

COMPARISON OF THE EFFECTIVENESS OF WARM BELT AND COLD BELT THERAPY TOWARDS REDUCING PAIN OF INTRANATAL 1st PHASE

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ABSTRACT

Labor pain is physiological. Pain that is not managed properly causes prolonged labor and is an indication for cesarean section. Previous research has proven that warm and cold compresses can reduce labor pain. Hot and cold compresses in this study were given in the form of a belt. The study aimed to compare the effectiveness of warm belt and cold belt therapy on reducing pain in the first stage of labor. This type of research was a quasi-experimental study. The sample of this study was 20 mothers who gave birth at the Kupu Health Center, Tegal Regency which were divided into 2 groups. Data analysis using Wilcoxon and Mann Whitney. The median values of labor pain before and after warm belt therapy were 7.00 and 4.00. Wilcoxon test results p-value of 0.004 (<0.05). The median values of labor pain before and after cold belt therapy were 8.00 and 5.50. Wilcoxon test results p-value of 0.003 (<0.05). The median values for reducing labor pain in the warm and cold belt therapy groups were 3.00 and 2.00, respectively. Mann Whitney test results p-value of 0.002 (<0.05). Warm and cold belt therapy has a significant effect on reducing pain in the first stage of labor. Warm belt therapy is more effective in reducing labor pain in the first stage than cold belt therapy.

Keywords: Warm Belt, Cold Belt, Warm Compress, Cold Compress, Labor Pain

BACKGROUND

Childbirth is a physiological process experienced by a woman. Labor is said to be normal if it occurs at term (37 to 42 weeks), is spontaneous, presents behind the head, lasts a maximum of 18 hours, and is not accompanied by complications for the mother or fetus. Every mother wants a normal, comfortable, and safe delivery. One of the ways to get a comfortable delivery is by optimally managing pain (Danuatmaja, 2004).

Labor pain is pain felt in the lower abdomen as a result of the opening and thinning of the cervix then the pain radiates to the lower back and spreads to the thighs caused by fetal pressure against the spine. Pain during labor is caused by a combination of stretching of the lower uterine segment (cervix) and ischemia (hypoxia) of the uterine muscles. Physiologically pain will certainly occur in every delivery. This is normal due to uterine contractions and cervical dilatation, which are needed for smooth delivery. Reaction to pain is a very individual response (Mander, 2004). This reaction depends on personality, emotional state and level of understanding, cultural background, family and education, and previous experience (Ersila et al., 2019).

Pain that is not managed properly can cause stress. Stress that is not managed properly will cause the release of catecholamine and steroid hormones, where these hormones can cause smooth muscle tension and vasoconstriction of blood vessels. This condition can cause a decrease in uterine contractions (uterine insertion), which results in a decrease in uteroplacental circulation, a reduction in blood and oxygen flow to the uterus, and the onset of uterine ischemia which causes pain impulses to increase. And if this is not handled properly, it will cause prolonged labor, and eventually, it will be an indication for delivery by cesarean section (Felina & Iryani, 2015)

World Health Organization (WHO), sets the average standard for sectio Caesarea in a country is around 5-15% per 1000 births in the world (WHO, 2016). Meanwhile, according to Riskesdas 2018, the rate of sectio Caesarea in Indonesia has passed the maximum limit of the WHO standard and this increase is a public health problem. Sectio

Caesarea delivery rate in Indonesia 15.3% sample of 20,591 mothers who gave birth in the last 5 years surveyed from 33 provinces (Kemenkes RI, 2018).

Based on the results of a survey, by researchers in the first quarter of 2020, at the Kupu Health Center, Tegal Regency, the referral rate for childbirth cases fluctuated with an average of 12 cases. In January there were 14 referral cases, in February there were 10 referral cases, in March there were 11 referral cases, and in April 2020 there were 13 referral cases. The indications for the referral cases varied, namely on indications of premature rupture of membranes (PROM) 29% (14 out of 48 cases), on indications of preeclampsia 20% (10 out of 48 cases), on indications of fetal position abnormalities 8% (4 out of 48 cases), on the indication of painlessness 10% (5 of 48 cases), on the indication of the long 1st stage 33% (16 of 48 cases). Most of these referral cases ended in delivery by cesarean section. The results of interviews with midwives at the Kupu Health Center about the actions taken to reduce labor pain, it was found that the midwife provided health education to maternity mothers about breathing relaxation techniques and the left side position, and had never been given warm or cold compress therapy. The results of interviews with 10 mothers who experienced labor pain at the Kupu Health Center stated that 60% of mothers coped with the pain by adjusting their breathing and strengthening their hearts in the hope that the pain would disappear when they saw their baby, and 40% of mothers coped with the pain by walking.

Management of labor pain in the first stage can be done by pharmacokinetic and non-pharmacologic methods. For pain in a normal delivery, it is not recommended to use pharmacotherapeutic methods, because of the side effects that can interfere with the delivery process. Some of the non-pharmacologic therapies recommended for pain management include relaxation, breathing techniques, movement and position changes, massages, hydrotherapy, compress therapy, music, acupressure, aromatherapy, and others. (Chomaria, 2012).

Several studies have proven the effectiveness of compresses to reduce labor pain, both warm and cold compresses. In this study, compresses were given by using a towel dipped in warm or cold water. This method of administration often allows the mother to give birth uncomfortable because it is wet, and has the risk of spilling. Besides that, this method is also not practical because you have to change compresses to keep them warm or cold (Astuti & Sulaeman, 2020). Therefore, in this study, researchers tested the hot and cold compress method which was packaged in a belt called warm belt and cold belt therapy.

Belt therapy is a compress therapy packaged in a belt made of waterproof material where there is a bag that can be filled with gel, either warm (warm) or cold (cold), as needed. This belt is designed in such a way as to ensure the comfort of pregnant women, including a buckle so that the width of the belt can be adjusted according to the size of the mother's belly. Warm therapy is given using hot pack gel that has been soaked in hot water that has been boiled beforehand, while cold therapy is given using ice pack gel that has been frozen in the freezer.

In the first stage of labor, pain arises due to contraction of the uterine muscles, movement of the cervix when opening, uterine ischemia (decreased blood flow resulting in a local oxygen deficit) due to myometrial contractions. Discomfort from cervical changes and uterine ischemia is visceral pain located below the abdomen radiating to the lumbar region of the back and down to the thighs. This causes the characteristic of this pain is not comprehensive but pain at a point. As a result of fetal descent, the location of the back pain shifts downwards, to the lower spine and the location of the fetal heart rate shifts down to the mother's abdomen when the head descends (Nufra & Azimar, 2019). Based on the characteristics of the first stage of labor pain, the warm belt and cold belt therapy are designed to compress the lower pelvic area without bothering to bother holding the compress, making it more practical to use.

Based on the description of the urgency of the research problem and the results of the survey above, the authors are interested in proving the comparison of the effectiveness of hot compresses and cold compresses on reducing first stage labor pain at the Kupu Health Center, Tegal Regency, where compresses are given with an innovative media belt, namely a warm belt. and cold belts.

METHOD

This type of research is quasi-experimental with a two-group pre-post test design. In this study, a comparison of the reduction in first-stage labor pain will be carried out in 2 groups: the group given warm belt therapy and the group was given the cold belt. Measure The first stage measurement of labor pain ried out twice in each group, namely before and after therapy, to determine the decrease.

Warm belt therapy is a compress therapy that is given with an innovative belt device made by researchers, where there is a bag to fill a hot pack of gel that has been soaked in boiling water for 10 minutes. Warm belt therapy was given to group 1 maternity mothers in the pelvic area for 15 minutes when contractions occurred. Cold belt therapy is a compress therapy that is given with an innovative belt device made by researchers, where there is a bag to fill ice pack gel that has been frozen in the freezer. Cold belt therapy was given to group 2 maternity mothers in the pelvic area for 15 minutes when contractions occurred. First stage labor pain is the respondent's response to the pain experienced during the first stage of labor, the active phase is maximally dilated, namely at cervical dilatation 4-9 cm, which is measured according to the respondent's perception using the Numerical Rating Scale (NRS). The first stage of labor pain was measured twice for each respondent, namely before and after 15 minutes of warm or cold belt therapy.

The sample of this study were all mothers giving birth at the Kupu Health Center, Tegal Regency with a total of 20 respondents who were divided into 2 groups, the warm belt therapy group and the cold belt therapy group, where each group consisted of 10 respondents. The sample in this study was taken using a purposive sampling technique, namely with certain criteria determined by the researcher. The criteria are mothers who gave birth normally, are willing to be respondents, can be invited to cooperate well, have been screened for covid 19 and are negative, are not allergic to heat (for those in the warm belt therapy group) who were identified through interviews before the intervention, and are not allergic to cold (for those in the warm belt therapy group). the cold belt therapy group) identified through pre-intervention interviews. The instruments used in this study were Standard Operating Procedures (SOP) for warm belt therapy, Standard Operating Procedures (SOP) for cold belt therapy, NRS observation sheets, observation sheets for warm belt therapy, and observation sheets for cold belt therapy.

Before analyzing the data to prove the hypothesis, a different test was conducted between labor pain data before warm belt therapy intervention and labor pain data before cold belt therapy using the Wilcoxon test. The results of the Wilcoxon difference test showed a p-value of 0.931 ($p\text{-value} > 0.05$). This means that there is no significant difference between labor pain data before warm belt therapy intervention and labor pain data before cold belt therapy, so the two groups can be said to be homogeneous. The data in this study were analyzed using a different test, both paired and unpaired. Before the analysis, the normality of the data was tested using the Shapiro Wilk test. The results of the data normality test showed that the data were not normally distributed ($p\text{-value} < 0.05$), so it was decided to use a nonparametric test, namely the Wilcoxon test and the Mann Whitney test.

RESULT AND DISCUSSION

This research was conducted at the Kupu Health Center, Tegal Regency from June to July 2020. This research was conducted on mothers who gave birth at the Kupu Health Center during that period, with several predetermined criteria.

The results of research on the effect of warm belt therapy in reducing labor pain can be seen in the following table.

Table 1. First Stage of Labor Pain Before and After Warm Belt Therapy

First Stage of Labor Pain	Mean	Median	Devises	Min - Max	p Value*
Before	7.30	7.00	0.674	6 - 8	0,004
After	4.40	4.00	0.516	4 - 5	

*Wilcoxon Test

Based on table 1. above, it can be seen that the median value of labor pain before warm belt therapy is 7.00 and after warm belt, therapy is 4.00. This shows that there is a decrease in labor pain after warm belt therapy is carried out. Wilcoxon test results show a p-value of 0.004 (< 0.05), then H_0 is rejected or H_a is accepted. This means that there is a

significant difference between first-stage labor pain before and after warm belt therapy. Based on these results, it can be concluded that warm belt therapy has a significant effect in reducing labor pain in the first stage.

Labor pain is an unpleasant feeling that can occur during the labor process. Pain is one of the natural defense mechanisms, namely a warning about danger. In pregnancy, pain attacks tell that the mother is experiencing uterine contractions (Andreinie, 2016)

Based on research results, the warmth of the warm belt therapy will last up to 2 hours. So that its use can be repeated during the first stage of labor without the hassle of changing the hot pack gel. In general, this warm belt therapy causes vasodilation of blood vessels, increasing blood flow to the warmed body part. This increase in blood flow will increase body relaxation, and reduce pain cycles, ischemic spasms, and hypoxia (Fadmiyanor et al., 2018).

The results of this study are in line with previous research, which states that the average value of the intensity of labor pain in the active phase of the first stage before being given a warm compress is 8.2, while the average value of the intensity of labor pain in the active phase of the first stage after being given a warm compress is 6, 2, so it was concluded that there was a decrease in pain intensity after being given a warm compress. The results of the study also stated that there was an effect of giving warm compresses to the intensity of labor pain in the first stage of the active phase (p p-value 0,000) (Xaverini & Sarita, 2017).

There is a similar study that proves that warm therapy can reduce pain, namely a study entitled "The effect of giving warm compresses on reducing labor pain in the active phase of the first stage of labor at the Independent Practice Midwife Yulia Fonna SKM Lipah Rayeuk Village, Jeumpa District, Bireuen Regency in 2019". The results of this study indicate that there is an effect of using warm compresses on reducing labor pain in the first stage of the active phase (Nufra & Azimar, 2019).

The results of research on the effect of cold belt therapy in reducing labor pain can be seen in the following table.

Table 2. First Stage of Labor Pain Before and After Cold Belt Therapy

First Stage of Labor Pain	Mean	Median	Devices	Min - Max	p Value*
Before	7.30	8.00	0.948	6 – 8	0,003
After	5.30	5.50	0.823	4 – 6	

*Wilcoxon Test

Based on table 2. above, it can be seen that the median value of labor pain before cold belt therapy was 8.00 and after cold belt therapy was 5.50. This shows that there is a decrease in labor pain after cold belt therapy. Wilcoxon test results show a p-value of 0.003 (<0.05), then Ho is rejected or Ha is accepted. This means that there is a significant difference between first-stage labor pain before and after cold belt therapy. Based on these results, it can be concluded that cold belt therapy has a significant effect in reducing labor pain in the first stage.

Based on the research results, the cold temperature produced by cold belt therapy ranges from 15-18 °C and can remain cold for up to 8 - 10 hours until the ice pack gel melts, depending on room temperature. So that its use can be repeated during the first stage of labor without the hassle of changing the ice pack gel. The cold belt is an innovation that is used to make cold compresses to make it easier to do and more effective. Cold belts are used without the need to hold the compress and change it repeatedly.

In general, cold compresses will cause vasoconstriction, which can reduce blood flow to a site and reduce bleeding, preventing the formation of edema and reducing inflammation. In addition, the result of vasoconstriction is the occurrence of a sensation of numbness in the compressed area, because the speed of flow of pain impulses reaching the brain becomes slower. This is what makes cold compresses used as analgesic therapy (Tarigan, 2020).

The results of this study are in line with previous research conducted at the Independent Practice Midwife in the City of Surabaya about the effect of giving ice gel compresses to labor pain in the active phase of the first stage. The ice gel in this study was administered directly without the aid of a tool. The results of the study showed that after the ice gel

compress, almost all 19 respondents (86%) experienced moderate pain and a small proportion of mothers who gave birth experienced severe pain, namely 3 (14%) (Mardiyana¹ et al., 2017).

The results of research on the effect of cold belt therapy in reducing labor pain can be seen in the following table.

Table 3. Decrease in First Stage of Labor Pain in the Warm Belt Therapy Group and the Cold Belt Therapy Group

Decrease in First Stage of Labor Pain	Mean	Median	Devices	Min - Max	p Value*
Warm Belt Therapy Group	2.90	3.00	0.567	2 – 4	0,002
Cold Belt Therapy Group	2.00	2.00	0.471	1 – 3	

*Mann Whitney Test

Based on table 3. above, it can be seen that the median value of reducing labor pain in the warm belt therapy group is 3.00 and in the cold belt therapy group is 2.00. This indicates that the warm belt therapy group decreased more than the cold belt therapy group. The results of the Mann-Whitney test show a p-value of 0.002 (<0.05), then H_0 is rejected or H_a is accepted. This means that there is a significant difference between the reduction in first-stage labor pain in the warm belt therapy group and the cold belt therapy group. Based on these results, it can be concluded that warm belt therapy is more effective in reducing first-stage labor pain than cold belt therapy.

Warm belt therapy is more effective because it can withstand hot temperatures longer so that it can increase blood vessel vasodilation and increase blood flow. The systemic response occurs through mechanisms of heat loss (sweating or vasodilation), and piloerection, and he, at production (shivering). The local response to heat occurs through stimulation of the nerve endings in the temperature-sensitive skin. Stimulation will send impulses from the periphery to the hypothalamus which will raise awareness of local temperature and trigger an adaptive response to maintain a normal temperature. The body can tolerate a wide range of temperatures (Oktasari et al., 2014).

This warm belt therapy can relieve pain by reducing muscle spasms caused by ischemia, stimulating neurons that block further transmission of pain stimuli, causing vasodilation and increased blood flow to the back area, and reducing inflammatory products such as histamine, prostaglandin,s a, and bradykinin. This is by the theory about the mechanism of pain reduction due to hot compresses because heat causes vasodilation of blood vessels thereby helping to increase blood flow to injured or changing body parts, heat may relieve pain by getting rid of inflammatory products such as bradykinin, histamine, and prostaglandins that cause pain. local pain. Heat also stimulates nerve fibers that close the gate so that the transmission of pain impulses to the spinal cord and brain can be inhibited. Heat also reduces muscle tension and joint stiffness. Heat reduces pain through vasodilation and relaxing effects (Fadmiyanor et al., 2018).

Giving a warm compress to the body area will give a signal to the hypothalamus via the spinal cord. Warm compresses applied to a woman's lower back in the area where the fetal head presses against the spine will reduce pain, heat will increase circulation to the area thereby improving tissue anoxia caused by pressure (Felina & Iryani, 2015).

CONCLUSION AND SUGGESTION

This study concludes that warm belt therapy and cold belt therapy have a significant effect on reducing first-stage labor pain, but warm belt therapy is more effective in reducing first-stage labor pain than cold belt therapy. Based on the results of this study, the use of a warm belt and cold belt therapy can be recommended to mothers in labor to reduce labor pain, especially warm belts, to obtain a comfortable and smooth delivery.

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