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ORIGINAL RESEARCH

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## THE EFFECT OF ACUPRESSURE AND EFFLEURAGE ON PAIN RELIEF IN THE ACTIVE PHASE OF THE FIRST STAGE OF LABOR IN THE COMMUNITY HEALTH CENTER OF KAWUNGANTEN, CILACAP, INDONESIA

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### ABSTRACT

**Background:** Pain during pregnancy and childbirth is a physiological process, but it leads to discomfort without pain management. Acupressure and effleurage are considered to be effective in reducing labor pain.

**Objective:** To examine the effect of acupressure and effleurage in reducing pain during in the active phase of the first stage of labor in the Community Health Center of Kawunganten, Cilacap, Central Java, Indonesia.

**Methods:** This was a quasi-experimental study with pretest-posttest control group design. There were 33 respondents recruited using simple random sampling. Numerical rating scale was used to measure labor pain. Data were analyzed using one-way ANOVA, post hoc ANOVA and repeated ANOVA for normal data distribution. Kruskal Wallis was also used for non-normal data distribution.

**Results:** There was a statistically significant mean difference of pain scale before and after given acupressure and effleurage (p-value <0.05). However, acupressure treatment had a greater effect in reducing pain compared with effleurage.

**Conclusion:** Acupressure and effleurage had a significant effect in reducing pain in mothers in the active phase of the first stage of labor. The results of this study are expected to enrich and contribute to the development of science in the field of health promotion, and serve as an additional input for midwives in order to carry out the care of mother during labor.

**Keywords:** labor pain, effleurage, acupressure

## INTRODUCTION

Although pain during pregnancy and childbirth is a physiological process for a woman, it should be overcome.<sup>1</sup> According to Mander,<sup>2</sup> pain accompanying uterine contractions affects the functional mechanism causing the physiological stress response. The long-term labor pain causes hyperventilation with respiratory frequency of 60-70 times per minute, thus lowering PaCO<sub>2</sub> and increasing pH. If the mother's PaCO<sub>2</sub> levels are low, the fetal PaCO<sub>2</sub> levels will be low resulting in a slow deceleration of the fetal heart rate. The pain also causes uncoordinated uterine activity that will lead to prolonged labor, which will ultimately threaten the fetus and mother's life.<sup>2</sup>

Uterine contractions cause dilatation and cervical depletion and ischemia (lack of oxygen) of the uterus due to myometrial artery contraction.<sup>3</sup> Because the uterus is an internal organ, the resulting pain is called visceral pain. However, visceral pain can also be felt in other organs, such as in labor, pain can be felt on the lower back (waist) and sacrum. Usually the mother only experiences pain only during contractions. Unlike visceral pain, the pain is localized to the lower abdominal area, vagina, rectum and perineum around the anus. This pain is called somatic pain and caused by stretching of the lower birth canal structure due to decreased fetal lower.<sup>3</sup>

Emotions such as anxiety and worries can increase the stress or fear of the mother, which can physiologically increase the contraction of the uterus thus increasing the perceived pain. When the woman in the inpartu condition experiencing stress, then automatically the body will make a

defensive reaction to release the stressor hormone (Catecholamine and adrenaline).<sup>3</sup> Catecholamine will be released in high concentration during labor if the prospective mother cannot eliminate fear before childbirth. The various body responses might be appear such as the uterus becomes increasingly tense so that the flow of blood and oxygen into the muscles continue to decrease as the arteries vasoconstriction resulting in the inevitable pain.<sup>3</sup>

Other factors that may affect the perception of labor pain include age, socioeconomic, parity of baby size, its presentation as well as knowledge and understanding of childbirth.<sup>4</sup> Lack of knowledge and understanding result to high anxiety and lead to pain. However, various methods are performed to reduce labor pain, both pharmacologically and nonpharmacologically. The use of pharmacological methods has better effectiveness, compared with nonpharmacological methods, but the use of pharmacological methods often causes side effects and sometimes does not have the expected effect. While non-pharmacological methods, in addition to reducing pain in labor, have non-invasive effects, simple, effective, and without harmful effects.<sup>5</sup> One of non-pharmacological techniques that can reduce labor pain include acupressure and effleurage.

Previous studies indicated that there were significant effects of acupressure and effleurage message in reducing pain in postpartum mothers or during prenatal.<sup>6,7</sup> However, little is known about its effect on the pain levels in postpartum mothers in the community health center of

Kawunganten Cilacap. Therefore, this study aimed to examine the effect of acupressure and effleurage in reducing labor pain in the active phase of the first stage of labor.

## METHODS

### *Design*

This was a quasi-experimental study with pretest posttest with control group design.

### *Setting*

This study was conducted in the Community Health Center of Kawunganten, Cilacap, Indonesia from 20 December 2016 to 9 January 2017.

### *Population and Sample*

Of the population of 108 maternity mothers, there were 33 respondents recruited using simple random sampling by determining the serial number. For respondents with serial number 1, 4, 7, 10 and so on up to 11 respondents included into the first group (acupressure group), respondents with serial number 2, 5, 8, 11 and so on up to 11 respondents included into the second group (effleurage group), and respondents with number 3, 6, 9, 12 and so on up to 11 respondents included in the control group. The samples were calculated using Lemeshow formula. The inclusion criteria were: 1) mothers in the active phase of the first stage of labor, 2) cervical dilatation 4-8 cm, 3) in normal physiological condition, 4) getting no pharmacological drugs, 5) intact membrane, 6) aged between 20-35 years, 7) and willing to be respondents.

### *Intervention*

Intervention was performed by researchers themselves who have been certified and competent. Effleurage was

given for 20-30 minutes and acupressure for 30-40 minutes. Acupressure is one of the healing methods in the traditional ancient Chinese medicine in the form of touch therapy (massage) with pressure at certain meridian points on the body to reduce pain. The meridian point is performed at the point of LI-4 between the first and second metacarpal bones (between the thumb and forefinger) done 30 times based on the clockwise, and on the SP-6 inside the lower leg, the width of 3 cun (4 fingers) on the inside of the ankle, behind the shinbone.<sup>8</sup> While effleurage massage was performed using a soft and light pressed fingertip. Effleurage massage is a safe massage technique that aims to improve blood circulation, provide pressure, warm the abdominal muscles and increase physical and mental relaxation. effleurage massage was performed in the mother's abdomen, with the technique of both palms doing a light sweep, firm and constant with a circular motion of the abdomen, starting from the lower abdomen above the pubic symphysis, pointing at the abdomen, continuing to the uterine fundus and then down to the umbilicus and back down the lower liver above symphysis pubis. The shape of the movement pattern is like "butterfly".<sup>9</sup> The control group in this study was only given a deep breathing technique.

### *Instrument*

Numerical rating scale<sup>2</sup> was used to measure labor pain in this study ranged from "0" representing "no pain" to "10" representing the worst pain.

### *Ethical Consideration*

This study was approved by the Research Ethics Committees of Poltekkes Kemenkes Semarang with number: 252/KEPK/Poltekkes-SMG/EC/2016. The

study permission was also obtained from the Department of National Unity and Public Protection in Cilacap. The researchers have confirmed that each respondent in this study has obtained an appropriate informed consent.

#### Data Analysis

For normal data distribution, one-way ANOVA, post hoc ANOVA and repeated ANOVA were performed to examine the difference of interventions between the three groups. For, non-normal data distribution, Kruskal Wallis was used for analysis.

## RESULTS

### Characteristics of Respondents

Table 1 shows that the majority of respondents among the acupressure, effleurage, and control groups were multigravida, aged 26 years, working, and had intermediate educational background. The Levene test showed p-value >0.05, which indicated that there were no significant differences of age, gravida, working status, and educational background among the three groups.

**Table 1** Characteristics of respondents based on age, gravida, working status, and education level

| Variable              | Group   |            |             | P-value |
|-----------------------|---------|------------|-------------|---------|
|                       | Control | Effleurage | Acupressure |         |
| <b>Age</b>            |         |            |             |         |
| Mean                  | 26.00   | 26.73      | 26.55       | 0.205   |
| SD                    | 6.132   | 5.798      | 4.525       |         |
| Median                | 23      | 27         | 26          |         |
| <b>Gravida</b>        |         |            |             |         |
| Primigravida          | 45.5    | 36.4       | 36          | 0.743   |
| Multigravida          | 54.5    | 63.6       | 64          |         |
| Total                 | 100     | 100        | 100         |         |
| <b>Working Status</b> |         |            |             |         |
| Working               | 63.6    | 64         | 54.5        | 0.743   |
| Not working           | 36.4    | 36         | 45.5        |         |
| Total                 | 100     | 100        | 100         |         |
| <b>Education</b>      |         |            |             |         |
| Elementary            | 27.3    | 45.5       | 18.2        | 0.808   |
| Intermediate          | 54.5    | 45.5       | 54.5        |         |
| High                  | 18.2    | 9.1        | 27.3        |         |
| Total                 | 100     | 100        | 100         |         |

**Table 2** Difference of pain intensity before and after intervention among the three groups in mothers in the active phase of the first stage of labor using One Way ANOVA

| Group            | Mean | SD    | Min | Max | P-value |
|------------------|------|-------|-----|-----|---------|
| <b>Pre-test</b>  |      |       |     |     |         |
| Control          | 6.55 | 1.293 | 5   | 9   | 0.504   |
| Effleurage       | 6.64 | 1.027 | 5   | 8   |         |
| Acupressure      | 7.09 | 1.136 | 5   | 9   |         |
| <b>Post-test</b> |      |       |     |     |         |
| Control          | 6.18 | 1.079 | 4   | 8   | 0.022   |
| Effleurage       | 6.27 | 1.104 | 5   | 8   |         |
| Acupressure      | 4.64 | 2.014 | 2   | 8   |         |

Table 2 shows that the mean of pain intensity in the control group was 6.55, effleurage group was 6.64, and

acupressure group was 7.09. The p-value was 0.504 (>0.05), which indicated that there were no significant differences of

pain among the three groups. However, posttest results showed p-value 0.022 (<0.05), which indicated that there was a

statistically significant difference on pain intensity levels among the three groups.

**Table 3** Mean difference of pain intensity levels among the acupressure, effleurage, and control group using Kruskal Wallis

| Group       | Mean  | SD     | Min | Max | P-value |
|-------------|-------|--------|-----|-----|---------|
| Control     | -0.36 | 1.206  | -2  | 1   | 0.006   |
| Effleurage  | -0.36 | 0.674  | -1  | 1   |         |
| Acupressure | -2.45 | 1.8864 | -5  | 0   |         |

Kruskal Wallis test as shown in the table 3 showed p-value 0.006 (<0.005), which indicated that there was a significant reduction of pain among the three groups.

However, the mean of pain reduction was higher in the acupressure group than the other two groups.

**Table 4** Mean difference of pain intensity levels using post hoc test

| (I) Group  | (J) Group   | Mean Difference (I-J) | Sig. |
|------------|-------------|-----------------------|------|
| Control    | Effleurage  | -.091                 | .885 |
|            | Acupressure | 1.545*                | .019 |
| Effleurage | Acupressure | 1.636*                | .014 |

Post hoc test shows that there was a significant mean difference of pain intensity levels between control and acupressure group with p-value 0.019 (<0.05); and between effleurage and acupressure group with p-value 0.014 (<0.05). However, there was no a significant mean difference of pain intensity levels between control and effleurage group with p-value 0.885 (>0.05). This result also indicated that the effect of acupressure was higher than effleurage.

given acupressure compared to those who were not given acupressure. Similar with the study<sup>10</sup> revealed that there was a significant reduction of pain levels from severe pain to the low level of pain after given acupressure. Thus, it is proved that acupressure is effective in reducing labor pain.

Literature stated that acupressure as well as acupuncture is a therapy that suppresses certain points on the body that are believed to overcome the discomfort when experiencing contractions before delivery. In the circumstances leading up to labor, acupressure in addition to relieve pain also to increase the intensity of contraction itself.

When given acupressure the body will release local hormone endorphin, produced in the brain and spinal cord. This hormone can function as a natural sedative that is produced by the brain, so as to create a sense of comfort. When a person is given acupressure, the

## DISCUSSION

Findings of this study revealed that there was a significant decrease of pain intensity after given acupressure and effleurage massage in mothers in the active phase of the first stage of labor.

The finding is in line with Damayanti's study<sup>7</sup> stated that there was a significant difference of pain levels in primipara after

endorphins will come out and be captured by the receptors inside the hypothalamus and limbic system that serves to regulate emotions and can cause relaxation and normalization of body functions.<sup>11</sup>

On the other hand, effleurage massage in this study was also proven to be effective in reducing pain. This is line with Fardilah's study<sup>12</sup> revealed that there was a significant difference of pain levels before and after given effleurage. Chang also stated that twenty-six of the 30 (87%) experimental group subjects reported that massage was helpful, providing pain relief and psychological support during labor.

Effleurage is a safe massage technique aimed at improving blood circulation, giving pressure, warming the abdominal muscles and improving physical and mental relaxation.<sup>13</sup> Massage lowers stress hormones and increases the hormone oxytocin, thereby reducing pain before labor. However, this study revealed that acupressure has a better effect than effleurage massage.

## CONCLUSION

It is concluded that acupressure and effleurage had a significant effect in reducing pain in mothers in the active phase of the first stage of labor. The results of this study are expected to enrich and contribute to the development of science in the field of health promotion, and serve as an additional input for midwives in order to carry out the care of mother during labor. The community health center may need to provide acupressure and effleurage training for midwives .

### Declaration of Conflicting Interest

None declared.

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### Authorship Contribution

All authors contributed equally in this study.

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