Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 3, pp: (343-356), Month: September - December 2020, Available at: www.noveltyjournals.com

Effectiveness of Two Different Positions During the Active Phase on Labor Pains Among Primeparea

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Abstract: **Background: Childbirth is a natural physiological process and it a special moment to mother and family. This process started at The first stage of labor which character as a longer and painful. For that parturient need methods to reduce the sense of labor pain. Aim: to assess the effectiveness of two different positions during the active phase on labor pains among primiparae. Method: A systematic review based on the PRISMA guidelines including a quantitative and qualitative review on maternal position and labor pain during the first stage of labor. A literature search was conducted using: CINAHL, MEDLINE and PubMed through the Saudi Digital library database. The search was conducted over the last seven years. All the included studies were critically appraised using Hawker et al. tool. After the selection process, seven studies matching the inclusion criteria identified and were incorporated in the review. Results: The literature review content categorized into three themes: sitting position, sideline position and both sitting and side line position. Conclusion: According to the literature findings, this review paper has some contradictory finings in the studies regarding the relationship between positions during the active phase on labor pains among primiparae. There is need for more studies to confirm this relationship.**

Keywords: **first stage, labor pain, labor position, sitting position, side-lien position.**

1. INTRODUCTION

The literature review provides a summary of the sources that the research has explored while investigating a related topic (Woo, 2017). It explains what the concept has been established on a subject and provides the knowledge of the subject, and what are their strengths and weaknesses. Also, the literature review five clear understanding of the identifying and structuring of the matter, gathering the information that associated with the concept, minimizing challenges, bearing on the appropriate methods to used and reducing the limitation, and generalizing the result (Mateo & Foreman, 2014).

2. SEARCH STRATEGY

A review of the literature conducted by using different databases including CINAHL, MEDLINE, and PubMed through the Saudi Digital library database. Google scholar was used for searching gray literature. The electronic search was completed on September 25, 2020, of CINAHL, Medline, and PubMed databases. Search terms included maternal position, labor pain, the intensity of pain, sitting position, side-lying position, and first stage. Search limits were applied, and they included the year of publication, which was searched from 2014 to 2020, and the English language. Full-text articles were obtained. Articles were excluded if their primary focus was not on the first stage of labor and not on sitting and sideline maternal position. Further studies were recognized by examining the bibliography lists of all used articles as well as the library books search.

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3. OVERVIEW OF STEGES OF LABOUR

Labor is the end stage of pregnancy which can be one of the most fearful and exhilarating stages for a woman to undergo (Gaffka, 2016). A normal human pregnancy lasts approximately 40 weeks from the first day of the last menstrual period. However, there is a large inter-individual variation in the duration of pregnancy, and a duration of 37 to 42 weeks from the last menstrual period is considered normal, after this period the onset of spontaneous normal labor is taking place. The causes of the large variation in the duration of human pregnancy remain poorly understood (Tanbo, Zucknick, & Eskild, 2018) . The onset of Labor begins when regular uterine contractions cause progressive cervical effacement and dilation **(Dresang & Yonke, 2015) .**

The process of labor going through four stages: First, second, third, and fourth, stage. Each stage has characteristic differ from the following one. The first stage called the dilatation stage and it takes a time range duration between 12 to 16 hours in primiparae and between 6 to 8 hours in multiparas. It is the longest stage **(Dresang & Yonke, 2015).**

The first stage starts at the beginning of the opening of the cervix (starting to dilatation) and ending when the dilatation is the complete opening of the cervix at ten centimeters and effaced. The lower limit of the cervical dilatation rate in primiparae is 1.2 cm\hour and in multiparas is 1.5 cm\hours. In the first stage of labor, there are three main physiological processes, they are: uterine contraction, effacement, and cervical dilatation **(Marshall, Raynor, & Nolte, 2016).**

4. PHYSIOLOGICAL PROCESSES OF THE FIRST STAGE OF LABOUR

4.1 Uterine contractions:

Are involuntary and the women cannot control of their duration, intensity, or progress. The uterine contraction usually describes as a tightening or cramping sensation that felt at the back then moves to the front as a wave-like **(Marshall et al., 2016).**

The duration of uterine contraction increased gradually from mild to moderate reaching too severe. At the beginning of the first stage, it takes twenty to thirty seconds in length which is mild contraction. Then increased in intensity and duration until sixty to seventy seconds, which is, severe. In addition, the interval between each contraction gradually shortens from 45 minutes to two minutes. As a result of this change in duration and interval of contractions are affecting in effacement and dilatation of the cervix **(Dashe, Bloom, Spong, & Hoffman, 2018).**

4.2 Effacement:

Is the softening, thinning, and shortening (taking up) of the cervical canal from a structure of 1 or 2 cm long to one in which no canal exists at all. As labor nears, the cervix begins to thin or stretch (efface) and open (dilate) to prepare for the passage of the baby through the birth canal (vagina). How fast the cervix thins and opens varies from woman to woman. In some women, the cervix may efface and dilate slowly over a period of weeks **(Dashe et al., 2018).**

Effacement is described in percentages. For example, if the cervix is not effaced at all, it is 0% effaced. If the cervix has completely thinned, it is 100% effaced. During the effacement, the edges of internal os are drawn upward, so that the former cervical mucosa becomes part of the lower uterine segment. In primiparae, effacement is accomplished before dilatation begins and in multi-pare, dilatation may proceed before effacement is complete. **(Dashe et al., 2018).**

4.3 Dilatation:

This means that the cervical canal or "os" enlarges from an orifice a few millimeters in diameter to an opening large enough to permit the passage of the fetus. Cervical dilatation is expressed in centimeters from 0 to 10. Zero means that the cervix is closed and 10 means that it is completely dilated. Dilatation occurs for two reasons: uterine contractions and pressure of the presenting part **(Dashe et al., 2018).**

When the uterine contractions put pressure on the amniotic sac, through hydrostatic pressure the sac burrows into the cervix in a pouch-like fashion, exerting dilating action and the presenting part of the fetus presses against the cervix. Without the membranes, the pressure of the presenting part against the cervix and the lower uterine segment has a similar, although less efficient effect **(Dashe et al., 2018).**

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5. PHASES OF THE FIRST STAGE

The first stage is divided into three phases they are early labor (latent phase), active labor (accelerated phase), and transition (deceleration phase).

The early phase (Latent phase) is usually the longest with slow cervical dilatation over several hours. it called latent because so little is happening that is measurable. It begins with the onset of regular contractions and lasts until the cervix is 3cm dilated, effacement of the cervix is from 0-40%. It lasts about 6 to 8 hours in primiparae and 3 to 5 hours in the multiparae. During this phase, the contractions become stabilized and mild. They occur nearly every 10-15 minutes and lasts about 15 to 20 seconds. Usually, women cope well with pain and discomfort in this phase **(Marshall et al., 2016)**

The following phase is the **active phase** (**accelerated phase**), faster rate of cervical dilatation the cervical dilatation begins to occur more rapidly, and the cervix dilates more from 4-7 cm. The fetus descends further in the pelvis. The dilatation rate in primiparae is 1.2 cm/hour & for the multiparae is 1.5 cm/hour. The average duration is 4 to 6 hours for primeparea and 2 to 4 for the multipara. The duration of contractions increases to 30 - 45 seconds. They occur 5 minutes apart and are moderate to strong in intensity. Women may lose control easily during this phase. As contractions increase, anxiety and discomfort increase and ability to cope with the labor pain is questionable **(Marshall et al., 2016)**

Finally, is the **transitional phase (deceleration phase),** during which the cervical dilation continues, but at a slower pace (8-10 cm), until full dilation occurs. In some women the deceleration phase is not noticeable, blending into the active phase. This is also a phase of more rapid descent, the contractions are more frequent, lasting longer (60 to 90 seconds), and are stronger. Transition is a short but intense phase, and many women, have a difficult time maintaining positive coping strategies. The average duration of this phase is 3 to 6 hours in primeparea and having a variable length in the multiparae **(Marshall et al., 2016).**

The second stage of labor (the pushing stage or expulsion stage). It begins with complete cervical dilatation (10cm) and effacement and ends with the birth of the newborn. Contractions occur every 2 to 3 minutes, last 60 to 90 seconds, and are described as strong by palpation. The average length in primiparae is approximately one hour although it may last two hours or longer and less than half that time for the multiparae **(Marshall et al., 2016).**

The second stage of labor has two phases (pelvic and perineal) related to the existence and quality of maternal urge to push and to obstetric conditions related to fetal descent; the early phase is called the pelvic phase, because during this phase the fetal head is negotiating the pelvis, rotating and advancing in descent. The later phase is called the perineal phase, because at this point the fetal head is lowered in the pelvis and distending the perineum. The occurrence of a strong urge to push characterizes the later phase of the 2nd stage and has also been called the phase of active pushing **(Marshall et al., 2016) (Dashe et al., 2018).**

The feeling of the tremendous urge to push in the mother is because of the lowered fetal head and is distending the perineum. This the beginning of the later perineal phase. The perineum becomes bulges and presenting of excessive bloody show. The fetal head disappears between contractions but becomes apparent at the vaginal opening. The crowned head appears at the time the top of the head no longer regresses between contractions. The fetus rotates, that is a maneuver out

(Dashe et al., 2018).

The third stage of labor (placental stage). It begins with the birth of the newborn and ends with the separation and birth of the placenta. It consists of two phases: placental separation and placental expulsion. The first one; after the infant is born the uterus continuous to contract strongly and can retract, decreasing markedly in size. These contractions cause the placenta to pull away from the uterine wall. The following signs of separation indicate that the placenta is ready to deliver. The later phase: after placental separation from the uterine wall, continued uterine contractions causes the placenta to be expelled within 30 minutes of birth **(Dashe et al., 2018).**

The fourth stage (restorative stage) of labor. Start after two hours of delivery of the placenta: it is the period of immediate recovery when homeostasis is reestablished. It is an important period to monitor the occurrence of complications, such as bleeding. It is also the time during which the newborn becomes acquainted with the mother as well as other family members **(Dashe et al., 2018).**

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6. LABOR PAIN

Labor is one of the most important events of a woman's life and usually is accompanied by fear of physical pain. The labor is making the mother filled with awe from childbirth pain **(Pilewska-Kozak et al., 2017).**

Most mothers experience pain during labor but not all of them have the same experience of labor pain, even the mother has not the same pain from pregnancy to another pregnancy. It is clear that labor pain is a challenge to manage in addition it is a complex and unique experience of pain and, consequently **(Whitburn, Jones, Davey, & Small, 2017) .**

7. DEFINITION OF PAIN

The pain is defined in scientific as 'an unpleasant sensory and emotional experience associated with actual or potential tissue damage. During labor and delivery, Labor pain is an essential sign of labor's progress. The severity of labor pain influenced by multiple factors, the woman's pain threshold, labor progress, fetus size, general health condition of the mother's, pelvic dimensions, fetus position during the delivery, psychosocial factors. **(Czech et al., 2018).**

Modern pain science recognizes that pain is a personal, subjective experience that is strongly linked to the social environment. Emotional and physical pain overlap both physiologically (based on the neural correlates of these experiences) and functionally (one can predict the other) , indicating that pain should be more comprehensively thought of as a driver to avoid physical as well as social threats to one's wellbeing . Pain is highly influenced by cognitive processes and is ultimately experienced within the context of its meaning to the individual. **(Whitburn et al., 2017).**

The two elements of labor pain are: visceral and somatic. The visceral one is resulting from cervical dilatation that occurs during the first stage of labor and it relates to the tension exerted on the cervix. The parturient felt that as labor pain. The somatic kind of pain appears at the end of the first stage and it lasts also in the second stage. It is because of exerted force on the vaginal part of the cervix, the vagina, and the perineum. **(Czech et al., 2018)**.

Pain stimulates the respiratory system, minute ventilation and oxygen consumption increase and hyperventilation may cause respiratory alkalosis and reduction in the amount of blood transported to the fetus **(Koyyalamudi et al., 2016).** Moreover, pain, anxiety, and stress during delivery can cause an increased release of catecholamines and cortisol into the circulation **(Asadi et al., 2015).**

8. CAUSES OF LABOR PAIN

Pain during labor is a fluctuating cycle, appearing waves, first peaking, and then subsiding in turn. The frequency of this cycle however increases as time passes and the time for delivery nears. It focuses on shifts as labor progresses; it may cause anxiety and some level of fear. Most of the pain during the first stage of labor is due to mechanical distention of the uterine segment, stretching of cervical tissues during dilatation, and pressure on surrounding structures and nerves **(Al-Battawi, Mahmoud, & Essa, 2017)**

Firstly, pain due to uterine contractions: normally, contraction of involuntary muscles such as the heart and stomach do not cause pain. This concept makes uterine contractions unique because they do cause it. Uterine contractions lead to uterine ischemia (decreased blood flow and therefore local oxygen deficit) the compression of the arteries supplying the myometrium is the cause of the uterine ischemia. During uterine contractions, hypoxia occurs and lactic acid accumulates in the uterine muscles. This pain predominates over the lower portion of the abdomen and radiates to the lumbosacral area of the back, iliac crests, gluteal area, and down the thighs (Al-Battawi et al., 2017).

Secondly, stretching of the cervix and perineum result in labor pain. When stretching of the cervix is complete and the woman feels the urge to push, as long as the woman is pushing, pain from the contractions may disappear. The woman is pushing until the fetal presenting part causes the final stretching of the perineum (Al-Battawi et al., 2017) and (Marshall et al., 2016). https://plagiarismdetector.net/

Thirdly, pressure on the maternal pelvis causes an afferent pain impulse that travels along the sympathetic nerves that enter the neuroaxis between the T11 to T12 spinal nerve segment and accessory lower thoracic and upper lumber sympathetic nerves. These nerves originate in the uterine body and cervix **(Al-Battawi et al., 2017) and (Marshall et al., 2016).**

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9. FACTORS AFFECTING LABOR PAIN

Labor pain is a subjective sensation that is influenced by multiple factors as physiological factors; anxiety; culture; previous experience; childbirth preparation; comfort; support and environment. Physiological factors refer to the normal physiological adaptation of labor. This includes obstetrical factors, as progressive cervical dilatation, perineal distention, intensity and duration of contraction, fetal position and size, in addition to history of dysmenorrhea **(Tavassoli, Dizaji, & Kelari, 2017)**

Anxiety is commonly associated with increase pain during labor. However, excessive anxiety may cause more catecholamine secretion, which causes a decrease in blood flow and increased muscle tension. Culture also shapes women's expression of labor pain, where the oriental women deal with their pains in silence. Unlike to the African one who yell and cry giving the impression that they have harder pain **(Asl, Vatanchi, Golmakani, & Najafi, 2018)**

Previous experience, women previous experience with pain: if labor is not their first painful experience, women are less likely to feel overwhelmed and more likely to have developed coping skills. These experiences can reduce fear and pain. Expectation and believes about labor pain i.e. women's experience of labor pain and what she thinks is necessary to remedy it are influenced by popular and cultural beliefs, including images in the media **(Tavassoli et al., 2017).**

Women's labor environment, including elements influencing the pain experience. Such as who is attending the labor with her, verbal and non-verbal communication with her, the quality of support she receives, the philosophy of care and the practices of medical staff, the familiarity and comfort of surroundings , including noise lighting, and temperature. Comfort and childbirth preparation are other factors. Where the most helpful interventions in enhancing comfort are: a caring nursing approach; a supporting presence and a cognitive work involving concentration or breathing. Where, the presence of significant other who provides physical, emotional, and psychological support to the women in labor is a beneficial form of care that significantly increases pain tolerance **(Tavassoli et al., 2017).**

10. PHYSIOLOGICAL EFFECTS OF LABOR PAIN

Labor and delivery exert stress on the cardiovascular and respiratory systems by increasing plasma catecholamine's .Physiological responses to pain occur largely as a result of activation of the autonomic nervous system including; changes in blood pressure, heart rate, respiratory rate and metabolic responses. The ***elevated blood pressure*** that may accompany acute pain is believed to be due to over activity of the sympathetic nervous system. Peripheral vasoconstriction is an adaptive response, as the blood shifts away from the peripheries. Increase heart rate occurs when the body attempts to increase the available oxygen and circulating fluids volume to the tissues. The shunting of blood from the peripheries to the vital organs (brain, heart, liver and kidney) is afforded to preserve the body life support system **(Koyyalamudi et al., 2016)** .

Labor pain is a powerful respiratory stimulus During labor, maternal $Paco_2$ can be reduced from 32 to as low as 16–20 mm Hg and respiratory alkalosis (pH 7.77 to 7.60), which in combination with the elevated plasma catecholamine concentrations may result in decrease in cerebral and uterine blood flow. These changes can further lead to nausea, fatigue, mental confusion, tetany, pallor and sweating. Moreover, pain itself produces an increase in catecholamines and a decrease in uterine blood flow & fetal oxygenation. Catecholamines also decrease intrauterine pressure and hence the frequency and strength of contractions are changed. **(Koyyalamudi et al., 2016)**

Rapid respiratory rate results from an increase in the amount of oxygen available to the heart and circulation. Increased respiration also helps eliminate carbon dioxide from the circulation. As regards the *neuroendocrine* and *metabolic responses*, unrelieved pain produces a catabolic state, that is stored energy is consumed to provide energy to vital organs and injured tissue. These responses are also known as the stress response. These effects include generalized increase in metabolism and oxygen consumption and increased blood glucose, free fatty acids, lactate and ketones **(DAVIDSON, 2019)**

Observable indicators of pain may include **behavioral cues** such as gross motor activity, verbal and facial expressions. *Motor behaviors* frequently encountered with pain experiences. Spasms of smooth or skeletal muscle frequently accompany visceral or deep somatic pain. *Behaviors* may include an increase in body activity-rubbing or supporting a painful area, frequent change in body position, walking or pacing **(DAVIDSON, 2019).**

Verbal responses can also appear because of pain including sighing, moaning, screaming, such crying, repetition of words or phrases, as well as statements about pain. Furthermore, the person may become angry or irritable. *Facial expressions* are almost intuitively observed when assessing pain. Specifically, pinched features, a knotted brow, facial grimaces, and perspiration present a portrait of pain to the observer **(Dashe et al., 2018)**

11. MANAGEMENT OF LABOR PAIN

Pain management in labour, like in any other care, also is one of the main goals of maternity care. Two models for pain management are identified, medical and midwifery models. The former model adopts pharmacologic methods of pain relief, such as systemic analgesia or anesthesia. Pharmacologic approaches are directed to eliminating the physical sensation of labor pain, all obstetric analgesia are invasive, and have the potential to cause side effects to both the mother and the fetus (Thomson, Feeley, Moran, Downe, & Oladapo, 2019).

The later model are non-pharmacologic such as warm water bath, breathing techniques, back massage, and changing position. It conceder as easily applicable, cheap and safe. The non-pharmacological approaches used to decrease the physical sensation of pain, and to prevent suffering by enhancing the psychological, emotional, and spiritual dimensions of care (Perry et al., 2017).

11.1. Pharmacologic methods of pain relief:

Pharmacological methods of pain relief during the first stage of labour refer to systemic analgesia and sedatives as well as regional analgesia such as epidural, spinal *analgesia* or pudendal block that reduces or decreases awareness of pain. Anesthesia causes partial or complete loss of sensation. Virtually all medications given during labor cross the placenta and have adverse effects on the mother and fetus. The adverse effects include: maternal hypoxia that decreases blood flow to the placenta resulting in fetal hypoxia and **acidosis (Czech et al., 2018).**

Drugs may also slow labor progress if given too early before labor is well established. However, the American College of Obstetricians and Gynecologists (ACOG) currently recommended that women can receive pain relief at the point they request it, regardless of cervical dilatation, even though medication given too early tends to slow labor contractions **(Madsen et al., 2018).**

11.1.1. Parenteral analgesics:

Nearly all parenteral opioids, analgesics and sedatives readily cross the placenta and can depress the foetus and reduce foetal heart rate variability due to depression of the central nervous system. *Systemic analgesics* are still widely used around the world, despite being significantly less efficacious than epidural analgesia. Pentazocine is still used in some developing countries where pethidine, morphine are not readily available. Many parenteral opioids have been used to provide obstetric analgesia but the most popular have been pethidine, morphine and diamorphine (Nanji & Carvalho, 2020)

11.1.2. Inhalational pain relief in labour:

Nitrous oxide is relatively insoluble in blood and has these properties. Administered usually via on a face mask or mouth piece Nitrous oxide has a low blood gas solubility coefficient [0.47] so it equilibrates rapidly with the blood. There is minimal accumulation with intermittent use in labour as it is rapidly washed out of the lungs. Adverse effects of entonox include drowsiness, disorientation and nausea which results in actual loss of consciousness in 0.4% of cases after prolonged use **(Richardson, Lopez, Baysinger, Shotwell, & Chestnut, 2017)**.

11.1.3. Regional labor pain relief techniques:

Regional analgesia for labour encompasses pudendal nerve block, paracervical block, and spinal, epidural and combined spinal epidural block. Regional analgesia is the most effective form of analgesia in labour. It reduces maternal pain, cardiovascular work and anxiety with minimal effects on the fetus. Regional analgesia is widely available in the developed world and has changed the labour experience for many women makings it much more pleasurable and satisfying and requires dedicated staff and monitoring **(Nanji & Carvalho, 2020).**

11.1.4. Pudendal nerve block:

It is possible for a pudendal nerve block to be sited on each side of the birth canal to provide analgesia for the second stage of labour or a straightforward instrumental delivery. The pudendal nerve arises from the sacral plexus of S2 to S4 and supplies the perineum, vulva, and vagina. Pudendal nerve block is often combined with perineal infiltration of local anesthetic to provide perineal anesthesia during the 2nd stage of labour (Nanji & Carvalho, 2020).

11.1.5. Local infiltration:

With local infiltration, the drug is injected subcutaneously into the true perineum prior to an episiotomy or repair of a laceration.

11.1.6 General anesthesia:

General anesthesia is rarely used for vaginal deliveries because it causes the woman to lose consciousness. However, it may be used for emergency cesarean births. Because the drug reaches the fetus in about 2 minutes, there is a risk of respiratory depression in the newborn. Major adverse effect in the mother is regurgitation with aspiration of the acidic stomach contents. This results in chemical injury to the lungs and aspiration pneumonitis **(Sigdel, Lama, Gurung, & Timilsina, 2018).**

11.2 Non-pharmacological methods of labor pain relief:

Non-pharmacological methods of pain relief in labour are interventions that may be used either as total pain management program or to complement pharmacologic interventions. These include physical or psychological activities that divert the mother's concentration away from pain. They also increase relaxation and pain threshold by cutting pain – fear-tension cycle. Most of these interventions are based on the gate control theory which assumes that distraction can be effective in preventing the brain from processing pain sensations coming into the cortex**(Czech et al., 2018).**

These methods include a wide variety of techniques to address not only the physical sensations to pain but also to prevent suffering by enhancing the psychological and spiritual components of care. So, these require patient preparation and antenatal education. These methods that provide natural pain relief can be very effective during labor and childbirth, eliminate & for delay the use of medication and the subsequent total dose received **(Czech et al., 2018).**

The reports of the World Health Organization show that natural techniques are mostly used for preventive and protective purposes. **(Pilewska-Kozak et al., 2017).**

A large prospective study found that women who avoided the use of medication were also more likely to be satisfied and confident in their ability to cope with the childbirth than those who use drugs. The analgesic effect of many of non-pharmacological methods is comparable to or even superior to narcotics that are administered parenterally, *these methods include:*

11.2.1 Continuous support:

The term continuous labor support refers to the use of a trained companion to provide nonmedical care of the laboring woman throughout labor and birth (usually with a doula). A nurturing, supportive companion during labor, who is neither a family member/close friend of the laboring woman, nor a member of the hospital staff, can help the woman cope with pain and anxiety and improve obstetrical outcomes. Continuous support from a partner or caregiver can reduce the frequent use of epidural analgesia and the amount of other analgesia administered to a mother **(Simkin, 2018).**

11.2.2 Warm water baths:

Warm water baths also called Hydrotherapy or water immersion, **increasingly** are available in some hospitals and birth centers. There are wide range of hydrotherapy options available, from ordinary bathtubs to whirlpool baths and a Jacuzzi tub. During the 1st stage of labor the woman immerse enough to cover the abdomen. Maintain the water at or below body temperature and limit bath time to one to two hours. The woman's membranes can be intact or ruptured. It has been recommended that physicians wait for active labor (more than 5 cm dilated) to begin before initiating baths **(Czech et al., 2018)**

Many women are comforted by the combination of warmth, water pressure, and the sound of the water. Warm water provides soothing stimulation of nerves in the skin, promoting vasodilatation, reversal of sympathetic nervous response and reduction in catecholamines. Also safe and effective, enhance relaxation, accelerate labor, decrease blood pressure, and increase feeling of control and reduce labor pain.

11.2.3 Sterile water injection

Sterile water injection also called intradermal water blocks or intracutaneous water injections. It is a simple procedure to perform. There are possible explanations for the effectiveness perhaps because of the gate-control theory and counter irritation mechanism (i.e., reducing localized pain in one area by irritating the skin in an area nearby) or an increase in the level of endogenous opioids (endorphins) produced by the injections. Intense stinging will occur for about 20 to 30 seconds after injection, but relief of back pain for up to 2 hours (Koyucu et al., 2018)

11.2.4 Application of heat and cold:

Superficial applications of heat and/or cold, in various forms, are popular with laboring women. They are easy to use, inexpensive, no prior practice, no side effects when used properly. Heat is typically applied to the woman's back, lower abdomen, groin, chest, face and/or perineum. Possible heat sources include a warm water bottle, heated rice-filled sock, warm compress (wash cloths soaked in warm water and wrung out), electric heating pad, or warm blanket. No studies have evaluated the optimal temperature or duration of heat therapy. The heat used for relief pain and chills, increase connective tissue extensibility, decrease joint stiffness and muscle spasm**(Ahmad-Shirvani & Ganji, 2016)**

Cold or cryotherapy include a bag or surgical glove filled with ice, frozen gel pack, camper's "ice" a hollow, wash cloth dipped in cold water or even a frozen bag of vegetables. Chilled soda cans, plastic rolling pin filled with ice, and bottle filled with ice, give the benefit of mechanical pressure when rolled on the lower back. Cold packs often available in hospitals. Cold used for relief pain, reducing inflammation and edema and relieving muscle spasm(Ahmad-Shirvani & Ganji, 2016)

11.2.5 Breathing techniques:

Rhythmic breathing promote relaxation or to provide distraction by helping the woman to concentrate on breathing rather than contractions. These enhance a woman's sense of control. Reduce discomfort generated by friction between the uterus and abdominal wall during contractions. Because the muscles of the genital area also become more relaxed, they do not interfere with fetal descent. There are various breathing techniques that the caregivers can teach laboring women such as cleansing breath, slow – paced breathing, modified – paced breathing and patterned – paced breathing **(Simkin, 2018)**

11.2.6 Massage

It is purposeful systematic manipulation of the soft tissues of the body, primary via touch and movement in order to promote relaxation to reduce anxiety, alleviate pain and also communicates caring during labor. Receptors in the brain receive the sensations of pleasure from the massage blocking reception of the painful stimuli of labor. Bare skin receives the signal best and unscented powders and lotions are helpful for massage. Massage can be in the neck, shoulders, back, thighs, feet or hands. It takes form of light or firm stroking, vibration, kneading, deep circular pressure, and continual steady pressure **(Simkin, 2018)**

11.2.7 Therapeutic touch(TT):

Touching another person can communicate such positive messages as caring, concern, reassurance, and love. Also enhance relaxation, no harmful effects and enhance feelings of well-being in the first stage of labor.TT is based on K-healing practice known as lying of the hands. Healers or trained nurse place themselves in a meditative state; hold their hands just above the woman and transfer the energy to relieve pain or other problems. Wiping the woman brow, assisting with effleurage or massage on back can reduce tension and increase relaxation. Applying firm pressure may relieve pain. Kneading and stroking muscles improves circulation(Simkin, 2018).

Therapeutic touch (TT) uses the concept of energy field within the body called prana. Prana are thought to be deficient in some people who are in pain. TT uses lying – on of hands by special trained person to redirect energy fields

associated(Anggorowati & Nanda)Painful contractions of the uterus can be treated by the application of pressure with the hands to the woman's back, abdomen hips, thighs, sacrum or perineum. Whether Touch as perceived as positive or not is dependent on who is touching the patient (Simkin, 2018).

11.2.8 Aromatherapy:

Aroma is the essential oils are lipid – soluble and are rapidly absorbed when applied externally or inhaled. They are excreted through the kidneys or expired through the lung. For labor woman, therapeutic grade oils such as lavender, rose, chamomile, and clary sage, mixed with carrier oil or lotion can promote relaxation and perception of pain (Nursahidah, Novelia, & Suciawati, 2020).

These can be administered in a variety of ways including in oil during a massage, in hydrotherapy bath, inhalation using electric vaporizers, a drop in the palm or on the forehead of the laboring woman. Aromatherapy reduces stress, tension, nausea and vomiting during labor. Beware, however, that pregnant and laboring women are highly sensitive to smell (Nursahidah et al., 2020) .

11.2.9 Focus and Distraction

Many methods of coping with pain rely on the laboring woman's ability to focus and use mind-diverting activities. Focusing one's attention is a deliberate activity and is aided by *verbal coaching, visualization, self-hypnosis, and concentration on a visual, auditory, or tactile stimulus.* Distraction is a more passive form of focusing attention by using stimuli from the environment that will draw attention away from pain. Also used with other strategies and may not be useful for severe pain. These techniques are help to reduce fear, anxiety and pain **(Valentine, 2020)**

11.2.10 Audio-analgesia

Audio-analgesia (music, talk) are used to control pain in childbirth. Many childbirth educators use music in their classes to create a peaceful, pleasant, and relaxing environment and they advocate for its use during labor as an aid to relaxation. Audio-analgesia for pain relief consists of soothing music between and during contractions. Music transmitted through earphones which can block out disturbing, distracting, or unpleasant sounds. Carefully chosen music can also reinforce rhythmic breathing patterns, massage strokes or facilitate focusing one's attention**(Levy, 2017)**

11.2.11 Acupuncture and acupressure (shiatsu)

Acupressure and acupuncture can be used in labor to relieve pain, promote circulation, the harmony of yin and yang and the secretion of neurotransmitters, thus maintaining normal body functions and enhancing well-being **(Schlaeger et al., 2017)**

Acupuncture: is the insertion of fine disposable needles into specific areas of the body to restore the flow of *qi* (energy) which is thought to be obstructing the flow of energy. There are 12 meridians and 365 acupuncture points along those meridians. Points are in neck, shoulders, wrists, lower back including sacral points, hips, the area below the kneecaps, ankles, nails on the small toes, and the soles of the feet **(Ozgoli, Mobarakabadi, Heshmat, Majd, & Sheikhan, 2016).**

Effectiveness may be attributed to the alteration of chemical neurotransmitter levels in the body or to the release of endorphins because of hypothalamic activation. For labor pain, placement of needles depends on the degree and location of pain, stage of labor, level of maternal fatigue, tension, anxiety and a variety of other factors. Acupuncture should be done by a trained certified therapist and qualified **(GÖNENÇ & TERZIOGLU, 2020).**

Acupressure is the application of pressure to the same points on the body to stimulate the acupuncture for therapeutic effects. It is best applied over the skin without using lubricants by heel of the hand, fist, or pads of the thumbs and fingers **(GÖNENÇ & TERZIOGLU, 2020).**

Also applied with contractions initially and then continuously during labor. Pressure heat, or cold is applied to acupuncture points called tsubos (points located along the body's meridians or energy flow lines) for 10 to 60 seconds, followed by rest for an equal period of time and can be repeated for up to six cycles. These points have an increased density of neuroreceptors and increased electrical conductivity **(GÖNENÇ & TERZIOGLU, 2020).**

11.2.12 Transcutaneous Electrical Nerve Stimulation (TENS) :

Transcutaneous Electrical Nerve Stimulation (TENS). TENS is one of electromagnetic therapy which involves the use of electromagnetic energy to diagnose or treat disease. *Electrical* stimulation is one of the oldest and most effective modalities used in physical therapy**(Shahoei, Shahghebi, Rezaei, & Naqshbandi, 2017).**

Nowadays, the wide variety of electrical stimulators has a single common purpose, the stimulation of tissues for therapeutic purposes. These tissues may be a muscle to relax or contract, a nerve to produce analgesia or a bone to enhance growth **(Santana et al., 2016)**. Alternative medicine providers may offer low-voltage electricity, magnetic fields, radio waves, or other types of electromagnetic energy generated by electric current for this purpose (Shahoei et al., 2017)

11.2.13 Movement and Position Changes

Finally but not least, During the first stage of labor, women alternate positions such as sitting, standing, side – lying , kneeling, and walking to provide rest and varying the intensity and the frequency of contractions. Also promote comfort, reduce medication requirement, and shorten labor. It may also relieve pain by shifting pressure and allowing the baby to **move (Al-Seady, Fadel, El-Gohary, & Marzouk, 2017)**.

In the first stage, the woman in an upright position will have stronger, more regular, and more frequent contractions because gravity help align the fetus with the pelvic angle as the uterus tilts forward with each contraction. Maternal mobility can be restricted when women take pain medication and obstetric or fetal monitoring, she advised to assume a side-lying position as often as possible to minimize fetal stress and enhance maternal fatal blood circulation (Emam & Al-Zahrani, 2018).

Frequent position changes (at least every hour) seem to achieve more efficient contraction, and contribute to comfort and relaxation. It is also helpful for the woman to sit up in a rocking chair or other comfortable chair, or in the shower (DAVIDSON, 2019)

12. MATERNAL POSITION AT FIRST STAGE OF LABOR:

12.1 Upright position:

12.1.1 Squatting position:

The squatting position is widely used for normal birth and it is one of the most effective positions. In this position the women crouches during contraction and then during relaxation she recuperates (Gizzo et al., 2014). Squatting encourages and strengthens the intensity of contractions, and can relieve pressure in the back, which reduce the labor pain. In practice, squatting position are two kinds: on tiptoes and with feet flat (Desseauve, Fradet, Lacouture, & Pierre, 2019).

12.1.2 Standing position:

Standing in upright position by women or against to a support which can be her bed, chair, nurse, or partner. A women can find asymmetrical position during standing reduce discomfort, such as having one leg bent with the foot on a small chair (Gizzo et al., 2014)

12.1.3 Walking around:

Encouraging the women to walking around as long no bleeding or rupture of membranes because upright positions shorten labor. In addition, walking around can aids the fetal to descent increases the frequency and intensity of contractions, give the woman sense of control, and reduce the pain with the ambulation. Although, it is important that the woman conserve energy, so taking rests regularly are recommended (DAVIDSON, 2019).

12.1.4 Sitting:

The women use the bed, chair, or a ball to sitting. The upright sitting position provide advantages similar to squatting. It relieve back pain with stronger, more effective uterine contractions. Women experiencing severe back pain have found that use of the chair can diminish or eliminate the pain and suffecent rest and comfort. As a recumbent position the fetal hart rate can be heard in the sitting position easly by using fetal monitoring machine(DAVIDSON, 2019).

12.1.5 Kneeling:

Either the women using this position by get down onto her knee on the bed or on a floor mat, she bent forward to support her weight with arms. The hands and knees position is more comfortable for a woman experiencing back labor because there is less pressure on the maternal back from the fetus. This position can increase the intensity of the uterine contraction. On the other hand , this position can make the mother hand tiered.(DAVIDSON, 2019).

12.2 Non-upright position:

12.2.1 Recumbent or semi-recumbent:

The women is lying flat on her back above the bed. A semi recumbent the women lying with angle 45 degree. The health care provider assumed recumbent or semi recumbent positions during labor; it is more convenient for the staff and easier in monitoring of the progression of labor and observing the status of the woman and fetus. However, the fetus and uterus in this position is press the blood vessels supplying the abdomen and the women back that result in decrease fatal blood and increase maternal back pain. The strength of the contraction reduced in this position and there is no effect of the gravity (Al-Seady et al., 2017)

12.2.2. Four-point kneeling:

The women in this position going on all four in which the abdomen is hanging freely. Weight of the women taken alternately between the hands and the forearms resting on a raised surface. This position allows the women to do pelvic tilts for comfort, while give the nurse or partner an access to the back to applying back massage(Marshall et al., 2016)

12.2.3. Side-lying :

A common position favored by some women and birth attendants is the left lateral Sims' or side-lying position. In this position, the woman lies on her left side with her left leg extended and her right knee drawn against her abdomen or flexed by her side or with both legs bent at the knees.

The advantage of this position is decreased the frequency of contractions, the intensity increases, yielding greater uterine efficiency. In addition, increase maternal comfort, without compromise venous return from the lower extremities, puts less stress and pressure on the maternal neck, and reduction of the chances of aspiration if vomiting occur. Women also perceive the lateral Sims' as a more natural and comfortable position and less intrusive with no stirrups or overhead lights required (DAVIDSON, 2019).

13. ROLE OF THE NURSE

The goal of the nurse midwife is the successful, uncomplicated birth of a new infant. The care of nurse starting from the first stage of labor and continues to the end of all process. The nurse answer all questions from mother and then she explains the environment and the procedures that will be a part of the labor and birthing care. The nurse can helps the woman undress and get into a hospital gown to be sure for her safe, during that, the nurse begin to develop a good rapport and communication with the mother and establish the nursing database. The nurse obtain essential information regarding the woman and her pregnancy.

The nurse keep the mother in a comfortable position.

After obtaining the essential information from the woman, the assessments begin, the nurse auscultates the fetal heart rate, assess the mother's blood pressure, pulse, respirations, and oral temperature, uterine contraction n status (frequency, duration, and intensity), cervical dilatation and effacement, and determined fetal presentation and station.

Collecting Laboratory Data After admission data are obtained, laboratory tests are needed to provide more extensive physiologic data of the mother. After initial physical assessments performed, the nurse takes a social history that provides a comprehensive view of both the mother's social habits and psychological factors that may affect birth experience.

During the first stage of labor, the nurse is concerned about the physical safety of the laboring woman and her child, as well as the emotional well-being of the laboring mother. The nurse continually assesses the effects of uterine contractions

on the process of labor and the well-being of the fetus. In addition, she monitors the mother's vital signs, contraction status, cervical dilatation changes, and intake and output.

In addition nursing care during the first stage, the nurse continue evaluate physical parameters of the woman and fetus. Maternal temperature is monitored every four hours except the temperature is within abnormal range. In such cases, the nurse take the temperature every hour. Moreover, take it every two hours once the amniotic fluid has ruptured. Blood pressure, pulse, and respirations are monitored every hour. The nurse palpates uterine contractions for frequency, intensity, and duration. vaginal exams are done to assess cervical dilatation changes, status of membranes, fetal position, and station. However, frequent vaginal exams increase the risk of infection, so that, the nurse performed as needed.

Pain Management and Comfort Promotion during labor is a universal challenge. Recently, women during labor have much effective and safe method to manage the labor pain, which can be include pharmacological and non-pharmacological methods. The nurse's position is ideal to help mother during management of labor pain with clear, concise, and balance information regarding a non-pharmacological pain relieve methods.(Marshall et al., 2016).

Non-pharmacological methods may include ambulation and position changes. At first stage of labor, nurse providing care in a clear, consistent, and evidence based explanation of both the risks and benefits of the changing of labor positions and enable women to choices the position which will afford the most comfort. In addition, that decrease a woman's sense of control that may have an effect on a reduction need for analgesia (Emam & Al-Zahrani, 2018).

The nurse provides support and encouragement for the woman and her partner using non-pharmacologic methods. Although women can't consciously direct the contractions occurring during labor, they can control how they respond to them, thereby enhancing their feelings of control.

Ambulation and Position Changes during labor are a useful for pain management and comfort. Nurses are in an ideal position to provide a balanced, clear, concise information regarding the effect of change position during labor at first stage. The nurse help the women to changing position frequently (every 30 minutes or so) and able the women to choose between sitting, walking, kneeling, standing, lying down, getting on hands and knees, and using a birthing ball. In addition, nurse support the mother in a chosen position with pillow or hand support. The nurse help the women to avoid the supine and sitting positions if it cause compression of the vena cava and decrease blood return to the heart and then result in fetal distress. With a portable fetal hart auscultation machine, the nurse allow the mother to swaying from side to side, rocking, or ambulating. Upright positions such as walking, kneeling forward, or doing the lunge on the birthing ball give most women a greater sense of control and active movement than just lying down (DAVIDSON, 2019).

The researcher will carry out this study to assess the effectiveness of two different positions during the active phase of the first stage of labor on intensity of labor pains, which can help the nurse and the women in chose the position for management the pain.

14. SUMMARY

This chapter explains deeply stages of labor, physiological process of first stage of labor, and the phases of first stage. In addition, definition of pain, causes of labor pain and the factor that affecting labor pain. Moreover, the physiological effect of labor pain and the two methods of labor pain management: the pharmacological and non-pharmacological methods. In addition, maternal position at first stage explained in detail.

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