labour, at least as a supportive therapy, as it is a non-invasive, affordable, and easily adaptable technique. Further research through randomised controlled studies should be conducted on a more heterogeneous sample of multiparous women and women from different cultural and social backgrounds, as this would facilitate the generalisation of research findings to the wider population. Additionally, it would be beneficial to conduct more literature reviews comparing different massage techniques.

Conflict of interest

The authors confirm that there are no known conflicts of interest associated with this publication.

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Ethical approval

Due to the chosen typology of the article, the research did not require special permission by the Ethics Committee.

Author contributions

Both authors contributed to the conception and design of the paper. The first author conducted the search, analysis, and interpretation of data, drafted and critically reviewed the manuscript, and approved its final version. The second author provided content guidance, critically reviewed the work, and approved the final version.

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