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*Original Research*

# The effectiveness of using warm compresses and birthing balls on the anxiety level of the active phase of the first stage of labor

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**ABSTRACT**

*Background*: Labor accompanied by pain reaches 90% of events; however, in developed countries, around 7-14% give birth without pain. Several attempts were made through non-pharmacological methods, including warm compresses and a birthing ball, to reduce anxiety into the active phase of the first stage of labor.
*Objective*: This study aims to analyse the effectiveness of warm compresses and birthing *balls* on the anxiety scale of women in labor during the active phase I.
*Methods*: This quasi-experimental study involved 30 primiparous women and multiparas with a gestational age of 36-40 weeks in the third trimester. Maternity mothers were divided into two groups. The first group obtained warm compresses, while the second group received warm compresses and birthing balls. The Hamilton Anxiety Rating Scale (HARS) was used before and after the intervention to measure labor pain.
*Results*: The independent t-test showed that warm compresses combined with the birthing ball were more effective in reducing anxiety levels than just warm compresses (p-value 0.030<0.05). The average score of respondents' anxiety after being given a warm compress was 48.60, and the average score of respondents' anxiety after being given a warm compress and birthing ball was 42.87.
*Conclusion*: The non-pharmacological method of using warm compresses *with* the birthing ball considerably reduces women's anxiety level in labor in the first active phase compared to only the single method of warm compresses.



## 1. Introduction

The beginning of cervical dilatation to complete in the first stage of labor is defined as the start of labor contractions from the first stage of the latent phase to the first stage of the active phase (Kitzinger, 2012). In the first stage of labor, women experience labor pains whose duration, frequency, and strength increase every time, so they need comfort to adapt to these labor pains (Sundaram et al., 2022). The pain experienced by women varies widely with

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different methods of non-pharmacological relief (Gunadi et al., 2022; Thomson et al., 2019). Global data shows that out of 27 million mothers giving birth in 121 obstetric centres from 36 countries, only 15% of deliveries take place without pain or mild pain, 35% are accompanied by moderate pain, 30% are accompanied by severe pain, and 20% are accompanied by very severe pain. The number of mothers giving birth in Indonesia was recorded at 5,050,637 people, an estimated 20% increase yearly, and 90.32% were assisted by health workers, namely doctors and midwives. As much as 90% of deliveries are accompanied by pain, although it has advanced to around 7-14% of painless births in society. Therefore, in the medical field, apart from pharmacological therapy, various alternative therapies and non-pharmacological techniques have been developed to reduce pain and fear during the birth process (Kemenkes RI, 2019).

The mother's anxiety level during labor will impact the delivery process, affecting the increase in respiratory frequency, heart rate, reduced energy, and fatigue during labor (Andriany & Gamayani, 2021). Efforts to reduce anxiety levels can be made both pharmacologically and non-pharmacologically (Thomson et al., 2019). Pharmacologically, it is by analgetic epidural injections, perineal and pudendal nerve blocks, using a Transcutaneous Electrical Nerve Stimulation (TENS) machine to stimulate the body to produce painkilling compounds. (Simkin & Bolding, 2004) Non-pharmacological management includes presenting a birth companion, changing position and movement, touch and massage, hypnosis, warm and cold compresses, soaking in warm water, acupuncture therapy, birthing balls, visualisation and concentration, and music (Aswitami & Septiani, 2020; Nufra & Azimar, 2019).

An alternative non-pharmacological method, namely warm compresses, has also been widely used to reduce pain in the first active phase of normal labor. A rubber bag is used for the equipment, filled with warm water at 36º- 40ºC. Warm compresses are placed on the lower back, and the woman’s position is tilted to the left. Giving this warm compress can be done for 20-30 minutes (Helti & Nila Hayati, 2022; Widi Astuti et al., 2020). In addition, relaxation using the Birthing Ball is commonly known in Pilates as fitball, swiss ball, and Petzi ball. The birthing ball is a physical therapy ball that helps women in labor in the first stage to adjust to a comfortable position, where the benefits besides relaxation also help cervical dilatation to progress labor (Yeung et al., 2019). The benefits of sitting on the ball and rocking back and forth are that it makes you feel comfortable and helps the progress of labor by using

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gravity while increasing the release of endorphins because the elasticity and curvature of the ball stimulate the receptors in the pelvis, which are responsible for secreting endorphins (Fitriahadi & Utami, 2019).

In a study conducted by Sahtria in 2015, with a p-value of <0.001, there was a decrease in the first active phase of labor pain after pelvic rocking was carried out with a birthing ball in pregnant women. In line with research in Iran, it was found that the p-value was <0.05 in the intervention group using the birthing ball (Kristiani et al., 2019). This shows a statistically significant relationship between the use of birthing balls and the intensity of labor pain. Other studies have also shown the difference in the effect of the birthing ball intervention on reducing pain during the first active phase in primigravidas with a p-value < 0.001, and there was also a difference in the effect of using the birth ball on the duration of labor. Using a birth ball has been shown to reduce active phase labor pain and accelerate the duration of the first stage. Birthing balls are recommended as an alternative to adapt to labor pain, duration, and effects on women's comfort and satisfaction while in midwifery services (Gau et al., 2011; Ulfa, 2021).

Based on these reasons, we aimed to analyse the effectiveness of warm compresses and birthing balls on the anxiety level of mothers in the first active phase. Therefore, the advantages of warm compresses and birthing balls are that they increase blood flow to the uterus, the placenta, and the baby, reduce pressure and can increase the exit of the pelvis by as much as 30%, provide comfort to the knees and ankles, provide back pressure on the perineum and thighs, performance gravity will push the baby down thereby accelerating the birth process.

## 2. Methods

The research method used was quasi-experimental with pretest and posttest group design techniques. This research was conducted at PMB W Banjarmasin. The population used was all third-trimester pregnant women expected to give birth in December 2022. The sample consisted of 30 women in the active phase of labor, which were divided into two groups, namely the control group with warm compresses and the treatment group with birthing balls, each group with 15 respondents. The anxiety scale measurement used is the HARS (Hamilton Anxiety Rating Scale) which consists of 14 statement items by Nursalam (Aswitami & Septiani, 2020).

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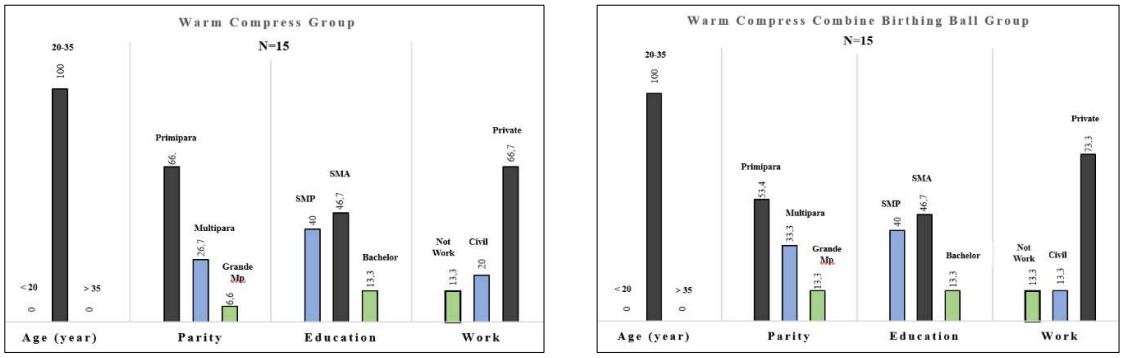
## 3. Results

### *Characteristics of Respondents*

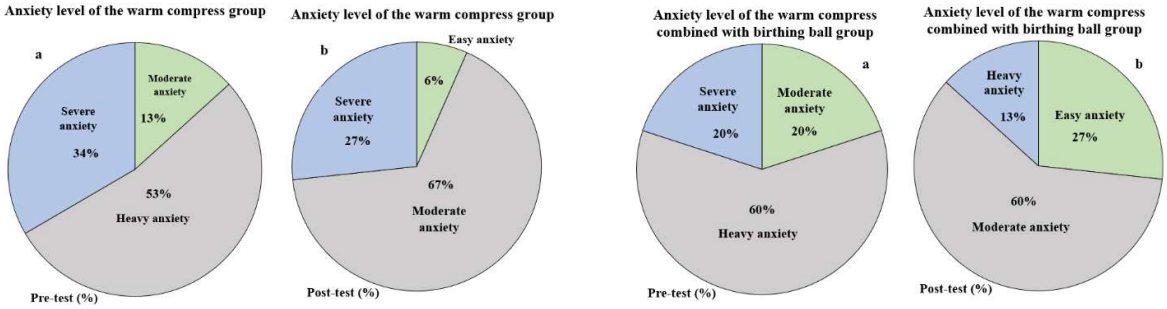
The characteristics of respondents in this study included two groups, namely the warm compress group and the warm compress group combined with birthing balls shown in Figure 1 and Figure 2, as follows:




(A) (B)

Figure 1. (A) Characteristics of the warm compress group, (B) Characteristics of the warm compress combined with birthing ball group

### *Univariate analysis*




(A) (B)

Figure 2. (A) Anxiety Levels Before (a) and After (b) giving warm compress, (B) Anxiety Levels Before (a) and After Giving (b) Warm Compress Combined with Birthing Ball Group

Based on Figure 1, the age category is 20 -35 years (100%) in both groups. The most parity category was primipara (66.7%; 53.4%). The most educated in both groups, the average was high school (46.7%). Meanwhile, for the job category, the self-employed are higher than ASN and the unemployed of the two groups (66.7%; 73.3).

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Then, in Figure 2, it is shown that the level of anxiety decreased in both groups. The enormous pain scale before (pretest-3a) treatment in the warm compress group was in the severe anxiety category (53%), and after (posttest-3b) treatment decreased to the moderate anxiety category (67%). Meanwhile, severe anxiety (34%) decreased to (27%). For the results shown in Figure 4, the anxiety level of the warm compress combined with the birthing ball group before (pretest-4a) was given treatment was highest in the category of heavy anxiety (60%), severe anxiety (20%), and moderate anxiety (20%). Then the anxiety scale after (posttest-4b) was given intervention also decreased from heavy anxiety to moderate anxiety (60%), severe anxiety to heavy anxiety (13%), and moderate anxiety decreased to the level of manageable anxiety (27%).

***Bivariate Analysis***

Table 1. Results of Giving Warm Compresses and Birthing Balls

| | Warm Compress | | Warm Compress Combined with Birthing Ball | |
|---|---|---|---|---|
| | Mean | p-value | Mean | p-value |
| Pre-test | 60,73 | 0,0001 | 60,53 | 0,0001 |
| Post-test | 48,60 | | 42,87 | |

Based on Table 1, the average respondent's anxiety score before a warm compress was 60.73 and decreased after a warm compress by 48.60. Statistical test results using the paired t-test obtained a p-value of 0.0001, meaning that warm compresses effectively affect the mother's anxiety level during the first active phase of labor. The average score of respondents' anxiety before the birth ball was 60.53 and decreased after the birthing ball to 42.87. The results of statistical tests using the paired t-test obtained a p-value of 0.0001, which means that using a birthing ball effectively affects the mother's anxiety level during the first active phase.

Table 2. Results of Differences in Effectiveness Between Warm Compresses and Warm Compresses Combined with Birthing Balls

| Type of Treatment | Average Anxiety Score | p-value | |
|---|---|---|---|
| Warm Compress | 48,60 | 0,030 | Difference |
| Warm Compress Combined with Birthing Ball | 42,87 | | |

Table 2 shows that the average respondent's anxiety score after being given a warm compress was 48.60, and the respondent's anxiety score after being given a warm compress and the birthing ball was 42.87. The results of statistical tests using the independent t-test

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obtained a p-value of 0.030, which means that there is a difference in the effectiveness of the combination of warm compresses and birthing balls on the anxiety level of the women during the first active phase.

## 4. Discussions

Regarding giving warm compresses and birthing balls as a non-pharmacological technique during the first stage of labor, the results show the difference between being given warm compresses only and warm compresses combined with birthing balls. The experience of giving birth for some women is different, including the pain experienced can cause discomfort (Türkmen & Oran, 2021) and anxiety (Çevik & Karaduman, 2020; Wu et al., 2022) and fear during labor (Schuiling & Sampselle, 1999). Worry, anxiety, fear, and even self-confidence are also affected by pain due to contractions in the active phase of stage I (Morikawa et al., 2020). Managing the pain in question is not eliminating or reducing pain; however, an adaptation to divert the attention of women in labor with a sense of comfort and calm. Women giving birth in these uncomfortable conditions increase high activity, thus experiencing fatigue (Dahlen et al., 2009), relaxation of muscle spasms, and severe anxiety to severe mental disorders (Türkmen & Oran, 2021). The emergence of uterine contractions as a sign of adequate and regular cervical dilatation opening is accompanied by aches and pains that cannot be avoided or reduced in intensity (Ahmed et al., 2019). Pain management strategies include non-pharmacological interventions to help women adapt to pain and pharmacological interventions to relieve labor pain. The experience between women's physical and emotional processes affects anxiety and fear of facing labor. If it is not appropriately handled, the mother experiences fatigue, and the duration of labor lasts longer. And in a state of anxiety and fatigue, the woman or her family is unsatisfied with the services received (Ganji et al., 2013).

In terms of the differences between these two methods, many studies have been conducted, especially in Indonesia; the results of measuring pain and anxiety scales after being given warm compresses decreased significantly, but in a short time and carried out continuously during the first phase of the process until complete dilatation of the cervix. Pain intensity that can be tolerated has not shown the results of the condition, whether anxiety and discomfort are also on the threshold of normal. Therefore, from observing the anxiety scale in this study, the warm compress treatment group combined with the birthing ball was

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more effective, with a p-value of 0.030, in reducing anxiety in the first stage. In a similar study, research before and after giving warm compresses and birthing balls showed decreased anxiety levels. Giving warm compresses and birthing balls during the first stage of labor gives comfort it can divert the pain experienced by the patient. Apart from that, this method can also increase body relaxation (Anggraeni A, 2021; Marlina, 2018). The birthing ball uses a rubber ball filled with air. The study states that giving warm compresses and birthing balls has the effect of reducing anxiety levels. In line with research by Wahyuni et al. (2021), the results of using a combination of these two methods reduce the anxiety level of mothers in labor during the first active phase (Wahyuni et al., 2021). The advantage of this birthing ball is that it increases blood flow to the uterus, placenta, and baby, relieves pressure and can increase pelvic output by as much as 30%, provides comfort for the knees and ankles, provides counter-pressure on the perineum and thighs, works with gravity pushing descent of the baby thereby accelerating the delivery process (Farrag, 2018; Taavoni et al., 2016).

Furthermore, the results of this study also discuss the relationship between the success of the two non-pharmacological treatments and the determinants of the respondent's characteristics. Age and parity are correlated with views and ways of thinking about something, so with the age of 20-35 years, acting in dealing with something will be more mature. It's different from those under 20 who are still minimal in thinking things through. In addition, the low level of anxiety in those aged over 35 years can be due to neuroticism (Djudiyah et al., 2016). Education does not have a significant relationship with anxiety levels; individuals with higher levels of education generally tend to be more aware of existing health services, so they access health information more frequently. A high level of education will have an understanding and adaptive response to an event so that it tends not to form fearful perceptions in making improvements to get higher expectations or be sensitive to the situation. The relationship between job characteristics and anxiety levels was found to be different before giving warm compresses. These results are in line with research by (Saragih et al., 2022) that respondents who work both as civil servants and are self-employed have a higher level of anxiety than women who do not work due to the minimal burden of thoughts and work must be borne so they have an easy anxiety level (Fortuna et al., 2022). Even though they have higher anxiety, there is a change in the decrease in anxiety levels after giving therapy, either warm or warm compresses and birthing balls.

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## 5. Conclusion

This study identified the primiparous individual characteristics that determine the new experience of anxiety and discomfort due to the first stage of labor pain. Warm compresses combined with birthing balls are associated with better outcomes than without birthing balls. Both methods are effective non-pharmacological alternative therapies and midwifery interventions for adapting to labor pain and reducing negative perceptions of anxiety, fear, and lack of confidence during critical phases. The overall practical implications of this are easy to apply, low cost, and harmless.

## 6. References

Ahmed, M., Demissie, M., Worku, A., Abrha, A., & Berhane, Y. (2019). Socio-cultural factors favoring home delivery in Afar pastoral community, northeast Ethiopia: A Qualitative Study. *Reproductive Health*, *16*(1), 1–9. https://doi.org/10.1186/s12978-019-0833-3

Çevik, SA., & 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

Anggraeni A, D. (2021). Pengaruh Terapi Birthball Terhadap Tingkat Kecemasan dan Penurunan Intensitas Nyeri Pada Ibu Bersalin Primipara Kala I Fase Aktif. *Jurnal Penelitian Dan Kajian Ilmiah Kesehatan*, *7*(2), 116–123.

Aswitami, N. G. A. P., & Septiani, N. G. A. P. (2020). Antenatal Clinical Hypnosis and Birth Ball Exercise as Adjunct Therapy For Management of Labor and Delivery Pain: a Summary of Its Empirical Findings. *Jurnal Midpro*, *12*(2), 233. https://doi.org/10.30736/md.v12i2.229

Dahlen, H. G., Homer, C. S. E., Cooke, M., Upton, A. M., Nunn, R. A., & Brodrick, B. S. (2009). "Soothing the ring of fire": Australian women's and midwives' experiences of using perineal warm packs in the second stage of labour. *Midwifery*, *25*(2). https://doi.org/10.1016/j.midw.2007.08.002

Djudiyah, Sulastiana, M., Harding, D., & Sumantri, S. (2016). Gender Differences in Neuroticism on College Students. *ASEAN Conference 2nd Psychology & Humanity*, 723–728.

Eka Andriany, Uni Gamayani, N. A. (2021). EFEKTIFITAS KOMPRES HANGAT DAN BIRTH BALL TERHADAP PENURUNAN RASA NYERI PADA IBU BERSALIN KALA 1 FASE AKTIF DI PMB MARTINI DAN PMB ROSLINA KABUPATEN ACEH UTARA. *Jurnal Kesehatan Samodra Ilmu*, *12*(1). https://doi.org/https://doi.org/10.55426/jksi.v12i1.142

**Health Sciences International Journal (HSIJ)**
Vol. 1, No. 1, August 2023, pp. 1 – 11
ISSN: 3026-5037 DOI: https://doi.org/10.71357/hsij.v1i1.3

Farrag, R. E. (2018). Using of Birthing Ball during the first Stage of Labor: Its Effect on the Progress of Labor and Outcome among Nulliparous Women. *International Journal of Nursing Didactics*, *8*(09), 01–10. https://doi.org/10.15520/ijnd.v8i09.2289

Fitriahadi, & Utami. (2019). Buku Ajar Asuhan Persalinan & Managemen Nyeri Persalinan. *Universitas Aisyiyiah Yogyakarta*, 284 hlm.

Fortuna, A. D., Saputri, M. E., & Wowor, T. J. F. (2022). Faktor – Faktor Yang Berhubungan Dengan Tingkat Kecemasan Warga Pada Masa Pandemi Covid-19 Tahun 2021 Di Kecamatan Sukmajaya Kota Depok. *Jurnal Keperawatan*, *10*(1), 34. https://doi.org/10.35790/jkp.v10i1.38850

Ganji, Z., Shirvani, M. A., Rezaei-Abhari, F., & Danesh, M. (2013). The effect of intermittent local heat and cold on labor pain and child birth outcome. *Iranian Journal of Nursing and Midwifery Research*, *18*(4), 298–303.

Gau, M. L., Chang, C. Y., Tian, S. H., & Lin, K. C. (2011). Effects of birth ball exercise on pain and self-efficacy during labor: A randomised controlled trial in Taiwan. *Midwifery*, *27*(6), e293–e300. https://doi.org/10.1016/j.midw.2011.02.004

Gunadi, Agus, Nurhayati Adnan , Fitrianingsih Endang Cahyawati, Tri Hapsari Listyaningrum, S. S. (2022). Trend of Non-Pharmacological Therapy for First Phase of Active Labor Pain: A Pilot Study. *Jurnal Epidemiologi Kesehatan Indonesia*, *6*(1), 29–34.

Helti, M. R., & Nila Hayati. (2022). The Effect of Warm Compresses on the Intensity of Labor Pain in Primigravida Mothers in the First Stage of Active Phase at the Blangkajeren City Health Center in 2022. *Science Midwifery*, *10*(5), 3641–3650. https://doi.org/10.35335/midwifery.v10i5.908

Kitzinger, S. (2012). *The New Experience of Labor*.

Kristiani, M., Utami, N. W., & Susmini. (2019). Faktor-faktor yang berhubungan dengan pengambilan keputusan persalinan SC pada ibu di RSIA Melati Husada Malang. *Nursing News*, *2*(3), 386–397.

Marlina, E. D. (2018). Pengaruh Pemberian Kompres Hangat terhadap Penurunan Kecemasan dan Nyeri Selama Kala I Fase Aktif Persalinan. *Jurnal Ilmiah Bidan*, *3*(1), 9–14.

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.

**Health Sciences International Journal (HSIJ)**
Vol. 1, No. 1, August 2023, pp. 1 – 11
ISSN: 3026-5037 DOI: https://doi.org/10.71357/hsij.v1i1.3

Na Wu, Rong Huang, Shanshan Shan, Yuehong Li, H. J. (2022). *Effect of the labour roadmap on anxiety, labour pain, sense of control, and gestational outcomes in primiparas*. *20*(February), 56–65.

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

Saragih, I. S., Simorangkir, L., Siallagan, A., & Saragih, I. D. (2022). Tingkat Kecemasan dan Analisis Faktor- Faktor yang Mempengaruhi Kecemasan Pasien Covid-19. *Jurnal Keperawatan Jiwa*, *10*(2), 363. https://doi.org/10.26714/jkj.10.2.2022.363-374

Schuiling, K. D., & Sampselle, C. (n.d.). *Exploring the Presence of Comfort within the Context of Labor*. 197–214.

Simkin, P., & Bolding, A. (2004). Update on nonpharmacologic approaches to relieve labor pain and prevent suffering. *Journal of Midwifery and Women's Health*, *49*(6), 489–504. https://doi.org/10.1016/j.jmwh.2004.07.007

Sundaram, M., Bhuvaneswari, G., & Chandrika, A. (2022). Birthing ball technique and Sacral Massage on Maternal and fetal wellbeing: An Experimental-Pilot report. *Cardiometry*, *23*, 173–178. https://doi.org/10.18137/cardiometry.2022.23.173178

Taavoni, S., Sheikhan, F., Abdolahian, S., & Ghavi, F. (2016). Birth ball or heat therapy? A randomized controlled trial to compare the effectiveness of birth ball usage with sacrum-perineal heat therapy in labor pain management. *Complementary Therapies in Clinical Practice*, *24*, 99–102. https://doi.org/10.1016/j.ctcp.2016.04.001

Thomson, G., Feeley, C., Moran, V. H., Downe, S., & Oladapo, O. T. (2019). Women's experiences of pharmacological and non-pharmacological pain relief methods for labour and labor: A qualitative systematic review. *Reproductive Health*, *16*(1). https://doi.org/10.1186/s12978-019-0735-4

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

**Health Sciences International Journal (HSIJ)**
Vol. 1, No. 1, August 2023, pp. 1 – 11
ISSN: 3026-5037 DOI: https://doi.org/10.71357/hsij.v1i1.3

Ulfa, R. M. (2021). Effect of the Use of Birth Balls on the Reduction of Pain and Duration of Labor During the First Stage of Active and Second Stage of Labor in Primigravida Maternity. *Science Midwifery*, *9*(2), 418–430.

Wahyuni, S., Wijayanti, I., & Betsy Maran, W. (2021). Efektivitas Birth Ball Exercisepada Ibu Bersalin Kala Iterhadap Lama Kala I Fase Aktif Dan Lama Kala Ii Di Ruang Bersalin Puskesmas Arso 3Kabupaten Keroom Provinsi Papua. *Intan Husada: Jurnal Ilmu Keperawatan*, *9*(1), 9–20. https://doi.org/10.52236/ih.v9i1.204

Widi Astuti, T., Susiloningtyas, I., Leny Wulandari, C., & Studi Kebidanan Program Sarjana dan Pendidikan Profesi Bidan, P. (2020). Literatur Riview: EFEKTIFITAS MASSAGE EFFLEURAGE TERHADAP TINGKAT NYERI PADA IBU BERSALIN. *Jurnal Keperawatan P-Issn*, *6*(2), 2477–1414.

Yeung, M. P. S., Tsang, K. W. K., Yip, B. H. K., Tam, W. H., Ip, W. Y., Hau, F. W. L., Wong, M. K. W., Ng, J. W. Y., Liu, S. H., Chan, S. S. W., Law, C. K., & Wong, S. Y. S. (2019). Birth ball for pregnant women in labour research protocol: A multi-centre randomised controlled trial. *BMC Pregnancy and Labor*, *19*(1), 1–6. https://doi.org/10.1186/s12884-019-2305-8