



The Differences of Pain During the First Labor Before And After Being Treated with Abdominal Lifting on Maternity in Surabaya City

Titi Maharrani¹, Aida Amaliya, Domas Nurchandra Pramudianti, Rekawati Susilaningrum

Department of Midwifery, Polytechnic Health Ministry of Health Surabaya,
Jalan Karangmenjangan No.12, 60282, Indonesia
titimaharrani@gmail.com

Abstract. This study aims to analyze the differences in pain before and after giving abdominal lifting to women in the first stage of labor. Methods: This research is a type of pre-experimental research design with a one-group pretest-posttest research design. The sample in this study was taken using a purposive sampling technique with a total of 49 respondents to mothers with the inclusion criteria for mothers giving birth on the date the study took place, during the first active phase, opening 4-10 cm, aged 20-35 years, willing to be respondents, primigravida and multigravidas. The independent variable is the abdominal lifting treatment, while the dependent variable is pain in the first stage of labor. The data collection instrument uses the NRS (Numeric Rating Scale) scale. Data analysis used the Wilcoxon signed rank test. Results: The results of this study indicate that there are differences in pain in the first stage of labor before and after being given the abdominal lifting treatment in birthing mothers with a significance value of $p\text{-value } 0.000 < \alpha (0.05)$ so that it can be interpreted that H_0 is rejected and H_1 is accepted. The results of this study are suggested to be an alternative method of reducing non-pharmacological pain in women in the first stage of labor Conclusion: There are differences in pain during the first stage labor before and after being given the abdominal lifting treatment.

Keywords: Pain, Abdominal Lifting, Labor

1 Introduction

Childbirth is a wonderful thing for a woman. Research conducted by anthropologists states that the process of pregnancy and childbirth is an important experience in a woman's life cycle. Childbirth is a physiological process, but most of the mothers in the first stage of labor feel pain due to stretching of the uterus and thinning of the cervix [1]. WHO (World Health Organization) (2020) in Liana (2021) reports that the incidence of women who lose their lives during childbirth and pregnancy is 295,000. In 2017, southern Asia and Africa contributed the highest MMR worldwide, which was around 86%. It has been recorded that as many as 211 maternal mortality rates (MMR) have

© The Author(s) 2023

T. Triwiyanto et al. (eds.), *Proceedings of the 6th International Conference of Health Polytechnic Surabaya (ICoHPS 2023)*, Advances in Health Sciences Research 72,

https://doi.org/10.2991/978-94-6463-324-5_62

decreased by 38% since 2000 globally per 100,000 live births. The Chairperson of the International Scientific Committee Conference on Indonesia Family Planning and Reproductive Health (ICIFPRH) in Sali Susiana (2019) stated that Indonesia's 2015 MMR (Maternal Mortality Rate) target is 102 per 100,000 live births. But in fact, until 2019, the MMR in Indonesia was still high, namely 305 per 100,000 live births.

In 2020, MMR in East Java increased, driven by the CO-19 pandemic. The East Java Strategic Plan target is 89.92, but the MMR data in East Java is now 98.39. Even though it is almost close to the MMR target, efforts to reduce MMR must be supported by the community in various sector [2]. The condition of MMR in Surabaya was recorded at 57 per 100,000 live births [3]. Efforts to reduce MMR are closely related to health workers, especially midwives, providing care starting from antenatal care services, birth planning and prevention of complications, and postpartum [4]. A British study of childbirth mothers found that 93.5% of women believed childbirth was a state of great distress for the mother. On the other hand, in Finland, 80% of women find childbirth painful and unbearable [5]. A study by Root et al. According to in Sari (2021), 68.3% of mothers reported that childbirth was accompanied by severe pain, and more than 86% of mothers would like to take steps to reduce pain during labor increase.

Aminah in Sitawati explained the results of a survey in a hospital in Indonesia: out of 10 mothers giving birth, only one person (10%) stated mild pain, two people (20%) moderated pain, and seven people (70%) had severe pain. Whereas in the results of a study conducted by Nurdiantini on primiparous and multiparous women during the first stage of labor, there were three people (15%) with moderate pain, eleven people (55%) with severe pain, and six people (30%) with very severe pain [5]. The birth process is the main cause for women with the potential to die during childbirth as a result of uterine inertia, namely interference with uterine contractions due to labor pain [6]. Pain during labor is caused by the anxiety, discomfort, and worries of the mother facing labor. Pain during childbirth is a common condition experienced by mothers in labor; therefore, giving birth normally without indications makes it very rare for pain reduction procedures to be carried out in the first stage [7]. Pain during the first stage of labor caused by anxiety results in psychological stress. When the mother feels stressed, the adrenaline hormone will increase, while the adrenaline hormone works parasympathetically with uterine contractions. Increasing the adrenaline hormone will inhibit contractions and slow labor [8].

Pain leads to increased sympathetic nerve activity, which can cause increased heart pressure, changes in blood pressure, changes in breathing, increased heart rate, nausea, vomiting, skin color changes, and excessive sweating. Pain can also cause behavioral changes in the mother, such as sobbing, crying, erratic limb movements, and muscle tension throughout the body [9]. There are several ways to reduce the sensation of pain during labor and improve maternal health through complementary treatments such as massage, breathing exercises, aromatherapy, music therapy, and birthing ball exercises [1]. According to Ayuningtyas, published in Sitawati (2023) in 2019, examples of labor pain treatments include acupuncture techniques, repositioning, aromatherapy, acupressure, hydrotherapy, massage effleurage, counterpressure, and music therapy tummy tucks and more. Of the several techniques, abdominal lifting is a technique that is easy to do when the mother feels contractions, with the mother lying on her back, placing

her head slightly higher, both hands behind the patient's waist, then touching the opposite direction to the top of the stomach without pushing into the stomach [10].

This method has not been widely used, especially in PM (Independent Midwife Practice) in the city of Surabaya. One of them is PM Frida Hari Surabaya. PM Frida Hari is one of the PBS in Surabaya with a relatively high number of deliveries compared to other PUBs. Thus, the application of abdominal lifting labor pain reduction techniques is expected to reduce pain during childbirth. The abdominal lifting method is an alternative and easy method of reducing pain because it only requires light strokes/touches. This method can reduce pain/pain in the back, has the advantage because by doing this method, the force of gravity can be optimized. It can be done at every stage of labor so that labor will be faster [11]. The position when doing abdominal lifting can align the long axis of the fetus with the pelvic inlet. Thus, this method can reduce pain during labor [10]. That way, the abdominal lifting technique needs to be done to reduce labor pain.

2 Method

This type of research is a pre-experimental design method, namely experiments that still have external variables that will influence the dependent variable, there are no control variables, the sample is not randomly selected [12]. The design used in this study was a pre-treatment and post-treatment group design (one group pretest – posttest design). The pre-treatment measurements provide information about principles related to the possibility of the subject if there is no treatment [13].

The procedure for performing the abdominal lifting is to ask the mother to lie on her back on the patient's bed, place her head higher, place both palms behind her hips, and simultaneously stroke the crown of her head in the opposite direction. Start by advising you to do not press the abdomen inward and perform abdominal raises only when the mother is in labor. The rate of administration is 2-3 times per minute, the duration is 50-60 seconds, and the dilation of the cervix is 4-10 cm. For four to five doses, researchers use the NRS scale (numerical rating scale) to measure the pain felt by mothers after a abdominal lifting.

This study used the Wilcoxon signed rank test because the data was not normally distributed to analyze differences in pain between two paired samples using SPSS software. Significance value or p -value <0.05 in the Wilcoxon statistical test, there is a significant difference [14].

3 Results

Respondents to this study were mothers who gave birth on 13th February – 31st March 2023 at Independence Midwifery Practice Farida Hajri Surabaya, totaling 49 people (Table 1 and Table 2).

Table 1. Frequency Distribution of Pain in the First Stage of Labor Before Being Given the Abdominal Lifting Treatment

Frequency (n)	Percentage (%)	Average Pain
49	100	6,47

Table 2. Frequency Distribution of Pain in the First Stage of Labor After Being Given Abdominal Lifting Treatment

Frequency (n)	Percentage (%)	Average Pain
49	100	5,51

Before the different test was carried out, a normality test was carried out using the Shapiro Wilk and a significance result of <0.05 was obtained so that the interpretation of the results was that the data was not normally distributed. Therefore, data analysis uses the Wilcoxon test.

Table 3. Analysis of Differences in Pain in the First Stage of Labor Before and After Being Given Abdominal Lifting Treatment Using the Wilcoxon Test

Before being given the abdominal lifting treatment		After being given the abdominal lifting treatment		ρ - value
Frequency (n)	Average	Frequency (n)	Average	
49	6,47	49	5,51	0,000

Based on Table 3, it can be seen that the data that has been obtained is analyzed using the Wilcoxon test to see the difference in pain before and after giving abdominal lifting with a delta value of 0.96. The results of the analysis of the data obtained using the Wilcoxon test had a significance value of 0.000 so that the interpretation of the results was ρ -value $0.000 < \alpha$ (0.05). It can be explained that there is a difference in pain before and after being given abdominal lifting treatment in laboring mothers.

4 Discussion

According to Potter & Perry's theory in Refindo pain on the NRS scale is classified into 4, namely: numbers 0 indicate no pain, numbers 1-3 mild pain, numbers 4-6 moderate pain, and numbers 7-10 severe pain [15]. Based on the research data obtained, the pain experienced by 49 respondents before abdominal lifting had an average of 6.47 on a pain scale of 0-10. The interpretation of this value is moderate pain, which is a condition when a mother in labor experiences a pain response grinning, hissing, but can show the location of the pain point and can describe it and still be able to follow directions. In line with this, several studies such as another study conducted

by Arantika, et al concerning differences in pain in the first stage of pre and post labor giving abdominal lifting interventions, effleurage massage, and deep back massage showed that the average pain score before abdominal lifting was 7, 4 on a scale of 0-10. This score indicates the average patient has severe pain [16]. Tuti, et al regarding the difference in pain in the first stage between abdominal lifting and counter pressure in women giving birth . The average pain score before giving abdominal lifting was 4.14 on a scale of 0-10 (moderate pain) [17]. Ryka, et al regarding reducing pain in the first stage of labor with effleurage massage and abdominal lifting, it was found that the average pain before giving abdominal lifting was 8.80 on a scale of 0-10 (moderate pain) [18]. The mechanism of pain during labor arises due to a response from the nerves due to contractions of the uterus which cause tissue damage around the vagina during labor [19]. Pain is a body mechanism for dealing with discomfort from pain, so that pain is a subjective event experienced by everyone, so everyone's body response to pain will be different [18].

Pain in labor occurs due to the activity of a dilated cervix, stretching of the pelvic floor muscles, and a stretched vagina. Labor pain consists of 2 types, namely visceral and somatic pain. Visceral pain is pain caused by contractions of the uterine wall due to cervical activity which dilates causing discomfort which causes thinning of the cervix and uterine ischemia so that blood cannot flow properly. This creates a deficit of oxygen in the area. Visceral pain originates from the lower abdomen, radiating to the back and down the femur. This pain occurs when the first stage of labor starts from opening I to approaching complete opening and stage II. Meanwhile, somatic pain is pain caused by a decrease in the lowest part of the fetus, resulting in pressure on the bladder, intestines, and stretching of the perineum [20]. There are many factors that can cause labor pains. Age is one of them. Yushi et al. found an association between age and pain intensity during the first stage of labor. Between the ages of 20 and 35, women undergo maximum physical and mental growth. Women in this age group are ready to go through the process of pregnancy and childbirth [21].

Age factor and birth factor are two factors that play an important role in labor because age affects a person's pain response. Young people experience more pain than adults, and primiparous women experience more pain than multiparous women because of increased pain perception [22]. Of course, the situation is different when compared to multiparous women. Multiparous women are more experienced in giving birth and have less fear of giving birth [23]. In this study, half of the respondents were between the ages of 20 and 25, which corresponds to young ages. Almost all respondents were parous, so the pain range predominated between 4 and 6 for her. Maryuni conducted research on the relationship between maternal characteristics and labor pain. The results of this study showed that there was no relationship between education level and labor pain. Most of the respondents in the study had secondary education level characteristics. The respondent's occupation also showed no relationship with the first stage of labor pain experienced. In contrast to research conducted by Whitburn, et al in 2017 which stated that pain is related to a person's level of education and experience. This is because pain is individual and relative [24].

This research is in line with research conducted by Liana which stated that mothers who gave birth before carrying out the lifting abdominal pain reduction technique stated

that no birth mothers experienced pain on a scale of 0 and the majority of birth mothers experienced pain ranging from 4-6 on the pain scale 0-10 [1]. Based on this, the researchers assumed that parity and age affect the way a person controls the pain they experience. In terms of age, those who are too young and classified as at risk tend not to have good emotional maturity. Conversely, if the age of the mother is classified as a mature age, it will be easier to control pain and have good emotional control.

The abdominal lifting procedure is performed on laboring mothers in the latent or active phase. Lay the mother on her back, put the mother's head slightly higher, put her hands on her back and stroke in the opposite direction at the same time. Apply to the upper part of the abdomen without pressing inwards, lasting for 50-60 seconds during contractions, gives 2-3 long doses per minute [10]. One of Sri Wulan et al. combines his massage with tummy tucks and breath relaxation. It is performed for 60 minutes, during the active phase when it opens 4 to 8 cm in 2 to 3 minutes, resulting in an analgesic effect on abdominal lifting [11]. Ratna's research performed abdominal lifting for women in labor in the first phase of the active phase in 2-3 times per minute lasting 50-60 seconds at an opening of 4-10 cm and there was an effect of abdominal lifting on reducing labor pain [7]. Ryka et al regarding the effectiveness of massage effleurage and abdominal lifting for labor pain in the active phase I stage I was carried out in 5 minutes for 5 treatments in approximately 20 minutes using a facial scale and showed that there were differences in pain before and after giving the mother the abdominal lifting treatment delivery [18].

Doing abdominal lifting to reduce labor pain can be applied to mothers in the first stage of labor because of the habit of Indonesian people reducing pain by touching or massaging the area that hurts. By doing abdominal lifting by the provider, the birthing mother will feel cared for, loved, cared for, and will increase her sense of comfort and the mother will have increased strength in facing labor [1]. According to research conducted by Erickson on reducing pain with abdominal lifting in women giving birth in Nadia & Ika all research volunteers showed a decrease in pain scores, although not significantly. This study applied the concept that being given a massage will produce endorphins which have the function of creating a sense of comfort so that during labor the mother can feel comfortable and can relieve pain [10].

The use of abdominal lifting techniques in reducing labor pain has other benefits. It can optimize the force of gravity so that it can facilitate the delivery process because of the help of gravity. This gravitational force occurs because the mother is in a semi-Fowler's position, so that the fetal head will quickly descend and make it easier for the mother to progress in labor [11]. In a study conducted by Mahdalena and Lisa there was no difference in the pain score of giving abdominal lifting to women in labor. The absence of influence was due to a lack of coordination and mutual trust between midwives and birth mothers. Another factor that causes failure is that the provider (midwife) cannot bring the mother to a comfortable condition, so the mother still feels restless and anxious. Anxiety experienced by mothers causes mothers to be less cooperative, so that the effect of abdominal lifting is not optimal and pain is not reduced significantly [9]. In Wan's research comparing counter pressure with abdominal lifting, counter pressure is more effective [25]. In this study, the researchers prioritized the comfort of the birthing mother, taught the mother how to regulate her breath so that she was relaxed, and

involved the companion of the birthing mother in applying the abdominal lifting method to regulate comfort. This research is in line with Liana's research concerning the effect of abdominal lifting techniques on reducing pain in the first stage of labor which states that there is an effect before and after being given abdominal lifting treatment in the first stage of labor [1]. The case study conducted by Nadia also shows the results of the effect of abdominal lifting in reducing pain (pain) during childbirth because mothers who receive touch or massage feel more comfortable and relaxed [10].

According to the results of the research that has been done and some of these reviews, the researcher assumes that the application of abdominal lifting techniques in reducing pain in the first stage of labor can be effective if there is good cooperation from both parties. Both from respondents and from providers (midwives). To support the head so that it is higher, it can be done by propping the mother's head using 2 pillows or by using a bed directly (adjusting to the existing facilities and infrastructure), which performs abdominal lifting on the right side of the birthing mother by setting the position as comfortable as possible. In this case, communication is very important. If the mother can receive good information from the midwife and the midwife can communicate the procedures for abdominal lifting properly, then the birthing mother will feel the effect of reducing the pain. On the other hand, if the mother is not cooperative and the midwife does not give a clear explanation about the technique, then the mother will not feel the benefits of abdominal lifting. Actually, if possible, the birth attendant (husband or family) can do abdominal lifting because health workers also have limitations when they have to do other tasks.

The abdominal lifting method, which is carried out with strokes in the opposite direction from the mother's back to the upper abdomen without pressing inwards, causes increased activity of the substantia gelatinosa of Rolando, a part of the body located in the spine that functions in modulating pain, temperature, and touch. The number of touches or strokes that are carried out will inhibit the T cell mechanism so that the pain experienced by the mother is not transmitted to the cerebral cortex in the brain [16]. The course of pain during labor begins with contractions in the uterus which spread to the large nerve fibers leading to the substantia gelatinosa of Rolando which is inside the vertebrae. Then these cells will transmit pain impulses to the brain. By carrying out stimuli such as vibration, rubbing, touching, or massage in the area, it will block impulses so that the brain will not receive these impulses, according to the closed gate theory put forward by Melzak and Wall [17].

The results of the meta-analysis in the study found that in order to reduce labor pain when compared to other non-pharmacological methods such as the descending analgesic system, namely self-healing by listening to classical music, mururata, and so on, the use of gate control techniques, namely inhibiting pain impulses by rubbing / touching more effective and fast in reducing labor pain [26]. Arantika et al also apply the gate control technique which provides three different interventions to reduce labor pain, namely abdominal lifting, effleurage massage, and deep back massages. The three techniques carried out in this study apply the theory that massage can improve the circulatory system, which can help stimulate cells to work more optimally, maximum cell activity can help reduce local pain and improve blood circulation to areas that feel pain, stimulate receptors on the skin in order to relax the muscles [16]. In a study conducted

by Tuti, et al concerning the difference of pain labor level with counter pressure and abdominal lifting on primigravida in the active phase of first stage labor, which consisted of 19 women with counter pressure intervention and 19 women with abdominal lifting intervention showed there is an effect of both interventions in reducing labor pain [27]. From this study, it was found that abdominal lifting reduces pain faster because the position of the mother during abdominal lifting is semi-fowler and can be assisted by her husband when positioning herself so that the mother feels more comfortable and relaxed in receiving intervention [17]. In this study, the researches did not require the mother to take a semi-Fowler's position at exactly 45°. However, researchers prioritize the comfort felt by the mother in labor so that the mother is free to adjust how high her head is positioned.

The results of this research are in line with research from Ratna Malawat entitled *Effects of the Abdominal Lifting Method on Pain Intensity of Mothers in Labor in Active Phase I at Tkt II Dr. Hospital. J. Latumeten Ambon*, which showed that before abdominal lifting was carried out, a pretest was carried out by means of which the researchers measured the pain intensity of the mother in labor. After that, the researchers performed abdominal lifting in the active phase of the first phase of labor and carried out a posttest to measure pain intensity after being given an intervention. The result is that there is a significant effect between the abdominal lifting method on reducing pain during the first active phase [7]. Based on this, the researchers assume that the application of abdominal lifting can have benefits for pain reduction because it is supported by previous research evidence and the gate control theory. The gate control theory relies on rubbing and touching the mother, giving a massage or rubbing sensation in the area that hurts so that the mother will feel comfortable and cared for. This action can also inhibit pain impulses that will be transmitted to the brain. It can also increase the endorphin hormones, which can create comfort for the mother so that the mother can become more relaxed. Not only as an effort to reduce pain in the first stage of labor, abdominal lifting can also reduce back pain during labor and provide the advantage of gravity so that it can speed up labor.

Research on labor pain cannot be generalized between individuals because each person has a different perception of pain, supported by culture, experiences that have been experienced, and the surrounding environment. To overcome anxiety, there needs to be good coordination between mothers, carers and health workers. This research is the first research conducted in Surabaya. Therefore, the characteristics of the place and research subjects are certainly different from previous studies

5 Conclusion

The purpose of this study was to find differences in labor pain before and after being treated with abdominal lifting in laboring mothers. In this study it was found that there were differences in labor pain before and after being treated. There are differences in pain during the first stage labor before and after being given the abdominal lifting treatment, although the value that appears is not so significant. This is influenced by the

perspective of pain experienced by each respondent. . In the future this research can be developed using a comparator (control) such as other methods that can reduce pain, so as to compare between the two methods which one is more effective in reducing pain.

References

1. Liana: Effect of Abdominal Lifting Technique on Pain. 5, 770–774 (2021).
2. Dinas Kesehatan Provinsi Jawa Timur: Profil Kesehatan Provinsi Jawa Timur 2020. (2021).
3. Dinas Kesehatan Kota Surabaya: Profil Kesehatan Kota Surabaya 2020. , Surabaya (2020).
4. Susiana, S.: Maternal Mortality Rate: Causal Factors and Responses. (2019).
5. Sari, Z.M., Utami, I.T., Veronica, S.Y.: The Effect of Respiratory Relaxation Techniques on Pain Intensity in Active Phase I Labor at Pmb Meyta Eka Faulia, S. St. Journal Maternitas. 2(2), (2021).
6. Chotimah, S.H., Indrayani, T., dkk. Differences in Breathing Techniques and Kneading Techniques on Pain Intensities in Active Phase I Labor i in the Walantaka Area of Serang City in 2020. Journal Health. (2020).
7. Malawat, R.: The Effect of the Abdominal Lifting Method on the Intensity of Pain of Mothers Inpartu Kala I Active Phase at Dr. J. Latumeten Ambon Hospital. Kaos GL Derg. 5, 39–43 (2020).
8. Sunarsih, S., Sari, T.P.: Labor pain and anxiety levels in mothers inpartu kala I active phase. Holistik J. Kesehat. 13, 327–332 (2020). <https://doi.org/10.33024/hjk.v13i4.1365>.
9. Ningsih, M.P., Rahmawati, L., Iii, P.D., Padang, K., Kemenkes, P., Korespondensi, P.: The Effectiveness of Counter Pressure and Abdominal Lifting Techniques on Pain Reduction in First Stage Active. Med. (Media Inf. Kesehatan). 6, 217–224 (2019).
10. Mainansi, N.S., Damayanti, I.P., Hang, U., Pekanbaru, T.: Jurnal Kebidanan Terkini (Current Midwifery Journal) Giving Abdominal Lifting Massage Education To Mothers. 2, 69–74 (2022).
11. Wulan, S., Soejoenoes, A., M, S.W., Hidayat, S.T.: The effect of effleurage and abdominal lifting massage in the labor pain The effect of effleurage and abdominal lifting massage in the labor pain. 8–11 (2017). <https://doi.org/10.5455/medscience.2017.06.8670>.
12. Adiputra, I.M.S., Trisnadewi, N.W., Oktaviani, N.P.W., Munthe, S.A., HULU, V.T., Budiastutik, I., Dkk: Health Research Methodology. Yayasan Kita Menulis, Denpasar (2021).
13. Hastjarjo, T.D.: Design of Quasi-Experiments. Bul. Psikol. 27, 187 (2019). <https://doi.org/10.22146/buletinpsikologi.38619>.
14. Gio, P.U., Caraka, R.E.: Basic Guidelines For Processing Data With Statcal Statistical Application Programs (Accompanied By Comparison Of Results With Spss & Minitab). USU Press, Medan (2018).
15. Refindo, D.T.: Effectiveness Of The Combination Of Massage Therapy And Heat Therapy On Reducing Pain And Increasing Range Of Motion (Rom) Of Knee Injuries In Patients Of Sports And Fitness Injury Therapy House. 1–23 (2023).
16. Pratiwi, A.M., Zuliyati, I.C., Fatimatasari, F.: Abdominal lifting, effleurage, and deep back massages effective in reducing pain during active phase of first stage labor. JNKI (Jurnal

- Ners dan Kebidanan Indones. (Indonesian J. Nurs. Midwifery). 9, 175 (2021). [https://doi.org/10.21927/jnki.2021.9\(3\).175-182](https://doi.org/10.21927/jnki.2021.9(3).175-182).
17. Oktriani, T., Ermawati, Bachtiar, H.: The Difference Of Pain Labour Level With Counter Pressure And Abdominal Lifting On Primigravida In Active Phase Of First Stage Labor. 3, (2018).
 18. Djuariah, R., Susanti, D., dkk. Effectiveness of Pain Reduction in Maternity Period I with Massage Effleurage and Abdominal Lifting Methods. *Jurnal Kesehatan Budi Luhur*. 15, 647–652 (2022).
 19. Palifiana, D.A., Khasanah, N.: Health education about pain reduction during labor as an effort to prepare for labor in pregnant women. *J. Karya Husada Community Service*. 1, 27–35 (2019).
 20. Rejeki, S., Irawan, R.M.B.: Level of labor pain in the first stage of labor through manual mechanical device therapy sacral region.
 21. Noviyanti, A.: Physical and Psychological Factors of Maternal in Labor with Intensity of First Stage of Labor Pain in Primipara ' s Mothers. 13, 437–444 (2022).
 22. Wang, G., Zhang, Z., Sun, J., Li, X., Chu, Y., Zhao, D., Ju, H., Wu, X., Cong, D.: Abdominal massage: A review of clinical and experimental studies from 1990 to 2021. *Complement. Ther. Med*. 70, 102861 (2022). <https://doi.org/10.1016/j.ctim.2022.102861>.
 23. Ulfah, M., Rosmaria: The Effect of Birth Ball Therapy for In-Partum Mothers on the Intensity of Active Phase I Labor Pain at PMB Nuriman Rafida Jambi. (2021).
 24. Maryuni: Relationship between maternal characteristics and labor pain. 2, 116–122 (2020).
 25. Anita, W.: Techniques of Pain Reduction in the Normal Labor Process : Systematic Review. *J. Endur*. 2, 362 (2017). <https://doi.org/10.22216/jen.v2i3.2357>.
 26. Bonapace, J., Gagné, G.P., Chaillet, N., Gagnon, R., Hébert, E., Buckley, S.: No. 355- Physiologic Basis of Pain in Labour and Delivery: An Evidence-Based Approach to its Management. *J. Obstet. Gynaecol. Canada*. 40, 227–245 (2018). <https://doi.org/10.1016/j.jogc.2017.08.003>.
 27. Coenen, P., Campbell, A., Kemp-Smith, K., O'Sullivan, P., Straker, L.: Abdominal bracing during lifting alters trunk muscle activity and body kinematics. *Appl. Ergon*. 63, 91–98 (2017). <https://doi.org/10.1016/j.apergo.2017.04.009>.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

