MINH
MALAHAYATI INTERNATIONAL JOURNAL OF NURSING AND HEALTH SCIENCE
ISSN 2620-9152 (Print)
ISSN 2621-4083 (Online)
DOI: 10.33024
Nomor: 79/E/KPT/2023

ARTICLE INFORMATION
Received: June, 08, 2024
Revised: September, 28, 2024
Available online: September, 29, 2024
at : https://ejurnal.malahayati.ac.id/index.php/minh

Effectiveness of massage therapy intervention for labour pain management during normal delivery: A literature review

Keny Nurchaeni Cahyaningtyas, Sulastri*

Program Studi Ilmu Keperawatan, Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Surakarta
Corresponding author. E-mail: sulastri@ums.ac.id

Abstract

Background: Labor and delivery pain is a common experience experienced by women around the world. Women who give birth normally experience significant levels of pain during labor. Efforts to increase knowledge and use of non-pharmacological interventions to manage labor pain, such as massage therapy, still need to be encouraged in pregnant women, various techniques such as deep back massage, effleurage massage, and foot massage have shown promising results in reducing pain experienced during labor.
Purpose: To know and analyze effectiveness of massage therapy intervention for labour pain management during normal delivery
Method: Literature study using search engine databases, namely ProQuest, Sciencedirect, Pubmed, and Scopus, with article publications ranging from 2018-2024. The literature search strategy involves keywords related to the topic and title of the study: "Massage" OR "foot Massage" OR "reflexiology" AND "Fatigue" AND "Hemodialysis" OR "Chronic Kidney Disease" AND "Randomised Control" OR "Clinical Trial".
Results: Obtained 10 articles that show the effect of massage therapy in reducing pain in patients who are undergoing labor and delivery.
Conclusion: Massage therapy carried out within a certain time span can effectively reduce pain levels in patients who are undergoing labor and delivery

Keywords: Labor and Delivery; Massage Therapy; Normal Delivery; Pain.

INTRODUCTION

Labor and delivery pain is a common experience experienced by women around the world. Various epidemiological studies show that almost all women who give birth normally (*vaginal delivery*) feel pain of varying intensity (Umar, 2021). Based on WHO data, it is estimated that around 130 million babies are born worldwide every year. Almost all mothers who give birth normally experience significant levels of pain during labor (Nanji & Carvalho, 2020). The intensity of labor and delivery pain can be affected by various factors, such as age, parity, culture, psychology, and the use of pain management techniques (Mathur, Morris, & McNamara, 2020). But in general, labor and delivery pain is considered one of the most intense pain experiences that women experience. Several studies reported that the average labor and delivery pain score on a scale of 0-10 was in the range of 7-9, indicating very severe pain (Hu, Li, Zhu, Wang, & Li, 2024; Palet-Rodríguez & Torrubia-Pérez, 2023).

In Indonesia, labor and delivery pain is also a common health problem experienced by mothers giving birth (Solehati, 2018). However, comprehensive epidemiological data is still limited. Several studies in Indonesia show that most mothers give birth with moderate to severe pain during the labor and delivery process (Rahayu & Kurniawati, 2020; Tanjung & Antoni, 2019). Research conducted

DOI: https://doi.org/10.33024/minh.v7i7.429

by Khasanah & Sulistyawati, (2020) reported that the average labor and delivery pain score was 7.2 on a scale of 0-10. Factors that can affect labor and delivery pain in Indonesia include age, parity, culture, and limited access and use of pain management techniques (Tanjung & Antoni, 2019). Efforts to increase knowledge and use of non-pharmacological interventions to manage labor and delivery pain, such as massage therapy, still need to be encouraged in Indonesia.

Massage therapy has been studied as an effective method to reduce labor and delivery pain (Beyable, Bayable, & Ashebir, 2022; Gönenç & Terzioğlu, 2020). Various techniques such as deep back massage, effleurage massage, and foot massage have shown promising results in reducing pain experienced during labor and delivery (Nanji & Carvalho, 2020). Previous studies have highlighted the positive impact of massage in reducing pain intensity. Massage therapy not only helps in managing pain but also contributes to reducing anxiety levels in labor and delivery (Nori, Kassim, Helmi, Pantazi, Brezeanu, Brezeanu, Penciu, & Serbanescu, 2023). The effectiveness of massage in reducing labor and delivery pain has been demonstrated through significant reductions in pain scores before and after massage sessions. In addition, massage therapy has been associated with shorter labor and delivery stage duration, decreased negative behavioral responses, and increased satisfaction among women who received massage during labor and delivery (Akköz Çevik & Karaduman, 2020).

The mechanism of action of massage therapy in lowering labor and delivery pain is thought to be related to increased blood flow, muscle relaxation, and increased release of natural endorphins that function as natural analgesics (Türkmen & Oran, 2021). In addition, the gentle touch and attention provided through massage can also help reduce maternal anxiety related to the delivery process, which can ultimately reduce the perception of pain (Beyable et al., 2022; Gönenç & Terzioğlu, 2020; Riazanova, Alexandrovich, & Ioscovich, 2018). Nonetheless, some studies have also shown that the effectiveness of massage therapy may vary depending on the massage technique used, the length of massage administration, as well as the individual characteristics of the mother giving birth (Altinayak & Özkan, 2024; Maghalian, Mirghafourvand, Ghaderi, Abbasalizadeh, Pak, & Kamalifard, 2022; Shahbazzadegan & Nikjou, 2022).

The results of observation of patients undergoing childbirth at Indriati Sukoharjo Hospital found that there was a condition of patients who had a high level of pain while undergoing childbirth, this was due to the lack of knowledge about independent interventions that can be carried out by patients and their families to reduce the fatigue condition, ease of implementation and the absence of excessive costs can make non-pharmacological therapy in the form of therapy massage can be one of the alternatives in reducing pain in patients undergoing childbirth at Indriati Sukoharjo Hospital.

RESEARCH METHOD

This study is a literature review of a number of key findings from the study that discuss the effectiveness of massage therapy in reducing pain during childbirth. When evaluating and selecting research publications, the authors followed the standard approach *of Preferred Reporting Items for Systematic Review and Meta-Analysis* (PRISMA). To determine the eligibility requirements for the journal being reviewed, the researcher used the PICO(S) standard. Journals that must be reviewed meet the journal requirements in table 1.

The source of the article that will be used in this Literature Study uses *search engine databases* , namely *ProQuest, Sciencedirect, Pubmed*, and *Scopus*, with article publications ranging from 2018-2024. The literature search strategy involves keywords related to the topic and the title of the research using the standard Boolean Operators "AND" and "OR". Keywords include: "*Massage*" OR "*foot Massage*" OR "*reflexiology*" AND "*Pain*" OR "*Labor and delivery Pain*" OR "*Intranatal Pain*" AND "*Randomised Control*" OR "*Clinical Trial*". The criteria for the selected article are English articles published in international reputable journals, available in *open access*, and the article is an intervention research that discusses the topic of foot massage in hemodialysis patients.

A four-stage PRISMA diagram is used for the article selection procedure (Figure 1). The author counts the number of articles from all database searches during the identification stage. In the second stage, screening, the author selects articles

Keny Nurchaeni Cahyaningtyas, Sulastri*

Program Studi Ilmu Keperawatan, Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Surakarta
Corresponding author. E-mail: sulastri@ums.ac.id

DOI: https://doi.org/10.33024/minh.v7i7.429

based on their title and abstract. Articles are included if they meet the requirements, and excluded if they are not. Authors select articles for eligibility in the third stage using full-text articles. Articles are included if they meet the requirements, and excluded if they are not. In addition, the methodological quality of publications that have undergone a full text review and meet the inclusion requirements are evaluated. In the fourth stage, articles relevant to the topic and title of the research are reviewed systematically.

Table 1. PICO Question.

	Criteria
Problem	Labor and delivery Pain
Intervention	Massage Therapy
Control	There is a control group for the therapy given
Outcome	Knowing Massage Therapy in Reducing Labor and delivery Pain
Study Design	Experiment Study, *Randomized Control Trial (*RCT), Quasy Experiment,

Keny Nurchaeni Cahyaningtyas, Sulastri*

Program Studi Ilmu Keperawatan, Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Surakarta
Corresponding author. E-mail: sulastri@ums.ac.id

DOI: https://doi.org/10.33024/minh.v7i7.429

RESEARCH RESULTS

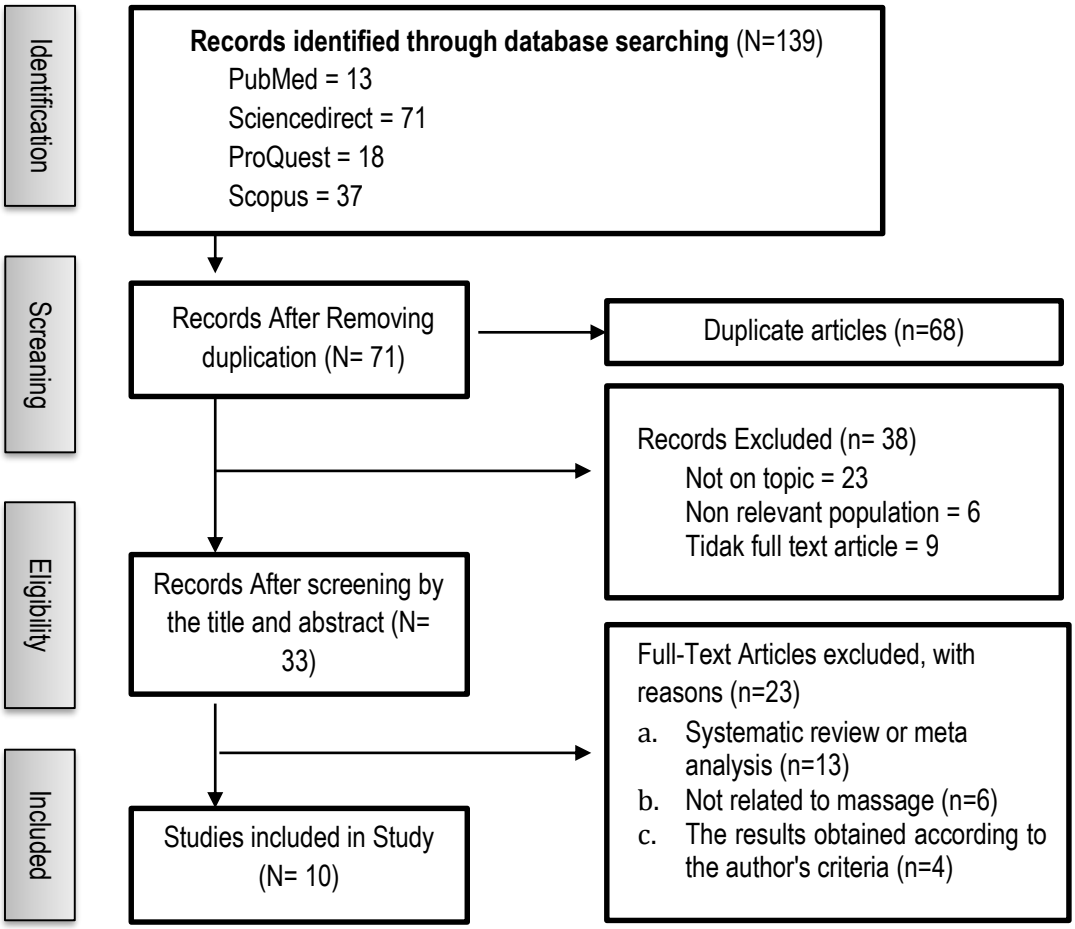

Figure: PRISMA Flow Diagram

It was found that 139 journals used journal search results based on predetermined keywords. After screening, 68 journals were duplicated. The PRISMA approach was then used to conduct a feasibility evaluation, with the result that 10 journals were suitable for further analysis, author's name, year of publication, research country, research design, and research findings obtained from the articles found.

Keny Nurchaeni Cahyaningtyas, Sulastri*

Program Studi Ilmu Keperawatan, Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Surakarta
Corresponding author. E-mail: sulastri@ums.ac.id

DOI: https://doi.org/10.33024/minh.v7i7.429

Table 2. Summary of The Articles'Review

(Author, Year) (Country)	Purpose	Method	Results
(Mammadov & Taş, 2024) (Cyprus)	To determine the effect of acupressure and massage used for the management of labor pain in the latent, active, and transition phases of the first stage of labor on labor pain and birth satisfaction.	• *Randomized Control Trial, 66 pregnant women who were about to give birth* • Effleurage massage and acupressure • Applied at LI4 points starting from the sacrum to the shoulders, neck area, and scalp • A total of 30 minutes with a duration of 10 minutes each in the latent phase (cervical dilation of 3-4 cm), once in the active phase (cervical dilation of 5-7 cm), and once in the transition phase (cervical dilation of 8-10 cm)	Massage apps are more effective than acupressure apps in reducing labor and delivery pain and improving birth satisfaction
(Ali, & Ahmed, 2018). (Iraq)	The focus of this study was to identify the impact of either change in position or back massage on pain perception during first stage of labor	• Quasi Experimental *Study*, 80 pregnant women who were in the delivery phase • Back massage • Performed during the first stage of labor and delivery at 4, 7, and 10 cm of cervical dilation or 20 minutes during contractions	Back massage may be a more effective pain management approach than a change in position during the first stage of labor and delivery
(Türkmen & Oran, 2021) (Turkey)	To determine the effects of sacral massage and heat application on the perceptions of labor pain and comfort level in pregnant women.	*Quasirandomized controlled experimental study*, 90 samples divided into 3 different intervention groups Effleurage and warm compress Applied to the right and left lateral portions 4-5 cm from the midline in the sacral vertebral region (S1-S4)	The application of heat and massage can be used as a safe and effective obstetric intervention to reduce the perception of pain in pregnant women and provide comfort during labor and delivery

Keny Nurchaeni Cahyaningtyas, Sulastri*

Program Studi Ilmu Keperawatan, Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Surakarta
Corresponding author. E-mail: sulastri@ums.ac.id

DOI: https://doi.org/10.33024/minh.v7i7.429

(Author, Year) (Country)	Purpose	Method	Results
		Warm compresses are applied for 20 minutes and effleurage massage is carried out for 10 minutes (for 4-5 cm, 6-7 cm and 8-9 cm cervical dilation)	
(Khairudin et al., 2024) (Malaysia)	To evaluate mechanical massage using an electric massage chair on labor pain in nulliparous women.	*Randomized counterbalanced crossover trial*, as many as 208 samples of women who will give birth Mechanical massage Back to pelvis Applied for 30 minutes	Mechanical massage using an electric massage chair significantly reduces labor and delivery pain, offering potential nonpharmacological pain management options during labor and delivery
(Kaçar & Keser, 2021) (Turkey)	To compare the effects of mechanical and warm mechanical massage application in reducing labor pain and enhancing childbirth satisfaction in primipara women	*Randomized Control Trial*, 210 pregnant women who are about to give birth Warm mechanical massage Back to pelvis Applied for 20 minutes	Mechanical massage in the lumbosacral can be used as a reliable and effective method to reduce pain and increase labor and delivery satisfaction

Keny Nurchaeni Cahyaningtyas, Sulastri*

Program Studi Ilmu Keperawatan, Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Surakarta
Corresponding author. E-mail: sulastri@ums.ac.id

DOI: https://doi.org/10.33024/minh.v7i7.429

(Author, Year) (Country)	Purpose	Method	Results
(Akköz Çevik & Karaduman, 2020) (Turkey)	To determine the effect of sacral massage on labor pain and anxiety.	*Randomized Control Trial*, 60 pregnant women who were about to give birth who were divided into control and intervention groups Massage on sacral vertebrae Applied for 30 minutes	The sacred massage applied during labor and delivery reduces women's labor and delivery pain, lowers the level of worry and anxiety, causes a greater feeling of satisfaction among pregnant women in the event of childbirth, positively affects the perception of childbirth and has no fetal side effects.
(Maghalian et al., 2022) (Iran)	To compare the effect of interferential electrical stimulation (IES) and Swedish massage (SM) on labor pain and childbirth experience (primary outcomes) and childbirth satisfaction, duration of active phase and side effects (secondary outcomes) in primiparous women.	*Randomized Control Trial*, 90 pregnant women who were about to give birth who were divided into control and intervention groups Sweedish Massage And Electrical Stimulation Interference At points T10-L1 and S2-S4 at cervical dilatation of 4 and 8-10 cm The stimulation group received electrical stimulation in a similar manner to the sweedish omassation group, with a baseline frequency of 4000 Hz and a pulse frequency of 80-120 Hz by the physiotherapist. The control group received only routine care	Sweedish Massage and Interference Electrical Stimulation is a safe method that can significantly reduce pain and duration of the active phase and increase Childbirth experience and satisfaction

Keny Nurchaeni Cahyaningtyas, Sulastri*

Program Studi Ilmu Keperawatan, Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Surakarta
Corresponding author. E-mail: sulastri@ums.ac.id

DOI: https://doi.org/10.33024/minh.v7i7.429

(Author, Year) (Country)	Purpose	Method	Results
(Shahbazzadegan & Nikjou, 2022) (Iran)	To determine the cervical dilatation appropriate for performing massage in order to reduce the labor pain and anxiety.	*Randomized Control Trial*, 60 pregnant women who were about to give birth who were divided into control and intervention groups Back and sacral massage Back massage at T10 and S4 points Triple massage in 5-7-9 cm dilation for 20 minutes	Proper cervical dilation for massage to reduce labor and delivery pain is observed at 7 cm. Also, massage has a significant effect on reducing anxiety. Therefore, massage is recommended as a routine treatment in 7 cm cervical dilatation
(Karatopuk & Yarıcı, 2023) (Turkey)	To reveal the effect of lavender essence inhalation and the massage therapy applied with lavender oil on the severity of labor pain of primiparous women.	• *Randomized Control Trial*, 121 participants divided into 2 groups • Circular massage and sacral compression with lavender oil • Lower Back (Lumbar) Region • Applied for 15 minutes in participants using 2 drops of lavender oil in each phase of labor and delivery	Inhalation therapy and massage applied using lavender essential oil contribute to the reduction of perceived labor and delivery pain. For this reason, massage therapy and inhalation applications using lavender oil are recommended to be applied by midwives as complementary methods to adapt to labor and delivery pain during labor and delivery
(Altinayak & Özkan, 2024) (Turkey)	To determine the effect of cold and warm acupressure applied to the LI4 acupressure point on childbirth comfort in primiparous women during labor.	• *Randomized Control Trial*, 129 participants divided into 2 groups • Cold and warm massage • At the LI4 acupressure point • Applying for 10 minutes in the active phase and transition of labor and delivery. The application is suspended for 1 hour, and then repeated 3 more times.	Warm and cold acupressure was found to reduce labor and delivery pain. Warm acupressure, in particular, has a more positive effect on the comfort of childbirth. Thus, warm and cold acupressure may be recommended to relieve labor and delivery pain and improve the comfort of childbirth

Keny Nurchaeni Cahyaningtyas, Sulastri*

Program Studi Ilmu Keperawatan, Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Surakarta
Corresponding author. E-mail: sulastri@ums.ac.id

DOI: https://doi.org/10.33024/minh.v7i7.429

DISCUSSION

The results of the analysis of 10 journals showed that various types of massage techniques were given in reducing labor and delivery pain, including back massage, effleurage massage, warm massage and cold massage, and acupressure massage. In general, the results of these studies show that the administration of massage therapy with a duration of 15-30 minutes can have a positive impact on reducing pain during the labor and delivery process. The effectiveness is also determined by the point at which massage therapy is performed, the results show that the massage point that can reduce pain in the labor and delivery process is in the back and sacrum or lower waist (Akköz Çevik & Karaduman, 2020; Kaçar & Keser, 2021; Karatopuk & Yarıcı, 2023; Khairudin, Vallikkannu, Gan, Hamdan, & Tan, 2024). The study conducted previously specifically explained that they performed massage at a specific acupressure point i.e. LI4 (Altinayak & Özkan, 2024; Mammadov & Taş, 2024) this was also done in the study of who provide massage at points T10-L1 and S2-S4 points T10 and S4 around the back and waist (Maghalian, Mirghafourvand, Ghaderi, Abbasalizadeh, Pak, & Kamalifard, 2022; Shahbazzadegan & Nikjou, 2022; Türkmen & Oran, 2021).

The process of performing the massage is also highly dependent on the ongoing labor and delivery phase, as carried out by Mammadov & Taş, (2024) in their study they performed massage therapy in the latent phase (cervical dilation 3-4 cm) for 10 minutes then in the active phase (cervical dilation 5-7 cm) for 10 minutes, and in the transition phase (cervical dilation 8-10 cm) for 10 minutes. This is also supported by Shahbazzadegan & Nikjou, (2022); Türkmen & Oran, 2021) who also perform massage in the form of effleurage massage techniques which are carried out for 10 minutes during the phase of 4-5 cm, 6-7 cm and 8-9 cm cervical dilation of childbirth. One of the benefits of doing this massage is that it can provide a sense of comfort, calmness, and distraction that appears through a series of psychological effects so that it can help mothers relax more and reduce anxiety during childbirth (Gönenç & Terzioğlu, 2020; Nori et al., 2023).

Massage can stimulate large-diameter nerve fibers (A-beta) which function to transmit sensations of touch and pressure. Activation of these nerve fibers can suppress the transmission of pain impulses through the pain control gate mechanism in the spinal cord (Mascarenhas, Lima, Negreiros, Santos, Moura, Gouveia, & Jorge, 2019). Massage can also help relax tense muscles during labor contractions by increasing blood flow which can help remove lactic acid and deliver oxygen and nutrients to the tissues so that the muscle relaxation process can reduce tension and pain felt by the mother (Tanvisut, Traisrisilp, & Tongsong, 2018; Uludağ & Mete, 2021).

Massage can stimulate the release of endorphins, which are natural pain-relieving hormones. In addition, endorphins can reduce the perception of pain felt by mothers during labor (Tanjung & Antoni, 2019).Massage therapy, specifically techniques such as Effleurage, play an important role in reducing labor and delivery pain through various mechanisms. Effleurage massage involves light circular movements of the body, which can help distract and reduce anxiety (Maghalian et al., 2022). Studies have shown that massaging certain cervical dilations, such as 7 cm, effectively reduces pain intensity and anxiety levels in women giving birth (Mammadov & Taş, 2024). The Effleurage technique, when applied during the first stage of labor and delivery, activates the autonomic nerves and inhibits pain stimulation, leading to a reduction in labor and delivery pain (Türkmen & Oran, 2021). In addition, this effleurage massage has also been positively beneficial for reducing pain and accelerating contractions during labor and delivery, emphasizing the positive impact of massage therapy on pain management in women giving birth (Akköz Çevik & Karaduman, 2020; Solehati, 2018). Overall, massage therapy, especially Effleurage, is recommended as a non-pharmacological approach to reduce labor and delivery pain and improve the delivery experience for women.

CONCLUSION

The results of this literature study show that massage therapy applied to the area around the hip and sacral area has been shown to reduce pain in patients undergoing the labor and delivery process. In addition, massage therapy that uses effleurage massage techniques is one of the methods that has an important role in reducing the intensity of pain in patients undergoing the delivery process.

Keny Nurchaeni Cahyaningtyas, Sulastri*

Program Studi Ilmu Keperawatan, Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Surakarta
Corresponding author. E-mail: sulastri@ums.ac.id

DOI: https://doi.org/10.33024/minh.v7i7.429

REFERENCES

Akköz Çevik, S., & Karaduman, S. (2020). The effect of sacral massage on labor pain and anxiety: A randomized controlled trial. *Japan Journal of Nursing Science*, *17*(1), 1–9. https://doi.org/10.1111/jjns.12272

Ali, S. A. S. K., & Ahmed, H. M. (2018). Effect of change in position and back massage on pain perception during first stage of labor. *Pain Management Nursing*, *19*(3), 288-294.

Altinayak, S. Ö., & Özkan, H. (2024). Effect of Warm and Cold Acupressure Applied to the LI4 Acupressure Point on Childbirth Comfort During Labor: A Randomized Controlled Trial. *Alternative Therapies in Health and Medicine*, *30*(2), 13–17.

Beyable, A. A., Bayable, S. D., & Ashebir, Y. G. (2022). Pharmacologic and non-pharmacologic labor pain management techniques in a resource-limited setting: A systematic review. *Annals of Medicine and Surgery*, *74*(January), 103312. https://doi.org/10.1016/j.amsu.2022.103312

Gönenç, I. M., & Terzioğlu, F. (2020). Effects of massage and acupressure on relieving labor pain, reducing labor time, and increasing delivery satisfaction. *Journal of Nursing Research*, *28*(1), 1–9. https://doi.org/10.1097/jnr.0000000000000344

Hu, Q. T., Li, Y., Zhu, Y., Wang, J., & Li, Q. (2024). Effects of Multi-Mechanism Complementary Therapy on Pain and Anxiety During Labor Latency in Primiparous Women. *Journal of Holistic Nursing*, *2*. https://doi.org/10.1177/08980101241232443

Kaçar, N., & Keser, N. Ö. (2021). Comparison of the effect of mechanical massage and warm mechanical massage application on perceived labor pain and childbirth experience: A randomized clinical trial. *European Journal of Midwifery*, *5*(2), 1–10. https://doi.org/10.18332/ejm/132883

Karatopuk, S., & Yarıcı, F. (2023). Determining the effect of inhalation and lavender essential oil massage therapy on the severity of perceived labor pain in primiparous women: A randomized controlled trial. *Explore*, *19*(1), 107–114. https://doi.org/10.1016/j.explore.2022.08.006

Khairudin, M. N., Vallikkannu, N., Gan, F., Hamdan, M., & Tan, P. C. (2024). Electric massage chairs reduce labor pain in nulliparous patients: a randomized crossover trial. *American Journal of Obstetrics and Gynecology MFM*, *6*(4), 101324. https://doi.org/10.1016/j.ajogmf.2024.101324

Khasanah, N. A., & Sulistyawati, W. (2020). Pengaruh Endorphin Massage Terhadap Intensitas Nyeri Pada Ibu Bersalin. *Journal for Quality in Women's Health*, *3*(1), 15–21. https://doi.org/10.30994/jqwh.v3i1.43

Maghalian, M., Mirghafourvand, M., Ghaderi, F., Abbasalizadeh, S., Pak, S., & Kamalifard, M. (2022). Comparison the effect of Swedish massage and interferential electrical stimulation on labor pain and childbirth experience in primiparous women: a randomized controlled clinical trial. *Archives of Gynecology and Obstetrics*, *306*(1), 37–47. https://doi.org/10.1007/s00404-021-06220-6

Mammadov, B., & Taş, Ç. (2024). The effect of acupressure and massage on labor pain and birth satisfaction: a randomized controlled trial. *Explore*, *April*. https://doi.org/10.1016/j.explore.2024.04.006

Mascarenhas, V. H. A., Lima, T. R., Negreiros, F. D. S., Santos, J. D. M., Moura, M. Á. P., Gouveia, M. T. D. O., & Jorge, H. M. F. (2019). Scientific evidence on non-pharmacological methods for relief of labor pain. *Acta Paulista de Enfermagem*, *32*, 350-357.

Mathur, V. A., Morris, T., & McNamara, K. (2020). Cultural conceptions of Women's labor pain and labor pain management: A mixed-method analysis. *Social Science and Medicine*, *261*, 113240. https://doi.org/10.1016/j.socscimed.2020.113240

Keny Nurchaeni Cahyaningtyas, Sulastri*

Program Studi Ilmu Keperawatan, Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Surakarta
Corresponding author. E-mail: sulastri@ums.ac.id

DOI: https://doi.org/10.33024/minh.v7i7.429

Nanji, J. A., & Carvalho, B. (2020). Pain management during labor and vaginal birth. *Best Practice and Research: Clinical Obstetrics and Gynaecology*, *67*, 100–112. https://doi.org/10.1016/j.bpobgyn.2020.03.002

Nori, W., Kassim, M. A. K., Helmi, Z. R., Pantazi, A. C., Brezeanu, D., Brezeanu, A. M., Penciu, R. C., & Serbanescu, L. (2023). Non-Pharmacological Pain Management in Labor: A Systematic Review. *Journal of Clinical Medicine*, *12*(23). https://doi.org/10.3390/jcm12237203

Palet-Rodríguez, M., & Torrubia-Pérez, E. (2023). The usefulness of complementary therapies in pain management during childbirth: an integrative review. *Enfermeria Global*, *22*(2), 481–496. https://doi.org/10.6018/eglobal.529861

Rahayu, N. A., & Kurniawati, H. F. (2020). Efektivitas Music Therapy terhadap Pengurangan Nyeri Persalinan: Systematic Review. *Jurnal Kesehatan Vokasional*, *5*(2), 83. https://doi.org/10.22146/jkesvo.55252

Riazanova, O. V., Alexandrovich, Y. S., & Ioscovich, A. M. (2018). The relationship between labor pain management, cortisol level and risk of postpartum depression development: A prospective nonrandomized observational monocentric trial. *Romanian Journal of Anaesthesia and Intensive Care*, *25*(2), 123–130. https://doi.org/10.21454/rjaic.7518.252.rzn

Shahbazzadegan, S., & Nikjou, R. (2022). The most appropriate cervical dilatation for massage to reduce labor pain and anxiety: a randomized clinical trial. *BMC Women's Health*, *22*(1), 1–8. https://doi.org/10.1186/s12905-022-01864-1

Solehati, T. (2018). Terapi Nonfarmakologi Nyeri Padapersalinan:Systematic Review. *Jurnal Keperawatan Muhammadiyah*, *3*(1). https://doi.org/10.30651/jkm.v3i1.1568

Tanjung, W. W., & Antoni, A. (2019). Efektifitas Endorphin Massage Terhadap Intensitas Nyeri Persalinan Kala I pada Ibu Bersalin. *Jurnal Kesehatan Ilmiah Indonesia …*, *4*(2), 48–53. http://jurnal.stikes-aufa.ac.id/index.php/health/article/view/65

Tanvisut, R., Traisrisilp, K., & Tongsong, T. (2018). Efficacy of aromatherapy for reducing pain during labor: a randomized controlled trial. *Archives of Gynecology and Obstetrics*, *297*(5), 1145–1150. https://doi.org/10.1007/s00404-018-4700-1

Türkmen, H., & Oran, N. T. (2021). Massage and heat application on labor pain and comfort: A quasi-randomized controlled experimental study. *Explore*, *17*(5), 438–445. https://doi.org/10.1016/j.explore.2020.08.002

Uludağ, E., & Mete, S. (2021). The effect of nursing care provided based on the philosophy of hypnobirthing on fear, pain, duration, satisfaction and cost of labor: a single-blind randomized controlled study: The effect of nursing care on the labor process and cost. *Health Care for Women International*, *42*(4–6), 678–690. https://doi.org/10.1080/07399332.2020.1835916

Umar, E. (2021). Factors that Contributed the Management of Stage 1 Labor Pain Maternity Mothers the Delivery Room Dr. Derajat Prawiranegara Hospital Serang in 2019. *KnE Life Sciences*, *2021*, 475–489. https://doi.org/10.18502/kls.v6i1.8638

Keny Nurchaeni Cahyaningtyas, Sulastri*

Program Studi Ilmu Keperawatan, Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Surakarta
Corresponding author. E-mail: sulastri@ums.ac.id

DOI: https://doi.org/10.33024/minh.v7i7.429