



Effects of Modified Bhadrasana Posture Implementation with Cold Compression During the First Stage Labor among Primiparous Women

Maliwan Rattaya*, Supatcha Kuakarn and Pattaratida Fongngam

*Division of Midwifery - Boromarajonani College of Nursing, Thailand.

Corresponding author: Maliwan Rattaya, Division of Midwifery - Boromarajonani College of Nursing, Thailand, Tel: +66815430007, E-mail: maliwanr@bennakhon.ac.th

Abstract

This quasi-experiment investigated the effects of cold compression on the reduction of pain during the first stage of labor of primiparous women by modifying Bhadrasana Posture. Study participants were 60 women who became pregnant for the first time at the central public hospital in the south of Thailand. Participants were randomly assigned to control and experimental groups, each consisting of 30 women. Researchers provided a standard care plan for the control group while midwives in the experimental group used a modified Bhadrasana Posture with cold compression when the cervix dilated 4 cm. Each posture was performed for 15 min every hour until the cervix was fully dilated. The results showed that the experimental group had a statistically significant difference in pain scores according to cervical dilation, $p < .001$. The experimental group had lower score of labor pain ($M = 7.17$, $SD = 1.09$) than the control group ($M = 8.57$, $SD = 1.28$, and $t = 4.57$). Furthermore, the labor pain score when cervical dilated 7-10 cm was lower ($M = 8.63$, $SD = 0.96$) than the control group ($M = 9.93$, $SD = 0.37$ and $t = 6.91$). According to the results, it has been demonstrated that the implementation of modified Bhadrasana posture with cold compression has significantly diminish the pain level in the first stage of labor among primiparous women.

Keywords: Modified Bhadrasana, Cold compression at the first stage labor, Labor pain, Pain management, Primigravida women

INTRODUCTION

Childbirth is a natural phenomenon which allow women to develop herself following the development of pregnant women. Some pregnancies might think that childbirth was a life-threatening event as it had multiple risks to themselves and babies, in which it could result in the fear when giving birth [1]. Labor pain is unavoidable as it is naturally occurred because of the uterus contractions in order to deliver the baby, placenta, and membranes out of the uterine cavity. Pregnant women who have given birth will suffer from pain at every stage of labor. The first stage of labor is determined as the longest stage compared to other stages and it caused some women cannot tolerance to the pain during this stage [2]. This circumstance causes some negative consequences to mother and baby afterwards such as increased the stress level and led to multiple complications of childbearing. The labor pain management, thus, is remarkably essential to every woman during the first stage of labor [3]. The pain management of the first stage of labor comprises of pharmacological and non-pharmacological implementation. The pharmacological administration shows effective results in reducing pain. However, it generated numerous negative side effects to maternal and neonatal [4]. Therefore, non-pharmacological pain management is available as an alternative approach in eliminate labor pain and proceed the childbirth normally. There are loaded of implementation which help to diminish the labor pain. One of the accomplished implementations is the posture of parturient, which could sharply decreased pain

level such as the semi sitting position, rocking motion, sitting position, squatting position, kneeling position, standing position, walking, slow dance, and birthing ball [5,6]. These specified gestures can promote the natural childbirth progression, efficiently uterus contracted and effortlessly drove baby's lead into the birth canal. Additionally, the posture could affect the cervix effacement and dilatation because the position supports with the gravity of the earth, and undergone childbearing effortlessly [5]. Globally, various innovations were developed in order to support childbirth and reduce unsatisfied labor pain. However, some health facilities in Thailand encounter with scarce resources and the parturient might not be cooperated with the particular positions. Therefore, the researchers formulated the posture which modified from daily life position and simple equipment in order to eliminate pain level and duration of the first stage of labor. According to the literature review, Bhadrasana position is categorized as Asana Yoga which used for exercising in pregnant women to extend hip joints and pubic bone [7],

Received: March 22, 2022; **Revised:** April 12, 2022; **Accepted:** May 5, 2022

Citation: Rattaya M, Kuakarn S & Fongngam P. (2022) Effects of Modified Bhadrasana Posture Implementation with Cold Compression During the First Stage Labor among Primiparous Women. *J Nurs Midwifery Res*, 1(2): 1-6.

Copyright: ©2022 Rattaya M, Kuakarn S & Fongngam P. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

including with to relax thigh muscles, pelvic floor, and reduced low back pain [8]. More importantly, this position is illustrated the efficient results of easily deliver the baby as Kongkanoi and Sirikhan [9] conducted a study to determine the effectiveness of modified Bhadrasana Posture in pregnant women while being at first stage of labor. The posture of modified Bhadrasana is sitting position with adjoining soles of feet, included with pulled the heels closed to perineum as much as possible and lean the body forward approximately 15-30 degrees. While implemented this position, a parturient woman leans her head on the pillow where it was placed on the Mayo Cart and both arms resting beside the head. The results showed that the modified Bhadrasana was associated with escalated cervix dilation [10]. However, the labor pain remains persist in parturient women following the progression of labor. Despite the study of modified Bhadrasana demonstrated the advantages to pregnant women at the first stage of labor, the limitation of study was it included women with multiple risks of pregnancy and regardless the age of women and number of gestations that affect the cervical dilatation and period of dilatation [11]. Therefore, the modified Bhadrasana position is very interesting topic, including with cold compression which promoting the reduction of labor pain. This modified pose should be introduced to the primigravida women in order to promote the effectiveness of childbirth and reduce labor pain. Also, this modified position implementation could be an alternative approach of labor care and improve the quality of maternity care.

THE OBJECTIVES OF STUDY

To examine the effects of modified Bhadrasana posture with cold compression for the pain reduction during the first stage of labor on primiparous women.

THE RESEARCH HYPOTHESIS

The primiparous women (experimental group) who will implement modifying Bhadrasana posture with cold compression as pain reduction during the first stage labor will have lower labor pain score than the primiparous women (control group).

THE STUDY FRAMEWORK

This study used the results of Bhadrasana position with cold compression in order to reduce the labor pain score during the first stage of labor. The framework of literature review regarding the Bhadrasana position, the dynamics of this posture, and the efficiency of cold compression to reduce pain in the first stage of labor. The posture of modified Bhadrasana is sitting position with adjoining soles of feet, whereas pulled the heels closed to perineum as much as possible and lean the body forward approximately 15-30 degrees. While implemented this position, a parturient woman leans her head and turn the head to one side on the pillow where it was placed on the Mayo Cart and both arms resting beside the head [10]. The parturient women lean their body forward to the Mayo

Cart could be promoted cardiac output and increased blood circulation to women and the babies because this position does not pressure an inferior vena cava pathway. The operation of uterine muscles is fully equipped by the oxygen blood flow which promote the effectiveness of pain reduction more than lying down position, and the baby is less likely to develop hypoxia incident [12]. Moreover, this modified posture can reduce low back pain and increase intrauterine pressure, by the uterus position and the baby are in the same axis with pelvic cavity, to deliver the baby effortlessly. The cold compression can promote the reduction of labor pain following the gate control theory because it decreased boy metabolism and reduced the rate of tissue destruction, diminish the emission of chemical causing labor pain, and terminate muscle spasms [13]. When the cold reaches the muscle layer, the tightness is reduced, formulate the comfortable feeling, and eventually women became ignoring the labor pain [14]. According to the study, cold compression between 20-30 min can reduce the pain effectively [15] particular lower back which is the most appropriate spot to reduce labor pain [4]. When women entered the active labor phase, cold compression at the abdomen and lower back is an alternative approach to pain management because both parts are determined as the most vulnerable spot to pain [16]. The reduction of labor pain led to better pain tolerance in women and the implementation can be followed correctly to promote a normal childbirth. This study was integrated by applying butterfly pose and cold compress together in order to reduce pain in the first stage of labor as shown in the chart below.

METHODOLOGY

This Quasi-experiment aims to identify the effects of modified Bhadrasana posture implementation with cold compression program as the pain reduction during the first stage labor on primiparous women. The study design was two-group post-test design, which was the following details;

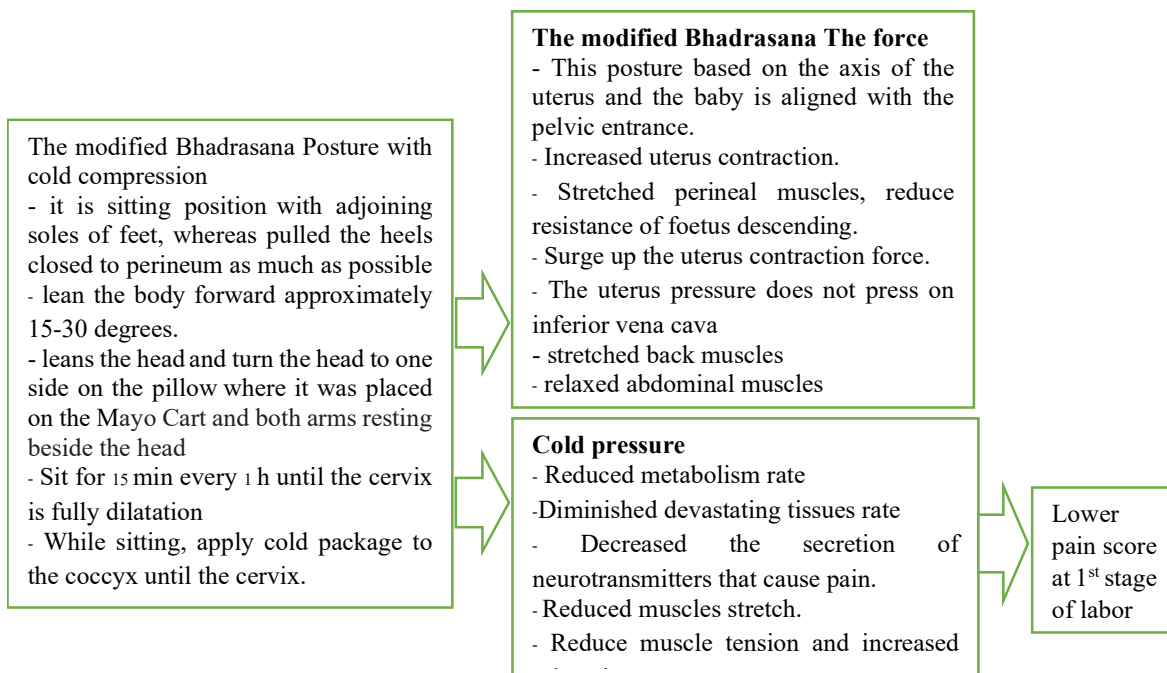
The population and sample size were 60 first-time pregnancy women between 18-35 years old, in which all pregnant women went into labor and delivery spontaneously at a center hospital in the southern region. The researchers purposively choose the particular women following these inclusion criteria;

- The first-time pregnant women between 37-41-week pregnancy
- No invasive pregnancy risks
- Height over 145 cm.
- The cervix dilatation for 4 cm and 80% of cervix effacement.
- Vertex presentation
- Approximately baby weight is not less than 2,500 grams, and not over 4,000 grams
- Regularly fetal heart beats.

- Willingly to the study after signed for consent form.

The sample size was determined by the test power analysis method, and find the magnitude of the effect size based on literature review of Dounghmani [10] to calculate proper sample size. The effect size was 3.81, which was (large effect size). However, in order to increase the reliability of study, 0.80 effect size was used to contribute the reliability at 0.95 and increased the confident of power of test. Polit and Beck [17] formulated test-power table which 30 participants of sample size was reasonable number, included 30 participants

of control group. Totally, 60 participants were included in the study and purposely choose into each group by switching to a group followed the inclusion. To control the influence of external variables, if there were complications arose during the study was implementing; such as fetal distress, abruption placenta, thin meconium in amniotic fluid, abnormal uterine contractions, implemented artificial ruptured membrane, received induction of labor procedure, and pharmacological pain management, the experiment will terminate in order to avoid maternal and neonatal adverse outcomes.



RESEARCH TOOLS

1. The collecting data tools comprises of 4 parts
 - a. Personal data questionnaire such as age, marital status, religion, education, level, occupation, individual and family incomes, height, and pre-birth weight.
 - b. Pregnancy information such as pregnancy gestation, high of fundus, estimated fetal weight, ante-natal visits, and birth preparedness.
 - c. The modified Bhadrasana posture and cold compression record such as the total period of the first stage since 4 cm of cervix dilatation until fully dilated. The numbers of modified Bhadrasana posture and cold compression implementation.
 - d. numerical rating scales record form to identify labor score based on 0 means no pain, 1-3 is mild pain, 4-6 is moderate pain, and 7-10 is severe pain [18]. Several advantages are simple to use and easy to assess, which it suitable for patients with acute pain; traumatic accidents and surgery patients. While disadvantages are the patient remembers the numbers and randomly answer.

Experimental research and the implementation of nursing intervention may cause the patient to respond in a considerate manner or not dare to respond if it's a face-to-face question-and-answer conversation

Research tools quality assessment

1. All research tools were validated the content Validity by 3 qualified persons; a nursing lecturer at the Boromarajonani College of Nursing, an APN Professional Nursing (APN) in maternal and infant nursing, and a Special Professional Nurse at Maharat Nakhon Si Thammarat Hospital, to assess the content validity and Coverage Language Format. Afterwards, the research tools were revised followed the recommendation in order to formulate the validity.
2. The reliability assessment by utilized the numerical rating scales with pregnant women at labor department, in which the 20 women were identified because their characteristics were similar to those of the experimental and control groups. Afterwards, the initiatives of data were used to calculate the reliability of the tool by

Cronbach's alpha coefficients which has a precision of .96.

COLLECTIVE DATA PROCEDURE

1. Preparedness for research

- a. The researchers proposed the research proposal to the committee board in order to consider the ethical consideration of research.
- b. The researcher conducted a document regard to the conducting of experimental research in human to the director of Collect of Nursing and the director of the hospital, where the experiment will implement, included requested for permission to initiatives the research.
- c. After the permission was approved, the head of researcher being engaged with the head of nursing and head of maternity department to inform the processes of research.

2. The implementation of research

- a. the researchers went to the delivery room to meet the in-charge nurse of the delivery room to inform the details and asked for advice on exploring the participants of the samples, and selected the samples according to the inclusion conditions.
- b. The researcher introduces ourselves formulated a relationship, explained the research objectives, and indicated the sample an opportunity to ask questions about the research. Also, the researchers inquired their consent to participate in the research, included informed the protection of rights to the participants.
- c. 60 participants were purposively assigned to control and experiment groups; the participants in both groups were collected personal data questionnaire and pregnancy information
 - i. The researchers explained the information regard to the process of the modified Bhadrasana posture, the duration of implementation, included with the cold compression to the experimental group.
 - ii. 30 participants of experimental group were implemented the modified Bhadrasana posture followed the guidance of intervention for the pregnant women in the first stage of labor based on literature review, and the cold compression was applied during the first stage of labor for 15 min in every hour until fully dilated of cervix.
 - iii. The modified Bhadrasana posture and cold compression record such as the duration of the first stage since 4 cm of cervix dilatation until fully dilated were recorded, as well as the numbers of implementation of modified Bhadrasana posture and cold compression.

Both control and experiment group were being measured the fetal heart rate and assessed the uterine contraction every 30

min. Also, the vital signs and vaginal examination were recorded every 2 h followed the standard of maternity care of the hospital. Moreover, numerical rating scales record was used to record labor pain.

DATA ANALYSIS

As part of the data analysis, the researcher used the data collected from both groups to analyzed the validity by examined the completeness the information. Afterwards, the data were analyzed followed the statistical methodology, which utilized the instant computer program to determine the level of statistical significance which was set at .05, with details of data analysis as follows:

1. Personal characteristics data were analyzed by using the frequency distribution statistics to calculate the percentage, mean, and standard deviation.

2. Personal data differentiation between the control and experimental groups were analyzed by using Chi-square, Fisher's Extract test, and independent t-test.

3. An independent t-test was utilized to the difference in pain scores for the first stage of labor in the group receiving the implemented the modified Bhadrasana posture and cold compression and the group receiving the usual nursing care.

ETHICAL APPROVAL

The result of modified Bhadrasana Posture with cold compression program as pain reduction during the first stage of labor of primiparous women was approved by the research ethical committee in human of Maharaj hospital, Nakhon Si Thammarat number 22/2562 at 7th May 2021. This research was conducted under the condition that if the participants were uncomfortable, they can leave the research at any time without any effect on receiving nursing services from the delivery department. In this study, one parturient had childbirth complications, thin meconium of amniotic fluid and fetal distress required emergency caesarean section. So, the experiment was terminated to avoid the maternal and neonatal adverse outcomes.

FINDINGS

General characteristics of sample size was a first-term parturient who gave birth at the delivery room department, a center hospital in the southern region, of which consisted of 60 participants divided into the control group and the experimental group, each group consisted of 30 people. Both groups had a mean age of 25.25 years (SD = 5.23). The minimum height was 151 cm, the maximum was 176 cm, and the average height was 160.92 cm (SD = 5.69). Minimum weight 43 kg. Maximum 99 kg. Average weight 66.85 kg (SD = 11.99). lowest BMI was 16.80 Kg/m² and highest was 36.36 Kg/m², and average BMI was 25.77 Kg/m² (S.D. = 4.15). Most of participants had secondary school level accounted for 48.3% and being a housewife and hired employee equally accounted for 35%. The lowest average monthly income, no

income, while the highest 70,000 baht. 55% of them earn less than 10,001 baht, and they reported that income was sufficient. 60% were nuclear family and had marital status. 75% of participants were Buddhist. When comparing the number, percentage, personal differentiation between the control group and the experimental group categorized by educational level, occupation, the sufficiency of income, marital status, and religion by Chi-Square Test (N = 60) found that the samples in both groups had similar personal data and the pregnancy information were no different. Researchers compared the level of labor pain between the control and experimental groups during the first stage of labor, as it demonstrated followed **Table 1**.

Table 1. The comparison of labor pain score between parturient who received the modified Bhadrasana Posture with cold compression program and the usual standard maternity care.

Pain score during the first stage of labor	Control gr.; (n = 30)		Experimental gr.; (n = 30)		T
	M	SD	M	SD	
Cervical dilatation at 4-6 CMS	8.57	1.28	7.17	1.09	4.57*
Cervical dilatation 7-10 CMS	9.93	0.37	8.63	0.96	6.91*

*** p<.001

This table illustrated that the experimental group had significantly lower labor pain score than the control group (p < .001). At 4-6 CMS of dilatation, the experimental group reported lower pain score (M = 7.17, SD =1.09) than the control group. Similarly, at 7-10 CMS of dilatation, the experimental group had less pain score (M = 8.63, SD = 0.96) than the control group (M =9.93, SD =0.37 and t = 6.91). According to the results, it illustrated that the pregnant women in the experimental group who received the applied butterfly pose in combination with the cold compress had lower pain scores in the first stage of labor than the control group who received the usual nursing care, in which accordance with the research hypothesis.

DISCUSSIONS

The study aims to compare the result of modified Bhadrasana Posture with cold compression program as pain reduction during the first stage of labor of primiparous women. The results showed that the outcome accordingly follow the research hypothesis. In the experimental group, labor pain scores were significantly lower than in the control group (p < .001).

1. The general characteristics demonstrated that the participants were aged 18-35 years (M=25.53, SD=4.95), which accordingly followed the average age of childbirth women in Thailand. Also, women’s height between 151-176

cm (M = 159.93, SD = 5.28) which corresponds to the average height of Thai women. Weight between 43-99 kg. (M = 67.20, SD = 13.65). During pregnancy, women gain weight based on their physical structure and will vary in weight based on their health and well-being [19]. Largely, women being married and Buddhist with mostly at the high school level. Furthermore, most of the participants were housewives, followed by employees and students with average family incomes of 17,700 baht, and some of them had no income at all because they were still studying.

2. The experimental group who received the applied butterfly position in combination with cold compression had lower pain scores in the first stage of labor than those who received the usual nursing care significantly at p < .001, in which is accordance with the research hypothesis. This research can describe the findings based on evidence-based academic principles. As a result of this modified Bhadrasana Posture, the baby's vertex moved downward and pressed the sciatic nerve at the pelvic area, causing the cervix to dilate more rapidly, though it did not reduce pain during labor [10]. The findings of this study contrast to the study of Sirisat [20] which explore the efficacy of Butterfly sitting. He found this particular gesture had a statistically significant reduction in pain scores from labor pain in both abdominal pain and back pain and the pain was reduced by 33%, the mean pain reduction was 23%. Thus, the pain in the birthing process is deep and intense, long-lasting, and has a complex mechanism [4]. The Butterfly poses have been shown to reduce pain in some studies, but only the Butterfly position intervention has been shown to be effective in reducing pain in some patients. In this study, we combined the modified Bhadrasana pose with a cold compress to reduce pain more efficiently. The cold sensation could reduce pain perception by closing the door according to the gate control theory, reducing metabolic rates, decreasing tissue destruction rates, decreasing the release of chemicals that cause pain, and decreasing muscle twitching [21]. The cold compression for 20-30 min was determined as an appropriate time that can alleviate the first stage of labor pain, particularly at lower back [4]. During the transitional phase of labor, the level of pain continues to decrease according to the experimental group had significantly lower mean pain scores in the early cervical and transitional stages than the control group (p < 0.001 and 0.001 respectively) [22] This explains that pain is caused by stimulation of pain receptors where the nerve fibers conduct pain sensations. By sending nerve impulses to the spinal cord, the C-fiber sends signals via the dorsal horn, which has a gate control system. In this stage, nerve impulses pass through T10-12 and L1, which increases the activity of neurons in Substantia-gelatinosa, causing transmission cells to transmit nerve impulses up to the brain and thereby

causing pain [23]. Pain generously appeared in the abdominal area and lower back. Applying a cold or hot compress causes a similar effect: it causes a change in skin temperature and stimulates peripheral nerve endings of the C-fiber group as well. As a result, the receiving of nerve impulses to feel pain is reduced and the pain was therefore reduced according to the gate control theory.

APPLYING THE RESEARCH RESULTS

Modified Bhadrasana poses with a cold compress should be applied to pregnant women in the first stage of labor to relieve pain.

SUGGESTION FOR FURTHER STUDY

Developing the model into a continuous care program should include combining modified Bhadrasana pose with cold compresses, alternating with various pain relief techniques that healthcare providers can utilize and developing the model as a guideline for further practice.

REFERENCES

- Luddangam P, Wirifai S, Auntarin S (2020) Perceived Self-Efficacy in Coping with Labor Pain. *Royal Thai Navy Medical J* 6(1): 4-15.
- Taveekaew C, Bouban K, Ketkaew S (2019) Coping with Pain in The First Stage of Labor and The Role of Midwifery in The New Dimension. *Vajira Med J* 5(3): 231-238.
- Techamuanwaiwi S (2015) Pain and Pain Management of Mothers during The First Stage of Labor. *JBCN* 31(1): 114-123.
- Phumdoung S (2012) *Obstetrics (Intrapatum)*. Songkhla: Allied Press. (in Thai).
- Somsap Y (2019) Parturient care in the first stage of labor. *Nurs J* 46(1): 218-228.
- Peeranat S (2010) Yoga ball, a simple helper, fit & firm. Available online at: <https://portal.weloveshopping.com/blog/>
- Sun YC, Hung YC, Chang Y, Kuo SC (2010) Effects of a prenatal yoga Program on the Discomforts of pregnancy and maternal childbirth self-Efficacy in Taiwan. *Midwifery* 26(6): e31-e36.
- Gaware VM, Dolas RT, Kotade KB, Dhamak KB, Somwanshi SB, et al. (2011) Promotion and improvement of fertility by yoga. *Int J drug*. Available online at: <http://www.ordonearresearchlibrary.org/data/pdfs/ijdf99.pdf>
- Kongkanoi K, Sirikhan S (2012) Yoga for Pregnant women. Bangkok: End Design (in Thai).
- Duangmani K, Somsap Y, Ingkathawarnwong T, Kala S (2017) Effects of Modified Bhadrasana Pose on Labor Pain and Duration of Active Phase in Parturients. *Pri of Naradh Uni J* 9(1): 35-49.
- Wanichpongphan P, Rasmeechareon K, Lertbhanpong T (2017) *Obstetrics*. Department of Obstetrics-gynecology, Faculty of Medicine Siriraj Hospital, Mahidol University: Bangkok. (in Thai).
- Lowdermilk DL (2010) *Labor and birth process*. Maternity nursing 8th ed. Canada: Mosby Elsevier. pp: 265-283.
- Eungapithum N (2011) Effect of Cold and Heat Compression on Labor Pain among Primiparous mothers. Thesis of Master of Nursing Science Program in advance midwifery, Nursing Faculty: Chiangmai University. (in Thai).
- Hongranai S (2012) *Intrapartum nursing care: The evidence based-practice*. Bangkok: Danex-inter corporation.
- Hajiamini Z, Masoud SN, Ebadi A, Mahboubh A, Matin AA (2012) Comparing the effects of ice massage and acupressure on labor pain reduction. *Complement Ther Clin Pract* 18(3): 169-172.
- Lawrence A, Levis GJ, Styles C (2013) Maternal positions and mobility during first stage labor. *Cochrane Database Syst Rev* 9(10): CD003934.
- Polit DF, Beck CT (2012) *Nursing research: generating and assessing evidence for nursing practice*. 9th ed. Philadelphia: Lippincott Williams & Wilkins.
- Breivik H, Borchgrevink PC, Allen SM, Rosseland LA, Romundstad Brevik H, et al. (2008) Assessment of pain. *Bri J Ane* 101(1): 17-24.
- Somsap Y (2013) *Basic Knowledge of Childbirth*. in Yaowares Somsap (Editor), *Midwifery*. 3rd ed. Songkhla: Hadyai Best Sell and Service. (in Thai). pp: 17-50.
- Sirisat M (2013) Maneewej's Butterfly position waiting on labor pain among Active Phase. *Region Med J* 26(3): 13-17.
- Kulnejittamat T (2017) Pain and Pain Management during Labor. *AIJ* 6(2): 158-165.
- Eungapithum N, Parisunyakul S, Sansiriphun N (2012) Effect of Cold and Heat Compression on Labor Pain among Primiparous mothers. *Nurs J* 39(4): 46-58.
- Sangtongrungharoen P, Ngamkham S (2019) Pain Management in Labor Based on the Neuromatrix. *J Nurs Asso Thai North Off* 25(2): 2-3.