

Article

# The Impact of Ice Massage at SP6 and LI4 Point on Labor Pain and Anxiety : a literature review

*Yulizawati<sup>1</sup>, Harridhil Silmi<sup>2</sup>, M. pemberdi Intasir<sup>3</sup>*<sup>1,2</sup> Department of Midwifery, Faculty of Medicine, Universitas Andalas, Padang, Indonesia<sup>3</sup> Department of Biology Education, Raja Ali Haji Maritime University, Tanjungpinang Indonesia**SUBMISSION TRACK**

Received: May 20, 2024

Final Revision: June 20, 2024

Available Online: June 30, 2024

**KEYWORDS**

Ice massage, labor pain, anxiety, SP6 , LI4

**CORRESPONDENCE**

Phone: +6281371863752

E-mail: Yulizawati@med.unand.ac.id

**A B S T R A C T**

**Background:** A midwife's fundamental care includes lowering anxiety, improving comfort, and managing labor pain. The health of the mother and fetus is adversely affected by some pharmacologic techniques for reducing labor pain. Applying ice massage to acupressure points can have a variety of benefits, including promoting energy flow there and reducing stress and discomfort by activating peripheral nerve receptors. Activating the spleen (SP6) and large intestine (LI4) points reduces labor pain and alleviate anxiety. **Purpose:** The aim of this paper is to review the literature to identify the effect of ice massage on labor pain and anxiety at SP6 and LI4 point. **Methods :** A narrative review of journal articles was conducted. Databases searched were PubMed and Google Scholar. Search terms used were "ice massage", "labor pain", and "anxiety". **Limitations** included 'English language' and 'published between 2000–2024'. **Results :** Reviewed for this paper were 10 studies that met the inclusion criteria. Results were categorised using thematic analysis. Themes that emerged were labor pain and anxiety and will be explored under these themes. **Conclusions :** The impact of ice massage on labor discomfort and anxiety has been covered in this review of the research. Most of the research articles that were used to source this review were conducted at SP6 and LI4 stages and published in clinical trials. The results of the study showed that applying ice massage to the LI4 and SP6 sites reduced labor discomfort. A midwife may think about using ice massage as a technique to lessen anxiety. Midwives can utilize the results of this study to manage labor discomfort.

## I. INTRODUCTION

One of the most significant physiological processes is childbirth. A mother experiences the most intense form of pain of her life during childbirth (Samadi et al., 2018). Even though birth and labor are thought of as normal physiological processes unrelated to disease or injury, labor pain can be quite painful and necessitates appropriate pain management (Poole, 2003).

A midwife's fundamental care includes lowering anxiety, improving comfort, and managing labor pain. The health of the mother and fetus is adversely affected by some pharmacologic techniques for reducing labor pain. Consequently, among the several choices for pain management, non-pharmacologic techniques should be made available as they are generally comfortable and have no negative effects on the fetus or the mother. During labor, midwives can employ a variety of non-pharmacologic techniques, such as massage, acupressure, and cold application. These methods may lessen anxiety during childbirth, minimize pain, and shorten the time it takes to complete labor (Türkmen et al., 2023).

Applying ice massage to acupressure points can have a variety of benefits, including promoting energy flow there and reducing stress and discomfort by activating peripheral nerve receptors. The explanation might be that ice massage stimulates thin fiber receptors more effectively than acupressure. Therefore, by applying pressure for longer periods of time and more frequently, acupressure can be used to improve its effects on labor pain. Maintaining the stimulation of acupuncture points over time may increase the vital energy flow in the meridians and provide more significant healing outcomes (Nehbandani et al., 2019). It is thought that the contraction of meridians causes the disruption that occurs during labor. Among these disruptions is pain. The contraction can be released and the meridians can be restored by stimulating the acupoints along the meridians. According to some researchers, activating the acupoints reduces pain because it prevents the pain sensation from being transferred and most likely raises endorphin levels in the blood (Chung et al., 2003).

Acupuncture or acupressure is a non-pharmacological way to assist women going into birth. Between the first and second metacarpal bones, in the center of the metacarpal bone, and on the radial side, external side of the hand, lies the Large Intestinal 4 (LI4) region. One of the body's most significant pain-relieving locations is the LI4 point. In uncomfortable circumstances, it should be strongly activated (Yildirim et al., 2018). Sanyinjiao is one of the locations that helps to lessen labor discomfort. This is the SP6 acupoint, located behind the posterior tibial plateau and four fingerbreadths above the inner ankle (Nehbandani et al., 2019). Activating the spleen (SP6) and large intestine (LI4) points increases the strength of uterine contractions and lessens labor pain (Türkmen et al., 2023).

Women may experience anxiety due to feelings of uncertain future circumstances. Therefore, there is a sense of concern about whether the future will bring with it a safe passage through this moment. The psychological symptom of anxiety that the respondents experienced took the form of physiological reactions including tightness, perplexity, and lack of confidence (Yulizawati, Fitria, et al., 2023). Estrogen and progesterone are added during pregnancy, which results in a variety of emotional alterations. Every pregnant woman experiences anxiety differently, particularly in her first pregnancy when it's a new experience for her or for a mother who experienced trauma during a prior pregnancy. Pregnant women's bodies will react physiologically in different ways to feelings of anxiety (Yulizawati, Hardisman, et al., 2023). Anxiety may be reduced with the use of cold massage treatments (Mirzaee et al., 2021).

The aim of this paper is to review the literature to identify the effect of ice massage on labor pain and anxiety at SP6 and LI4 point.

## II. METHODS

The method consists of research design, place and time of research, population and samples, data measurement, and data analysis methods. Please provide sufficient details of the methods include ethical conduct.

The aim of narrative reviews is to provide a comprehensive synthesis of published literature on a specific topic in a narrative format. Unlike systematic reviews, which follow a structured methodology, narrative reviews offer a more interpretative and descriptive analysis of existing literature (Ferrari, 2015). Databases used in this review included PubMed and Google Scholar. The search terms used are “ice massage”, "labor pain" and "anxiety". The use of only the word "anxiety" proved problematic for some databases because it retrieved all anxiety-related articles outside the context of childbirth and this required refinement by adding the search terms "anxiety" AND "labor". Inclusion criteria included English language, published in a peer-reviewed clinical trial studies, full-length and published between 2000–2024. Exclusion criteria included Studies with high risk of bias or those studies in which the effects of ice massage during labor was not the primary outcome of interest.

## III. RESULT

The literature search revealed the following (Table 1). Some papers taken from Google Scholar are not primarily focused on anxiety, but may have mentioned anxiety in passing and show up in searches, this is also excluded.

**Table 1. Results of literature search**

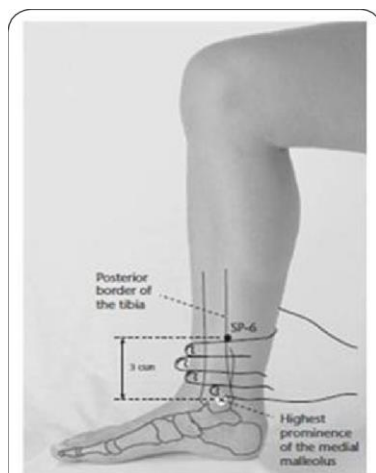
Database	Search term “ice massage” AND “Labor pain”	Search Term “ice massage” AND “Anxiety” AND “Labor”
Pubmed	7	1
Google Scholar	81	79

The impact of ice massage on labor pain and anxiety has been investigated from a variety of accupoint within the literature. Most of the research examines the impact of ice massage at two pressure points that applied in the body, from large intestinal (L14) and spleen (SP6) points on labor pain and anxiety from a variety of testing scales. It was common to find duplicate articles in several databases. After duplicates were removed and the exclusion criteria had been applied, the final number of papers reviewed regarding the effect of ice massage with labor pain was 6. While the final number of papers reviewed related to the effect of ice massage with anxiety in labor was 4. Each literature related to the impact of ice massage is arranged according to the theme: labor pain and anxiety.

## IV. DISCUSSION

### The Impact of Ice Massage on Labor Pain

In Turkey's Balıkesir province, at the birth room of Atatürk City Hospital, a randomized controlled trial was carried out. The requirements for participation were being a singleton, having a healthy fetus, being 38 to 40 weeks gestation, anticipating a vaginal birth, having a cephalic presentation, being in stage 1 of childbirth, and having a cervical dilatation of 4 to 5 cm. Multiple pregnancies, multifetal gestations, high-risk pregnancies, and hospital arrivals with cervical dilatation greater than 5 cm were excluded criteria. Any diagnostic of a complication during the current pregnancy or a diagnosis of complications related to birthing was considered to be a high-risk pregnancy. The labor pain was measured using the Visual Analog Scale (VAS). The vertical line on the VAS ranges from 0 to 10. In this study, cervical dilatation was measured using the VAS at 4 to 5 cm, 6 to 7 cm, and 8 to 9 cm prior to the intervention and after it. The participant was asked to choose a comfortable position, and the midwife used rotational motions to identify the SP6 point on both legs and administer ice massage. In the ankle, the SP6 point is situated three to four finger breadths above the posterior malleolus bone (Figure 1). The ice was covered in gauze to keep it from coming into touch with the skin directly. The Mann-Whitney U test was utilized to examine variations in labor pain means since it is appropriate for non-normally distributed data. In this study, labor pain perception was decreased by applying ice massage to the SP6 point at cervical dilation measurements of 4 to 5 cm, 6 to 7 cm, and 8 to 9 cm (Türkmen et al., 2024).



**Figure 1. SP6 Acupoint** (Kurniawan et al., 2018)

During childbirth, the continuous stimulation of acupressure points can improve the meridians' vital energy flow, leading to more significant therapeutic effects. Labor pain levels in the intervention groups are found to be lower than those in the control groups in trials identical to this one that used acupressure on the SP6 point. Decreased pain during labor will result in the mother participating in the process, feeling less pain throughout delivery, and giving birth without the need for medications (Türkmen et al., 2024).

The effect of applying acupressure during the active phase of labor on the assessments of labor pain in nulliparous women was examined in a randomized controlled experiment. Three treatments were randomly assigned to the women: light touch (n = 71), acupressure at the SP6 on both legs during the contraction for thirty minutes (n = 71), and routine care (n = 70). A visual analogue

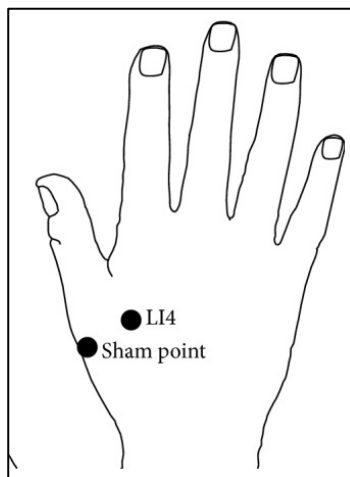
scale was used to measure labor pain experiences at baseline, right after therapy, and 30, 60, and 120 minutes later. The acupressure group experienced a reduction in labor discomfort, which was most obvious just after treatment, according to the results (Hjelmstedt et al., 2010).

Although there haven't been many research done on it yet, acupressure is one pain management technique that can be utilized for labor pain. The purpose of the study was to ascertain how Hoku point ice massage affected labor pain. This clinical trial study included sixty pregnant women who met the inclusion criteria. The participants were split into two groups of thirty each at random (Control group: just the Hoku point is touched; Case group: the Huko point is massaged with ice). Thirty minutes were spent on this process. The individuals' labor pain was assessed both before and after the surgery using a visual analog scale. The outcomes demonstrated that ice massage of the Huko point reduced labor pain in a statistically significant way ( $P < 0.001$ ) (Enjezab et al., 2008).

An experimental controlled study was carried out with the goal of determining the impact of both short-term (40 minutes) and long-term (80 minutes) ice massages to the LI4 (figure. 2) acupressure site on the perception of labor pain. The "Visual Analog Scale (VAS)" was employed to gauge the experience of pain. Patients select their own pain level on a 10-cm ruler with one side representing painlessness and the other representing potentially the most terrible pain. After adding 30 cc of water, ice packs were chilled until they solidified. For the safety of pregnant women, ice packs were encircled by gauze bandages during application in labour. Every ice package utilized in the investigation was the same size. When the VAS averages before and after acupressure treatment were compared, the VAS values in both groups changed with time. This change indicated a propensity for the control group to increase and a tendency for the experimental group to decline. It was determined that the opposing changes were statistically significant ( $p = 0.001$ ). Pain perception was positively reduced for the ladies in the experimental group following acupressure application (Yildirim et al., 2018).

A study was conducted on the impact of 20 minutes of simultaneous application of LI4 acupressure on both hands on the level of pain experienced during the initial phase of labor. The findings demonstrated that applying acupressure to this acupoint is a more successful way to treat labor pain than simply touching the LI4 point (Hamidzadeh et al., 2012).

The perception of labor pain severity 24 hours postpartum following LI4 ice massage was assessed using a pain questionnaire. They discovered that applying ice to the L14 acupoint caused labor pain intensity in women to decrease from "distressing" to "discomforting" when they were questioned within the first 24 hours following delivery (Raisler & Waters, 2003).



**Figure 2. LI4 Acupoint** (Kong et al., 2015)

### **The Impact of Ice Massage on Anxiety**

The study was conducted to examine the effect of ice massage on anxiety. The State-Trait Anxiety Inventory (STAI) scale was created by Spielberger and colleagues to assess both trait anxiety and state anxiety, or how someone feels in general (Spielberger et al., 1971). With 20 4-point Likert-type items (1, nearly never; 4; almost always), the State Anxiety subscale is composed. Products can convey feelings that are happy or unhappy. Items that score positively are reverse-scored, and the subscale total score is the sum of all items. Between 20 and 80 are the subscales cores. Greater anxiety levels are indicated by higher scores. In both the intervention and control groups, there was a significant negative connection between labor-related comfort levels at 8 to 9 cm and state anxiety levels at 6 to 7 cm. Labor comfort levels declined as state worry levels rose (Türkmen et al., 2023).

According to research by Mirzaee et al, applying cold massage and acupressure to the Hegu (LI4) point for 30 minutes had no discernible impact on labor anxiety levels. The lack of variation in the anxiety levels may have resulted from the fact that both groups got comparable levels of care and attention throughout delivery as part of standard midwifery care (Mirzaee et al., 2021).

It has been discovered that combining ice and acupressure works better. An investigation of how acupressure affects labor anxiety at point LI-4. Three groups were randomly assigned to 165 nulliparous women in this experimental investigation. Group II had an ice massage, Group III received acupressure, and Group IV received control. Every group has fifty-five ladies in it. The duration of the 30-minute intervention involved a cervical dilation of 3–4 cm on LI-4. revealed a statistically significant drop in anxiety ( $p < 0/001$ ) when compared to the control group. When compared to the control group, the length of the first and second stages of labor as well as the anxiety level were both considerably ( $P \leq 0/001$ ) lower (Kaviani et al., 2012).

The mechanism of action of cold therapy and massage is explained by the gate control hypothesis. The gate control theory states that competing sensations at the spinal cord level prevent pain signals from traveling through the cord. Furthermore, using heat or massage during childbirth raises dopamine and serotonin levels. Muscle spasms are relieved, comfort is raised, pain is mentally diverted, energy flow in acupuncture points is facilitated, and anxiety is decreased as a result (Simkin & Bolding, 2004).

## V. CONCLUSION

This literature review has discussed the effects of ice massage on labor pain and anxiety. The majority of research articles sourced for this review were published in clinical trials and conducted at SP6 and LI4 points. The study's findings demonstrated that labor pain was decreased by ice massage administered to the LI4 and SP6 points. One of the main focuses of delivery-related services is managing labor pain, which is also one of the essential aspects of midwifery care. Ice massage can be considered by midwife as a method for reducing anxiety and labor pain management.

## REFERENCES

- ng, U. L., Hung, L. C., Kuo, S. C., & Huang, C. L. (2003). Effects of li4 and bl 67 acupressure on labor pain and uterine contractions in the first stage of labor. *Journal of Nursing Research*, 11(4), 251–260. <https://doi.org/10.1097/01.JNR.0000347644.35251.C1>
- ezab, B., Khoshbin, A., Bokaei, M., & Naghshin, N. (2008). Effect of Ice Massage on Hoku Point for Reduction of Labor Pain. *SSU\_Journals*, 15(4), 69–74. <https://jssu.ssu.ac.ir/article-1-625-en.html>
- ari, R. (2015). Writing narrative style literature reviews. *Medical Writing*, 24(4), 230–235. <https://doi.org/10.1179/2047480615z.000000000329>
- nidzadeh, A., Shahpourian, F., Orak, R. J., Montazeri, A. S., & Khosravi, A. (2012). Effects of LI4 Acupressure on Labor Pain in the First Stage of Labor. *Journal of Midwifery and Women's Health*, 57(2), 133–138. <https://doi.org/10.1111/j.1542-2011.2011.00138.x>
- lmstedt, A., Shenoy, S. T., Stener-Victorin, E., Lekander, M., Bhat, M., Balakumaran, L., & Waldenström, U. (2010). Acupressure to reduce labor pain: A randomized controlled trial. *Acta Obstetrica et Gynecologica Scandinavica*, 89(11), 1453–1459. <https://doi.org/10.3109/00016349.2010.514323>
- iani, M., Ashoori, M., Azima, S., Rajaei Fard, A., & Hadian Fard, M. (2012). Comparing the Effect of Two Methods of Acupressure and Ice Massage on the Pain, Anxiety Levels and Labor Length in the Point LI-4. *SSU\_Journals*, 20(2), 220–228. <https://jssu.ssu.ac.ir/article-1-1982-en.html>
- ng, S. P., Tan, Q. W., Liu, Y., Jing, X. H., Zhu, B., Huo, Y. J., Nie, B. Bin, & Yang, D. H. (2015). Specific Correlation between the Hegu Point (LI4) and the Orofacial Part: Evidence from an fMRI Study. *Evidence-Based Complementary and Alternative Medicine*, 2015. <https://doi.org/10.1155/2015/585493>
- niawan, A., Terawan, V. M., Djuantono, T., & Bisri, T. (2018). Acupuncture as adjuvant general anesthesia on cesarean section. *Journal of Anesthesiology and Clinical Science*, 7(1), 3. <https://doi.org/10.7243/2049-9752-7-3>
- zaee, F., Hasaroeih, F. E., Mirzaee, M., & Ghazanfarpour, M. (2021). Comparing the effect of acupressure with or without ice in LI-4 point on labour pain and anxiety levels during labour: a randomised controlled trial. *Journal of Obstetrics and Gynaecology*, 41(3), 395–400. <https://doi.org/10.1080/01443615.2020.1747412>

- bandani, S., Koochakzaei, M., Keikhaie, F., & Jahantigh, F. (2019). Comparison of the Effect of Hot and Cold Massage at Spleen 6 on Pain Relief During Active Labor Phase: A Clinical Trial. *Med Surg Nurs J*, 8(3), 97075. <https://doi.org/10.5812/msnj.97075>
- le, J. H. (2003). Analgesia and Anesthesia During Labor and Birth: Implications for Mother and Fetus. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, 32(6), 780–793. <https://doi.org/10.1177/0884217503258498>
- sler, J., & Waters, B. L. (2003). Ice massage for the reduction of labor pain. *Journal of Midwifery and Women's Health*, 48. [https://doi.org/10.1016/s1526-9523\(03\)00277-0](https://doi.org/10.1016/s1526-9523(03)00277-0)
- adi, P., Alipour, Z., & Lamyian, M. (2018). The Effect of Acupressure at Spleen 6 Acupuncture Point on the Anxiety Level and Sedative and Analgesics Consumption of Women during Labor: A Randomized, Single-blind Clinical Trial. *Iranian Journal of Nursing and Midwifery Research*, 23(2), 87. [https://doi.org/10.4103/IJNMR.IJNMR\\_199\\_16](https://doi.org/10.4103/IJNMR.IJNMR_199_16)
- kin, P., & Bolding, A. (2004). Update on nonpharmacologic approaches to relieve labor pain and prevent suffering. *Journal of Midwifery & Women's Health*, 49(6), 489–504. <https://doi.org/10.1016/J.JMWH.2004.07.007>
- alberger, C. D., Gonzalez-Reigosa, F., Martinez-Urrutia, A., Natalicio, L. F. S., & Natalicio, D. S. (1971). The State-Trait Anxiety Inventory. *Revista Interamericana de Psicología/Interamerican Journal of Psychology*, 5(3 & 4), 3–4. <https://doi.org/10.30849/RIP/IJP.V5I3>
- kmen, H., Çetinkaya, S., Kiliç, H., Tuna, S. D., Şirvanci, M., & Mutlu, H. (2024). The Effect of Ice Massage Applied to the SP6 Point on Labor Pain, Labor Comfort, Labor Duration, and Anxiety: A Randomized Clinical Trial. *Journal of Midwifery and Women's Health*. <https://doi.org/10.1111/jmwh.13600>
- kmen, H., MUTLU, H., TUNA, S. D., & ŞİRVANCI, M. (2023). The Effect of Ice Massage Applied to SP6 Point on Labor Pain, Labor Comfort, Labor Duration, and Anxiety. <https://doi.org/10.22541/au.167368331.14786987/v1>
- lirim, E., Alan, S., & Gokyildiz, S. (2018). The effect of ice pressure applied on large intestinal 4 on the labor pain and labor process. *Complementary Therapies in Clinical Practice*, 32, 25–31. <https://doi.org/10.1016/j.ctcp.2018.02.015>
- izawati, Y., Fitria, H., Oktova, R., & Arief, I. (2023). The Effectiveness of Pre-Mommy Applications to Improving Knowledge, Behavior, and Psychological Conditions in The Preconception Period Women of Reproductive Age. *Women, Midwives and Midwifery*, 3(3), 28–35. <https://wmmjournal.org/index.php/wmm/article/view/102/67>
- izawati, Y., Hardisman, H., & Tasya, L. D. (2023). Hypnobirthing as an Effort to Reduce Anxiety in Pregnant Women: A Literature Review. *Women, Midwives and Midwifery*, 3(2), 68–78. <https://doi.org/10.36749/wmm.3.2.68-78.2023>

## BIOGRAPHY

**Yulizawati** Yulizawati was born in Kampar on July 20, 1982. She has been a lecturer in the Bachelor's Degree Midwifery Program at the Faculty of Medicine, Andalas University, since May 1, 2014. From 2022 to the present, she has served as the Head of the Midwifery Department at the Faculty of Medicine, Andalas University. She completed her Diploma III in Midwifery at the Polytechnic of Padang, Bukittinggi Midwifery Program, graduating in 2002. She worked at RSIA Eria Bunda Pekanbaru from 2003 to 2004, and at Akbid Indragiri Rengat from 2004 to 2014. She



then graduated with a Diploma IV in Midwifery in 2004 and a Master's Degree in Midwifery in 2010 from the Faculty of Medicine, Padjadjaran University. Since 2020, she has been a member of the Indonesian Midwifery Collegium and the Editor-in-Chief (EiC) of the Journal of Midwifery (JoM).

**Harridhil Silmi** Harridhil Silmi was born in Pasar Kuok on September 24, 1996. She completed her Bachelor's degree in Midwifery at the Faculty of Medicine, Andalas University, in 2017. She continued her studies in the Midwifery Professional Education program at the same university, graduating in 2020. From 2021 to 2023, she worked as a Midwife under the Special Assignment for Nusantara Sehat at the Indonesian Ministry of Health. Since 2023, she has been actively serving as a Research Assistant in the Department of Midwifery at the Faculty of Medicine, Andalas University.

**M. Pemberdi Intasir** M. Pemberdi Intasir is a lecturer in the Biology Education Study Program at the Faculty of Teacher Training and Education at Raja Ali Haji Maritime University.