

Effect of Back Massage on the Intensity of Labor Pain

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ARTICLE INFORMATION

Received: 24, July, 2022

Revised: 24, October, 2022

Accepted: 26, October, 2022

KEYWORDS

Back Massage; Intensity of Labor Pain; Active Phase of the First Stage of Labor.

Massage Punggung; Intensitas Nyeri Persalinan; Kala I Fase Aktif.

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DOI

<https://doi.org/10.36456/embrio.v14i2.5981>

ABSTRACT

Labor is the process of expulsion of the fetus the uterus through the birth canal. Every woman labor must experience labor pain. Labor pain is physiological because it is caused by uterine distension and cervical dilation. Based on a preliminary study among 6 women in labor, 100% of respondents experienced pain, 33.3% of respondents responded to the pain by grinning and hissing, and were able to follow orders provided by healthcare workers well. 50% of respondents responded to pain by shouting, crying, and sometimes were able to follow orders provided by healthcare workers. Furthermore, 16.7% of respondents responded to pain by crying hysterically, screaming and pulling nearby objects. This study aims to analyze the effect of back massage in reducing pain intensity during the active phase of the first stage labor. This was a pre-experimental study with a pretest post-test one group design. Data were collected using an observation sheet. Study samples were primiparous and multiparous women in the active phase of the first stage of labor (20) at Private Practice Midwife of Mrs. "I" Mancar Peterongan Jombang. Samples were selected through accidental sampling technique. Before the back massage was performed, most of respondents experienced very severe pain (40%). After back massage, most of respondents experienced moderate pain (50%). Spearman's Rank correlation test obtained Spearman's Rank count of (0.6) > Spearman's Rank table of 0.4 which indicated that there was an effect of back massage in reducing pain intensity during the active phase of the first stage of labor. It can be concluded that the intensity of labor pain could be reduced by applying back massage.

Persalinan adalah proses keluarnya janin dalam rahim melalui jalan lahir. Setiap ibu bersalin pasti mengalami nyeri persalinan. Nyeri persalinan merupakan hal yang fisiologis karena disebabkan distensi uterus dan peregangan serviks. Berdasarkan studi pendahuluan dari 6 inpartu 100% mengalami nyeri, 33,3% merespon nyerinya menyeringai, mendesis, dan dapat mengikuti perintah dari tenaga kesehatan dengan baik. 50% merespon nyeri dengan berteriak, menangis, terkadang bisa mengikuti perintah tenaga kesehatan. 16,7% merespon nyeri dengan menangis histeris, berteriak serta menarik benda didekatnya. Penelitian ini bertujuan menganalisis pengaruh massage punggung terhadap penurunan intensitas nyeri persalinan kala I fase aktif. Jenis penelitian pre eksperimental dengan teknik pretest post-test one group design, instrumen penelitian lembar observasi. Sampel ibu bersalin primipara dan multipara kala I fase aktif (20) di PMB Ny. "I" Mancar Peterongan Jombang. Tanggal 09–28 Mei 2022. Sampling yang digunakan aksidental. Sebelum dilakukan massage punggung sebagian besar responden merasakan nyeri yang sangat (40%). Setelah dilakukan massage punggung sebagian besar responden mengalami nyeri sedang (50%). Uji korelasi Spearman's Rank diperoleh Spearman's Rank hitung (0,6) > Spearman's Rank tabel (0,4) artinya ada pengaruh massage punggung terhadap penurunan intensitas nyeri persalinan kala I fase aktif. Kesimpulan yang didapatkan adalah intensitas nyeri persalinan dapat berkurang setelah dilakukan massage punggung.

Introduction

Labor is a process of expulsion of the fetus from the uterus through the birth canal. Childbirth is a natural thing that will be experienced by every pregnant woman. Labor is divided into 4 stages. In the first stage, the cervix dilates until 10 cm (Henderson, 2015). The first stage is also called the cervical dilation period. The second stage is called the expulsion stage. Due to the contraction and force of pushing, the fetus is pushed out until it is born. In the third stage of labor, the placenta separates from the uterine wall. Furthermore, the fourth stage starts from the delivery of the placenta until 2 hours after delivery (Prawirohardjo, 2014).

Labor pain is natural discomfort during labor. Labor pain is not new condition but has been known for a long time. Pain is unique and different for each individual. Pain usually experienced by a woman when facing the active phase of the first stage of labor. In this phase, the contractions will last longer and more frequently. Back pain will get worse in this phase and emotionally the woman also feels restless and her self-confidence begins to waver (Mander, 2014).

If a mother experiences excessive anxiety (stress), it will lead to the formation of catecholamines or stress hormones. Excessive levels of catecholamines in the active phase of the first stage of labor can reduce blood flow to the uterus, which further reduce the oxygen supply available to the fetus, resulting in hypoxia in the fetus (Long C, 2016). Severe and prolonged labor pain can affect ventilation, namely hyperventilation with a respiratory rate recorded of 60-70 times/minute. Such condition can affect the acid-base balance of the circulatory system, resulting in alkalosis. The real danger of alkalosis during labor is a decrease in oxygen transfer to the fetus. Alkalosis can also induce uterine vasoconstriction, prolonged labor. Increased ventilation along with the use of energy to push during the second stage of labor can increase maternal oxygen consumption thereby worsening fetal oxygen (Cunningham, 2013). Furthermore, the experience of emotional pain can cause distress due to serious emotional pain which may lead to postpartum depression (Mander, 2014).

Due to significant effect of labor pain, it is necessary to have pain control methods. Pain control methods can be divided into 2 types, namely pharmacological and non-pharmacological methods. Pharmacological methods include inhalation analgesia, opioid analgesia, regional analgesia/anesthesia, and general anesthesia. On the other hand, non-pharmacological methods include homeopathy, aromatherapy, hypnosis, visualization of labor, auditory and visual images, relaxation, and back massage (Danuatmaja, B dan Meiliasari, 2014).

Back massage technique is the simplest pain therapy technique and uses human soft reflexes to hold, rub or squeeze the painful body part. Pain in the first stage is transmitted by afferent nerve fibers (sympathetic fibers) from the 10th, 12th thoracic nerves, and lumbar nerves to the back. Giving back massage is considered to close the pain gate because it is able to inhibit the pain transmission towards higher centers in the central nervous system. One of the advantages of back massage technique is to create psychological effect that can reduce anxiety (Mander, 2014).

Based on a preliminary study conducted on March 19–23, 2022 at Private Practice Midwife of Mrs. "I", there were 6 women in labor and they were only recommended to perform deep breaths. 100%

of respondents experienced pain, 33.3% of respondents responded to the pain by grinning and hissing, and were able to follow orders provided by healthcare workers well. 50% of respondents responded to pain by shouting, crying, and sometimes were able to follow orders provided by healthcare workers. Furthermore, there was 1 woman (16.7%) who responded to pain by crying hysterically, shouting and pulling nearby objects and also constantly straining uncontrollably.

Based on the background that has been described, it is necessary to investigate the effect of back massage in reducing pain intensity during the active phase of the first stage labor. It is expected that women in labor can carry out the delivery process smoothly without worrying about the pain that will be experienced so that their mentality becomes stronger since back massage can relieve the labor pain.

Methods

This was a pre-experimental study with a pre-test post-test one group design (Notoatmodjo, 2014). The study subjects were 20 mothers with normal delivery who experienced labor pain. Sampling was made based on accidental technique namely total sampling, namely all women in the active phase of the first stage of labor from cervical dilation of 4-9cm. Statistical test used the Spearman Rank correlation test with the significance level based on a p value of <0.05.

This study used an observation sheet to measure the level of pain based on the Faces Pain Rating Scale (Hidayat, 2015). Pain measurement was performed before and after back massage. Bivariate analysis was carried out to determine whether there was an effect of independent variable, namely back massage on the dependent variable of the intensity of labor pain. To prove the effect, the Spearman Rank test was applied to determine the difference in treatment between the two sample/treatment groups with the condition that the data were normally distributed. At the statistical significance level of $p < 0.05$, there was an effect of back massage in reducing pain intensity during the active phase of the first stage of labor. This study has been approved bases on ethical clearance issued by School of Health Science Insan Cendekia Jombang No.012/KEPK/ICME/V/2022

Results

Table 1 revealed that before being given back massage 40% of respondents experienced very severe pain and 15% of respondents experienced moderate pain.

Table 1. Distribution of Pain Intensity among Women in Labor in Before Back Massage

Pain variable	Frequency	Percentage (%)
No pain	0	0%
Mild pain	0	0%
Moderate pain	3	15%
Severe pain	5	25%
Very severe pain	8	40%
Pain was unbearable	4	20%
Total	20	100%

Labor pain is discomfort during labor that is natural. Pain perception is a highly subjective and complex event that is influenced by factors that trigger nociceptor-nociceptor stimulus and nociceptor impulse transmission.

Table 2 revealed that before being given back massage 50% of respondents experienced moderate pain and 20% of respondents experienced severe pain

Table 2. Distribution of Pain Intensity among Women in Labor in After Back Massage

Pain variable	Frequency	Percentage (%)
No pain	0	0%
Mild pain	6	30%
Moderate pain	10	50%
Severe pain	4	20%
Very severe pain	0	40%
Pain was unbearable	0	20%
Total	20	100%

The results of the study regarding the intensity of labor pain in the active phase of the first stage after back massage revealed a decrease the intensity of pain. Before being given a back massage the level of pain that was expressed with a very painful level was 40%. After a back massage it decreased to 0%. 25% women experienced severe pain before back massage, decreased to 20% after back massage. There were 20% of women who experienced unbearable pain before back massage, and after back massage it decreased to 0%. Furthermore, there were 15% of women who experienced moderate pain before back massage, and it decreased to 50% after back massage. Meanwhile, there was no woman who experienced mild pain before back massage, and after back massage it becomes became 30% and none of the women experienced no pain.

Table 3 revealed that before back massage and after back massage 0% of respondents had no pain, 30% of respondents experienced mild pain, 65% of respondents experienced moderate pain, 45% of respondents experienced severe pain, 40% of respondents experienced very severe pain, and 20% of respondents experienced unbearable pain.

Table 3. Cross-tabulation of the effect of back massage in reducing pain intensity during the active phase of the first stage of labor

Back Massage	Labor pain						Total
	NP	Mild	Moderate	Severe	Very Severe	Unbearable	
Before back massage	0 (0%)	0 (0%)	3 (15%)	5 (25%)	8 (40%)	4 (20%)	20 (100%)
After back massage	0 (0%)	6 (30%)	10 (50%)	4 (20%)	0 (0%)	0(0%)	20 (100%)

The results of the study regarding the intensity of labor pain showed that before back massage, the level of pain that was expressed with a very painful level was 40%. Meanwhile, after back massage, most of respondents experienced moderate pain as much as 50%. The comparison of labor pain before and after back massage showed that 40% of very severe pain and 20% of unbearable pain were significantly reduced became 0%. Thus, it was proven that back massage could significantly reduce the pain intensity pain during the active phase of the first stage of labor, especially 60% primiparous and 40% multiparous women involved in this study.

The results of data analysis on the effect of back massage in reducing pain intensity during the active phase of the first stage of labor at Private Practice Midwife of Mrs. "I" Mancar Peterongan Jombang using the Spearman Rank test showed that there was an effect of back massage in reducing pain intensity during the active phase of the first stage of labor.

Discussion

The results showed that before the back massage was performed, most of respondents experienced very severe pain (40%). Such pain was expressed by a very sad face, complaining, grinding teeth, closing eyes or mouth tightly or opening eyes or mouth wide. There were 25% of women in labor who experienced severe pain which was expressed by a very sad face, hissing and wrinkling the forehead. 20% of respondents experienced unbearable pain which was expressed by a very scared face, crying, screaming and biting her lip, and the women could not stand the pain. There were 15% of women in labor who experience moderate pain which was expressed by a less happy face, grinning, hissing, and could still bear the pain. In this study, there were no women who experienced mild pain and none who had no pain.

Uterine contractions cause cervical dilatation and effacement as well as uterine ischemia (decreased blood flow resulting in a local oxygen deficit) due to contraction of the myometrial arteries. Pain impulses in the first stage of labor are transmitted through the spinal nerve segments of T 11 – 12 and the accessory nerves of the lower thoracic and upper lumbar sympathetic nerves. This pain originates in the lower abdomen and radiates to the lumbar region of the back and down the thigh. Usually the mother experiences this pain only during contractions and is free of pain in the interval between contractions (Mochtar, 2013).

Based on the results of observations through observation sheets, it could be seen different pain threshold and facial expressions of each individual. Such responses were caused by uterine contractions that lead to cervical dilation and effacement, as well as uterine ischemia. Pain during labor that occurs in the first stage due to uterine contractions will cause 2 events, namely cervical dilatation and effacement and uterine ischemia (decreased blood flow which lead to reduced O₂ levels in the uterus) (Priharjo, 2013).

Pain experienced by the women during labor comes from the cervical dilation and stretching of the lower birth canal. Vasoconstriction can also be in the first stage of labor due to uterine contractions, which may result in uterine ischemia due to a decrease in blood flow and a lack of O₂ supply to the uterus (Priharjo, 2013). According to Bobak (2015), labor pain is a natural discomfort during labor caused by strong uterine contractions and tension of the supporting ligaments, cervix, vagina, bladder and rectum, stretching of the cervix, pelvic floor muscles and vagina. According to Priharjo (2013) pain experienced by a woman during childbirth is a sense of discomfort, both mild and severe. Labor pain is physiological because it is caused by uterine distension, cervical dilation, and stretching of the lower birth canal. This is in accordance with the opinion of Tamsuri (2016) that pain lead to various expressions made by a client such as crying, grimacing, screaming hysterically, restless, anxious, tired face, lethargy and sweat which fills the face and the patient cannot follow the order provided healthcare workers properly. The client's response to this pain can be influenced by the body's ability to tolerate pain.

This study revealed that back massage could reduce the intensity of labor pain. This can be seen from the response of the women when the back massage was performed. They became more comfortable

and the women felt being cared for. The labor process that is considered painful will be reduced by a gentle touch on the area of pain. Giving back massage is one of midwifery cares. Comfortable conditions and the attention of healthcare workers really help smooth the delivery process, especially reducing the intensity of labor pain. This is in accordance with the opinion of Mander (2014), that back massage can make women in labor more refreshed, relaxed, and comfortable during labor. The tactile stimulation and positive feelings that develop when caring and empathic forms of touch act to strengthen the effect of back massage for pain control.

The study finding is supported by Danuatmaja B dan Meiliasari (2014) that giving back massage during labor makes the mother feel closer to the person who cares for her. The presence of someone who cares and wants to help is a source of strength when a woman is sick, tired and afraid. In addition, a friendly delivery room environment can reduce anxiety among women in labor. Such opinion is also supported by Potter (2015) that pain during labor can be reduced if the woman concerned has been motivated and prepared to undergo the labor process. The presence of husbands, other family members, healthcare workers, who are supportive and attentive and foster self-confidence are very instrumental in reducing pain.

According to Mander (2014) back massage not only causes pure physiological effect but it is more widespread. Psychological effect through massage can reduce anxiety by blocking the lumbar 1 to lumbar 5. This can close the gate of pain due to changes in the sympathetic nervous system. Pain impulses are inhibited so that the pain stimuli do not reach a higher center, namely the central nervous system so that tension and anxiety can decrease and the pain experienced can be reduced.

According to Potter (2015) back massage can cause the release of endorphins, thereby blocking the transmission of larger and faster A-beta sensory nerve fibers. This process reduces pain transmission through small diameter C and delta-A fibers. The synaptic gate closes the transmission of pain impulses. This is supported by Tamsuri (2016) that back massage has the effect of reducing anxiety and muscle tension. Stimulation of back massage is believed to stimulate large diameter fibers so that they are able to block or reduce pain impulses.

Factors that influence labor pain are parity, age, type, culture, knowledge on pain and its causes, meaning of pain, unsupportive delivery environment, unaccompanied birthing mother, fear and anxiety, stress, and fatigue. According to Mander (2014), another factor that significantly influences pain response is the presence of closest people and their attitude towards the client. Individuals from different socio-cultural groups have different expectations about the person to whom they express their complaints about pain. Individuals experiencing pain often rely on family members or close friends for support, assistance or protection. Even though one still feels pain, the presence of someone she loves will minimize loneliness and fear. If there are no family or friends, the pain response often makes the mother even more depressed. Therefore, the presence of family members or husbands is very important for women in labor.

Primiparous women often experience longer and more painful pain intensity compares to multiparous women (Muhiman, 2016). Primiparous women require a stronger cervical stretch because

there has never been a stretch. This is what causes stronger contractions in the first stage which can lead to higher anxiety and doubts about their ability to cope with labor pain (Simkin, P dan Ancheta, 2015). They usually focus to focus solely on the pain. Thus, the experience factor in labor greatly affects labor pain.

The main goal of back massage using the effleurage technique is relaxation. Three to ten minutes of back massage can lower blood pressure, slow heart rate, increase breathing, and stimulate natural pain-relieving endorphins. This back massage can reduce the pain experienced by women in labor since the massage is performed so as to prevent the pain response to reach the nervous system. The release of endorphins can reduce pain. Massage can also provide comfort to mothers in labor due to perception that they are treated well and cared for (Tamsuri, 2016).

This statement is also supported by Danuatmaja, B dan Meiliasari (2014) that back massage can stimulate the production of endorphins that relieve pain naturally. According to Tamsuri (2016) massage stimulates the body to release endorphins which can relieve pain naturally. Stimulation of back massage is believed to stimulate large diameter fibers so that they are able to block or reduce pain impulses. This opinion is supported by Mander (2014) that giving back massage back massage can block the lumbar 1 to 5, which is considered to close the pain gate because it is able to inhibit the pain transmission towards higher centers in the central nervous system. Thus, tension and anxiety can be reduced and the pain experienced can simultaneously be reduced.

Conclusions

Based on the discussion and analysis results, it can be concluded that there was an effect of back massage in reducing pain intensity during the active phase of the first stage of labor. Before the back massage was performed, most of respondents experienced severe pain. After back massage, most of respondents experienced moderate pain. Thus, the intensity of labor pain could be reduced by applying back massage.

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