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### **EFFECTS OF HEGU POINT SUPPRESSOR (LI 4) AND BIRTH BALL TECHNIQUE ON LABOR PAIN: A REVIEW**

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#### **ABSTRACT**

**Background:** Pain in labor is the cause of fear, anxiety and childbirth trauma among pregnant women so that it affects the health condition of the mother and the fetus. Non-pharmacological methods such as pressing the hegu point (LI 4) and birth ball technique are believed in reducing the intensity of labor pain without side effects. This study aims to analyze the effect of pressing hegu point (LI 4) and technique birth ball on labor pain.

**Methods:** This was a literature review using PRISMA-P (Preferred Reporting Items for Systemic Review and Meta-Analysis Protocols) to identify all published articles with 'point hegu (LI 4)', 'birth ball', and 'labor pain' as the keywords. Electronic databases such as Google Scholar and Science Direct were used in searching the articles that were published between 2011 and 2019. Other criteria were articles that used experimental research design and written in English and Indonesian language.

**Results:** There were 18,072 articles recorded, of which 10 articles were included in the systematic review. By pressing hegu points (LI 4) for 20 minutes to 240 minutes, it helped mothers to reduce labor pain. Sitting on a birth ball by wiggling the pelvis relieved the labor pain, improved the self-control, as well as felt satisfied with birth experiences.

**Conclusion:** Methods of pressing hegu points (LI 4) and birth ball techniques can effectively reduce the intensity of labor pain. Further study can be conducted using other keywords and methods.

**Keywords:** Hegu point (LI 4), birth ball, labor pain

#### **INTRODUCTION**

Labor is a physiological process in which the results of conception such as the fetus, membrane, umbilical cord and placenta come out of the uterus [1]. During labor the majority of mothers experience pain but the pain that occurs in each mother must vary or vary [2]. Pain is a very disturbing sensory and emotional event due to nociception tissue damage, periper senditization, fatigue changes, central sensitization, ectopic excitability, reorganization of inhibition structures, both actual and potential due to the emergence of pain caused by multiple processes between tissue injury stimuli and experience of the subject of pain [3]. While labor pain is a normal process that can lead to physiological and psychological stress that is common where 90% of women are accompanied by pain [4].

Pain in labor is due to the contraction of the uterine muscles and pressure on the cervix which is felt like strong cramps in the abdomen, groin, back and there is also a feeling of soreness that occurs, so it can have an impact such as fear, stress and anxiety during labor, the body will respond to increased production of catecholamines and adrenaline which makes the heart beat faster, breathing faster, blood pressure rises and muscles become tense, this can make the mother nervous, panic, speak loudly and increase pain perception, due to a decrease in production endorphin hormone and the production of the

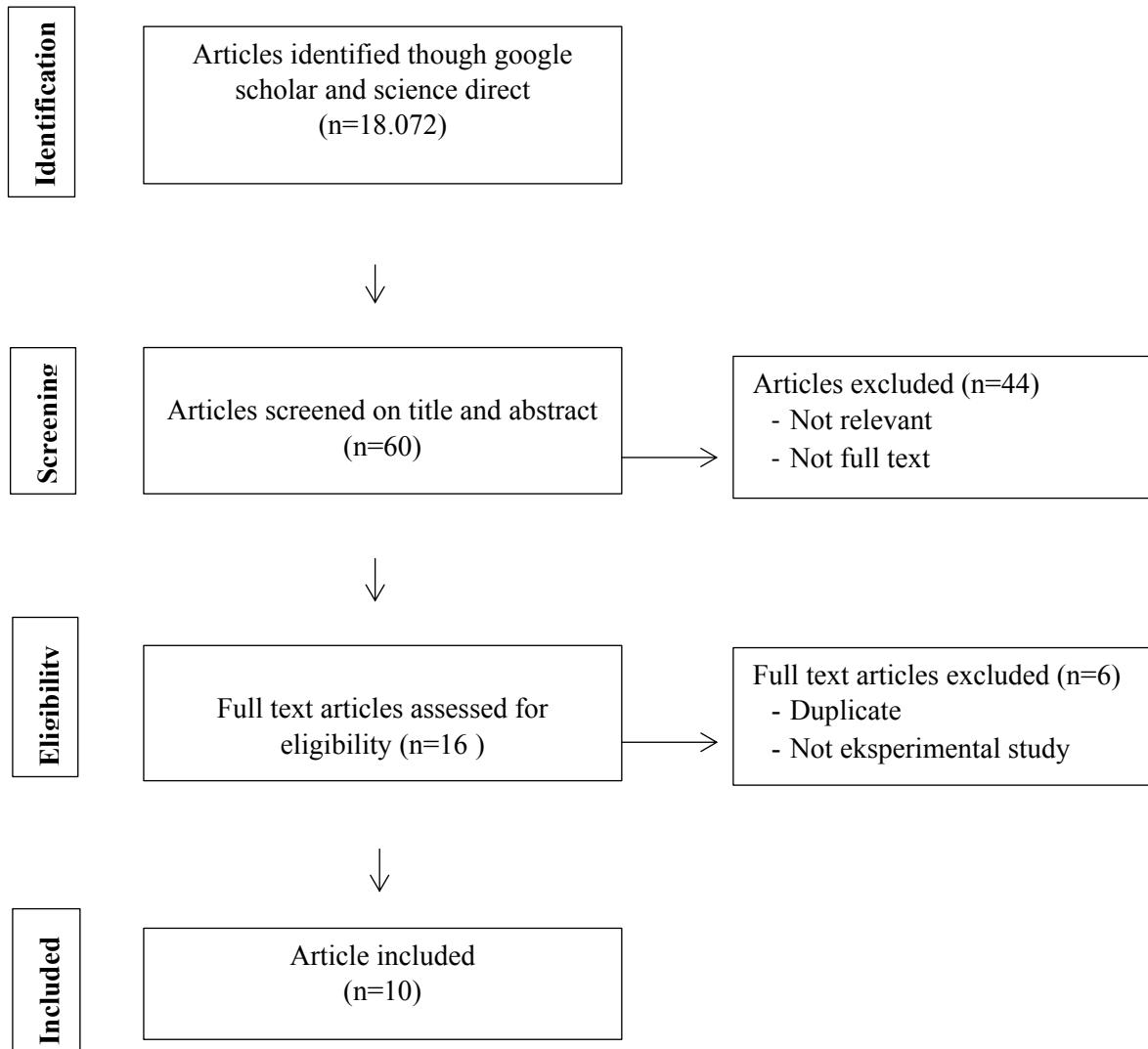
hormone oxytocin from the body which can inhibit contractions and can cause fetal distress [5]. Labor pain based on the results of research conducted on maternity mothers showed that there were 2 people who experienced mild pain (7.1%), moderate pain as many as 15 people (53.6%) and experienced severe pain as many as 12 people (39.3%) [6]. Overcoming labor pain in the mother can be done by several methods, namely pharmacology (medical) and non-pharmacological (non-medical) methods [7]. Non-pharmacological methods in reducing the intensity of labor pain have no side effects and types of non-pharmacological methods that are often used to reduce labor pain, namely massage, water bath, hypnosis, aroma therapy, breathing techniques, tens, music therapy, vertical position and acupressure [8].

Acupressure is an alternative method used to reduce pain by doing massage or pressure on sensitive surface areas of the body as a place of junction of blood vessels, nerves or muscle structures that have special sensitivity that can be done using fingers [9]. Acupressure has many points, one of which is the hegu point (LI 4), which is the point between the first and second metacarpal bones which are in the distal fold of both hands which is done by pressing and massage which can overcome pain during labor [10]. Emphasis on hegu point (LI 4) belongs to a non-pharmacological technique that is easy to do, without causing side effects that can harm the mother or fetus and is effective in reducing labor pain [11]. Massage at hegu point (LI 4) with 3-4 cm and 7-8 cm opening obtained significant results in overcoming labor pain before intervention average pain from 10 (10-10) to 9 (8-9) [12]. In addition to overcome labor pain can also be done by using a birth ball technique which is also included in the non-pharmacological method, where the birth ball technique is a technique to deal with labor pain by sitting on the ball while shaking the pelvis from the front to the sides of the ball, hands, knees hug the ball and can also be done by bending over the ball [13]. The birth ball technique can be effective in dealing with labor pain where as many as 70% experience moderate pain while those who do not use the birth ball technique experience more severe pain that is as much as 85% [14].

Research related to hegu points (LI 4) and birth ball techniques in pain management has been carried out, but there are several studies that assess their effects in labor. Therefore, the author intends to conduct a systematic review and aims to analyze the effects of hegu point suppression (LI 4) and birth ball techniques in dealing with labor pain

## METHODS

This systematic review used the PRISMA protocol (preferred reporting items for systematic review and meta products). The strategy used in the search for articles aims to analyze all articles published about Hegu Point (LI 4) birth techniques in dealing with labor pain. Through electronic databases google scholar at point hegu (LI 4) as many as 398 and birth ball as many as 18.072 while science directly at point hegu (LI 4) there are 28 articles and birth ball there are 546 articles. The search process is carried out for 15 days from February 4 to 2019. Keywords: Point Hegu (LI 4), birth ball, labor pain. The inclusion criteria in this systematic review are articles discussing hegu point (LI 4) and birth ball techniques in dealing with labor pain, full text, 2011-2019 from articles, experimental research, English and Indonesian articles. While exclusion criteria are irrelevant articles or incomplete, article below 2011 duplicate article. Articles that have been found are identified and filtered by author then extracted data into tables with predetermined titles. The article selection process is presented in the chart below.



## RESULTS

There are 18,072 articles found with keywords in English and Indonesian. Found ten articles were included in this study, but the results of a study that combined between hegu point emphasis (LI 4) and birth ball techniques have not been found. Table 1 below shows evidence of the effect of hegu point suppression (LI 4) and birth ball technique on labor pain.

No	Title	Author	Year	Place	Method	Results
1	Effects of LI4 acupressure on labor pain in the first stage of labor	Hamidzadeh Azam, Farangis Shahpourian, Shahpourian, Roohangiz Jamshidi, Orak, Akram, Sadat Montazeri, Ahmad Khosravi	2012	Iran	Randomized clinical trial (RCT)	There were significant between the group subjective labor pain scores immediately and 20, 60 and 120 minutes after intervention ( $p \leq 0.001$ )
		[15]				
2	The effect of acupressure on santinjiao and hugo point on labor pain in nulliparous woman: A randomized clinical trial	Sehhatie Shafaie Fahimeh, Rafat Kazemzadeh, Firous Amani, Reza Heshmasti	2013	Iran	Randomized controlled clinical trial	There was a significant decrease in maen intensity of pain after each intervention in the experimental group with different dilatations (4,6,8 and 10 cm)
3	The effect of acupressure on labor pain intensity and duration of labor: A randomized controlled trial	Dabiri Fatemeh And Arefeh Shahi	2014	Iran	Randomized controlled clinical trial	The difference in the scores between the acupressure and control group was statistically significant ( $p<0.001$ )
4	Comparison of the effect of acupressure at yong quan (KI-1) and hegu (LI-4) acupoints on pain intensity of labor pain in primiparous women	Kaviani Maasumeh, Nasim Partash, Sara Azima, Mohammad Javad Hadyanfar, Mehrab Sayadi	2015	Iran	Interventional clinical trial	<ul style="list-style-type: none"> <li>- The intensity of pain significantly decreased in the intervention group compared to the control group after application of LI 4 at 3-4 cm dilation (<math>p&lt;0.001</math>)</li> <li>- A significant difference was found among the three groups regarding the internsity of pain 7-8 cm dilation (<math>p&lt;0.001</math>) and second stage of labor (<math>p&lt;0.001</math>)</li> <li>- A significant difference was observed among</li> </ul>

No	Title	Author	Year	Place	Method	Results
5	Effect of LI4 and BL32 acupressure on labor pain and delivery outcome in the first stage in primiparous women: a randomized controlled trial	Ozgoli Giti, Sedigheh Sedigh Monarakabadi, Reza Heshmat, Hamid Alavi Majd, Zohreh Sheikhan	2016	Iran	Randomized controlled trial (RCT)	the three group in the regard immediately, 30 minutes and 60 minutes after application of acupressure LI 4 ( $p<0.001$ ). Significant difference in pain relief LI4 at 4-10 dilation ( $p=0.001$ )
6	Effect of birth ball usage on pain in the active phase of labor a randomized controlled trial	Taavoni Simin, Somayeh Abdolahian, Hamid Haghani, Leyla Neysani	2011	Iran	Randomized controlled trial	Mean pain scores in the birth ball group were significantly lower than the pain scores in the control group $p<0.05$
7	The use of birth ball as a method of pain management in labour	Hau Wai-Lei, Siu-Ling Tsang, El Al	2012	Hong Kong	Non equivalent control group design	Use of the birth ball reduced pain and anxiety levels of in labour
8	Combination practices of counter pressure and birth ball exercise towards the labor pain intensity	Sari Novita, Runjati, Diyah Fatmasari	2016	Indonesia	Quasi experiment	The mean labor pain after treatment was 70% (moderate pain), while the control group was 85% (severe pain)
9	Application of pelvic rocking exercises using birth ball to labor pain and level of beta -endorphine	Hidayati Niken Wahyu, Runjati, Bedjo Santoso	2017	Indonesia	Quasy experimental	Birth ball technique is effective in treating labor pain in the treatment group - $4.55 \pm 1.050$ , while in the control group the difference is on average is $-1.75 \pm 1.618$ with a value of $p = 0,000$ .
10	Efect of pelvic movement using birth ball and listening to nature	Taavoni S, charkamyani, hashemdaghi, nazem ekbatani	2018	Iran	Randomized clinical trial	The average score of pain using the birth ball technique is therse significant

No	Title	Author	Year	Place	Method	Results
	sounds and honey syrup consumption on labor pain in nulliparous woman ; a rancomized clinical trial	[22]				differences between groups and interventions (p<0.001)

## DISCUSSION

Labor pain that occurs as a result of uterine contractions and cervical dilatation which can cause fear, difficulty, and labor trauma to the mother [23]. As long as labor pain occurs we can benefit by emphasizing the hegu point (LI 4) which is effective in reducing pain, without causing side effects that can harm the mother or baby [11]. Besides using emphasis on hegu point (LI 4) the benefits that can also be taken in overcoming labor pain with a birth ball technique that can make stronger uterine contractions, cervical dilatation and thinning faster [24]. Ten articles received positive results at Hegu Point (LI 4) and birth ball techniques to reduce the intensity of labor pain.

### a. *Hegu point (LI 4)*

Hegu point (LI 4) is a non-pharmacological method that is cost effective, does not have an adverse effect on the mother and fetus, so it can be used as an important intervention in reducing pain during labor done immediately after intervention, 20 minutes, 60 minutes, 120 minutes , 180 minutes and 240 minutes can reduce pain and the mother feels more satisfied with the birth that occurs [15]. Emphasis on the Hegu point (LI 4) that occurs can decrease labor pain due to increased production of endorphin hormones which cause interference to the nerve membrane, stimulate the spinal cord, midbrain and pituitary to be released such as endoiphine, serotonin and norepinephrine which aim to block pain, besides that it can also release adrenocorticotropin (ACTH) and pituitary hormones [14]. The release of hormones from the body due to stimulation at point LI 4 which can reduce pain during labor that makes the mother become calmer and not restless, if uncontrolled pain can occur an increase in catecholamines which cause interference with uterine contractions so that it can cause uterine inertia and if it cannot be overcome, it will also occur for a long time [10].

### b. *Technique birth ball*

The birth ball technique can overcome labor pain by the way the mother sits on the ball by shaking the pelvis forward, backward, left, right and can also be done while kneeling by hugging the ball [25]. Sitting on a birth ball by wiggling the pelvis can relieve labor pain, improve self control and gain a more satisfying birth experience [24]. The position of labor, appropriate changes in position and movement can improve comfort or reduce pain intensity, increase satisfaction for free movement and improve self control [26].

Shaking the pelvis using birth ball can stimulate the large nerve membranes in the spine which can increase the mechanism of substantive gelatinus activity in the periaqueductal gray area, resulting in a closed door that can inhibit T cell activity, after which the results of this perception will return receptors that can affects the thalamus, hypothalamus and limbic system, to increase the production of the hormone endorphin which is carried to the brain to be translated so as to reduce the sensation of pain [21]. The birth ball technique is also included in inexpensive non-pharmacological methods and can increase the occurrence of vaginal delivery [27]. The use of the birth ball technique in maternal times can release the hormone endorphin which serves to help reduce pain, reduce tension, create a relaxed and calm feeling that can change the level of oxidation, which is usually a factor

that often affects labor pain in the mother, namely age, environment, personal experience, culture, anxiety, fatigue, family support, relaxation methods used, psychological conditions and stress, if the mother experiences stress, the body will do a defensive reaction that automatically stimulates the body to secrete hormone stressors such as catecholamines and adrenaline, catecholamines released with high concentration and if the mother cannot cope with stress before birth, the body response that occurs makes the uterus more tense, blood flow and oxygen in the uterine muscle decreases because the arteries shrink or narrow so that they can cause inevitable pain [28]. Birth ball technique can be used as an effective tool in dealing with labor pain with complementary methods that can support the mother during labor [29].

Emphasis on hegu point (LI 4) and birth ball technique is recommended as a non pharmacological method that is inexpensive, uncomplicated and has no side effects on maternal and fetal health. So that it can be done in hospital or maternity clinic.

## CONCLUSION

This systematic review provides valid evidence that the emphasis on hegu points (LI 4) and birth ball techniques can reduce the intensity of labor pain. In addition to dealing with labor pain, emphasis on hegu point (LI 4) and birth ball technique is recommended as a non-pharmacological method that is inexpensive, uncomplicated and has no side effects on maternal and fetal health. So that it can be done in a hospital or maternity clinic. Further systematic reviews can be made with other keywords and methods. Appropriate and high-quality articles are also needed for more accurate and comprehensive comparisons and analyzes.

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