



Breathing techniques and warm compresses as therapy for adaptation of labor pain in the active phase of the first stage: A literature review

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ARTICLE INFO	ABSTRACT
<p>Article history: Received 6 March 2023 Accepted 13 July 2023</p> <p>Keywords: Breathing techniques Warm compresses Adaptation of labor pain The first stage</p>	<p>Background: The active phase of the first stage of labor creates unpleasant conditions due to sensory and emotional experiences from the interaction of physiological and psychological processes. Labor pain coincides with maternal adaptation to pain. Labor pain results in uncoordinated uterine contractions, which results in a prolonged duration of the first stage of labor and impaired fetal well-being.</p> <p>Objective: This study aims to describe the application of a breathing technique model combined with warm compresses as an adaptation therapy for active phase I labor pain.</p> <p>Methods: Selected articles within five years, from 2017 to 2021. Initial research search results on the topic included 150 articles from PubMed and Google Scholar, keyword PICOS(T). The final selection stage was based on the inclusion criteria of 23 articles and eliminating the outer domains of the nine articles. Article covering JBI's critical assessment and synthesised a total of fourteen.</p> <p>Results: The findings of fourteen articles showed the average difference in pain scale and intensity before and after treatment. In addition to pain intensity, the results also show that pain can be adapted through these two methods, and provides a sense of comfort, reduces anxiety, and increases relaxation, especially in primigravid women.</p> <p>Conclusion: Obstacles appear in the phase and if the woman is in an abnormal pregnancy condition. Skilled attendants and family social support were accommodating in the success of this experiment. Practical implications and recommendations are needed to consider the length of treatment time and materials for compressed bottles of rubber or glass bottles.</p>

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1. Introduction

Labor is the process of expulsion of the fetus in full-term pregnancy at 37-42 weeks of gestation with the spontaneous back of the head within 18 hours without complications for the mother or fetus (Pasaribu & Tarigan, 2018). The process of the first stage of labor begins when the



uterus contracts so that the cervix dilates from the latent phase to the active phase (Petitprez et al., 2022). This phase creates unpleasant conditions due to sensory and emotional experiences from the interaction of physiological and psychological processes (Adienggara, 2020; Koyyalamudi et al., 2016). Labor pain coincides with the mother's adaptation to the pain (Sandström et al., 2017). Support from the closest people and appropriate pain management methods from birth attendants are expected to help mothers adopt and accept pain manifestations as a comfortable and safe delivery process (Black et al., 2008; Yuliandari et al., 2020). Women in labor who have difficulty adapting to labor pain result in uncoordinated uterine contractions, which results in the duration of the first stage of labor is prolonged and the well-being of the fetus being disrupted (Akbarzadeh et al., 2018). Discomfort originates from the lower abdomen due to the dilatation and thinning of the cervix; the pain spreads to the lower back and down to the thighs, which results in pressure on the women's spine (Labor & Maguire, 1948; Raana & Fan, 2020).

In line with a study conducted in Saudi Arabia by Baljon et al. (2022) showed that labor pain was adapted to non-pharmacological methods. Non-pharmacological therapies such as breathing techniques combined with reflexology and massage. The results simultaneously reduced anxiety (2.9 vs 4.2, $F = 80.4$, $p < 0.001$), adrenocorticotrophic (ACTH) (133 vs 209 pg/mL, $p < 0.001$), cortisol (1231 vs 1360 nmol/mL, $p = 0.003$), oxytocin (159 vs 121 pg/mL, $p < 0.001$), and shortened the duration of labor (165 vs 333 minutes, $p < 0.001$), improved vital signs, which resulted in higher APGAR scores, and increased women satisfaction (Baljon et al., 2022). This provides significant practice evidence for considering the method on a non-pharmacological basis.

The intervention of the warm compress method provides a balance for the enlargement of blood vessels in the body, resulting in homeostasis and reducing excessive worry and anxiety, which indirectly can adjust the appearance of the pain. A study by Suyani (2020) showed that the average pain score before treatment was 8.66, and the average was 5.83 after treatment. The results of the Paired T-Test analysis, pain intensity before and after treatment, obtained significant differences ($p = 0.000$; 95% CI -3.352 (-2.314) (Suyani, 2020). Meanwhile, in other studies, p -value / Sig. (2-tailed) of 0.005, $\alpha < 0.05$, meaning that have a significant reduction between the average labor pain before 8.12 and after warm compresses at 6.86 (Aslamiyah et al., 2021). In addition to the warm compress method, intervening breathing technique methods are also used for adaptation to labor pain (Whitburn et al., 2019). This study aims to describe the application of the breathing technique model combined with warm compresses as an adaptation therapy for active phase I labor pain.

2. Method

The article search strategy was published over five years, from 2017 to 2021. The initial research search results on the topic included 150 articles from PubMed and Google Scholar, using the PICOS(T) keyword. The final stage is selecting based on the inclusion criteria of 23 articles and eliminating the outer domain of the nine articles. The inclusion articles that met the JBI critical appraisal and were synthesised were 14. The description is seen in Figure 1 as follows:

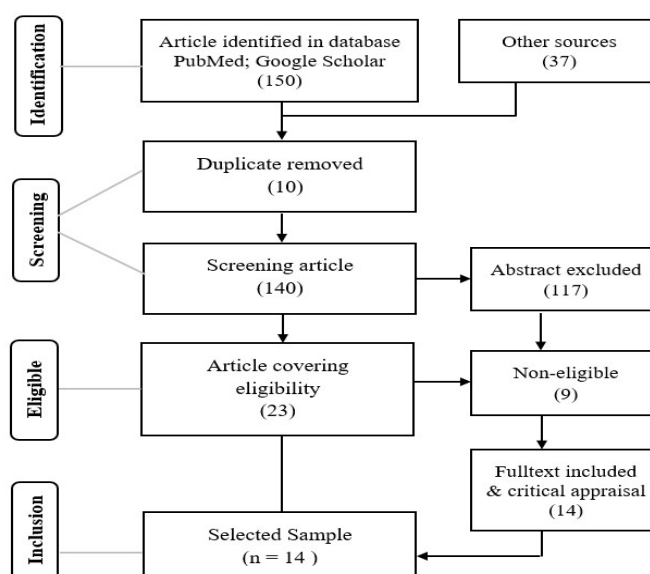


Figure 1. Study Selection Flow by PRISMA

3. Results

Among the 14 synthesised articles, the most non-pharmacological methods were nine on warm compress (64.28%) and five on breathing techniques (35.71%). For study design, most (71.42%) were presented by Quasi-Experimental, and the others (28.57%) were three pre-experimental articles and one article from RCT. Although with different research methods, the pattern is the same followed, including using only normal risk parturients without comorbidities and the first active phase of labor. This strategy is quite adequate in assessing the effectiveness and differences of specific interventions.

All the identified studies were midwifery care practices for mothers during the active and latent phases. Most studies describe comparisons between the two groups by looking at the differences in the two-sample data before and after being given treatment/ intervention. The following finding is that all of these experimental studies affect the output of the pain scale, pain



intensity, and duration of time in the second stage. Table 1 below explains the Non-Pharmacological Method (NPM), Breathing Technique (BT), and Warm Compress (WC), the research methodology used, and the results of each study.

Breathing Technique (BT) Method

The Breathing Technique (BT) method is an alternative to pain adaptation in the active phase of the first stage of labor. The total findings show a significant effect on adaptation to pain during the active phase I phase. Wilcoxon Sign Rank statistical test, p-value $0.000 < \alpha 0.05$ (Chotimah et al., 2020; Nurhayati, 2018). Value of difference in pain intensity 1.33; SD 1.16 (Fitri, n.d.).

The t-Dependent test results were obtained before relaxation 6.27; SD 1.38 and after intervention 4.77; SD 1.68 with an average difference of 0.59 (Annisa, 2019). The two study tests were t-Independent and t-Paired; the Visual Analog Scale (VAS) measured the pain scale. In addition to showing an effect on pain adaptation and intensity, it also on the shorter duration of the first stage (Astuti & Bangsawan, 2019). This BT technique is also accompanied by the addition of deep breaths to relax the muscles of the arms, legs, stomach, and back. Increased socialisation of counselling and training in relaxation techniques such as hypnobirthing is also recommended (Aritonang, 2017). Then, in line with Baljon et al. (2022), best practices besides breathing exercises are also suggested to add reflexology and massage as non-pharmacological analgesia with conditions for average pregnant women (Baljon et al., 2022; Nurhayati, 2018), added acupressure as the most effective intervention compared to the placebo group (Hu et al., 2021).

Warm Compress (WC) Method

Labor pain is fluctuating or cyclical and appears several times during contractions and subsides during relaxation. The tolerance limit for pain for each woman in labor is different, especially for primigravida women (Ying, 2017). The total results show that warm compresses have an effect on active phase I labor pain. Devi et al. (2017) compressed the sacral, and pain was assessed using the Numerical Pain scale and the FLACC scale (Thingbaijam et al., 2017). In line with Morikawa (2020) from Japan, hot compresses are applied to the lumbar area and use the Visual Analogue Scale (VAS) (Morikawa et al., 2020). Meanwhile, Sari et al. (2020) intervened for approximately 20 minutes during contractions, and the pain scale was measured twice using the Face Pain Rating Scale (FPRS) (Ofori et al., 2020). Farahmand (2020) described the effect of two stages of warm compresses, namely the strength of the pain during labor and after delivery in primiparous women, and used the VAS (Farahmand et al., 2020).



Table 1. Synthesis of study result

Authors (year)	NPM	Design of study	Findings	Recommendation
Fitriati et al., (2021)	Warm compress	Pre-Experimental Study	WC affects the intensity of pain during the first active phase.	Back or area that hurts during contractions
Morikawa et al. (2020)	Warm compress	Quasi-Experimental Study	Labor pain is reduced by using a compress.	For women who complain of low back pain during early labor.
Farrahmand et al. (2020)	Warm compress	Randomised Clinical Trial	Compared to CG, the average T-test pain intensity was significantly reduced in EG stage I, stage II, and after delivery.	Intervention between contractions at 10 - 15 minutes of early labor.
Suyani (2020) (12)	Warm compress	Quasi-Experimental Study	Reduce the intensity of labor pain in the first stage of the active phase.	The jar contains warm water.
Ofori et al. (2020).	Warm compress	Quasi-Experimental Study	WC is effective in reducing the pain of the first stage of labor.	WC for 20 minutes, given to the woman's lower back or in the part where the fetal head presses against the spine.
Alfarisyi et al. (2020)	Warm compress	Quasi-Experimental Study	A comparison of WC on EG is more effective than on CG.	In the area of pain during contractions
Aslamiyah et al., (2020) (13)	Warm compress	Pre-Experimental Study	The study's results had a significant effect on decreasing the labor pain scale.	The jar contains warm water.
Aritonang (2020)	Breathing Technique	Quasi-Experimental Study	BT affects the intensity of labor pain.	Increased socialisation of counseling and training in relaxation such as hypnobirthing.
Astuti & Bangsawan, (2019)	Breathing Technique	Quasi-Experimental Study	Relaxation techniques have an effect on reducing labor pain in the first stage of labor.	Take a deep breath from the nose for 3-5 seconds and exhale through the mouth for 3-5 seconds while the uterus contracts.
Annisa (2019)	Breathing Technique	Quasi-Experimental Study	Relaxation deep techniques have an effect on reducing labor pain in the first stage of labor.	BT for 20 minutes in the first 10 minutes.
Fitri et al. (2019)	Breathing Technique	Quasi-Experimental Study	Deep breathing techniques are effective in reducing the intensity of labor pain.	The patient controls self-breathing, the oxygen in the body increases, and the patient relaxes.
Nurhayati, (2018) (15)	Breathing Technique	Pre-Experimental Study	BT relaxation has an effect on reducing pain during the first active phase.	Inhale deeply, fill the lungs with air, exhale slowly, and relax the arms, legs, stomach, and waist muscles.
Devi et al. (2017)	Warm compress	Quasi-Experimental	The rate of improvement on the pain scale was slower in EG	The therapy for labor pain is in the first



		Study	compared to CG.	stage.
Nugraheny & Sumarni, (2017)	Warm compress	Quasi-Experimental Study	WC has a significant effect on the scale of pain in the latent phase & active phase.	The jar contains warm water.

NPM: non-pharmacology method; WC : warm compress; BT: breathing technique; EG : experiment group; CG : control group



Furthermore, the level of pain felt by the mother before labor can cause anxiety and worry excessively so that the muscles become spastic and stiff, and the birth canal becomes narrow and less relaxed (Labor & Maguire, 1948). Studies with 20 samples have a significant effect on the active phase compared to the latent phase (Nugraheny, 2018). Like the study of Suyani (2020), 18 samples are used, one group pretest and post-test design, and the results of the paired t-test intensity of the pain before and after the treatment obtained significant differences ($p = 0,000$; 95%CI -3,352-(-2,314) (Suyani, 2020). Alfarisyi et al. (2020), with a non-Equivalent Control Group of as many as 20 samples, also showed the effectiveness of the toilet more significantly ($p = 0.002$) in the experimental group (Rini Sulistiawat Alfarisyii, Fitri Rapika Dewi, 2020). A pre-experimental study by Aslamiyah et al. (2020) from 10 samples using a jar containing warm water with two other studies (Aslamiyah et al., 2021; Nugraheny, 2018; Suyani, 2020). Fitriati et al. (2021), with 30 respondents, had moderate pain of 4.63 to 1,847, and after the compress was also moderate pain of 3,17 to 1,621. The T-test statistical test shows the effectiveness of the adaptation and intensity of labor pain $p=0,000 < \alpha 0.05$) (Fitriati et al., 2021).

4. Discussions

Breathing Techniques and Warm Compresses are non-pharmacological methods for labor pain management (Mascarenhas et al., 2019). The nature of labor pain persists in the first stage of the active phase, getting stronger as the cervix dilates (Baljon et al., 2022). Excessive labor pain can cause anxiety, especially for primigravida women (Ying, 2017). For this reason, continuous pain management therapy is needed to be able to adapt and be comfortable going through the pain of labor (Amru et al., 2022; Petitprez et al., 2022). Based on the results of a review of several articles, on average, researchers used an observation instrument with a Visual Analog Scale (VAS) and Numeric Scale in warm compress studies and breathing techniques. The pain was measured before and after the intervention. Before the intervention, the average respondent experienced severe pain; after the intervention, the average respondent experienced a decrease in the pain scale to low pain (Hu et al., 2021).

This generally does not affect the strength of the natural contractions of labor; it is just that respondents feel they are more adaptable to receiving labor pain, so the pain is lighter, and the delivery process runs comfortably. Warm compresses on the lower back area, namely pressing the fetal head to the spine, because the heat will increase circulation in the pressure area to improve



tense muscles in the pressure area (Gallo et al., 2018; Alfariyiy & Dewi, 2020). Labor pain is also influenced by breathing relaxation, which is an indicator of the body's response to pain, focusing on controlling breathing. Deep breathing relaxation techniques will reduce anxiety so that a feeling of calm, relaxation, and comfortable appears, especially during the first active phase (Parsa et al., 2020). Because the person's pain threshold is different, if the mother feels calm, relaxed, and relaxed, pain that is considered severe becomes even easy. This is what is called that women are able to adapt to labor pain. Based on the analysis results in research articles, warm compresses and breathing techniques each has a positive value and impact on the active phase of labor pain response in the first stage (Morikawa et al., 2020). Both therapies can be used simultaneously; when labor pains start to come, the family or midwife can guide the woman to do deep breathing relaxation techniques while giving warm compresses to the stomach or waist. The combination of the two therapies will make the mother feel comfortable and slowly adapt to labor pains until the delivery process is complete (Akbarzadeh et al., 2018).

Labor pain during the first stage of the active phase should not be eliminated because pain must pass through during the labor process (Smith et al., 2018). However, as skilled attendant or midwife who plays a direct role in the field, they choose to apply alternative NPM for pain management (Ying, 2017). Acceptance and adaptation to pain, where pain is one of the main factors in the success of the first stage of warm compresses or breathing techniques, can be used as an alternative method of caring for normal childbirth in pain management (Nufra & Azimar, 2019). Apart from being easy and economical, warm compresses & guidance on breathing techniques are also easily applied by birth attendants. For example, midwives can provide education and training for a husband or close family for this method. This method also has no risks or negative impacts (Gallo et al., 2018).

Of course, this NPM should also be done before the influence of pain medication (pharmacology) (Mascarenhas et al., 2019). In more than one method, midwives are required to be able to combine the warm compress method and deep breathing techniques because both can function equally during contractions. When giving warm compresses, women can also be guided to do deep breathing techniques simultaneously with the midwife (Farahmand et al., 2020). Thus, it is hoped that the women will feel comfortable and safe and accept pain adaptation. So, the women's adaptation to pain response can also be used as a benchmark for caring for women by midwives.



5. Conclusion

This model encourages evidence and best practice interventions that the most critical pain intensity is the experience of adaptive management managed by women in the first stage of the active phase. Adequate adaptation supports reducing excessive anxiety and fear and promotes relaxation, security, and comfort. Apart from that, even though barriers appeared during the latent phase and if the woman was in an abnormal pregnancy, the presence of skilled attendants and family emotional support was beneficial in the success of this trial. Practical implications and recommendations are needed to consider the length of treatment time and materials for rubber compress bottles or glass bottles.

6. References

- Adianggara. (2020). *PENGARUH PEMBERIAN TEKNIK RELAKSASI TERHADAP TINGKAT NYERI PERSALINAN : SEBUAH TINJAUAN SISTEMATIK*.
- Akbarzadeh, M., Nematollahi, A., Farahmand, M., & Amooee, S. (2018). The Effect of Two-Stage Warm Compress on the Pain Duration of First and Second Labor Stages and Apgar Score in Prim Gravida Women: a Randomized Clinical Trial. *Journal of Caring Sciences*, 7(1), 21–26. <https://doi.org/10.15171/jcs.2018.004>
- Annisa, N. H. (2019). EFEKTIVITAS METODE RELAKSASI PERNAPASAN PADA NYERI PERSALINAN. *JURNAL ILMIAH FORILKESUIT*, 1(2), 55.
- Aslamiyah, T., Hardiato, G., & Kasiati, K. (2021). Reducing Labor Pain With Warm Compress on the 1st Stage Labor of the Active Labor Phase. *Indonesian Midwifery and Health Sciences Journal*, 4(4), 295–305. <https://doi.org/10.20473/imhsj.v4i4.2020.295-305>
- Astuti, T., & Bangsawan, M. (2019). Aplikasi Relaksasi Nafas dalam terhadap Nyeri dan Lamanya Persalinan Kala I Ibu Bersalin di Rumah Bersalin Kota Bandar Lampung. *Jurnal Ilmiah Keperawatan Sai Betik*, 15(1), 59. <https://doi.org/10.26630/jkep.v15i1.1359>
- Baljon, K., Romli, M. H., Ismail, A. H., Khuan, L., & Chew, B. H. (2022). Effectiveness of Breathing Exercises, Foot Reflexology and Massage (BRM) on Maternal and Newborn Outcomes Among Primigravidae in Saudi Arabia: A Randomized Controlled Trial. *International Journal of Women's Health*, 14, 279–295. <https://doi.org/10.2147/IJWH.S347971>
- Black, M., Shetty, A., & Bhattacharya, S. (2008). Obstetric outcomes subsequent to intrauterine death in the first pregnancy. *BJOG: An International Journal of Obstetrics and Gynaecology*, 115(2), 269–274. <https://doi.org/10.1111/j.1471-0528.2007.01562.x>



- Chotimah, S. H., Indrayani, T., & Carolin, B. T. (2020). Perbedaan Teknik Pernafasan Dan Teknik Kneading Terhadap Intensitas Nyeri Pada Persalinan Kala I Fase Aktif Di Wilayah Walantaka Kota Serang Tahun 2020. *Jurnal Ilmiah Kesehatan Dan Kebidanan*, IX(2).
- Desi Ernita Amru, Astik Umiyah, Pintam Ayu Yastirin, Neny Yuli Susanti, D. A. N. (2022). Effect of Deep Breathing Techniques on Intensity of Labor Pain in The Active Phase. *The International Journal of Social Sciences World*, 3(2), 359–364.
- Farahmand, M., Khooshab, E., Hasanzadeh, F., Amooee, S., & Akbarzadeh, M. (2020). The effect of warm compress Bi-stage on pain strength in labor stages and after delivery. *International Journal of Women's Health and Reproduction Sciences*, 8(1), 46–52. <https://doi.org/10.15296/ijwhr.2020.06>
- Fitri, 2019. (n.d.). *Hubungan Teknik Nafas Dalam Terhadap Pengurangan Intensitas Nyeri Kala I Fase Aktif di Klinik Pratama Jambu Mawar*.
- Fitriati, E., Yunita, P., & Marzila Fahnawal, T. (2021). Pengaruh Kompres Hangat Terhadap Intensitas Nyeri Persalinan Kala 1 Fase Aktif Pada Ibu Bersalin Di Ruang Kebidanan Rsud Raja Ahmad Tabib Tanjungpinang. *Zona Kebidanan*, 12(1), 123–136.
- Gallo, R. B. S., Santana, L. S., Marcolin, A. C., Duarte, G., & Quintana, S. M. (2018). Sequential application of non-pharmacological interventions reduces the severity of labour pain, delays the use of pharmacological analgesia, and improves some obstetric outcomes: a randomised trial. *Journal of Physiotherapy*, 64(1), 33–40. <https://doi.org/10.1016/j.jphys.2017.11.014>
- Hu, Y., Lu, H., Huang, J., & Zang, Y. (2021). Efficacy and safety of non-pharmacological interventions for labour pain management: A systematic review and Bayesian network meta-analysis. *Journal of Clinical Nursing*, 30(23–24), 3398–3414. <https://doi.org/10.1111/jocn.15865>
- Koyyalamudi, V., Sidhu, G., Cornett, E. M., Nguyen, V., Labrie-Brown, C., Fox, C. J., & Kaye, A. D. (2016). New Labor Pain Treatment Options. *Current Pain and Headache Reports*, 20(2), 1–9. <https://doi.org/10.1007/s11916-016-0543-2>
- Labor, S., & Maguire, S. (1948). The Pain of Labour. *British Medical Journal*, 1(4553), 706. <https://doi.org/10.1136/bmj.1.4553.706-a>
- Mascarenhas, V. H. A., Lima, T. R., Dantas E Silva, F. M., Dos Santos Negreiros, F., Santos, J. D. M., Moura, M. Á. P., De Oliveira Gouveia, M. T., & Jorge, H. M. F. (2019). Scientific evidence on non-pharmacological methods for relief of labor pain. *ACTA Paulista de Enfermagem*, 32(3), 350–357. <https://doi.org/10.1590/1982-0194201900048>



- Morikawa, M., Sekizuka-kagami, N., & Tabuchi, N. (2020). Comparison of lumbar hot compresses and lumbar massage on labor pain-alleviating effects during the first stage of labor. *Journal of Nursing Science and Engineering*, 7(April 2019), 25–32.
- Aritonang NF. (2017). EFEKTIFITAS TEKNIK RELAKSASI NAFAS DALAM TERHADAP ADAPTASI NYERI PERSALINAN DI KLINIK BIDAN EKA SRI WAHYUNI KEC MEDAN DENAI TAHUN 2017. *BMC Public Health*, 5(1), 1–8.
- Nufra, Y. A., & Azimar, A. (2019). Pengaruh Pemberian Kompres Hangat Terhadap Penurunan Rasa Nyeri Persalinan Kala I Fase Aktif Di Bidan Praktek Mandiri Yulia Fonna Skm Desa Lipah Rayeuk Kecamatan Jeumpakabupaten Bireuen Tahun 2019. *Journal of Healthcare Technology and Medicine*, 5(2), 362. <https://doi.org/10.33143/jhtm.v5i2.481>
- Nugraheny, E. (2018). Efektifitas Pemberian Kompres Hangat Terhadap Pengurangan Rasa Nyeri Persalinan Kala I. *Jurnal Ilmu Kebidanan*, 2, 91–101.
- Nurhayati, Y. (2018). Pengaruh Teknik Relaksasi Pernafasan terhadap Penurunan Nyeri Persalinan pada Kala I Fase Aktif. *Jurnal Keperawatan Dan Kebidanan*, 45–48.
- Ofori, D. A., Anjarwalla, P., Mwaura, L., Jamnadass, R., Stevenson, P. C., Smith, P., Koch, W., Kukula-Koch, W., Marzec, Z., Kasperek, E., Wyszogrodzka-Koma, L., Szwer, W., Asakawa, Y., Moradi, S., Barati, A., Khayyat, S. A., Roselin, L. S., Jaafar, F. M., Osman, C. P., ... Slaton, N. (2020). Pengaruh kompres hangat terhadap penurunan nyeri pada persalinan kala 1. *Molecules*, 2(1), 1–12.
- Parsa, P., Khodakaramy, B., Farhadian, M., & ... (2020). The Effect of Breathing Techniques on Maternal Behavioral Changes against Labor Pain and APGAR Score in Primiparous Women. ... *Scientific Journal*, 18(2), 107–113. <https://doi.org/10.52547/psj.18.2.107>
- Petitprez, K., Mattuizzi, A., Guillaume, S., Arnal, M., Artzner, F., Bernard, C., Caron, F. M., Chevalier, I., Daussy-Urvoy, C., Ducloy-Bouthors, A. S., Garnier, J. M., Keita-Meyer, H., Lavillonnière, J., Lejeune-Sadaa, V., Le Ray, C., Morandeau, A., Nadjafizade, M., Pizzagalli, F., Schantz, C., ... Sentilhes, L. (2022). Normal delivery: physiologic support and medical interventions. Guidelines of the French National Authority for Health (HAS) with the collaboration of the French College of Gynecologists and Obstetricians (CNGOF) and the French College of Midwives (CNSF). *Journal of Maternal-Fetal and Neonatal Medicine*, 35(25), 6576–6585. <https://doi.org/10.1080/14767058.2021.1918089>



- Raana, H. N., & Fan, X. N. (2020). The effect of acupressure on pain reduction during first stage of labour: A systematic review and meta-analysis. *Complementary Therapies in Clinical Practice*, 39, 101126. <https://doi.org/10.1016/j.ctcp.2020.101126>
- Alfarisyii RS & Dewi FR. (2020). Fase Aktif Persalinan Normal di Puskesmas Sungai Durian Kabupaten Kubu Raya. *Jurnal Kebidanan Khatulistiwa*, 6, 35–42.
- Riska Susanti Pasaribu¹, Citra Kartika Tarigan², M. (2018). *PENGARUH KOMPRES HANGAT DAN MASSAGE PUNGGUNG TERHADAP PENGURANGAN RASA NYERI PERSALINAN KALA II DI PRAKTEK BIDAN MANDIRI BIDAN (PMB) DEBY KECAMATAN MEDAN AMPLS KOTA MEDAN*. 14, 63–65. <https://doi.org/10.15900/j.cnki.zylf1995.2018.02.001>
- Sandström, A., Altman, M., Cnattingius, S., Johansson, S., Ahlberg, M., & Stephansson, O. (2017). Durations of second stage of labor and pushing, and adverse neonatal outcomes: A population-based cohort study. *Journal of Perinatology*, 37(3), 236–242. <https://doi.org/10.1038/jp.2016.214>
- Smith, C., Levett, K., Collins, C., Dahlen, H., Ee, C., & M, S. (2018). management in labour (Review). *Cochrane Database of Systematic Reviews*, 3. <https://doi.org/10.1002/14651858.CD009290.pub3>. www.cochranelibrary.com
- Suyani, S. (2020). Pengaruh kompres hangat terhadap intensitas nyeri persalinan kala I fase aktif. *Jurnal Kebidanan*, 9(1), 39. <https://doi.org/10.26714/jk.9.1.2020.39-44>
- Thingbaijam, R., Devi, K., Memchoubi, N., & Sujita, D. (2017). *Effect of sacral warm compress on the level of pain during first stage of labour among primi gravida mothers*. 3(6), 144–149.
- Whitburn, L. Y., Jones, L. E., Davey, M. A., & McDonald, S. (2019). The nature of labour pain: An updated review of the literature. *Women and Birth*, 32(1), 28–38. <https://doi.org/10.1016/j.wombi.2018.03.004>
- Ying, L. C. (2017). Perinatal Massage Programme for Labour pain relief. *Introduction to Surgery for Students, September*, 297–309. https://doi.org/10.1007/978-3-319-43210-6_23
- Yuliandari, M., Septiani, L., Rowawi, R., Komalaningsih, S., & Garna, H. (2020). Effect of Zilgrei Method and Lumbal Massage Combination on Labor Progress during Latent Phase of First Stage of Labor in Primigravida. *Global Medical & Health Communication (GMHC)*, 8(2), 162–167. <https://doi.org/10.29313/gmhc.v8i2.5083>