

# Application of Pelvic Rocking Exercises Using Birth Ball to Labor Pain and Level of Beta-Endorphine

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**Abstract:** ***Background:** Very severe pain in labor must be overcome effectively, if not resolved can affect the condition of the mother and fetus. Efforts to reduce labor pain effectively and efficiently are done by ending the labor. Pelvic rocking exercise using birth ball is one of the choices for labor management pain that can improve the progress of labor. **Objective:** To analyze the effectiveness of giving pelvic rocking exercises using birth ball to reduce pain in the first stage of labor and increase in beta-endorphine levels in labor. **Methods:** Quasy experimental with pre-post test design with control group design. Sample 40 is divided into 2 groups. Each group consists of 20 respondents. Group 1 was given the intervention of pelvic rocking exercises using birth ball, while group 2 was the control group. Analysis was used to assess differences in pain reduction between the 2 groups using Mann-Whitney test, while differences in the increase in beta-endorphine levels used Independent T-Test. **Results:** The mean labor pain after being given treatment was 67% (mild pain), while the control group was 26% (moderate pain). The results of different labor pain tests using the Mann-Whitney test obtained p value = 0,000. The mean level of  $\beta$ -endorphins after being given treatment was 140.25 ng / ml, while the control group was 56.72 ng / ml. The results of different test levels of  $\beta$ -endorphins using the Independent T-Test obtained p value = 0,000. **Conclusion:** Pelvic rocking exercises using birth ball are effective for reducing pain in the first stage of labor and increasing beta-endorphine levels in labor.*

**Keywords:** childbirth, pelvic rocking exercises, birth ball exercises, labor pain, beta endorphine

## 1. Introduction

The World Health Organization (WHO) estimates that every year 210 million pregnancies occur worldwide. 20 million of the 210 million women experience pain as a result of pregnancy. Research conducted on 2700 pregnant women who were undergoing labor found that only 15% of all deliveries took place without pain or mild pain, 35% of deliveries took place with moderate pain, 30% of deliveries took place with severe pain and 20% of the remaining deliveries accompanied by with very great pain.[1] Severe pain in labor must be treated effectively because if it is not resolved it can affect the condition of the mother and fetus. Maternal disorders include physiological changes in the body (increase in blood pressure, increase in heart rate, and increase in respiratory rate, long labor), while in the fetus due to narrowing of blood vessels so that blood flow and oxygen from mother to fetus decrease.[2] Efforts to reduce labor pain through a non-pharmacological approach, namely using the active birth method in the form of mobilization by encouraging mothers to choose the position that is considered the most relaxing to minimize pain, including walking and left tilt position. In practice, there still be many women who experience severe pain and pain during contractions.[3] Efforts to reduce labor pain effectively and efficiently are done by ending the labor. Pelvic rocking exercise with birth ball is part of the choice for labor management pain that can improve the progress of labor. [4]

## 2. Literature Survey

Labor pain is an unpleasant sensory and emotional experience where contractions of the uterus occur during labor. Labor pain is interpreted as a signal to inform the mother that she is starting the stage of labor.[5] Labor pain for the first time can occur due to the appearance of contractions of the uterine muscles which cause opening of the cervix, uterine ischemia due to contraction of the myometrial artery.[6] Reduction of labor pain can use pharmacological and non-pharmacological methods. The use of pharmacological methods in the form of analgesics and anesthesia allows not to be the first choice for labor considering the potential side effects on the mother and fetus.[7] Non-pharmacological method is pain management based on mother's care in the first stage, one of which is relaxation through pelvic rocking exercise using a birth ball.[8] The use of pelvic rocking exercises with birth ball is to shake the pelvis by using a birth ball when the labor process enters the first stage, sitting on the ball slowly swinging and wiggling the hips forward and back, left side right and circular so the pelvis becomes relaxed.[9]

## 3. Methods/Approach

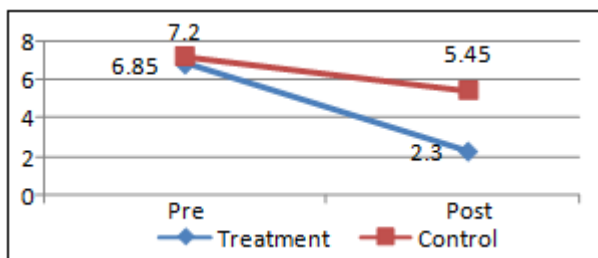
This research is an experimental research with a pre-post test with control group design. The number of samples is 40 respondents divided into 2 groups. Each group consisted of 20 respondents. Group 1 was given pelvic rocking exercises

intervention using a birth ball, while group 2 was the control group. Assessment of labor pain uses a numeric rating scale (NRS), while beta-endorphine levels are assessed using laboratory clinical trials. The analysis used to assess the difference in pain reduction between the 2 groups using the Mann-Whitney test, while the difference in the increase in beta-endorphine levels using the Independent T-Test.[10] Ethical approval was obtained from the Ethics Committee for Health Research at the University of Sultas Agung Semarang.

#### 4. Result & Discussion

##### 4.1 The effectiveness of the application of pelvic rocking exercises using birth ball to decrease first stage labor pain in the treatment group compared to the control group

The results of measurement of labor pain using NRS (Numeric Rating Scale) found that the level of labor pain before intervention in the treatment and control groups had a p value <0.05. This means that there are significant differences between before and after the intervention in the treatment and control groups. The average difference in the NRS measuring scale in the treatment group was  $-4.55 \pm 1.050$ , whereas in the control group the average difference was  $-1.75 \pm 1.618$  with p value 0,000. It can be said that the application of pelvic rocking exercises using birthballs is more effective in reducing labor pain in the first stage compared to the control group.



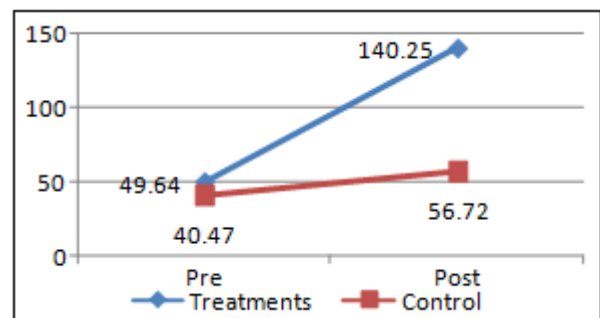
**Figure 1 :** The difference in intensity of labor pain

Efforts to reduce labor pain effectively and efficiently by ending labor. Pelvic rocking using a birth ball is one of the choices for management of non-pharmacological labor pain that can improve the progress of labor. Pelvic rocking exercises can strengthen the abdominal muscles and waist.[11] This exercise can help the mother to relax between contraction and reduce pressure on the waist by moving the fetus forward from the waist of the mother. Pelvic rocking using a ball born during labor can stimulate postural reflexes and maintain muscle tone, stimulate ulcer receptors to respond to pain and then release beta-endorphine so that they can block the transmission of pain stimuli and reduce pain and reduce anxiety, lack of use of petidine, facilitate decline head of the fetus, reducing the duration of the first period, increasing the satisfaction and well-being of the mother.[12] Pelvic rocking using a birth ball can close the gate of labor pain.[13] Stimulus from pelvic shake exercise using a birth ball stimulates large nerve fibers in the spinal cord. This stimulation increases the mechanism of substantive gelatinus activity in the periaqueductal gray area. This results in a closed door mechanism so that T cell activity is inhibited.

The results of this perception are returned to the receptors, then affect the thalamus, hypothalamus and limbic system. As a result of pain activity being inhibited, the production of endorphins increases, is brought to the brain for translation. Increased production of the hormone endorphine causes a decrease in pain sensation. This is in line with the gate control theory proposed by Melzack and Wall that pain impulses are sent when the defense is opened and the pain drive is inhibited when the defense is closed, thereby reducing pain intensity.[14]

##### 4.2 The effectiveness of the application of pelvic rocking exercises uses a birthball to increase beta-endorphine levels in the treatment and control groups

Beta-endorphine levels before being given intervention in the treatment and control groups had p value <0.05. This means that there are significant differences between beta-endorphine levels before and after intervention in the treatment and control groups. The average difference in beta-endorphine levels in the treatment group was  $79.121 \pm 21.216$ , while the control group had an average difference of  $16.245 \pm 24.838$  with p value 0,000. This means that pelvic rocking exercises using birth ball are more effective in increasing beta-endorphine levels compared to the control group.



**Figure 2:** The difference in level of beta-endorphine

Someone when doing pelvic rocking exercises uses a birth ball, then beta-endorphine comes out and is caught by receptors in the hypothalamus and limbic system which functions to regulate emotions. Increased beta-endorphine has turned out to be closely related to a decrease in pain. [15] Beta-endorphine acts as a neurotransmitter and neuromodulator which blocks the transmission of pain messages.[16] Pelvic rocking exercises using birth ball are one way to avoid complications caused by anxiety by reducing the increase in adrenal hormones in the maternal body. [17] Pleasant sensory stimulation causes the release of beta-endorphine which can inhibit anxious stimulus resulting in fewer anxiety stimuli transmitted to the brain. [18] Stimulation of beta-endorphine in the brain is called the raphe nucleus to secrete serotonin, causing it to relax, calm and reduce anxiety. Serotonin also works as a neuromodulator to inhibit nociceptive information in the spinal cord.[19]

This neuromodulator closes the defense mechanism by occupying receptors in dorsal horn so that it inhibits the release of substance P. Inhibition of substance P will make pain impulses unable through projection neurons, so that it

cannot be continued on higher processes in the somatosensory and transitional cortex.[20]

## 5. Conclusion

Pelvic rocking exercises using birth ball are effective for reducing labor pain in the first stage and increasing beta-endorphine levels in maternity. Mothers need physical and psychological preparation for childbirth, so the labor process runs safely, comfortably and with minor trauma.

## 6. Future Scope

The limitation in this study is that researchers have not been able to control other disturbing variables that can affect labor pain and increase beta-endorphine levels.

## 7. Other recommendations

Subsequent research needs to develop other variables in the form of a comprehensive assessment and control the factors that influence the effectiveness of the intervention given.

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## Author Profile



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