Management of Labour Pain by using non-pharmacological Measures

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Abstract

Introduction: Pain during childbirth is a special experience of a woman that vary from one individual to another, that is caused by uterine contractions and cervical dilatation during labour. Nature and level of pain influence by various physiology, psychology and environmental factors. Thus, pain relief during childbirth is essential therefore, the delivery period will be uneventful.

Non-pharmacological pain relief measures: *Controlling pain without harm to mother, non-pharmacological measures assure in reducing labour pain with less or even no harm to the mother and fetus. These measures include sensory stimulation measures eg. breathing technique, aromatherapy and music therapy that provides sensory input to the brain to promote relaxation, enhance positive thoughts and transmission of nociceptive stimuli of pain during labour and cutaneous stimulation measures include back massage, changing position, heat and cold application, transcutaneous electrical nerve stimulation, hydrotherapy and acupressure that work as to stimulation of nerves by using skin manipulation in an attempt to reduce pain impulses to the brain.*

Conclusion: *The major aspects of midwifery care are supporting women during labour pain thus, they must understand the choices of the mother's for manage with labour pain. However, non-pharmacological measures are helpful for decelerating pain and discomfort during labour which is easy to given and cost-effective.*

Key Words: Breathing technique, aromatherapy and music therapy, back massage, changing position, application of heat and cold, Transcutaneous electrical nerve stimulation, acupressure and hydrotherapy.

Introduction

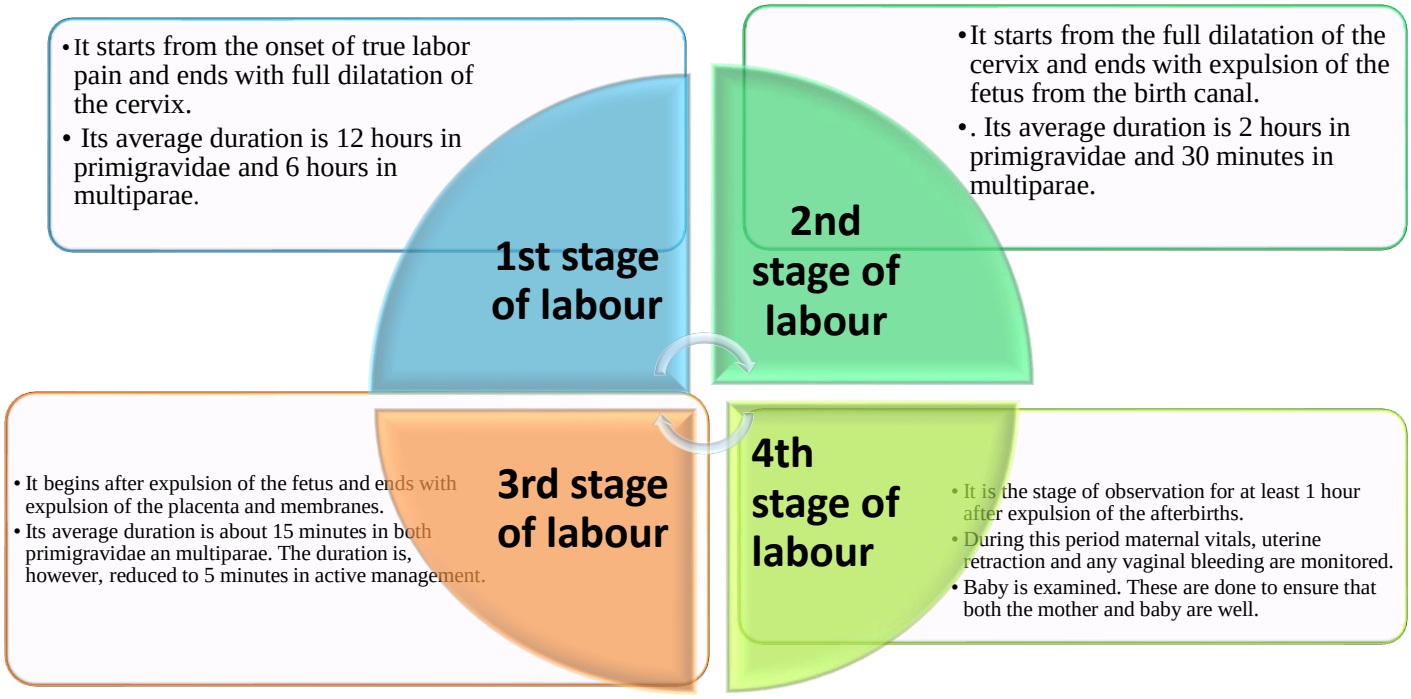
Pregnancy is a moment of happiness for every women's life whereas, one of immense stress such as physically and mentally even for healthy women. However, during pregnancy anxiety increase because of anticipated uncertainty associated with it. Various evidence revealed that anxiety in pregnancy affects pregnant women's health and also an impact on labour outcomes such as premature delivery, prolonged labour, caesarean birth, and low birth weight.[i]

The complex physical, psychological and emotional experience of labour affected every woman differently.[ii]Primigravida mothers have feelings of worry regarding labour pain. It will be possible to provide need-based care during pregnancy by understanding their feelings. Thus, midwives can provide appropriate non- pharmacological measures to mothers during childbirth. Therefore, the delivery period will be smooth and uneventful.

Normal Labour is a series of events that take place in the genital organs in an effort to expel the viable conceptus out of the womb through the vagina to the external world. It is characterized by the presence of regular uterine contractions with effacement, dilation of the cervix and fetal descent.[iii]

Stages of normal labour

The stages of normal labour have four stages namely the first stage (cervical stage), second stage, Third stage (placental stage) and fourth stage of labour. The stages of labour elucidate below:[iv]



Pain is unpleasant, complex, highly individualized experience with both sensory and emotional components. During pregnancy mothers commonly worry about labour pain since various physiology, psychology and environmental factors control the nature and degree of pain during childbirth and similar to in which they will respond and cope with labour pain.[v] At term, the factors of the beginning of labour

pain are described by several theories such as uterine distension, fetoplacental contribution, oxytocin, and myometrial oxytocin receptors.[vi]

Pain during the cervical stage of labour originates in the fundus of the uterus and cervix and are subsequently transmitted via the T11 to T12 spinal nerve segment and accessory lower thoracic and upper lumbar sympathetic nerves and pain is visceral pain.[vii]

Non- pharmacological pain relief measures used in labour

The pain during labour has been familiar for many years. Initially, childbirth education and practicing non-pharmacological techniques for apply in managing delivery pain and facilitating the progress of labour. [viii]

The methods selection depends on the situation, availability and choice of woman and their caregivers.[ix]

Pain at the time of childbirth can be inclined by various factors similar to cultural practices, earlier experiences with pain and emotional support. Midwifery must be aware of and sensitive to individual variations in a mother's choices for dealing with labour pain.[x]

Alternative and complementary therapies are gradually more in current practice for both consumers and professionals and are based on a philosophy of holism and interaction between mind, body and spirit in which it is believed that all components in combination contribute to the whole.[xi]

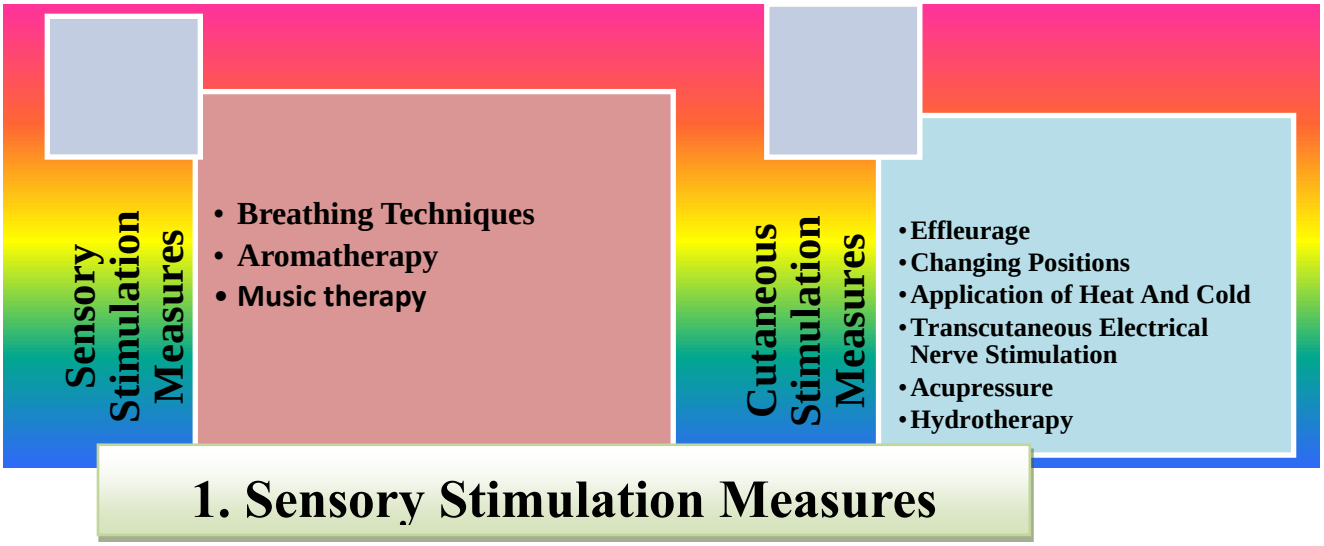
Midwifery support mothers in several aspects of childbirth. The major aspect of midwifery is provided care to women during labour pain. Childbirth decisions are influenced through family members and traditional practice which commonly results in not prefer medications used to relieve labour pain. Hence, Midwives were encouraging ambulation and positioning to achieve comfort. [xii]

Pharmacological and non-pharmacological measures are utilized to reduce pain during labour. However, medications used during labour may cause risks for the mother and the unborn baby. [xiii]

Non-pharmacologic measures are safe and inexpensive that helps mothers to control pain during delivery. However, they need support from midwifery who is competent to use non-pharmacologic measures for discomfort and help in pain relief in labour.[xiv]

Nonpharmacologic measures to encourage relaxation and relieve pain during labour such as:

Fig:1 Nonpharmacologic measures to encourage relaxation and relieve pain during labour such as:



SSM refers to provides sensory input to increase relaxation, develop positive thoughts and transmission of nociceptive stimuli of pain in labour.

1. Breathing Techniques

Relaxation is central to many of the techniques for managing labour pain. Reduction of fear and anxiety facilitates the body's efficient use of energy for labour, thereby reducing fatigue and thus making labour more effective. Tense abdominal muscles from resistance to uterine contraction and use of oxygen, resulting in less oxygen available to the fetus.[15]

Breathing technique to provide a distraction, reducing the perception of pain and helping the woman to maintain control throughout contractions. During 1st stage of labour breathing technique promote relaxation of abdomen muscles thereby increase the size of the abdominal cavity that helps to reduce pain during contraction of uterus muscle by decrease friction between the uterus and abdominal wall.[xv]

A. Paced Breathing Technique

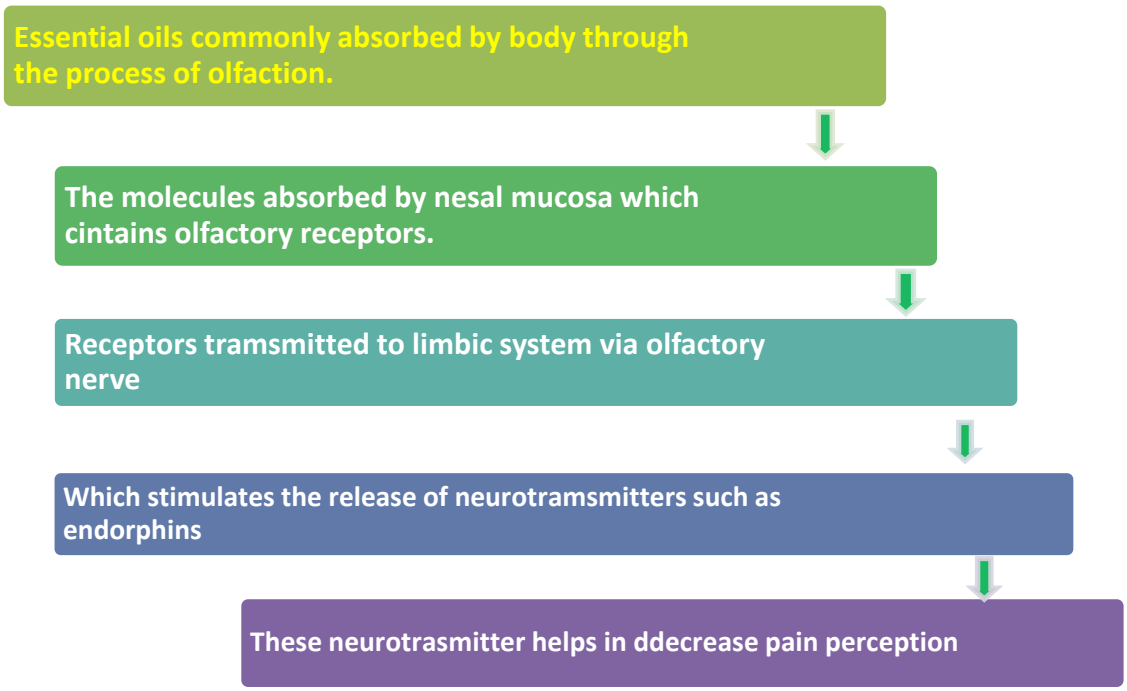
Paced breathing use to decrease stress, pain and increase relaxation during labour. The term paced breathing now is used to describe the research-based breathing technique. This breathing technique uses a deep breath during inhalation and exhalation, it takes 5-10 deep breaths for a minute in every 15-second intervals. At the time of inhaling mother should place hands on the lower part of the abdomen and stroke gently upward toward to ribs. As exhale, let hands glide back down. Massaging the uterus during a contraction can help ease the discomfort..[xvi]

Throughout 1st stage of labour slow deep breaths no longer helps the mother to manage labour pain. Practice modified paced breathing start with slow and deep breath when a contraction begins then accelerate inhale-exhale as the contraction at peaks. There is no specific time to perform breathing exercises but can start at 6 weeks before delivery. This is important that breathing should be in a regular pattern.[17]

2. Aromatherapy

Aromatherapy can be defined as the therapeutic use of plant essential oils. Aromatherapy has a variety of applications that it uses aromas to engage the sense of smell in healing dynamic.

Tab:1 Steps of reduction of pain process by essential oil



Aromatherapy uses distilled oils from plants, flowers, herbs and trees to promote well being. The purpose of using aromatherapy during labour is to manage pain, reduce anxiety and create satisfaction in mothers during childbirth. Tiran, Mack, 2000. Suggested that the use of herbal teas have good effects on labour. Whereas, Lavender, clary sage and bergamot promote relaxation during labour.[xvii] Massage is another most effective way to apply essential oils to the body, it promotes the rate of blood flow thus facilitating the absorption of essential oils.

According to the reviewed of several studies, the subsequent important oils may be helpful during labour such as Lavender, Jasmine, Salvia, Bitter Orange, Geranium Rose helps lower pain scores during labour. Whereas, Salvia helps in decreased length of labour.[18]

Ethel E. Burns (2007), conducted a study on the use of aromatherapy to examine the contribution in promotion of maternal comfort during labour. The result suggested that the use of aromatherapy during childbirth was helpful and decrease the need for further pain relief during labour. The study also showed that aromatherapy may have the potential to augment labour contractions for women in dysfunctional labour.[xviii]

Another study conducted by Burns E (2000), study suggests that two essential oils that are clary sage and chamomile are effective in alleviating pain, that aromatherapy can be effective in reducing maternal anxiety, fear and pain during labour. [xix]

Clary Sage Oil

Chamomile Oil

3. Music Therapy

The World Federation of Music Therapy defines music therapy as the use of music and musical elements (sound, rhythm, melodies, or harmonies) to support communication, relationships, movement, appearance and other relevant therapeutic objectives, thereby solving physical, emotional, mental, social, and cognitive needs.[xx]

Campbell (1991), the human body is driven by its own rhythms similar to heart rate, respiration and brain waves influence by each other for example if slow down breath thus heart rate and brain waves also decrease.

Landreth and Landreth (1994), suggest that the response to changes in sound wave frequency, amplitude and timbre is possible through a limited number of mechanisms including that (1) music may stimulate the involuntary central nervous system, causing physiological reactions that later as involved in conscious thought (2) music may be transmitted first to higher levels of the brain, where sound becomes involved with emotion and abstract thought before affecting physiology (3) both 1st and 2nd mechanisms work in concert.[xxi]

Another study conducted by Qun Wan ,Fang-Yuan Wen, 2018, on the effects of acupressure and music therapy on reducing labour pain. The result revealed that Acupressure and music therapy could reduce labour pain significantly. Acupressure had an advantage in decreasing uterine pressure compared to music therapy, whereas music therapy owned more benefits on reducing the anxiety levels than acupressure. Moreover, the combination therapy could also reduce the intensity of labour pain greatly.[xxii]

2. Cutaneous Stimulation Measures

1. Massage Therapy

A variety of methods have been considered to relieve labour pain. One of the most popular methods used was massage therapy. It helps in promoting pain relief, increase relaxation and reducing emotional stress in labour.[xxiii]

Several theories are estimated to elucidate the pain mechanism by massage. These theories include such as a reduction in cortisol and norepinephrine levels,[xxiv] an increase in serotonin levels, stimulation of endorphin release and increased oxygen supply to tissues. [xxv]

Systematic manipulation of the soft tissues within the body, particularly the muscles, tendons and skin now as massage. Swedish massage, which is the simplest form of massage. There are five strokes used in Swedish massage such as effleurage, Petrissage, Friction, Tapotement and vibration.

Effleurage is a type of massage that focuses on a pregnant mother abdomen. it gives help in interrupt the pain. During effleurage, use circular, rhythmic stroking movements with the palm of the hand to lightly massage over the abdomen and focusing on the rhythm and movement that can help in reducing labour pain.[xxvi] Petrissage is kneading the muscle with the fingers and thumb of each hand alternatively in a large C-shaped motion. Whereas, friction focused circular movements using pads of the fingers or the heel of the hand to penetrate deeper muscle layers or around joints.[xxvii]

Some studies suggested the effectiveness of massage during labour. In this view Kimber (2008) compared three groups of participant as one group received massage combined with a relaxation technique, another group received music therapy and a control group received the usual maternity care. The authors observed a tendency toward a reduction in pain in the massage group, although the difference between two groups was not statistically significant.[xxviii]

Pain theory states that pain stimuli can be modified as they travel on small-diameter nerve fibers along the ascending pathway through the spinal cord. a gate mechanism can be activated by sensations travelling through large-diameter fibers, which transmit messages more quickly. Habituation may occur in15 to 20 minutes.

2. Changing Positions during labour

The positions chosen by the mother for childbirth is an important that will provide comfort during the stages of labour and some positions will be helpful for the normal progress of labour. Ambulation, mobility

during labour improves both the mother's experience. It also increases uterine contraction effectively, decrease the length of labour and decline the need for pharmacological analgesia.[xxix]

Several positions are used during labour which includes upright birthing positions such as kneeling, standing, squatting. Whereas, recumbent and semi-recumbent positions like side-lying, supine with or without the head of the bed raised up, semi-sitting in bed, lithotomy position and lateral position. Researchers believe that giving birth in an upright position can help the mother and baby with several physiologic changes during labour. Upright positioning also helps the uterus contract more strongly, efficiently and helps the fetus to adjust in the birth canal. Gupta et al. 2017, research findings suggested that magnetic resonance imaging (MRI) studies have revealed that compared to the back-lying position, the dimensions of the pelvic outlet become wider in the squatting and kneeling or hands-and-knees positions. Finally, research has revealed that upright birthing positions may increase maternal satisfaction and lead to more positive birth experiences.[xxx]

According to WHO, "Care in Normal Birth," mothers in labour should adopt any position as they feel comfortable, whereas preferably avoiding long periods lying supine. It is recommended that midwifery need training in supporting births rather than supine position because of the positive effect of upright birthing positions.

3. Application of heat and cold

Warm compression, a warm bath, a moist heating pad can enhance relaxation and reduce labour pain. Warmth increases blood circulation and relieves muscle ischemia. Whereas, a cold application such as cold cloths or ice packs may be effective in increasing comfort when the mother feels warm and may be applied to pain areas by reducing the muscle temperature and reliving muscle spasms.[xxxi]

Cold application use during labour pain helps to diminish pain by many mechanisms such as inhibit pain perception by stimulation of peripheral neural receptors, increase energy flow in acupuncture points, declining muscle tension and also distracting from pain. It also decreases the catecholamine level and therefore raise endorphin level. Thus, helps in decrease pain level.[xxxii]

4. Transcutaneous Electrical Nerve Stimulation

TENS is a widely used, well appreciated and effective method of pain relief. The hypotheses that modulation of the pain impulse reaching the substantial gelatinosa and liberation of endogenous.[xxxiii] TENS used for the relive of labour pain with variable success. Skin electrodes of conductive adhesive are placed over the T10–L1 spinal region bilaterally.[xxxiv]

Evidence showed that when using TENS helps to a reduction in the demand for Pethidine and other pain relief. TENS is more effective in labour. There are few limitations to the utilization of TENS in labour because it may cause a slight interference with the fetal monitor and skin allergies may be caused by the electrodes.[xxxv]

5. Acupressure

Acupressure is the applied pressure to the points where compose energy network routes throughout the body, augmenting the flow of bio-energy and thus changing the symptom experience. Acupressure has four basic effects on the body such as analgesic, homeostatic, immunity enhancement, and sedative.[xxxvi]

Acupressure specific points in the hands and fingers are stimulated to encompass the best effect in alleviating pain and increase relaxation. The effects of acupressure on labour pain during childbirth has been studied in controlled and randomized that suggested are 3 acupuncture points were identified for acupressure such as SP6, IG4 and B67, these points action that affects the activity in the uterus and which can induce childbirth. [xxxvii]

The mechanism of acupressure as pain relief that has been explained via gate control, nociceptive afferent, and endorphin theories. Gate control theory explained that applying pressure on acupuncture points stimulates thick C fibers without myelin, thus preventing pain stimuli from reaching the cortex. As per nociceptive afferent theory that acupressure inhibits the transmission of pain to the brain by stimulating mechanoreceptors and Endorphin theory believed that acupressure stimulates endorphin secretions which helps to reduce pain during labour.[xxxviii]

A study conducted by Martina K Sebastian (2014), on the effect of acupressure on labour pain in a hospital, Delhi. The result revealed that the non-pharmacological method of pain relief measure like acupressure at the point L14 was effective in diminishing labour pain in the experimental group.

6. Hydrotherapy

Bathing, Showering and jet hydrotherapy with warm water are non-pharmacological measures that can be used to promote comfort and relaxation during labour. Buoyancy in the water results in general body relaxation and temporary relief from discomfort and pain. This reduces women anxiety and enhances the feeling of well-being. it will help to decrease catecholamine production and triggers an elevate in the levels of oxytocin that stimulate uterine contraction and release endorphins which helps to reduce pain perception.[xxxix]

Manckey, Simkin (2002) suggested that during the bath, if the woman's temperature and the FHR increase, the process of labour becomes less effective relief of pain is reduced, the woman can come out from the bath and return at a later time.

According to the most recent survey, mother who used hydrotherapy in delivery mentioned that it was effective to relieve pain during labour similar to morphine and Fentanyl. The survey also reported that hydrotherapy relieved anxiety during labor.[xl]

References

[i] Kathryn Erows, Voncarl Baeyer. Predictor of positive child experiences [Internet]. [Place Unknown]: Kathryn Erows, Voncarl Baeyer; 1996. [Updated 2009 May 8; cited 2018 Jun 12]. Available from- URL http://www.labour.org

[ii] Myles. Textbook of Obstetrics .15th ed. London new York: Elsevier; 2009.p.449-501

[iii] Dutta's D.C. Textbook of Obstetrics. 6th ed. India: Jaypee Bothers Medical Publisher; 2013.p. 115

[iv] Dutta's D.C. Textbook of Obstetrics. 6th ed. India: Jaypee Bothers Medical Publisher; 2013.p. 115-17

[v] Lowdermlk Perry. Textbook of maternity and women's health care. 8th ed. America: .Publisher Mosby.2014. p.488

[vi] Dutta's D.C. Textbook of Obstetrics. 6th ed. India: Jaypee Bothers Medical Publisher; 2013.vol 2.p. 125-36.

[vii] Lynna Y. Littleton, Joan C. Engebretson. "Maternity nursing care". 2007. Houston. (Indian Edition, Hriyana). publisher Thomson Delmar learning. p. 483-84.

[viii] Lynna Y. Littleton, Joan C. Engebretson. "Maternity nursing care". 2007. Houston. (Indian Edition, Hriyana). publisher Thomson Delmar learning. p. 325

[ix] Lowdermlk Perry. Textbook of maternity and women's health care. 8th ed. America: .Publisher Mosby.2014. p.325

[x] Lynna Y. Littleton, Joan C. Engebretson. "Maternity nursing care". 2007. Houston. (Indian Edition, Hriyana). publisher Thomson Delmar learning. p.482

[xi] Myles. Textbook of Obstetrics .15th ed. London new York: Elsevier; 2009.p.959

[xii] Pauline Mc Cabe, Judy Jacka. Complementary therapies in Nursing and Midwifery. 1st ed. Australia: Ausmed; 2001. p.291.

[xiii] Sudha Bharathi A. A study to evaluate the effectiveness of music therapy in reducing pain perception during first stage of labour among primi mothers in Sivakasi maternity center at Madurai (Doctoral dissertation, CSI Jeyaraj Annapackiam College of Nursing, Madurai).

[xiv] Lowdermlk Perry. Textbook of maternity and women's health care. 8th ed. America: .Publisher Mosby.2014. p. 493

[xv] Lowdermlk Perry. Textbook of maternity and women's health care. 8th ed. America: .Publisher Mosby.2014. p.493

[xvi] **Dr. Laura Riley**, November 02, 2009. Breathing and Relaxation Techniques for Labor. Available from https://www.parents.com/pregnancy/giving-birth/pain-relief/practicing-for-labor/.

[xvii] Williams K. The Aromahead Blog-Aromatherapy Education and Resources DIY Travel-Sized Moisturizing Foam Soap with Geranium.

[xviii] Ethel E. Burns, Caroline Blamey, Steven J. Ersser, Lin Barnetson, and Andrew J. Lloyd.The Journal of Alternative and Complementary Medicine.Apr 2000.141-147.http://doi.org/10.1089/acm.2000.6.141 Published in Volume: 6 Issue 2: September 24, 2007.

[xix] Burns E, Blamey C, Ersser SJ, Lloyd AJ, Barnetson L. The use of aromatherapy in intrapartum midwifery practice an observational study. Complement Ther Nurs Midwifery. 2000 Feb;6(1):33-4. doi: 10.1054/ctnm.1999.0901. PMID: 11033651.

[xx] Vink, A.; Hanser, S. Music-Based Therapeutic Interventions for People with Dementia: A Mini-Review. Medicina 2018, 5, 109.

[xxi]Landreth JE, Landreth HF. Effects of music on physiological response. Journal of research in music education. 1974 Apr;22(1):4-12.

[xxii] Wan Q, Wen FY. Effects of acupressure and music therapy on reducing labor pain. International Journal of Clinical and Experimental Medicine. 2018 Jan 1;11(2):898-903.

[xxiii] Field T. Pregnancy and labor massage. Expert review of obstetrics & gynecology. 2010 Mar 1;5(2):177-81.

[xxiv] Chang MY, Wang SY, Chen CH. Effects of massage on pain and anxiety during labour: a randomized controlled trial in Taiwan. Journal of advanced nursing. 2002 Apr;38(1):68-73.

[xxv] Zwelling E, Johnson K, Allen J. How to implement complementary therapies for laboring women. MCN: The American Journal of Maternal/Child Nursing. 2006 Nov 1;31(6):364-70.

[xxvi] Price SP. Touch and massage. Aromatherapy for Health Professionals E-Book. 2011 Nov 11:163.

[xxvii] Pauline Mc Cabe, Judy Jacka. " Complementary therapies in Nursing and Midwifery". publisher Ausmed. Australia. 2001. Page-150-151.

[xxviii] Kimber L, McNabb M, Mc Court C, Haines A, Brocklehurst P. Massage or music for pain relief in labour: a pilot randomised placebo controlled trial. European Journal of pain. 2008 Nov 1;12(8):961-9.

[xxix] Myles. Textbook of Obstetrics .15th ed. London new York: Elsevier; 2009.p.494-95

[xxx]Gupta JK, Sood A, Hofmeyr GJ, Vogel JP. Position in the second stage of labour for women without epidural anaesthesia. Cochrane database of systematic reviews. 2017(5). https://evidencebasedbirth.com/evidence-birthing-positions/

[xxxi] Lowdermlk Perry. Textbook of maternity and women's health care. 8th ed. America: .Publisher Mosby.2014. p. 496

[xxxii] Simkin P, Bolding A. Update on non-pharmacologic approaches to relieve labor pain and prevent suffering. J Midwifery womens Health. 2004;49:489–504.

[xxxiii] Solomon RA, Viernstein MC, Long DM. Reduction of postoper- ative pain and narcotic use by transcutaneous electrical nerve stimulation. Surgery. 1980;87(2):142–146.

[xxxiv] Tsen LC, Thomas J, Segal S, Datta S, Bader AM. Transcutaneous electrical nerve stimulation does not augment epidural labor analgesia. J Clin Anesth. 2001;13(8):571–575.

[xxxv] Dowswell T, Bedwell C, Lavender T, Neilson JP. Transcutaneous electrical nerve stimulation (TENS) for pain management in labour. Cochrane Database of Systematic Reviews. 2009(2).

[xxxvi] Raana HN, Fan XN. The effect of acupressure on pain reduction during first stage of labour: A systematic review and meta-analysis. Complementary therapies in clinical practice. 2020 May 1;39:101126. Available from https://www.sciencedirect.com/science/article/pii/S174438811930502X

[xxxvii] Mafetoni RR, Shimo AK. The effects of acupressure on labor pains during child birth: randomized clinical trial. Revista latino-americana de enfermagem. 2016;24.

[xxxviii]https://journals.lww.com/jnrtwna/fulltext/2020/02000/effects_of_massage_and_acupressure_on_relieving.10.aspx. GÖNENÇ, Ilknur Munevver[1*]; TERZIOĞLU, Füsun[2]

[xxxix] Lowdermlk Perry. Textbook of maternity and women's health care. 8th ed. America: .Publisher Mosby.2014. p.495

[xl] https://www.mhealth.org/childrens/blog/2018/november-2018/what-is-hydrotherapy-and-how-can-it-help-during-labor