THE EFFECT OF INTEGRATED PAIN MANAGEMENT PROGRAM ON LABOR PAIN, DURATION OF FIRST STAGE OF LABOR, AND CHILDBIRTH EXPERIENCE IN PRIMIPAROUS MOTHERS

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ABSTRACT

The purpose of this quasi-experimental research is to determine the effect of the integrated pain management program on labor pain, duration of first stage of labor and childbirth experience in primiparous mothers. The Symptom Management Model and Gate Control Theory were used as the theoretical framework for this study.

Sixty subjects were purposively selected from obstetric department, Metta pracharak (Wat Raiking) Hospital, who were then equally divided into an experimental and a control group. The experimental group received usual care plus the integrated pain management program administered by the researcher beginning at 32^{nd}-38^{th} weeks of gestation and during labor, while the control group received usual care from staff nurses. Data were collected by self-administratered questionnaires from June, 2002 – April, 2003. Frequency, percentage, mean, standard deviation and independent t-test was used to analyze the data.

The results of this study revealed that the mothers in the experimental group had statistically significant lower mean score of labor pain both in active and transition phases ($t = 11.32$, $p < .001$ and $t = 8.81$, $p < .001$ respectively) and shorter duration of first stage of labor ($t = 6.47$, $p < .001$) than those in the control group. For the perception of childbirth experience the experimental group had statistically significantly higher scores in childbirth perception than those in the control group ($t = -21.53$, $p < .001$).

The result of the study suggested that using the integrated pain management program in primiparous mothers can reduce pain during labor, shorten duration of the first stage of labor and also impact positively on the perception of childbirth experience. So this program is one of the more effective choices for primiparous mothers in dealing with labor pain which, may in turn, be administered by the nurse him/herself.

KEY WORDS : PAIN MANAGEMENT / LABOR PAIN / DURATION OF FIRST STAGE OF LABOR / CHILDBIRTH EXPERIENCE
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ผลของโปรแกรมการจัดการกับความเจ็บปวดแบบผสมผสานต่อความเจ็บปวดในระยะคลอด ระยะเวลาในระยะที่หนึ่งของการคลอด และประสบการณ์การคลอดของมารดาครรภ์แรก (THE EFFECT OF INTEGRATED PAIN MANAGEMENT PROGRAM ON LABOR PAIN, DURATION OF FIRST STAGE OF LABOR AND CHILDBIRTH EXPERIENCE IN PRIMIPAROUS MOTHERS)

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บทคัดย่อ

การวิจัยกึ่งทดลองนี้มีวัตถุประสงค์เพื่อ ศึกษาผลของการใช้โปรแกรมการจัดการกับความเจ็บปวดแบบผสมผสานต่อความเจ็บปวดในระยะคลอด, ระยะเวลาในระยะที่หนึ่งของการคลอด และประสบการณ์การคลอดของมารดาครรภ์แรก โดยใช้แบบจำลองการจัดการกับอาการร่วมกับทฤษฎีควบคุมประตูเป็นกรอบแนวคิดในการศึกษา

การเลือกกลุ่มตัวอย่างเป็นแบบเฉพาะเจาะจง จากแผนกสูติกรรมโรงพยาบาลเมตตาประชารักษ์ (วัดไร่ขิง) จำนวน 60 ราย แบ่งเป็นกลุ่มทดลอง และกลุ่มควบคุม กลุ่มละ 30 ราย กลุ่มทดลองได้รับการพยาบาลในระยะตั้งครรภ์และระยะคลอดตามปกติร่วมกับโปรแกรมการจัดการกับความเจ็บปวดแบบผสมผสานจากผู้วิจัยตั้งแต่อายุครรภ์ได้ 32-38สัปดาห์และระหว่างเจ็บครรภ์คลอด ในขณะที่กลุ่มควบคุมได้รับการพยาบาลตามปกติจากพยาบาลประจำการ เก็บรวบรวมข้อมูลโดยใช้แบบสอบถามในระหว่างเดือนมิถุนายน พ.ศ. 2544 - เดือนเมษายน พ.ศ. 2545 วิเคราะห์ข้อมูลด้วยการคำนวณค่าความถี่ ร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และการทดสอบค่าที

ผลการวิจัยพบว่ามารดาในกลุ่มทดลองมีค่าเฉลี่ยของความเจ็บปวดในระยะคลอดช่วงปากมดลูกเปิดเร็วและระยะเปลี่ยนแปลงน้อยกว่ามารดาในกลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ ($t = 11.32$, $p < .001$ และ $t = 8.81$, $p < .001$ ตามลำดับ) และมีระยะเวลาในระยะที่หนึ่งของการคลอดสั้นกว่ามารดาในกลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ ($t = 6.47$, $p < .001$) ส่วนการรับรู้ประสบการณ์การคลอดนั้นมารดากลุ่มทดลองมีการรับรู้ประสบการณ์การคลอดดีกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ ($t = -21.53$, $p < .001$)

ผลการวิจัยชี้ให้เห็นว่าการใช้โปรแกรมการจัดการกับความเจ็บปวดแบบผสมผสาน สามารถช่วยลดความเจ็บปวดในระยะคลอดให้กับมารดา ทำให้ระยะเวลาในระยะที่หนึ่งของการคลอดสั้นลง และส่งเสริมให้เกิดการรับรู้ประสบการณ์การคลอดที่ดี ดังนั้นโปรแกรมการจัดการกับความเจ็บปวดแบบผสมผสานนี้จึงเป็นอีกหนึ่งทางเลือกที่ดีสำหรับมารดาครรภ์แรกที่จะใช้เผชิญกับความเจ็บปวดในระยะคลอด อีกทั้งเป็นบทบาทอย่างหนึ่งที่พยาบาลสามารถนำมาใช้ช่วยเหลือมารดาได้โดยอิสระ

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CHAPTER 1
INTRODUCTION

Background and Significance of the Study

All laboring women have to cope with unavoidable pain because they can not have parturition without pain. Almost all laboring women, approximately 97 percent, report that labor was the hardest experience in their life; therefore, laboring women, especially the primiparae, are anxious and fear of childbirth. Fear causes physical stress that affects blood circulation in uterus and cervix muscle, leading to delayed cervix dilatation and increased perception of labor pain, which occurs at the peak of uterine contraction. Fear increases with the increase in intensity of labor pain thus the senses of fear and pain are formed into a continuous circle called Fear – Tension – Pain Syndrome (Dick – Read, 1984; 197). With the increased intensity of labor pain, the laboring women tend to have ineffective pain management behavior such as screaming, writhing, asking for analgesic drugs, losing self-control, and ignoring to cooperate during the delivery. As a result, the women may have physical weakness causing long-term labor and they may finally need operative delivery. Therefore, it is important to help laboring women with appropriate pain management. Two approaches are generally used for the relief of labor pain: pharmacological and non-pharmacological approach.

Labor pain management with pharmacological approach is under the decision of obstetricians. However, the use of drugs in restricted, especially in 2-3 hours before parturition, as several studies show that drugs have effects on both mothers and infants such as suppressing the mother's and fetus' respiration, relaxing muscle thus causing prolonged labor (Nichols & Humenick, 1988: 99; Newton, et al, 1995: 89-92). The decrease in uterine contraction may also lead to postpartum hemorrhage and birth asphyxia, which are major causes of maternal and fetal death in Thailand nowadays (Nipanpron, B.E. 2543: 4; Sutit, B.E. 2543: 1). It is also found that the use of drugs

increases the risk of delivery with forceps or vacuum extraction instead of normal labor by four times (Kamininski, Stafl & Aimam, 1987: 770-773; Thorp, et. Al, 1993: 851-858) and increase the risk of cesarean operation by 5 times (Lieberman, et al., 1996: 993-1000). Such instrumental deliveries cause trauma of perineum thus the mothers may have difficulties in taking care of their babies afterward (Albers, et al., 1996: 269-276). The risk from cesarean delivery is six times higher than tat of normal labor (Wirote and others, B.E. 2541: 60) and postoperative pain highly interfere the mothers' performance of childcare (Chayapron, B.E. 2542: 5). In addition, epidural block induces back pain that may remain for six weeks to one year postpartum (Breen, et al., 1994: 29-34; MacArthur, Lewis & Knox, 1992: 1279–1282; Russell, et al., 1993: 1299–1303). It may also causes nerves trauma, hypotension and fever with body temperature higher than 100.4 ^{o} F or 38^{o} C in labor period (Camann, et al., 1991: 565-568; King, 1997: 380; Lieberman, 1997: 415-419; Ploeckinger, et al., 1995: 24-27; Throp & Breedlove, 1996: 63-83). The infants of the mothers who received analgesic drug by either muscular injection or epidural block tend to have a higher temperature than those of mothers not receiving any analgesic drugs (Macaulay, Bond & Steer, 1992: 665-669; Ransjo–Arvidson, et at. 2001: 5-12); therefore, infectious investigation and antibiotic treatment are necessary for these infants. Analgesic drugs may also cause the decrease in sucking performance of the infant after birth and the increase in crying behavior (Ladawan, B.E. 2542: 104; Ransjo–Arvidson, et al., 2001: 5-12; Scanlon, Brown & Weiss, 1974: 121-128)

During childbirth, the mothers have various experiences, both positive and negative; and they will remember these experiences for the rest of their life (Panpilai, B.E. 2540: 1; Supranee and Yaowalak, B.E. 2531: 90-91; Penny Simkin, 1991: 203-210; 1992: 64-81). It is reported that that mothers can remember their first labor experience for 20 years. The good experience provides the mothers with an increase in their self-confidence and self-esteem in coping with other difficulties in their life. On the contrary, mothers with negative perceptions of childbirth experience will feel angry and distressed; some may have nightmares and bad relationship with their husband, including problems of sexual activities after childbirth. Good pain management during labor is associated with positive perception of childbirth experience. The mother's perception of childbirth experience can predict the future

mother-child boding, as anxiety and depression will decrease in two months postpartum, especially in the mothers aged 21–34 years old (Peterson & Mehl, 1978 Cited in Mercer, 1985: 205). The mothers with negative childbirth experience will pay attention to themselves rather than to their infants, leading to poor mother-child bonding, abandonment, and child abuse, followed by problems of homeless child, drug addition, and criminal acts. According to a survey conducted by the Department of Social Welfare, there were 112,435 neglected children in 1994; the number increased to 268,106 in 1999 (Academic Report. Department of Social Welfare, Ministry of Social Development and Security, 2000: 19). A large proportion of national budget has been increasingly distributed for delivering support and supplying resources for these children; for instance in 2001 the budget was raised to almost 463.39 million bath from 316.72 million bath in 1993.

Because of the aforementioned reasons, several studies have been conducted to seek effective labor pain management with non-pharmacological approach in order to provide the mothers with more choices for coping with labor pain thus having positive experience of childbirth. For -example, the provision of childbirth preparation course with lessons of pain management strategies such as muscle relaxation, position and movement, stroking abdomen, and breathing techniques (Rodsukon, B.E. 2530; Julapron, B.E. 2531; Chaweewan, B.E. 2533; Usa, B.E. 2534; Panipa, B.E. 2537; Watsika, B.E. 2539; Jaruwan, B.E. 2540; Wasana, B.E. 2540; Somsiri, B.E. 2542; Sukpinush, B.E. 2543; Venus, B.E. 2543), music therapy (Datchanee, B.E. 2539; Mantana, B.E. 2540; Yuwadee, B.E. 2541) and promoting their partners to play assistant role in labor room (Pranee, B.E. 2531; Prakaikaew, B.E. 2534).

However, there are some limitations in previous studies; for example, childbirth preparation classes were usually started around the laboring week (36 weeks of gestational age) and mothers attended the classes only once or twice thus lacking time to practice and develop their skills. Moreover, laboring women are mostly left to overcome labor pain on their own-- whereas nurses are just teaching or giving advice. In reality, laboring women can efficiently use pain management strategies only in the latent phase when the uterus contraction is infrequent and mild. They are able to conduct self-care activities, to pay attention to the environment, to seek and receive about pain relieving techniques, and to maintain self-control for appropriate practice.

However, when the women engage in the active and transition phase, they become less responsive to the environment, e.g. not wanting to talk or receive advice, having short concentration, having self-control difficulties, and depending on others especially in relieving pain; thus the women may ask for analgesic drugs, cesarean operation, back massage, or attending nurses (Piriya, B.E. 2540: 127; Sherwen, Scoloveno & Weingarten, 1995: 626 – 629). Nevertheless, at present, most hospitals do not allow husbands or family's members to attend the delivery or to give support to the laboring women in delivery room.

Therefore, the researcher of this study was interested in finding an intervention model that responds to the need of laboring women in real situation by integrating complementary nursing techniques such as back massage to reduce labor pain in the active & transition phase. This model can be included in the childbirth preparation class at appropriate time so that the mothers will have reduced labor pain, shorten duration of first stage of labor, and positive perception of childbirth experience. A significant rationale for the study is that this non-pharmacological approach is an independent nursing role that can be delivered to mothers at the delivery period. Pain management in this study was based on the Model of Symptom Management proposed by Larson and associates (1994) and the Gate Control Theory proposed by Melzack and Wall for the promotion of positive labor experience among mothers. Back massage induces stimulation to large nerve fibers thus reducing or completely blocking the nerve pathways for pain perception. These distracters (large fiber stimulation) are brought to work by closing down a hypothetic gate in the spinal cord. For cerebral cortex translation of pain perception, it depends on memory and cognitive process. Laboring knowledge and pain management skills should be taught to laboring women in order to improve their self-confidence and self-control. Decreased pain in addition to the ability to maintain self-control of laboring women enhances self-esteem and positive experience perception. The researcher of this study, therefore, is interested in conducting a study on the effect of integrated pain management program on labor pain, duration of first stage of labor and childbirth experience in primiparous mothers. The finding of this study should be beneficial for the development of nursing service, education and nursing research. Furthermore, the intervention can be an additional choice in responding to the national health care reform policy, including

the low-cost healthy life policy, health assurance for all, or 30 –bath universal health care scheme. It is also an application of complementary and alternative therapy nursing to current medical management.

Theoretical framework

This study was based on the Symptom Management Model, which is proposed by Larson and associates (1994) with the principle concept that good pain management could lead to good result, i.e. decreased pain perception, and positive experience in laboring period. Larson and associates view symptom as subjective experiences reflecting changes in a person's biopsychosocial function, sensation, or cognition, which are causes of suffering. Labor pain is also an uncomfortable symptom experience, leading to the response that is different in each individual depending on emotion, culture, social, and other factors (Tongsawat, 1988: 42; Suppasri, 1997: 29; Bonica, 1994: 621-623). More than 90 percent of laboring women need to cope with pain (Srisomboon, 1997: 1). Labor pain, therefore, is a symptom that requires effective management. The management of labor pain, according to Larson and associates is reviewed below.

A basic assumption of the model of symptom management proposed by Larson and colleagues is that symptoms need to be managed and symptom management strategies can influence or control the symptom experience and symptom outcomes as illustrated in figure 1.

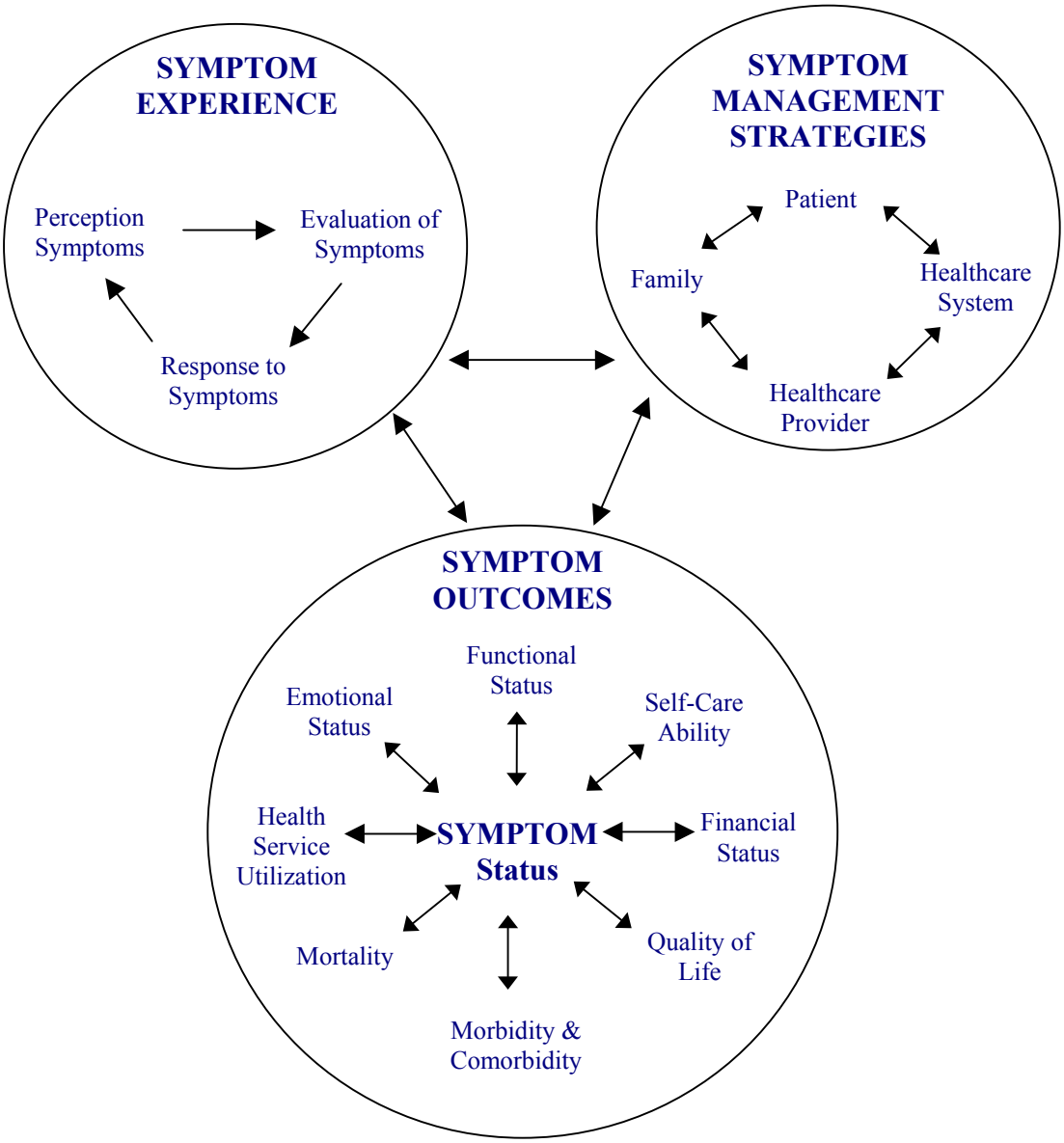


Figure 1: Model of Symptom Management (Larson, et al., 1994: 274)

Symptom Experience

The symptom experience is dynamic, involving the interaction of the patient's perception of a symptom, evaluation of the meaning of a symptom, and response to symptom.

Perception of symptom refers to whether individual notices a change from the way he or she usually feels or behaves. Perception is a conscious, cognitive interpretation of information gathered by the sense in the context of a particular environment or situation. The perception factors consist of 1) individual factor, 2) environment factors and 3) health and symptom factors.

Labor pain perception depends on the aforementioned factors such as individual factors including age (Fridh, et al., 1988: 117-124; Bonica, 1996: 35), marital status (Fridh, et al., 1988: 117-124; Lederman, et al., 1979: 94-97; Morgan & Barden, 1985: 114-118; Norr, et al., 1977: 260-275), personality (Piriya, B.E. 2540: 31; Buxton, 1990: 101), financial and family status (Norr, et al., 1977: 260-275; Sulanta, B.E. 2528: 42-43), number of pregnancy (Gaston – Johansson, et al. cited in Bonica, 1996: 35; Lowe, 1987: 340-346; Lowe, 1991: 193-208), and mother's physical status (Barbara, 1984 cited in Jintana, B.E. 2533: 33). All factors influence pain perception in parturition period. Environment is one of the importance perception factors, because inappropriate environment will have effect in the increasing of stress and decreasing of pain tolerance. The environmental factors consist of physical environment comprising hygiene, quietness, home-like environment, appropriate light and temperature; psychosocial environment comprising good relationship between laboring women and health care providing that leads to the sense of warmth and confidence, as well as care and concern. For health and symptom factors, it is found that complications during pregnancy induce different pain perception: the pregnant women with high risk will have higher stress level and pain perception than those with low risk (Kamp & Hatmaker, 1989: 331-336; Magni, et al., 1986: 273-276; Norr, et al., 1977: 260-275). Pregnant women who receive antenatal care tend to perceive less pain that those not having antenatal care during pregnancy (Nunnally & Aguiar, 1974: 469-479).

Evaluation of symptom refers to individual's judgment of the symptom, which reflect factors that will later define the characteristics of perceived experience such as symptom severity, cause, treatment, and the effects of symptoms. Primiparous women tend to view parturition as bad experience, as they have no labor experience. They anticipate the laboring as severe, painful and terrifying moment that may do serious harm to their life and the baby's Moreover, most primiparous women do not have knowledge or experience about the position, frequency and duration of labor pain (Jaruwan, B.E. 2540: 18).

Response to symptom refers to the person's response to symptom or syndrome in physical, psychological and behavioral responding including feelings, thoughts, or behaviors that are secondary to actual or potential health problems. One

symptom may be responded in more than one way. Labor pain induces physical, psychological and behavioral responses in the mothers (Bonica & McDonald, 1995: 1313-1343; Bonica, 1994: 624-630; McDonld, 2001: 1394-1397). Physical responses occur in respiratory system, neuro-endocrine system, circulatory system, metabolic system, gastrointestinal system and the fetus. For psychological response, labor pain provides the mother with negative; the perception of bad experience has effect on postpartum psychological health status, maternal-newborn attachment, and sexual relationship with the husband and fear for the next pregnancy and childbirth. Behavioral responses include verbal expression –such as shouting, screaming, agitated and crude talk; motor behavior such as aggressive and restless movement, inability and changes in sleep pattern changing because of trouble from pain (Affonso, 1979 cited in Jintana, B.E. 2533: 25-27).

Symptom Management Strategies

A basic assumption of the model is that all troublesome symptoms are in need of management, and symptom management should influence or control the symptom experience, not just symptom outcome. The goal of symptom management is to avert or delay a negative outcome through the cooperation of health care system, health care providers, family and the individual. At present, most hospitals still have closed system in labor room thus the cousin or husband s not allowed to take assistance role during childbirth. Therefore, possible pain management strategies are mainly dependent on mother-nurse participation. In addition to the management of physical symptoms, pain management strategies also include the control of pain experience.

Physical pain management can be explained with the Gate Control Theory (Melzack & Wall, 1982), which states that physical pain can be blocked by gate control. In the gate control system, noxious impulses originating in nociceptive receptors, which distribute throughout the stimulated area, are transmitted via primary afference neurons in dorsal horn of the spinal cord. The stimuli are then processed primarily in the substantia gelatinosa of the dorsal horn, which functions as a gate for ascending or descending nerve impulse, and are transmitted by interneurons of spinothalamic tract to cerebral cortex. The nerve impulses that pass through the gate control include small and large nerve fiber impulses. Small nerve fiber impulses will

open the gate control system, whereas the large one closing it. When the number of large nerve fiber impulses is larger than the number of small nerve fiber impulses, the gate control at spinal cord is blocked thus diminishing nerve impulses to the brain. On the other hand, when the number of small nerve fiber impulses is larger than the number of large nerve fiber impulses, the gate control at spinal cord opens for neurotransmission to the brain immediately and the pain is perceived. The neurotransmission of large nerve fibers is also regulated with the brain-stem system where the cognitive-affective control system is located. The neurotransmission of pain impulses to the cerebral cortex depends on the memory and cognitive process, past experience, culture, and the level of anxiety. In active and transitional phase, the uterine contraction causes pressure applied on the cervix, joint and tendon in the uterus thus stimulating the neurotransmission from small nerve fibers to the spinal cord. To decrease the perception of pain in the brain, the quicker and more intense impulses from the large nerve fivers are required and such impulses can be stimulate with an effleurage on the abdomen or a back massage. In addition, strategies for reducing neurotransmission from small nerve fibers can also be applied; for example, muscular exercise to promote strength and elasticity of muscles relating with laboring, body movement and upright positioning to diminish pressure from the uterus on the back and the bottom, breathing exercise to raise the diaphragm thus preventing pressure applying on top of the uterus, pain control exercise via cognitive-effective control by teaching about laboring process, labor pain and pain management thus promoting the mother's self-confidence and self control, and distracting techniques such as muscle relaxant technique and concentration technique.

Therefore, the integrated pain management program is a childbirth preparation technique with the integration of all aforementioned principles in order to reducing pain during the laboring period, shortening the labor process and promoting positive experience of childbirth. In this program, a nurse would provide mothers with information about the laboring process and pain management strategies; the mothers would then learn and practice the strategies by themselves. They would be given a tour around the actual labor room in real environment and situation and would develop relationship with staff in the labor room in order to diminish the impacts from environment factor. In latent phase, the mothers would receive advice, coaching and

support to use pain management techniques that they had previously practiced by themselves. In active and transitional phase, the mothers would receive back massage from a nurse. All these activities are symptom management integrating with experience controlling through the perception and evaluation of symptom so that the mothers could evaluate the symptom correctly in terms of intensity, position, frequency, curability, onset time and life-threatening quality. Moreover, they would be able to give proper response to labor pain without having either physical or psychological negative impacts. The integrated pain management program is summarized in Figure 2 below.

Symptom Outcomes

Referring to the model of symptom management, outcomes associated with the symptom experience are conceptualized as 10 multidimensional indicators including: symptom status, self-care ability, financial status, morbidity and comorbidity, mortarlity, quality of life, health service utilization, emotional status, and functional status. The symptom status is central, and the other indicators are related. The symptom outcomes may be changed by different pain management strategies of client, family, health staff, and health system. The integrated pain management program would promote the symptom outcomes in aspect of healthy symptom status, including shorten laboring period and decreased perception of labor pain perception. The program would also have effect on other indicators. For functional status, the program would enhance the mothers' functional ability to the maximum level unless they are under severe labor pain yielding; and for emotional status, positive experience perception would be promoted. For long-term outcomes or outcomes relating to the following pregnancies, the mothers were expected to perceive, evaluate, and respond to the symptom correctly, as well as being able to use pain management strategies effectively. As a result, they would have good symptom outcomes in symptom status, self-care ability, financial status, morbidity and comorbidity, mortality, quality of life, health service utilization, emotional status, and functional status. The conceptual framework concerning the variables in this study is summarized in Figure 3.

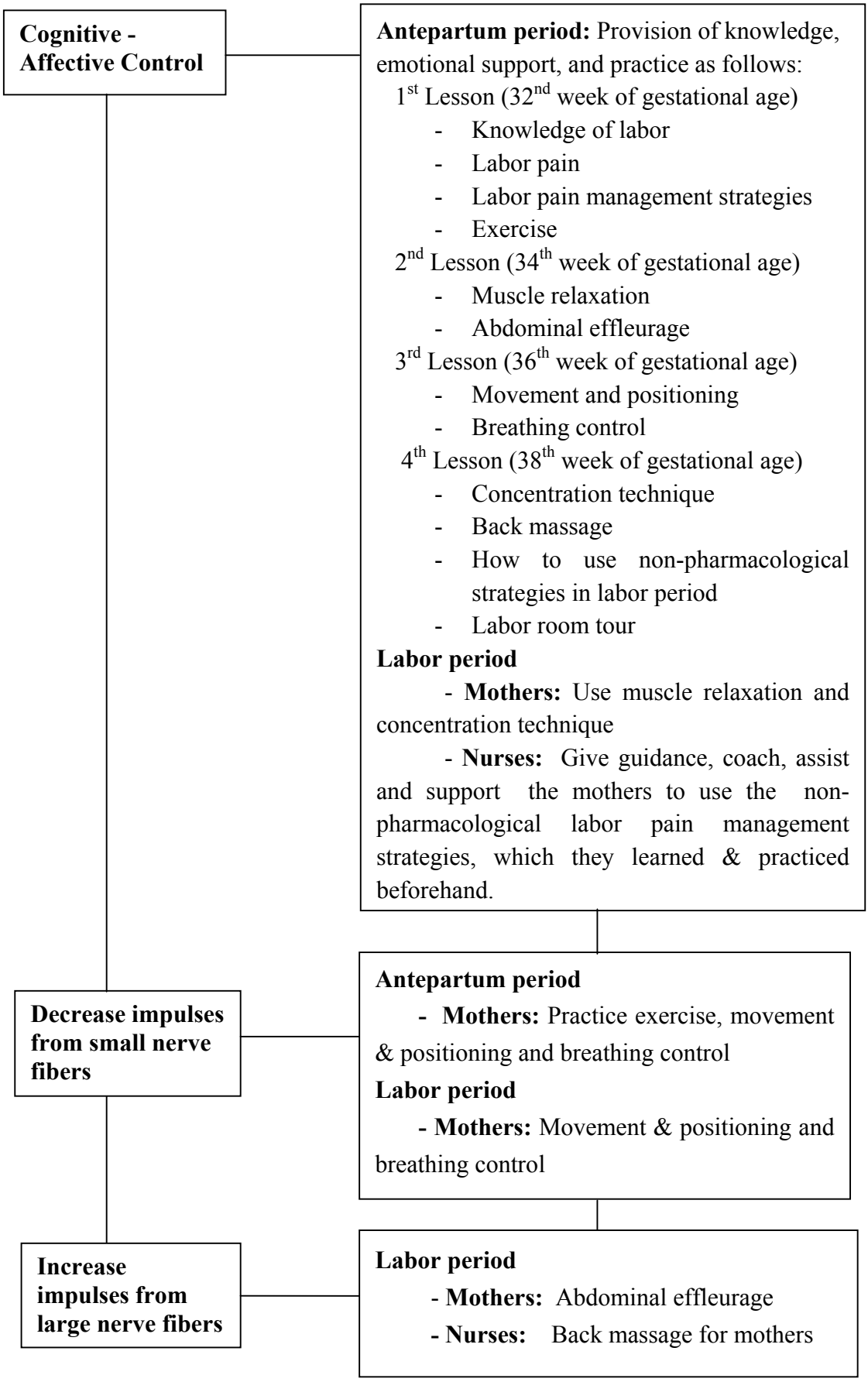


Figure 2. Labor pain management strategies

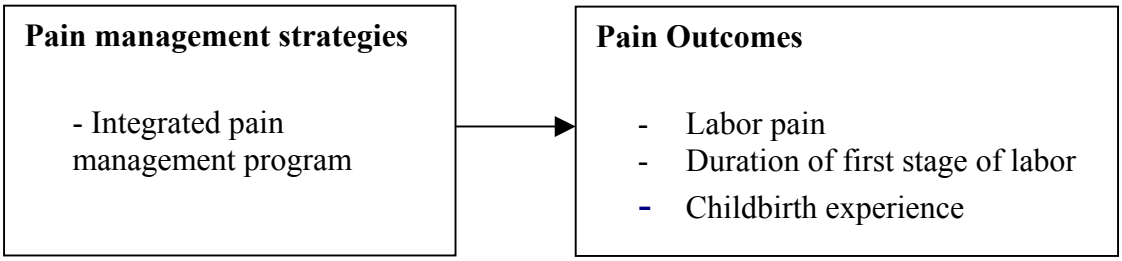


Figure 3: The conceptual framework of the study

Objectives

1. To study the effect of the integrated pain management program on the labor pain level between primiparous mothers who received the integrated pain management program in comparison with those who did not receive the intervention.
2. To study the effect of the integrated pain management program on the duration of first stage of labor between primiparous mothers who received the integrated pain management program in comparison with those who did not receive the intervention.
3. To study the effect of the integrated pain management program on the perception of childbirth experience between primiparous mothers who received the integrated pain management program in comparison with those who did not receive the intervention.

Hypothesis

1. The primiparous mothers who received the integrated pain management program had labor pain at lower level than those who did not receive the intervention.
2. The primiparous mothers who received the integrated pain management program underwent the shorter duration of the first stage of labor than those who did not receive the intervention.
3. The primiparous mothers who received the integrated pain management program had better perception of childbirth experience than those who did not receive the intervention.

Scope of the Study

This study was a quasi- experimental research, aiming to study the effect of the integrated pain management program on labor pain, the duration of first stage of labor, and the perception of childbirth experience. The study was conducted with 60 primiparous mothers, divided into two groups of subjects receiving the integrated pain management program and subjects not receiving the intervention. The sample of this study was the primiparous mothers who received antenatal care and gave birth at Mettapracharak (Wat Raiking) Hospital, Nakornpratom, during the period of June 2002 – April 2003.

Expected outcomes and benefits of the study

1. For nursing service, the research finding about the efficacy of integrated pain management program could be applied as nursing guidelines for nurses and midwives in antenatal care unit and labor room in the delivery of nursing care during pregnancy and laboring periods for the reduction of labor pain and the promotion of positive childbirth experience.

2. For nursing education, the research finding could be applied to the lessons for nursing students in order to promote understanding and awareness of nursing care for labor pain and pain management. In addition, the integrated pain management program could be applied to nursing practice, as it is an independent nursing role.

3. For nursing research, the finding of this study can be used as guidelines for further research on the effect of integrated pain management program on the other relating factors or on the mothers of different characteristics.

Definition of terms

Integrated pain management program refers to nursing performance in order to manage pain in the first laboring period. The program was non-pharmacological approach for pain management, based on Larson's model of symptom management and the gate control theory, as detailed below.

1. Antepartum nursing care was the childbirth preparation course using educational plan, which was developed by the researcher of this study. The childbirth

preparation course was given during the 32 and 38 weeks of gestational age for the total number of four lessons. The contents covered general knowledge about laboring, labor pain, pharmacological and non-pharmacological labor pain management strategies, demonstration of exercise, muscle relaxation, effleurage, movement and position, breathing control, and concentration techniques, followed by mothers' performance, and the labor room tour.

2. Intrapartum nursing care was given according to the stage of childborth, comprising:

- Latent phase nursing care refers to the provision of help and support to laboring women, including coaching them how to use pain management strategies that they were previously trained in pregnancy period such as muscle relaxation, effleurage, movement and position, breathing control and concentration techniques.

- Active and transitional phase nursing care refers to the same nursing care as latent phase, in addition with the provision of back massage to reduce pain from uterine contraction.

Usual nursing care refers to normal nursing activities that nursing personnel provide to pregnant women since the first time they visit antenatal care. The activities include the provision of health education about health practice during pregnancy at the first and the second trimester of antepartum period. When a pregnant woman is admitted in the labor room, she will be told to lie down in bed with her head tilt at the level of about or less than 30 degrees. The pregnant woman is allowed to get out of bed to go to toilet only when the membrane remains intact and she is still in latent phase. Some women may receive advice about breathing technique during uterine contraction.

Labor pain level refers to the mother's uncomfortable or suffering symptom caused by uterine contraction during the cervical dilatation phase of 4-10 cms. The labor pain level is measured with the color- pain scale designed by Pronnirun Udomthavornsuk (1985), which the scores range between 0-10. The higher score reflects the higher pain level.

Duration of first stage of labor refers to the first stage of labor reported in hours and minutes. The duration of parturition begins from true labor pain, known by the consistency of uterine contraction including cervical dilation, to the complete dilatation of cervix (10 cms.).

Perception of childbirth experience refers to feeling, opinion, hope, or satisfaction of the mothers in any situation occurring in first stage of labor and delivery period, which is assessed by the perception of childbirth experience questionnaire (Yuwadee, B.E. 2541). This instrument consists of 42 question items with a four-point Likert scale (1-4). The possible total scores range from 42-168. Higher scores reflect better perception of childbirth experience.

CHAPTER 2
LITERATURE REVIEW

This study aimed to determine the effect of integrated pain management program on labor pain, duration of first stage of labor and childbirth experience in primiparous mothers. Textbooks, articles, documents, and thesis dissertations related to this study were reviewed for the study. The literature review is presented below in the following order: knowledge of labor, labor pain, labor pain management strategies, the integrated pain management program, and perception of childbirth experience.

Knowledge of labor

Labor is a natural process by which the uterus expels or attempts to expel the fetus, placenta, and amniotic sac (Dickason, Silverman & Kaplan, 1998: 282). Multiple theories have been proposed to explain the biophysiological factors that initiate labor; however, this process is not yet fully understood (Simpson & Creehan, 1990: 152). It is likely that a combination of maternal – fetal factor influence labor onset. The most widely accepted theories are the following explanations for labor onset (Reeder, Martin & Koniak, 1997: 502-3, Olds, London & Ladewig, 1996: 573, Pilliteri, 1995: 471):

Maternal Factor Theory

The assumptions underline this theory are the following:

1. Uterine muscles stretches, causing release of prostaglandin.
2. Pressure on cervix stimulates nerve plexus, causing release of oxytocin by maternal posterior pituitary gland, which is called the Ferguson reflex.
3. Oxytocin in circulating blood increases slowly during pregnancy, rises dramatically during labor, and peaks during second stage. Oxytocin and prostaglandin

work together to inhibit calcium binding in muscle cells, raising intracellular calcium and thus activating contractions.

4. Estrogen/progesterone ratio change, estrogen excites uterine response but progesterone quiets uterine response. Decrease of progesterone allows estrogen to stimulate the contractile response of the uterus.

Fetal Factor Theory

The underlying assumption of this theory is the following:

1. Placental aging and deterioration triggers initiation of contractions.
2. Fetal cortisol, produced by the fetal adrenal glands, rises and acts on the placenta to reduce progesterone formation and to increase prostaglandin. Anencephalic fetuses (no adrenal glands) tend to have prolonged gestation.
3. Prostaglandin, produced by fetal membranes (amnion and chorion) and the decidua stimulate contractions. When arachidonic acid stored in fetal membranes is released at term, it is converted to prostaglandin.

Duration of labor

Length of labor varies for each woman. Generally, characteristics of most labors will be similar in length, progression, cervical changes, and fetal descent. Labor and birth have traditionally been divided into four stages, as listed below.

1. The first stage of labor (the dilating stage) begins with the onset of regular labor contractions and ends with the complete dilatation of the cervix. The average duration of first stage of labor is about 14 hours: approximately 13 hours in nullipara and approximately 7 hours in multiparous. This stage is subdivided into three phases:

1.1 The latent phase – from the onset of uterine contraction until the cervix dilates 3 centimeters. Duration of this phase is approximately 8.6 hours for the primigravidas and 5.3 hours for the multigravidas. This phase has mild intensity of uterine contraction of 25 – 40 mmHg; the duration of each contraction is about 30 – 40 seconds and 3 – 30 minutes apart.

1.2 The active phase – cervix dilates 4 –7 centimeters. Duration of this phase is approximately 4.6 hours for primigravidas and 2.4 hours for the multigravidas.

This phase has moderate to strong intensity of uterine contractions about 50 – 70 mmHg, 40 – 60 seconds of duration and the contraction occurs every 2.5 minutes. Cervix dilates at the rate of approximately 1.2 centimeters/hour for nullipara and 1.5 centimeter/hour for the multipara.

1.3 The transition phase – cervix dilates 8 – 10 centimeters. Duration of this phase is approximately 3.6 hours for primigravidas and 1 hour for the multigravidas. This phase has strong intensity of uterine contraction of 70 – 90 mmHg with duration of 60 – 90 seconds, and every 1.5 – 2 minutes in frequency.

2. The second stage of labor (pelvic stage) begins from complete cervical dilatation to the delivery of newborn. Duration is approximately 1 hour for nullipara and 6 – 30 minutes for multipara. This phase has strong intensity of uterine contraction of 70 – 100 mmHg with duration of 40 – 60 seconds, every 2 – 3 minutes in frequency.

3. The third stage of labor (placental stage) begins from the delivery of the newborn to the delivery of the placenta and membranes. Duration of this phase is 5-30 minutes. In this phase, there is strong intensity of uterine contractions and the uterus changes to globular shape.

4. The fourth stage of labor (recovery stage) begins from the delivery of the placenta and membranes to the first two hours postpartum. Uterus becomes firm at the level of two fingerbreadths above umbilicus.

Components of the Birth Process

There are three interrelated components, often called the "three Ps," that constitute the process of labor and birth. They are powers, passage, and passenger. (Olds, London & Ladewig, 1996: 363 – 371; Dickason, Silverman & Kaplan, 1994: 281 – 8)

1. Power

The powers of labor are forces that cause the cervix to open and that propel the fetus downward through the birth canal. The two powers are the uterine contractions and the mother's pushing efforts.

1.1 The uterine contractions are the primary power of labor during the first stage. Uterine contractions are involuntary smooth muscle contractions.

Women cannot consciously cause them to stop or start. Contractions cause the cervix to efface and dilate. Each contraction has three phases: *Increment*, the period of increasing strength; *Acme*, or peak, the period of greatest strength; and *Decrement*, the period of decreasing strength. The duration of contractions normally ranges from 30 to 90 seconds, averagely about 1 minute. The intensity (strength), of the contraction is measured in mmHg. Normal spontaneous contractions often exert pressures of about 60 mmHg; However, they may vary between 20 and 75 mmHg. Cervical dilatation is less likely to occur with pressures of less than 25 mmHg above the resting tone.

The frequency or interval refers to the time between the beginning of one contraction to the beginning of the next. This period of relaxation does not only provide rest for the uterine muscles and for the mother but it is also essential to the welfare of the fetus. During the myometrial relaxation that follows the contraction in normal labor, there is a rebound phenomenon during which the uteroplacental blood flow increases above the control levels, thus, oxygen and other essential nutrients are transported to the fetus too. When contractions occur consistently for longer than 90 second or more frequently than every 2 minutes, placental function may be disrupted, resulting in a decrease in fetal oxygenation and presenting potential danger to the fetus from intrauterine hypoxia (Reeder, Martin & Koniak, 1997: 529 – 30).

1.2 The mother's pushing efforts are the secondary power when the woman's cervix is fully dilated. She adds voluntary pushing to involuntary uterine contractions to propel the fetus downward through the pelvis.

2. Passage

The passage consists of the bony part and the soft part.

2.1 Bony part such as the pelvis must have appropriate size and shape. Significant point of size is ischeal spine of which the appropriate width is 10 centimeters. An appropriate shape is gynecoid.

2.2 Soft part includes the cervix, vagina, and perineum. Labor will progress if there is good dilatation of the cervix, and vaginal and perineum must be flexible (Olds, London & Ladewig, 1996: 369). On the other hand, soft parts may yield less readily if mother is older; the cervix has scars; or if the previous childbirth was many years ago (Thompson, 1995: 125).

3. Passenger

The passenger is the fetus, along with the placenta and membranes. Labor will progress well if the fetus has normal size and the burrow of placenta does not obstruct the labor.

In addition to the 3Ps, other factors may influencs progress in labor and child birth, as detailed below (May & Mahlmeister, 1994 : 436).

- *Maternal Age*

Very young women (younger than 16 years) may have immature and small pelvis, increasing the risk of cephalopelvic disproportion while older women (older than 35 years) are more likely to have twins, breech, or occipitoposterior presentations and are more likely to have longer second stage of labor.

- *Maternal Weight*

Overweight women are at risk of delays or arrests in latent or active phases of labor and of soft-tissue dystocia and prolonged second stage of labor, as a result of excessive weight.

- *Birth Interval*

When the interval since the last birth is less than one year, the woman is at risk of a more rapid labor and a smaller infant.

- *Birth Weight and Gestational Age*

Preterm and small fetuses are usually born after fast labor, whereas large fetuses are generally associated with longer labor, especially at the second stage of labor. Gestational age of less than 37 weeks is associated with higher rates of malpresentation, which can affect the progress of labor. Gestational age of more than 42 weeks is associated with macrosomia, or large body size of the fetus, and a higher risk of birth complications.

- *Fetal position*

Labor progress is most effective when the fetus is in a well-flexed vertex position.

- *Status of Amniotic Sac*

Early rupture of the amniotic sac may interfere with the progress of labor because the synthesis in the chorion of prostaglandin, substances that cause uterine contraction, is impaired. There is no evidence that rupture of the amniotic sac shortens

labor and some evidence that the fetus may be at higher risk for acidosis when membranes are ruptured before the second stage of labor.

- *Site of Placental Implantation*

High or fundal implantation of the placenta has been shown to be associated with prolonged labor, possibly because of interference with myometrial contractility in the area.

- *Maternal Position During Labor*

The woman's position during labor has been shown to affect uterine activity. Standing or upright positions have been found to be most efficient on dilating the cervix and have been associated with lower incidence of umbilical cord compression and increased maternal comfort. The lateral recumbent position appears to result in less efficient uterine contractions than the upright position. The supine position is associated with more frequent but less efficient contractions.

- *Psychological Factors*

Maternal psychological status has direct effects on the progress of labor. Stress and anxiety stimulate the release of stress hormones called catecholamines, which are known to inhibit uterine activity. Childbirth preparation has been shown to be helpful in reducing stress and anxiety associated with labor and birth and may contribute to a more favorable labor progress and outcome.

- *Medications*

The use of narcotic analgesia has been shown to slow down the active phase of labor. Magnesium sulfate, used in the treatment of pre-eclampsia, has been shown to diminish the frequency and intensity of uterine contractions and reduce the resting tone of the uterus. There is some controversy about whether regional anesthesia, such as epidural anesthesia, slows the progress of labor and contributes to increased need for oxytocin augmentation and cesarean delivery.

Progress of labor assessment

Progress of labor can be assessed with 2 methods:

1. Cervix examination. This examination aims to know about dilatation and effacement of cervix, station of presentation and internal rotate of fetus head.

2. External assessment. This is done through observing uterine contractions such as duration, frequency and intensity of uterine contraction as well as observing the descending of the fetus by observing the point of the fetal heart sound at the pregnant women's abdomen.

Labor pain

Labor is a well-authenticated model of acute pain (Melzack, 1993: 117). In the phase of labor, uterine contraction is significant in leading to dilatation and effacement of the cervix including the descending of the fetus, which leads to birth (Clark, Affonso & Harris, 1993 : 417). On the other hand, uterine contraction contributes to labor pain. Women have said that labor pain was the most painful experience they ever had (May & Mahlmeister, 1994 : 600).

Cause of labor pain

Labor pain is initiated from physical and psychological causes during the labor (Jimenez, 1988: 100-106; May & Mahlmeister, 1994: 600-601). The pain has mechanism, pathways and characteristics as follows (Bobak, Lowdermilk & Perry, 1995 : 222 ; Bonica, 1996: 34-35 ; Lauretti, 1999 : 235-237 ; Lowe, 1996 : 83-85, McDonald, 2001 : 1398-1400):

1.Physical causes of pain

1.1 Pain in the first stage of labor – during the first stage, labor pain is caused entirely by uterine contractions and their effects. The hypotheses formerly proposed to account for the pain include:

-pressure on nerve endings between the muscle fibers of the body and the fundus of the uterus.

-contraction of the ischaemic myometrium and cervix consequent to expulsion of blood from the uterus during the contraction, or due to vasoconstriction consequent to sympathetic hyperactivity caused by fear.

-inflammatory changes in the uterine muscles.

-contraction of the cervix and lower uterine segment consequent to fear thus inducing hyperactivity of the sympathetic nervous system.

However, most available data support the concept that the pain of the first stage of labor is predominantly a result of dilatation of the cervix and labor uterine segment and of the consequent distension, stretching and tearing of these structures during contraction. Cervix dilatation stimulates nociceptors (free nerve endings), excites activity in myelinated (A-delta) and unmyelinated C fibers which carry impulses from uterine plexus to hypogastric plexus, lumbar sympathetic and lower thoracic chain to T_{10}, T_{20} and L_1 to the brain. The nerve impulses are transmitted via the lateral spinal-thalamic tract, which includes 2 groups of nerve fibers comprising:

- Neospinothalamic tract – the majority of A-delta fibers carrying nerve impulses to the dorsal and the thalamus, then to the cerebellum where the pain sensations are received and translated for the information regarding intensity, characteristics, and location of pain.
- Paleospinothalamic tract – the majority of C fibers carrying nerve impulses to the reticular formation, the medial thalamus, the hypothalamus, the limbic system, and the frontal cortex where emotional responses are stimulated, leading to behavioral responses.

Pain during latent phase is usually felt in the lower abdomen and in the skin over the lower lumbar spine and the upper sacrum. With intense pain, sensations may also be felt above and below these areas, that is in the upper thighs and the umbilical region.

1.2 Pain in the second stage of labor. Once the cervix is fully dilated, the amount of nociceptive stimulation arising in this structure decreases but the contractions of the uterine body and distension of the lower uterine segment continue to cause pain in the same areas of reference as in the first stage of labor, including:

-traction on the pelvic parietal peritoneum and the structures it envelops, including the uterine ligaments;

- stretching and tension of the bladder, urethra and rectum;

-stretching and tension of ligaments, fascia, and muscles in the pelvic cavity;

-abnormal pressure on one or more roots of the lumbosacral plexus.

These factors produce pain by stimulating the pain nerve endings and sending impulses via the pudendal nerve directly to S_2, S_3 and S_4 to the lateral spinothalamic tract and, finally, to the brain. The mothers will develop aching, burning or cramping discomfort in the thigh, and upper legs in addition to the increasing pain at lower sacrum, vagina and perineum.

1.3 Pain in the third stage of labor is caused by uterine contraction and dilatation of cervix. During the delivery of placenta, the pain pathway is similar to the pain in the first stage of labor but the pain is less intense. The mothers will feel the pain at the lower back, abdomen, and perineum.

2. Psychological cause of pain

When entering labor, pregnant women, especially primigravidas, may be afraid of the delivery. Fear induces stress that can interfere blood circulation and the functioning of uterine smooth muscles, leading to the supression in smooth muscles of lower uterus and cervix that interrupts cervical dilatation and leads to pain during contractions. This cycle is called “fear – tension – pain syndrome”. When fear increases, stress increases, resulting in the increase in pain level (Dick – Read, 1984: 295-297).

Factors influencing labor pain

In addition to the role played by such intrinsic factors as the intensity, duration, and pattern of contractions and related physiological and biochemical mechanisms, the extent of pain and suffering associated with childbirth is influenced by many factors as follows : (Bonica, 1994 : 621-623; McDonald, 2001 : 1400-1403).

1. Physical factors such as age, parity and physical condition of the mothers, the condition of the cervix at the onset of labor and the relationship of the size of the fetus to the size of the birth canal. Older primiparae (> 40 years) experience longer and more painful labors than young primiparae. The cervix of the multiparae begins to soften even before the onset of labor and is less sensitive than that of the primiparae. In general, the intensity of uterine contractions in early labor tends to be higher in primiparae

than in multiparae, whereas in the later phase of labor the reverse is true (Melzack & Schaffelberg, 1987; Gaston – Johansson, et al., 1988 cited in Bonica, 1994 : 621).

In the presence of dystocia caused by a contracted pelvis, a large baby or abnormal presentation, the mother experiences more pain than under normal conditions. Kohnen (1986) found that the mothers who labor and deliver in vertical position (sitting, standing or squatting), experience less pain and have a shorter second stage of labor. However, Melzack and Belanger (1989) found that in the latent and early first stage of labor, mothers had less pain in the vertical position but in the late first stage and second stage they experienced less pain in the lateral supine position. In addition, it was noted that primiparae had more pain in the late first stage while multiparae had more pain in the early first stage. Fridh and associates (1988 cited in Bonica, 1994 : 621) also found relationships between menstrual pain and higher labor pain scores. Moreover, fatigue, lack of sleep, and physical weakness also have influence on the mother's tolerance to pain, pain perception, and expressional behavior related to pain.

2. Physiological and biochemical factors. A number of studies have demonstrated a progressive increase of plasma beta – endorphin, beta – lipotropin and adrenocorticotropic hormone (ACTH) levels during labor; all of which are derived from a common precursor (Csontos, et al., 1980; Golan, et al., 1981; Facchinetti, et al., 1982; Abbovnd, et al., 1983; Fettes, et al., 1984; Goebelsmann, et al., 1984 cited in Bonica, 1994 : 621). These hormones have been found to reach the peak level, at delivery or in the immediate postpartum period, at 4-10 times higher than the level at prelabor and nonpregnant period. This finding have led to the speculation that plasma beta – endorphin might have an intrinsic analgesic role during parturition.

On the other hand, other opioid systems may play a role in raising the pain threshold. This suggestion is based on the findings of Gintzler (1980) who noted that the pain threshold in rats rises at the end of pregnancy, peaks around delivery, and returns to normal nonpregnant level within 12 hours of delivery. This pregnancy–induced analgesia is blocked by the opioid antagonists naloxone and naltrexone. Similar rises in pain threshold have been noted in studies involving humans during late pregnancy, in which responses to radiant heat to dermatomes C_1- S_1 or intense

pressure applied to the forearm was used as aversive (noxious) stimuli (Rust, et al., 1983; Cogan & Spinnato, 1986 cited in Bonica, 1994: 622). Gintzler and colleagues (1983) have identified the pregnancy–induced hypalgesia as resulting from action of spinal dynorphin and Kappa opioid receptor systems. These data suggest that this system may be sufficient to lower the intensity of pain and perhaps modify the quality of the pain of paturition.

3. Psychological factors. These factors can, and frequently do, affect the incidence and intensity of labor pain. They include the mentality, attitude, and mood of the mothers at the time of labor and other emotional factors. Fear, apprehension, and anxiety probably enhance pain perception and pain behavior (Dcutsch, 1955; Zuckerman, et al., 1963; Brown, et al., 1972; Roading & Cox, 1985; Fridh, et al., 1988 cited in Bonica, 1994: 622). One of the most common causes of fear and anxiety is ignorance or misinformation about the process of pregnancy and parturition and what the onset of labor signifies. Uninformed mothers, especially the primiparae, can be disturbed by fear of the unknown, death, suffering, severe pain, mutilation, or possible complications, and by concern for her condition or that of her fetus (Bankang, 1990: 33; Srikanjanaperd, 1999: 48-78; Gorrie, McKinney & Murray, 1994: 266; Sherwen, 1995: 520).

The mothers who have had unplanned, unmarried or illegitimate pregnancy or have an ambivalent or negative reaction to gestation report more pain than those who do not (Nettelbladt, et al., 1976 cited in Bonica, 1994: 622; Deutsh, 1995 cited in MacDonald, 2001: 1404). The relationship between the mothers and their spouses also plays an important role in the degree of pain they experience. Melzack (1989: 225-229) reported that the effective pain scores were higher when the husband was in the labor room than when he was absent. Moreover, the positive feelings of the expectant father forward the pregnancy seem to be an important factor in decreasing the mother's feeling of apprehension during pregnancy. When expectant fathers were very supportive of their mates during pregnancy and labor, the mothers experienced less pain during delivery (Norr, et al., 1977: 715; Fridh, et al., 1988: 93).

Another motivation factors which also has effect on pain is perceived self-efficacy. The mothers' confidence in ability to handle labor and labor pain was the most significant predictor of all components of pain during active labor because they

feel 'I can do', so the greater confidence the mothers have, the less pain and vice versa (Lowe, 1989: 237-245; Lowe, 1991: 457-463; Manning & Wright, 1983: 421-431; Bunserb, B.E. 2539: a).

4. Cultural and ethnic factors. These factors have long been considered to be important in influencing pain tolerance and pain behavior. Persons of Italian and other Latin cultures are said to express pain in an emotive fashion and to exaggerate their verbal report, whereas Scandinavians, Irish, Asians, and Eskimos, are said to be more stoic and to manifest less pain behavior. Experimental data and clinical observations, however, suggest that although racial, cultural and ethnic differences do exist, they appear to be differences in expressiveness consequent to underlying attitudes toward pain, rather than differences in the sensory experience or pain perception. Bonica (1994: 622) reported her studies of 2,700 parturients in other countries and of 8,000 parturients in the United States. The report revealed that the frequency and intensity of labor pain and the request for analgesia of mothers in the Unites States were the same as mothers living in Asia and the pain behavior was also similar to that observed among mothers in their native countries.

5. Environemental factors. These factors are also important laboring factors that influence pain perception because they may promote mothers' adaptation or may induce stress. Good environment enhances mothers' adaptation and patience to stimuli. Inappropriate environment causes stress and mothers have to use more energy thus the reserve energy is reduced, as well as the ability to control one's self for pain management. The reduction in reserved energy results in diminished patience to pain and the increase in the mother's perception of pain. The environment factors that influence pain are classified into two types: physical environment and psychosocial environment. The physical environment includes personal hygiene, place, quietness, home-like environment, appropriate lighting and temperature, ventilation, and tasty food. The psychosocial environment includes good relationship between laboring women and health care team, which leads to the sense of trust and confidence and feeling of being cared and concerned. Fear of labor will be reduced when nurse stay with the mothers to keep them company because they feel safe and confident that they will safely undergo childbirth and, as a result, the mothers can maintain better self-control during the delivery.

Effects of labor pain

Labor pain has both physical and psychological impacts on mothers and fetuses, as detailed below (Bonica, 1994: 624–630; McDonald, 2001; 1394–1397; Wimonlak, B.E.2543: 124–128).

Effects on the mother

1. Changes in ventilation. The pain of childbirth is a powerful respiratory stimulus and consequently causes a further marked increase in tidal volume and minute ventilation, and an even greater increase in alveolar ventilation. This causes a fall of $PaCO_2$ from the pregnancy level of 32 mmHg to a value of 16–20 mmHg, or occasionally as low as 10–15 mmHg, and also causes concomitant increase in pH to 7.5–7.6, resulting in respiratory alkalosis. This condition, which may occur at the peak of each uterine contraction, is associated with decreases in cerebral and uterine blood flow and a shift to the left of the maternal oxygen dissociation curve. With the onset of the relaxation phase, pain no longer stimulates respiration so that the hypocapnia causes a transient period of hypoventilation that decrease the maternal PaO_2 by 10–50 percent with a mean of 25–30 percent, especially in mothers receiving analgesic drugs in opioid class as the drug action enhances depressant effect of respiratory alkalosis. When the level of PaO_2 in mother falls below 70 mmHg, it has a significant effect on the fetus, as it induces a decrease in fetal PaO_2 and late deceleration.

2. Neuroendocrine effects. Human studies have shown that severe pain and anxiety during active labor cause an increase in the epinephrine level by 3–6 times higher, an increase in the norepinephrine (NE) level 2–4 times higher, and increase in the cortisol level by 2–3 times and significant increases in corticosteroid and ACTH levels during the course of labor before reaching the peak values at or after the delivery. It is noted that the higher epinephrine levels were significantly associated with uterine activity at the onset of active labor (4-cm cervical dilatation) and with prolonged active phase (4-10 cms cervical dilatation). The increase in epinephrine and cortisol levels correlates significantly with anxiety and pain.

3. Cardiovascular changes. During labor, there is a progressive increase in cardiac output. In the first stage of labor, the increase is about 15–20 percent above that of pre-labor; the increase rises to 35–40 percent during late first stage. Available data suggest that 40–50 percent of the increase in cardiac output during contraction is

due to the extreme amount of blood, about 250-300 ml, released from the uterus in addition to increased venous return from the pelvis and lower limbs into the mother's blood circulation system. The rest is caused by an increase in sympathetic activity provoked by pain, anxiety, apprehension and the physical effort of labor, which contribute to the progressive rise in cardiac output as labor advances. Uterine contractions in the absence of analgesia also cause increases of 20-30 mmHg systolic pressure and 15-20 mmHg diastolic pressure, leading to a significant increase in left ventricular work. This is tolerable for healthy women but may be deleterious for the women who have heart disease, pregnancy–induced hypertension, pulmonary hypertension or severe anemia.

4. Metabolic effects. During pregnancy, the basal metabolic rate and oxygen consumption progressively increase; at term, their values are 20 percent above normal and increase further during labor. In the first and second stage of labor, free fatty acids and lactate levels increase significantly, apparently as a result of pain–induced release of catecholamines and the consequent sympathetically induced lipolytic metabolism.

Increased sympathetic activity caused by labor-by-labor pain and anxiety also increases metabolism and oxygen consumption. The increased oxygen consumption, plus that inherent in the work of labor, together with the loss of bicarbonate from the kidney as compensation for the pain–induced respiratory alkalosis and often reduced carbohydrate intake, produce a progressive metabolic acidosis which disturbs the fetus (Banica & McDonald, 1995: 1329).

5. Gastrointestinal and urinary function. Gastric release is stimulated during painful labor and results in an increase in gastric acid secretion. Moreover, the pain and associated anxiety and emotional stress produce segmental and suprasegmental reflex inhibition of gastrointestinal and urinary motility and function, and consequently a significant delay in gastric and urinary bladder emptying. These reflex effects of nociception are aggravated by the recumbent position and by the use of uploads and other depressant drugs. The combined effect of pain and depressant drugs can cause food and fluids other than water to be retained for as long as 36 hours or more. Delayed gastric emptying of the acidic gastric contents increases the risk of regurgitation and pulmonary aspiration, especially during the induction of general

anesthesia. This hazard has long been and today remains one of the most common causes of maternal motility and morbidity due to anesthesia.

6. Psychological effects. Severe labor pain can produce serious long-term emotional disturbances that might impair the mother's mental health, negatively influence her relationship with her baby during the first few crucial days and cause a fear of future pregnancies that could affect her sexual relationship with her husband (Bonica, 1994: 129, Niven & Murphy-Black, 2000: 244-255). In addition, the pregnant women will experience fear-tension-pain syndrome during labor (Dick-Reac, 1984: 296-297). Labor pain leads to the sense of fear, causing stress that interferes smooth muscle functioning; as a result the progress of cervical dilatation is disturbed and pain increases. With increasing pain, the women's fear elevates thus increasing stress; and these feelings recur, like a cycle.

7. Effects on uterine activity and labor. Although catecholamines and cortisol are increasingly secreted, pain and emotional stress may either increase or decrease uterine contractility thus influencing the duration of labor. Norepinephrine increases uterine activity, whereas epinephrine and cortisol decrease it (Lederman et al., 1978: 495-500). Severe pain and anxiety cause such an increase in epinephrine and cortisol levels that uterine activity is consequently decreased and labor is prolonged. In some cases, pain and anxiety produce uncoordinated uterine contractions manifested by a decrease in intensity, coupled with an increase in frequency and uterine tonus.

Effects on the fetus

During labor, the intermittent reduction of intervillous blood flow during the peak of a contraction leads to a temporary decrease in placental gas exchange. This impairment is often further increased by pain-induced severe hyperventilation that causes severe respiratory alkalosis and results in: 1) a shift (to the left) in maternal oxygen dissociation curve, which diminishes the transfer of oxygen from mother to fetus; 2) maternal hypoxemia during uterine relaxation with consequent fetal hypoxemia; and 3) a reduction in uterine flow which is provoked by an increase in norepirephrine and cortisol release. In addition, it is found that the mothers who are anxious and in pain have a higher incidence of abnormal fetal heart rate patterns and their infants have lower Apgar score at 1 and 5 minutes after birth in comparison with the infants whose mothers are not anxious and receive good pain relief.

Pain assessment in laboring period

The characteristics of labor pain consist of duration, interval, and frequency of pain. Therefore, labor pain can be assessed with examination and observation by placing 4 fingers on the high of fundus and observing pain-contract relation and its duration. Nurses may collect both subjective and objective data whilst timing the contractions (Piyarat, B.E 2524: 36-37). Pain assessment is based in the principle that pain is a phenomenon reflecting one's adaptation to the environment. Pain expression is usually multidimensional, thus pain assessment has to be multidimensional as well. The conceptual framework of pain assessment is classified into 2 dimensions: characteristic dimension and assessment usage dimension.

Measure dimension	Characteristic dimension	Assessment usage dimension
Physical dimension	- Location - Onset - Duration - Etiology - Syndrome	- Site of disease - extend of disease - duration of pain
Sensory dimension	- Intensity - Quality - Pattern	- Intensity - pain quality - pain pattern
Affective dimension	- Mood state - Anxiety - Depression - Well being	- mood - anxiety - depression - adjustment
Cognitive dimension	- Meaning of pain - View of self - Coping skill and strategies	- meaning of pain - value of torture - coping strategies

Measure dimension	Characteristic dimension	Assessment usage dimension
	- Previous treatment - Attitudes and beliefs - Factors influencing pain	- Other symptoms
Behavioral dimension	- Communication - Interpersonal interaction - Physical activity - Pain behaviors - Medications - Interventions - Sleep	- communication - intervention - excretion - nutrition - caring activity - functional state
Sociocultural dimension	- Ethnocultural background - Family and social life - Work and home responsibilities - Recreation and leisure - Environmental factors - Attitudes and beliefs - Social influences	- adaptation - coping - supporting - caring - spiritual - relationship - time and management

Source: McGuire, D.B. (1992). Comprehensive and multidimensional Assessment of Pain Journal of Pain and Symptom management, 5 (July 1992): 314-315.

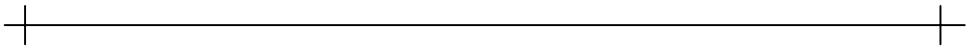
Pain can be assessed in multidimensional way as above; therefore, there are many types of pain assessment tools for measuring pain in various dimensions, (Bunserb,B.E. 2539: 28–32; McGuire, 1992: 335–336; Rowlingson, 1994: 13–25).

1. Sensory /discriminative dimension is related to how the pain actually feels to the individual who has it. The component being measured in this dimension is the

intensity of pain, judging from quantitative and subjective measurement. It is an efficient assessment because of its validation and reliability (Feldman, 1991: 101) because pain is a subjective feeling, of which only the person experiencing pain can describe (MaCaffery, 1979: 11; Carpenito, 1993: 208). The following tools, which are commonly used for measuring pain in this dimension, are simple and convenience.

1.1 Verbal Descriptive Scale (VDS). This measure assesses the intensity of pain from individual's verbal response. The measure is a five-level rating scale, comprising painless, mild pain, moderate pain, severe pain and unbearable pain.

1.2 Visual analogue scale (VAS). The examinee is asked to mark the intensity of his/her pain on the scale. Then, the length of the line is measured in millimeters with a ruler, and that is the intensity of the patient's pain at the moment of measuring. This procedure is repeated at intervals to obtain the profile of the intensity of pain (pain score) over a specific period of time.



No pain — Pain as bad as it could possibly be

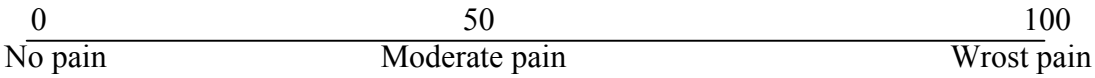
Visual analogue scale

1.3 Stewart's Pain-Color scale. Pain is ranked into 10 boxes and is assigned to different colors. The disadvantage of this technique is that the color shades may be confusing for the examinee, and it is unusable with color-blind patients.

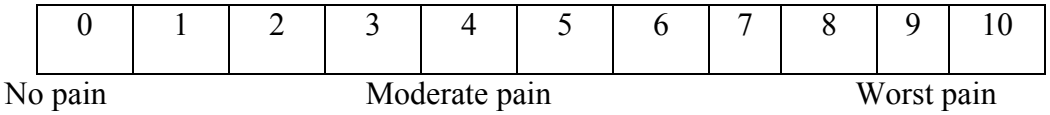
0	1	2	3	4	5	6	7	8	9	10
Green yellow	Yellow	Yellow orange	Orange	Orange red	Red	Red brown	Brown	Black brown	Black	

1.4 Numerical rating scale (NRS). The examinees will be asked to identify how much pain they are having by choosing a number from 0 to 100: 0 means no pain, 50 means moderate pain, and 100 means the worst pain imagined. The examinee may report the level of pain intensity by choosing a number from 0 (no pain)

to 10 (the worst pain imagine), which is arranged in 1x1 cm^2 box, called 11-Point Box Scale: BS-11.

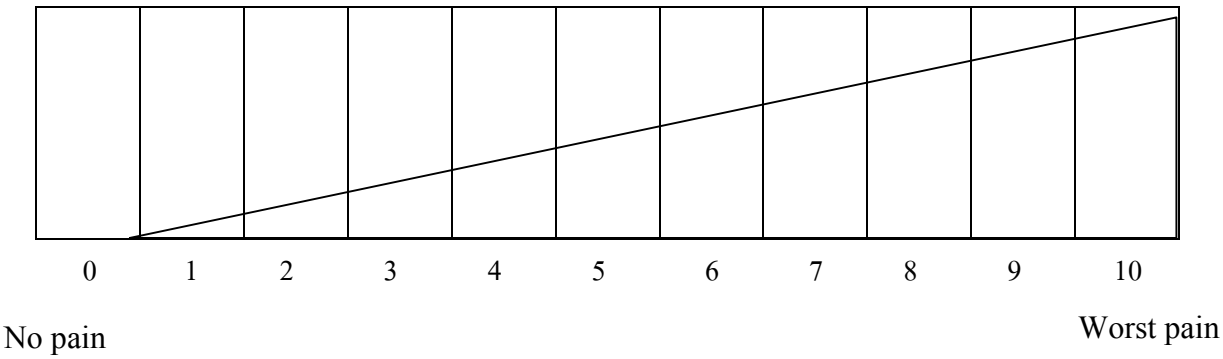


0-100 Numeric Rating Scale



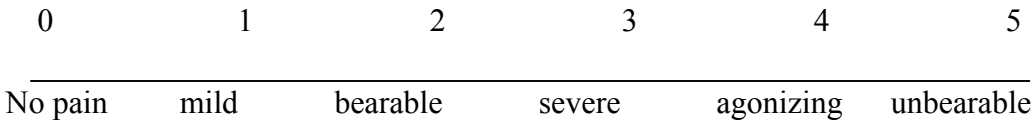
11–Point Box Scale : BS–11

1.5 Color pain rating scale. Pronnirun Udomthavornsuk (B.E. 2528) developed this scale by combining Stewart's Pain-Color with 11-Point Box Scale. A diagonal line is drawn rightward, starting from the second box and finishing at the right top corner of the eleventh box. The under-line triangle is colored with red, and the shade of red in each box is darker as the pain perception increases. The empty box (0) reflects no pain whereas the strongest red box (10) reflects unbearable pain.



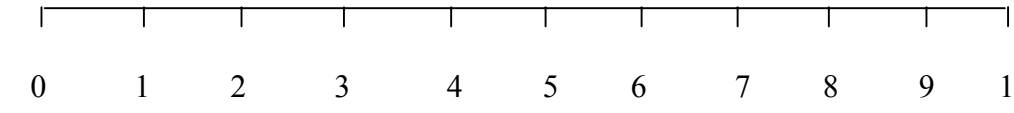
Pain-Color rating scale, developed by Pronnirun Udomthavornsuk

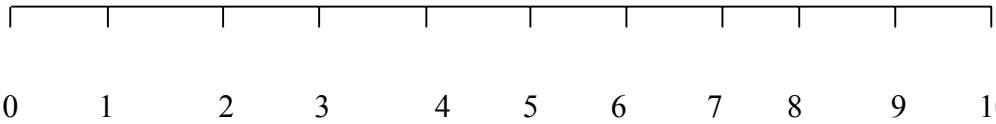
1.6 Descriptive or simple scale. This measure divides pain into six degrees: no pain, mild pain, bearable pain, severe pain, agonizing pain, and unbearable pain.



A drawback of this measure is that patients have few possibilities to determine the intensity of pain; therefore, it is difficult for them to precisely define the pain they feel. Therefore, the fewer choices of rating scale may help in improving the reliability of the instrument but the validity diminishes (McGuire, 1992: 352).

2. Affective evaluation dimension. A measure of this dimension is Johnson's two-component scale, which divides pain measurement into two parts; pain sensation and pain suffering scale.





This measure is simple and convenient; however, the validity and the reliability of the tool are not yet guaranteed.

3. Cognitive/ behavioral dimension. The measures of pain in this dimension are reviewed below.

3.1 Cognitive measure includes time estimation of pain magnitude and pain chart. Time estimation of pain magnitude by Bilting (Bilting, et al. in McGuire, 1992: 341), is the instrument that divides pain perception by period of time and pain time. The pain chart, such as Margoles' measure (Margoles in McGuire, 1992: 341), is the instrument is the self-record of pain site, pain time and pain intensity.

3.2 Pain coping behavior measure. There are measures for both acute and chronic pain assessment, such as coping behavior observation tool developed by Hanken and associates. The assessment of acute pain coping behavior involves the observation of pain focusing, anxiety, pain description and expression, muscle reaction, and breathing pattern and control. The measure used for assessing the labor pain coping behavior is the measure developed by Bonnel and Boureau. The tool was tried out with 100 primiparae; the pain coping behavior under observation included breathing response, movement, and agitation. The level of pain in this measure in divided into 5 levels, with the score ranging from 0 to 4. The higher score reflected the higher level of pain, as listed below.

Pain level	**Behavior**
0	Normal breathing, no grasping and no restlessness
1	Changing of breathing pattern during uterine contraction, including concentration to trained breathing control or changing of breath rhythm under pain
2	Grasping during uterine contraction, such as bed sheet, bed rim, bed-side-rail, closing person
3	Similar to the behavior in the second level except in capable of relaxation through uterine contraction
4	Agitation or uncontrolled movement during uterine contraction

Source: Bonnel, A.M. & Boureau, F. (1985). Labour Pain Assessment : Validity of Behavioral Index. Pain, 22(1) : p. 83.

Time estimation of pain magnitude, pain chart, and behavioral pain index measures are the efficient tools for pain assessment because of the clarification, simplicity, and availability properties of the tools; however, these measures have drawback due to the unclear reliability and validity.

4. Multipledimension measures. This measure assesses pain in various dimensions, including the incidence, intensity, quality, and other aspects of labor pain. Melzack and associates (Melzack & Togerson cited in McGuire, 1992: 345) carried out a series of studies using the McGill Pain Questionnaire (MPQ) (1975), which becomes the most extensively tested multidimensional scale of pain measurement available. This measure consists primarily of 4 parts: 1) pain behavior, 2) word description chosen by the examinee (20 items—2-6 situations per item), 3) characteristics or pattern of acute pain, chronic pain and occasional pain, and 4) present pain index (PPI), measuring pain from none to worst pain.

The MPQ is effective and convenient tool, but pain assessment with this measure is time-consuming due to its multiple parts and the examinee may be confused and cannot choose the situation because of cultural difference.

During labor, especially in the active and transitional phase when the pain ranges between moderate and very severe pain, pregnant women can barely tolerate tress and pain or cannot tolerate at all. The women, therefore, hardly respond to the environment; they do not want to answer questions, speak in short sentences or do not speak and are mostly agitated, drowsy, confused, etc. They may misunderstand a lengthy command or suggestion and lose their self-control (Piriya, B.E.2540: 127-128; May & Mahlmeister, 1994: 619). Therefore, multiple-section instrument and long questionnaire with numerous question items or various colors are not appropriate for pregnant women who are having labor pain. Instead, the simple and convenient instrument that is not time-consuming tends to be more appropriate and the measure of cognitive dimension should provide reliable data. Therefore, the pain-color rating scale developed by Pronnirun Udomthavornsuk (B.E. 2528) was utilized for labor pain assessment in this study because of its advantage in using red color to represent the sense of pain. Red is the color that can attract the mother's interest whilst having pain, in addition to its quality as a vivid and outstanding choice. Moreover, the increasingly darker shades of red are distinctive and have noticeable features thus it is usable for most examinees, especially those who cannot understand the description for numeric degrees of pain and those who are color-blind.

Labor pain management strategies

Most laboring women, approximately 97 percent, agree that pain experienced during labor and childbirth is the most severe pain they ever had in their lives (Jatupon, B.E.2540: 1; Reeder, Martin & Koniak, 1997; 504; May & Mahlmeister, 1994: 600). Since labor pain highly affects both the mother and the baby in physical and psychological aspect as previously mentioned, pain management is needed to help laboring women having positive childbirth experience. Pain management cannot totally relieve labor pain but it can alleviate, increase tolerance and promote pain coping behavior. At present, pain management strategies can be classified into two main groups as discussed below.

1. Pharmacological pain management strategies. Common pharmacological interventions for pain management include analgesic drugs and regional anesthesia. Analgesic drugs cannot stop pain sensation but they can alleviate discomfort and pain, relieve stress and anxieties, promote relaxation, and enhance the sense of comfort. Drugs in this group include narcotic analgesic drugs, sedative drugs, hypnotic drugs, and tranquilizer drug. Nevertheless, the use of these drugs in 2–3 hours before the labor stage will induce adverse effects such as nausea/vomiting, ventilation depression, decreased heart rate, hypotension, vertigo, sweating, faint, and retention of urine; furthermore, the adverse effects may extend to the fetus, causing ventilation suppression in the newborn and diminished sucking reflex in early birth stage. For regional anesthesia, the mechanism of action is to temporarily interrupt the transmission of pain impulses notably pain and when drug effects is finished the neurotransmission will be reactivated as usual.

The regional anesthesia widely used is epidural block. The physicians performing epidural block must be skillful in this procedure, as well as having ample knowledge about anatomy and physiology because the procedure may subsequently induce hypotension, back pain, severe headache, retention of urine, or inflammation of nerves.

2. Non-pharmacological pain management strategies. The non-pharmacological approach does not only relive fear and anxiety, but also reduces drug requirement. With this approach, both the mother and the fetus are saved from side effect and drug complications. However, the interventions must be well understood

and practiced since pregnancy period. There are many pain management strategies, including breathing technique, muscle relaxation, superficial heat and cold compress, hydrotherapy, touch, distraction, cutaneous stimulation, transcutaneous electric nerve stimulation, hypnosis, acupuncture, and acupressure. (Bobak, Lowdermilk & Perry, 1995: 223–228; Browning, 2000: 272–276; McKinney, et al., 2000: 432; Nichols & Humenick, 1988: 95–290; Bobak& Jensen, 1993: 448–458; Field, et al., 1997: 286–291; Martin & Reeder, 1991: 237–245; Pilitteri, 1995: 310– 314, Penny Simkin, 1995 : 161–171; Simpson & Creehan, 1996 : 229–235)

However, Only one technique cannot totally relieve labor pain. Therefore, attempts have been made to combine various strategies for relieving labor pain, commonly known as childbirth preparation. It is a pain management strategy widely used at present. The preparation usually starts in third trimester of pregnancy because at this period – 32 weeks of gestational age and older – the mothers are usually concerned about their fetus and the labor (Usa, B.E. 2534: 192 ; Auvenshine & Enriques, 1990 : 70). Moreover, the mothers will have enough time for learning and practicing until they are both physically and mentally prepared to cope with labor. At present, the childbirth preparation techniques that are commonly used are the following:

1. Dick-Read's method. Dr. Grantly Dick-Read, an English obstetrician, pointed out the drawbacks of using drugs such as sedative drug, analgesic drug, and anesthesia. In his two books, Natural Childbirth (1993) and Childbirth without Fear (1994), Dick-Read theorized that pain in childbirth was the result of social conditioning and a fear-tension-pain syndrome. Laboring women's fear are often emphasized from unknown and misunderstanding, especially about the laboring process, thus causing anxiety, fear and physio-psychological stress, resulting in delayed cervical dilatation of cervix caused by uterine muscle stress. The replacement of fear of unknown with understanding and confidence will help pregnant women to overcome the fear-tension-pain cycle thus reducing the transmission of pain impulses to the brain, or changing the mother's perception of birth. Dick-Read's childbirth preparation consists of: 1) provision of knowledge about labor and birth; 2) physical preparation such as exercise to prepare the body for labor and to relieve discomfort, abdominal breathing exercise which will lift abdominal wall and muscle from the

contracting uterus, muscle relaxation training to relieve muscle tension and stress during uterine contraction, and abdominal stroking to relieve pain during uterine contraction and to distract the attention by shifting the point of focus.

2. Lameaze's method. Dr. Ferdinand Lamaze was a French obstetrician who proposed the concept of pain reduction or pain relief with the psycho prophylaxis method. He believed that individual's mind could be trained to prevent the sense of pain and that women could also be conditioned to not experience pain in labor. The Lamaze's technique grew out of Pavlov's work on classical conditioning. It is composed of three basic structures, as follows:

2.1 Conditioned is conditional response that is related to the stimulation, to which the person was not related in the past. The stimulus is brought to stimulate repeatedly in regular interval of times. Thus, pregnant women will be taught about the appropriate response on uterine contraction by using muscle relaxation and breathing control pattern, so the conditioned words are begun from "uterine contraction" to "uterine relaxation", which they will be used with laboring reaction behavior.

2.2 Concentration is structured on the basis that when a person pays attention to or focuses on something, emphasizing intensive impulses to reach the perception level thus diminishing other impulses. In laboring period, the most intensive impulse comes from uterine contraction and unprepared women usually focus on labor pain and fear of the increasing pain perception thus losing self-control. These women have inappropriate response and have rejection behavior while suffering from labor. Lamaze's method conditions women to respond to uterine contraction with controlled muscular relaxation and breathing patterns, instead of crying out and losing control. The laboring women who are taught and trained beforehand during pregnancy will be able to control their physical response immediately during uterine contraction and the pain consequently decreases.

2.3 Self–control results from repeatedly practice of labor techniques in childbirth preparation period, using verbal signals such as "uterine contraction" and "uterine relaxation", until it they become conditional words. The laboring women who are previously trained will be able to control their responses to

uterine contraction by following the conditioned practice automatically until the end of laboring.

Lamaze' childbirth preparation method consists of 3 steps: 1) provision of information about pregnancy and labor, which is believed to reduce anxiety and fear of unknown or new situation, thus decreasing pain perception; 2) physical preparation comprising muscle relaxation, chest-breathing pattern of which the chest movement lifts the diaphragm off the contracting uterine, thus giving it more room to expand; and 3) psychological training to enhance coping strategies including focusing on different focal point to leap from the occupied nerve pathways so that they cannot respond to pain stimuli.

3. Bradley method. Robert Bradley – a Denver obstetrician – advocated the Bradley method, which is based on observations of animal behavior during birth and emphasizes the harmonious work of the body, using breath control, abdominal breathing, and general body relaxation. The technique stresses environmental factors such as darkness, solitude, and quietness to make childbirth a more natural experience. Bradley method also encourages the husband to participate in laboring, which is known as husband–coached childbirth.

In addition to the aforementioned childbirth preparation methods, Janet Balaskas's method, known as Active birth, is also a popular one (Jearanai, B.E. 2539: 1). Balaskas believes that labor is a natural phenomenon; thus 90–95 percent of women can undergo normal labor (Robertson, 1996 cited in Warisa, B.E. 2542: 105). Therefore, labor should be conducted with natural strategies. The preparation for this method includes the provision of information about labor, physical exercise, movement and positioning. Movement and positioning are especially emphasized because the comfortable positioning and movement contribute to the mother's comfort and the progression of labor, as a certain position can shorten the duration of the first stage of labor.

Upright position reduces uterine compression to the aorta and inferior venacava blood vessels and encourages perfect uterine relaxation. Supine position induces prolonged labor more than upright position because in supine position, the intel pelvic axis slopes downward, causing the obstetrical conjugate angled at 30 degrees with the horizontal line. The uterus usually lies slightly backward in supine

position thus it is quite difficult for fetal engagement to progress into the pelvic cavity; in upright position, however, the uterus moves forward and the birth canal is in straighter line. The uterus, the fetal axis and the inlet pelvic axis are in same line that facilitates the fetal engagement into the birth canal. Various positions and movements could be applied for labor and birth, including standing, walking, sitting, leaning forward with support, lying on one side, squatting, and leaning forward while kneeling. In addition, upright position during laboring is can be benefited from the gravity effort. The women may maintain upright position by walking, sitting, or standing; Postural change every 30–40 minutes helps in relieving muscle weakness and adjusting the fetus-pelvic proportion. In laboring period, physicians usually avoid to using contraction stimulants and analgesic drugs, as well as operative procedure such as amniotomy, episiotomy, or any invasive investigation. The mothers will not have perineum shaping, enema, or even breathing control; instead, they are allowed to move, have postural changes, control breathing in their own rhythm and pattern, and they will receive support, encouragement, and empowerment throughout the laboring period.

Mothers who have childbirth preparation will have psychological capacity and pain coping behavior better than unprepared mothers (Julapron, B.E.2531: 1; Chawee, B.E.2526: 1-2; Panipa, B.E.2537: 2; Watsika, B.E. 2539: 1-2; Rodsukon, B.E. 2530: 2; Lamai and others, B.E. 2534: 3; Somsiri, B.E. 2542: 2; Sukpinush, B.E. 2543: 2). Furthermore, they have perceived self-efficacy of pain coping behavior at a high level (Jaruwan, B.E.2540: 1; Watsika, B.E. 2539: 1). They were present with good self-control during laboring (Prakaikeaw, B.E. 2534: 1; Venus, B.E. 2543: 1; Willmuth, 1975: 38-41). They expressed good attitude, positive experience and good mother-infant relationship after childbirth (Panipa, B.E.2537: 1; Wasana, B.E.2540: 1; Sukpinush, B.E. 2543: 2; Usa, B.E. 2534: 1). It is evident that, in the past and the present, childbirth preparation is highly beneficial to the mothers and the babies as reviewed above; nevertheless, a single childbirth preparation method does not completely answer to all the mother's needs during laboring period, as shown below.

Method / Item	Dick-Read	Lamaze	Bradley	Balaskas
Information	yes	yes	yes	yes
Breathing control	yes (abdominal)	yes (chest)	yes (chest)	yes (no pattern)
Physical exercise	yes	yes	-	yes
Muscle relaxation	yes	yes	yes	-
Concentration	-	yes	yes	-
Effleurage	yes	-	-	yes
Movement & position	-	-	-	yes
Husband-coached	-	-	yes	-
Nurse-coached	yes	yes	-	-
Mental support	yes	yes	yes	yes

Dick-Read and Balaskas's methods include effleurage whereas Bradley's method focuses on husband-coached labor, which is not fit with general labor room in most health service centers in Thailand. In addition, the application of a single method may enhance pain coping behavior, but it cannot totally relive pain (Piriya, B.E. 2540: 42; Bonica, 1994: 623). All the above childbirth preparation methods emphasize mothers' practice and performance under the supervision or support from nurses. In reality, however, the mother's self-control capacity for pain coping behavior of mothers will decrease in active and transitional phase of labor because of the acute, severe and lengthy pain (15-18 hrs.). The mothers usually feel weak from unrest thus having less tolerance to pain. Therefore, the combination of pain management techniques should relieve pain more effectively. The integrated multiple non-pharmacological pain management methods are significant, as it is important to seek effective nursing interventions that is also appropriate to the service system of the

labor room such as integrated childbirth preparation technique with jet hydrotherapy, music, touch, acupressure or back massage.

Integrated pain management program

Integrated pain management program is a program with new pattern that practically answers to all mothers' needs. It responds to labor pain in each stage of labor in every dimension and it is consistent with the present service system of labor rooms. The program is an application of both Dick-Read's and Balaskas' method, consisting of information about labor, exercise activities, muscle relaxation, chest breathing control as abdominal breathing control is difficult due to abdominal muscle strain from uterine contraction, concentration technique, effleurage, movement and positioning, back massage in active and transitional phase when the mothers lose self-control and environmental concern thus ignoring instruction, suggestion and rhythm regulating. Massage therapy is also applied for pain relief, as it is an independent nursing role, requires short practicing time, and cost-effective. Moreover, the delivery of massage during active and transitional phase of labor can relieve pain by stimulating the skin as stated in the gate control theory. Massage is also a kind of therapeutic touch, which is highly efficient because it induce the sense of comfort, relaxation, and self-control (Birch, 1986: 270-276). The review of literature concerning human pain perception has shown that effective pain management requires three major components, comprising cognitive-affective control, decreasing nerve impulses from small nerve fibers, and increasing nerve impulses from large nerve fibers, as detailed below.

Cognitive-Affective control. The control involves four strategies, as follows:

1) Provision of knowledge about childbirth and pain management strategies. The provision of knowledge started in the third trimester of pregnancy, i.e. 32 weeks of gestational age, because the mother is more interested and much concerned about the baby and the delivery in this period. (Srikanjanaperd, 1999: 24; Cheuhom, 1991: 78; Auvenshine & Enriques, 1990: 4157; Sherwen, Scoloveno &

Weingarten, 1995: 520). The reception of information and labor room tour diminish the mother's fear. Moreover, the mother has gained more experience and knowledge regarding perceived symptoms and correct assessment of symptoms thus having more self-confidence in coping with labor pain. The decrease in the sense of fear inhibits neurotransmission from the cortex and the thalamus thus almost closing the gate or or inducing sensory deprivation, resulting in pain relief or no pain (Reeder, Martin & Koniak, 1997: 500).

2) Emotional support, aiming to decrease emotional stimulation to the mother with the strategies similar to the way that the provision of knowledge can reduce fear.

3) Concentration. The most intense impulse from concentration on one focal point will reach the perception level, and the intensity of other impulses will be decreased. In laboring period, the most intense impulse comes from uterine contraction, which emerges from the sense of labor pain and fear. With such intensity of pain, the mother will lose self-control, have rejection behavior, and inappropriate coping behavior on account of the suffering from labor pain. The concentration technique will induce more intense impulse to distract the mother from uterine contraction.

4) Muscle relaxation for reducing pain and promoting physical comfort. Muscle relaxation techniques can distract the mother from pain sensation. It diminishes emotional stimulation on the central nervous system in the brain because the body respond to the stimuli will be decreased. The limbic system, which controls emotional response, is less stimulated, causing the closing down of hypothetical gate in the spinal cord (Madder, 1979; Hyman et al., 1989 cited in Nontasawatsri, 1999: 39). A well-known muscle relaxation technique is Jacobson's progressive muscle relaxation (Jacobson, 1929 cited in Nichols & Humenick, 1988: 134-136), which is based on the principle that stress stimulates automatic nervous system, especially the sympathetic nervous system, and the body will increasingly release cathecholamine under stress, resulting in increased pulse rate, respiratory rate and blood pressure increasing, in addition to overall muscular strain and spasm. Thus, muscular strain indicates the occurrence of stress and the feedback is subsequently sent to the central nervous system, which increases response to stress in return. Frequent occurrence of

stress does not only cause permanent muscular strain, but the muscular tension also progressively increases. The application of muscle relaxation technique inhibits stress feedback to the brain and the nerve pathways for pain perception are interfered or completely blocked, resulting in the sense of comfort and appropriate coping. Muscle relaxation involves two components: 1) contraction and relaxation of each body part by contracting the muscle and holding it for a while before relaxing the muscle to the extent that it feels totally relaxed, and 2) identifying the feelings: as a result of muscular contraction and relaxation, the mother will be more conscious of stress occurrence. This is the process of progression from involuntary muscular contraction to voluntary contraction under sub-conscious level. With regular and continual practice of distraction technique, the laboring woman can immediately perceive uterine contraction and she will be able to perform muscle relaxation and maintain normal emotion even under the stimulated situation.

Decreasing nerve impulses from small nerve fibers

The following three methods are commonly used for decreasing nerve impulses from small nerve fibers:

1) Physical exercise is the technique which promotes muscle strength, enhances uterine function and extension, and decreases pain from physical changes during labor such as uterine enlargement, distension of abdominal wall, backache due to the change of vertebral curve, the release of hormone relaxin which causes relaxation of tendon and joint for childbirth preparation, and the extension and tearing of perineum muscles. These changes stimulate neurotransmission via small nerve fibers thus increasing pain perception.

2) Movement and position can promote fetal engagement along with the gravity and can shorten the duration of labor. The leaning forward position and kneeling can reduce pain by decreasing pressure on the back and the buttock because the uterus is in forward position.

3) Chest breathing control reduces pain by diminishing pressure from diaphragm. The chest movement with this breathing technique lifts the diaphragm upward during uterine contraction.

Increasing nerve impulses from large nerve fibers

The stimulation on the skin, which is rich of large nerve fibers, can increase the nerve impulses from fibers, leading to the closing of hypnotic gate in the spinal cord. As a result, the perception of pain stimuli is reduced. The following two techniques are usually used for increasing neurotransmission through large nerve fibers:

1) Abdominal effleurage – a light stroking on the abdomen in rhythm with breathing during contractions. It is used to distract the women from contraction pain as stated in the gate control theory. Laboring women are generally encouraged to conduct this skin stimulation technique by themselves.

2) Massage. The application of massage on the affected area can reduce pain as suggested in the gate control theory. It can also induce endorphin release from the pituitary gland (McCaffery, 1979: 134-139). Massage is an easy and effective method, which promotes the mother's physical and emotional well-being (Joanne, 1990: 14-16; Nolan, 1998: 108-112). In addition to the reduction of pain perception, massage also diminishes laboring stress, shortens the laboring period, reduces length of hospital stay, and decreases postpartum depression. (Field, et al., 1997: 286-291). Various people, including nurses, one's self, relatives and husband can delivered massage. Low back pain, such as sacral pain, usually spreads over both bottoms and thighs like a cramp. This pain is common in the first stage of labor on account of lower uterine resistance and cervix or nerve compression from fetal engagement. Massage is the most efficient method that nurses can deliver to relieve backache. It was found that 70 percent of the massaged laboring women reported increased comfort after having back massage (Myles, 1989: 37). The massage in this program was given in the active and transitional phase in order to diminish pain and enhance self-control for other complimentary strategies in pain management.

Some techniques in this program can manage pain in various ways. Education is used for cognitive-affective control. In addition, it decreases nerve impulses from small nerve fibers by reducing adrenaline secretion after the decrease in fear and anxiety. As a result, the uterine and cervical dilatation progresses normally and there will be no pain from the inconsistency between uterine and cervical contraction. Breathing control, effleurage and massage help distracting the mother from pain to these interventions, which are also cognitive-affective control.

Perception of childbirth experience

Perception of childbirth experience refers to the feeling, thought, and interpretation of various situations that occur during pregnancy and delivery. Individual mother has different experience; some mothers have good perception of childbirth experience; some have bad perceptions of childbirth experience. The difference is on account of various factors, as reviewed below (Clark, Affonso & Harris, 1993: 345-356).

1. Attitude. The mothers who feel that the experience of labor and enhances their self-worth would view childbirth as a meaningful event. Their expectations and goals about childbirth are realistic and attainable, and they receive positive feedback from health care providers for their cooperation during pregnancy and delivery. These mothers have positive perceptions of childbirth experience.

On the other hand, the mothers who view childbirth as a negative experience, especially those whose the desired goal is not achieved, will behave in contrary to the expectations of others and health care providers; for instance, ignoring the details about examination or about the progress of labor. These mothers will have negative perceptions of childbirth experience.

2. Role expectations. The expected role may be defined by culture, the event, and the individual's perception of desired behaviors. For example, some women prefer to have dependent role, and exhibit this dependence by frequent demands and inability to make even minor decisions. If mothers cannot perform to meet the expected role, they may have contradictory feelings about role taking. This may affect their role performance and they may have negative perception of childbirth as a result.

3. Fears and Anxiety. Several certain environmental features may cause stress and fear. For example, unfamiliar place and person, hospital regulation, reception of some treatment and care such as intravenous fluid transfusion, fleet enema, perineum cleansing, intermittent vaginal examination, restriction of movement, constant monitoring, augmentation, etc. (Chalmers, Enkin & Keirse, 1989: 806). In addition, anxiety and fear during labor do not only arise from physical stressors, but also from unmet expectations and progress of labor. According to

Athaseri and Serisathien's study (1988: 27-28), primiparae who do not undergo much augmentation have positive perceptions of childbirth experience.

4. Sensory Alteration. Various sensory receptions may alter during labor. The alteration may be in form of either sensory overload or sensory deprivation.

- Sensory overload is a consequence of physical changes such as vaginal secretions, ruptured membranes, frequency of contraction, and changes in the cervix. It also develops under the influence of the labor room environment such as frequency of vaginal examinations, preparation of equipment for the delivery, and rapid movements of the staff. Inappropriate conversation among the staff may also induce stress to pregnant women.

- Sensory deprivation results from the interruption of usual activities to meet basic needs such as bed rest, confinement due to intravenous fluid transfusion, lack of visitors, etc. The mother may also feel deprived from self-identity, as she may be referred to with a number or a label instead of calling by name.

5. Sense of loss. During labor, women may experience a sense of loss as follows:

5.1 Loss of expectations or values. Prior to labor, a woman and the family may have expectations concerning the baby's appearance, gender, or even the events during labor and delivery. The women will have a sense of loss when their expectations are not fulfilled, leading to sadness from loss.

5.2 Loss of the sense of self-worth, including

- Loss of self-worth concerning the image, resulting from the loss of control over physical functioning. For instance, spontaneous bowel movements or urination may generate feeling of losing control over one's eliminative functions. The expanding figure after delivery may lead to the sense of loss of body image.

- Loss of self-esteem; this is usually interrelated with the loss of control in coping with the situation, the reception of negative or no feedback about one's behaviors, and unmet expectation.

- Loss of roles; the woman who enters labor is usually not given recognition for her career status. Instead, she is viewed simply as another woman in labor.

Several other factors affect the perception of childbirth experience. For instance, the duration of labor: the mothers who have short duration of labor tend to have positive perception of childbirth experience (Athaseri & Serisathien, 1988: 27-28). Psychosocial factors including early interaction with the baby, support from the husband during labor, experience of greater positive life events the year prior to birth, and a higher total positive self-concept contribute to positive perception of childbirth experience (Mercer, Hackley & Bostrom, 1983: 202-207).

These factors act like stimuli to sensory receptors. Mothers interpret the stimuli that she receives during labor by using her past experiences, needs, and beliefs to determine her perception of childbirth experience, which can be classified into two ways:

- Positive perception of childbirth experience leads to satisfaction of labor.

- Negative perception of childbirth experience leads to dissatisfaction of labor and may have effect on mother and child relationship in the future.

The assessment of mother's perception of childbirth experience helps nurses to recognize the mother's attitude about the pregnancy, thus they can immedicately help her if necessary.

Assessment of childbirth experience perception

The assessment of mother's perception of childbirth experience allows the nurses to deliver care that is mostly relevant to the individual's perception. The assessment is conducted in the following manner:

1. Prepartum stage. The assessment at this stage is mostly concerned with the factors affecting perception of childbirth experience so that nursing care plan can be made to provote positive perception of childbirth experience. The assessment includes the following topics (Clark, Affonso & Harris, 1993: 357-358):

1.1 Expectations and perception of labor – nurse should seek answers to questions such as the following:

- What do you expect labor to be like for you?

- Did you have any preparation for labor?

- Were there any stressful events happened to you before your labor began or during your pregnancy?

- Do you anticipate any discomforts during labor? If so, how do you plan to handle them?

- Can you tell me what you know or have heard about labor?

- Do you have any goals, specific wishes, or desires, which you hope to achieve during labor?

- What do you expect the staff and other to do to help you during labor?

1.2 Meaning of the labor experience, including information regrarding the attitudes toward labor and perceived values of the labor experience. Questions for consideration are:

- Is labor viewed as a life-threatening event or as a means of self-fulfillment and attainment of desired goals?

- What is the cultural meaning or significance of labor?

- Is there support or conflict of the individual's ascribed meaning of labor compared with that of the hospital or the culture?

1.3 Factors that increase stress and threaten natural labor. The following information should be obtained:

- Knowledge and understanding of the labor process

- Concerns and fears

- Awareness and understanding of events to occur in the hospital

- Degree of discomfort and disruption of daily patterns prior to the onset of labor

- Attitudes toward the pregnancy and the labor.

1.4 Support system desired and available during labor. Questions include:

- What are the plans or expectations in regard to coping?

- Who is desired for attendance during labor and what is expected from the person?

- Are situational reports available?

When the nurse collects sufficient data of the above issues, she will develop better understanding of individual mother, leading to appropriate planning of nursing care for each mother. Thus the pregnant women's coping with labor pain will be improved, leading to positive perceptions of childbirth experience.

2. Postpartum stage. At the end of the delivery, nurses should reassess the mother's perception of childbirth experience. The aim of reassessment is to examine the mother's reaction to the events during labor. The sense of maternity depends on the person's personality, duration of labor, perceived labor pain, doctors' and nurses' actions, as well as the husband's and relatives, during the labor and immediately after birth (Serisathien, 1987: 37).

Various tools are use for measuring the perception of childbirth experience. For instance, 1) Cesarean Birth-Experience Questionnaire such as Open-ended items about birth experience , developed by Fawcett and Burritt (1985) or Felling tone instrument: Ten items perinent to cesarean birth experience (Tcheng, 1984); 2) Instrument for fathers' responses to childbirth, e.g. Twenty-nine-items scale, (Cronenwett & Newmark, 1974), Questionnaire on fathers' need during childbirth : Fifty items (MacLaughlin, 1983); and 3) The specific dimension such as Interview on touch in labor: Extension of penny (1979), Interview schedule (Birch, 1986), Verbal estimation of time passage: Procedure to assess time passage (Beck, 1983), Speed of time passing scale: Subjective measure of time passage(Isenberg, 1978), Interaction Modes: categories for coding women's verbal, postural and tactual behaviors in labor (Richardson, 1979), and Hand action coding scheme: Three dimensions of hand actions (VanMuiswinkel, 1984). The measure of the perception of childbirth experience in postpartum period that has been frequently used these days is the Perception of Birth Scale Twenty-nine – item scale of perception of birth experience, which was developed by Marut and Mercer in 1979 (Walker, 1992: 230- 231). The questionnaire was created for investigating the perception of childbirth experience by assessing the following issues (Marut & Mercer, 1979; 260-266):

1. Success in skill for releiving pain
2. Confidence during labor and delivery
3. Relaxation during labor and delivery

4. Satisfying feeling during delivery
5. Self-control while having labor pain and during delivery
6. Expectation about the baby
7. Cooperation with the obstetric team
8. Partner's help through labor pain and delivery
9. Memory of events while having labor pain and during delivery
10. Pain during delivery
11. Unpleasant feeling during delivery
12. Worries about the baby's condition
13. Feeling about the use of equipment during delivery
14. Expectations about labor experience before the labor onset
15. Choices of treatment
16. Opportunities in exchanging childbirth experience and feelings after having such conversation
17. Satisfaction with the birth outcome
18. Duration from post-delivery to holding the baby and duration of mother's holding the baby.

Referring to the review of relate literature, labor pain is caused by physical and psychological changes. Various factors, including anatomical, physiological, psychological and cultural factors have effects on pain. A person's perception of pain depends on the gate control system in the spinal cord in combination with the central nervous system functioning. The stimulation on small nerve fiber opens the gate from which pain impulses are transmitted to the brain; on the other hand, large fiber stimulation closes the gate from thus blocking or diminishing neurotransmission. The central nervous system will interpret pain signal into pain sensation. Laboring pain has significant effects on physical and psychological changes in the mother and the fetus. A safe approach for labor pain management is non-pharmacological approach, as the mother and the fetus will be saved from drug effects and complications. Also, it is a low-cost approach as no expensed for drug and equipment is required. There are several non-pharmacological pain management strategies in the past and present; however, those strategies cannot totally respond to pain and internal changes in

practice on account of the increasing pain and the mother's lowering self-control over the progressive laboring stage.

The integrated pain management program was a novel program that responses to maternal requirement in relevant to the real situation, consistent with the labor room service system, and in accordance with the National Health Reform policy – Good health in low cost, Health assurance for all, 30-baht health scheme. It is also a an integration of alternative therapeutic nursing with modern medicine system. The program, which was aimed to reduce the labor pain during delivery and promote positive perception of childbirth experience, was adapted from the concept proposed by Dick-Read, Lamaze and Balaskas combining with cutaneous stimulation with massage. Pregnant women who were at 32-38 weeks of gestational age was instructed in a childbirth preparation course for four times. In latent phase of labor, nurses would encourage and support the laboring women, as well as coaching them, in using the pain management strategies previously trained and practiced in the childbirth preparation classes. The strategies included muscle relaxation technique, effleurage, movement and positioning, breathing exercise, and concentration. In active and transitional phase, the mothers still received support and encouragement as in phase latent phase and would have back massage from nurse along with the information about the progression of labor, in addition to continual coaching on muscle relaxation and psychological support. These strategies would reduce pain perception with cognitive-affective control technique. Exercise, movement and positioning, and breathing control would diminish pain perception by decreasing impulses from small fibers while effleurage and massage would reduce pain perception by increasing impulses from large fibers. The decreased pain, in combination with their participation in the delivery and ability to have normal labor, would induce the sense of satisfaction in the mothers, leading to good impression and positive perception of childbirth experience.

CHAPTER 3
METHODOLOGY

This study is a quasi-experimental research. It is designed to determine the effect of integrated pain management program on labor pain, duration of first stage of labor and perception of childbirth experience in primiparous mothers.

Population and Sample of the Study

The target population of this study was the first time pregnant women with 32 weeks of gestational age or older who visited antenatal care unit and gave birth at Mettapracharak (Wat Raiking) Hospital, Nakornpratom, during the period of June 2002 to April 2003.

The sample was purposively selected from the target population, provided that the women's characteristics met the following inclusion criteria:

Inclusion criteria

1. 20-34 years old
2. Wanted pregnancy
3. Literate in Thai language
4. Pregnant with fetus that was in vertex presentation and occiput anterior
5. Having no gestational and/or medical complications during antepartum, intrapartum and postpartum periods, such as hemorrhage, hypertension, diabetes mellitus, heart disease, anemia, etc.
6. Gave birth with normal delivery.

Exclusion criteria

Pregnant women who did not completely attend all four lessons of the integrated pain management program. .

With the purposive sampling method, the researcher recruited 60 subjects for the study, as suggested by Polit and Hungler (Polit & Hungler, 1983: 427; Luecha, et al., 2000: 84). It is recommended that an experimental research should be carried out with the total number of at least 20-30 subjects in each study group; or else, there should not be less than 10 subjects in a study group. For this study, 60 women whose characteristics met the inclusion criteria were selected and were divided into control and experimental groups with 30 women in each group. At the beginning of the study, there were 35 women in the control group. During the process of the study, 5 women were dropped out for the following reasons: giving birth by caesarean section; receiving epidural block during the delivery; not willing to participate in the study; and giving birth to the fetus birth asphyxia. Therefore, the total number of subjects the control group was 30, eventually. The number of subjects in the experimental group started was originally 40 but 10 subjects were later dropped out. The reasons of dropping out were: five subjects incompletely attended the antenatal class; three subjects did not return to give birth at Mettapracharak (Wat Raiking) Hospital; one subject developed gestational hypertension at the 36th week of pregnancy; and the other one withdrew from the study. Finally, there were 30 subjects in the experimental group.

Data were collected from the control group first and from the experimental group later in order to prevent contamination from the intervention, which might occur if subjects from different groups had met and exchanged information. Moreover, the separated period of data collection would prevent any disheartening influence on morale and willpower, or feeling of unfairness in the intervention.

Setting

The study was conducted at Mettapracharak (Wat Raiking) Hospital, which is a 250-bed secondary hospital affiliated with the Department of Medicine, Ministry of Public Health. Antenatal Care Unit of the hospital opens on Tuesday and Thursday from 1.00 to 4.00 p.m. The first visit for antenatal care at the antenatal care unit for the first time should be when the pregnancy is not older than 12 weeks of gestational age and it may be either normal or complicated pregnancy. Nevertheless,

almost all complicated pregnancies are subsequently referred to Nakornpratom Hospital, the central hospital, for secondary care. The unit, with 3 attending obstetricians provided antenatal care to averagely 80–20 pregnant women per day. Every prenatal woman will have two lessons of health education at the first and the second trimester of pregnancy. Health education includes knowledge about self-care practice during pregnancy such as eating, resting, sexual intercourse, follow-up appointment, and abnormal signs and symptoms. The childbirth preparation is not included in the lessons. For the labor room of the hospital, there are seven beds for attending labor and two delivery beds. The number of women undergoing labor at the hospital is averagely 90–100 per month. The relatives and husbands are not allowed to attend the labor in labor room. However, hospital administrators and the Obstetric Department support the concept of active birth, thus obstetricians and nurses do not usually apply active management in case of normal delivery.

Instrumentation

This study used two sets of instrument, comprising intervention and data collecting instruments.

Intervention instrument

The instruments for the intervention were integrated pain management program, lesson plan, and handbook for labor pain management.

1. The integrated pain management program was composed of:

1.1 Knowledge about labor and labor pain management strategies in antepartum period. The knowledge was provided to the pregnant women in four lessons.

Lesson 1 (32^{nd} week of pregnancy): The knowledge provided in this 90-minute lesson included labor definition, labor symptoms, preparation of equipment, hospital admission, laboring phase, factors influencing labor pain, labor pain, labor pain management, and exercise.

Lesson 2 (34^{th} week of pregnancy): The 60-minute lesson provided knowledge about muscle relaxation and effleurage.

Lesson 3 (36^{th} week of pregnancy): The 60-minute lesson provided knowledge about positioning and breathing control.

Lesson 4 (38th week of pregnancy): The 60-minute lesson provided knowledge about concentration technique, massage, and the use of non-pharmacological strategies in labor pain management, including a labor room tour.

1.2 Emotional support. The women would receive emotional support along with the information about progression of cervical dilatation. They would also receive help in positioning and movement. Mental support was also given trough the encouragement and respect as shown in the staff's use of polite words and the willing to help through coaching.

1.3 Pain management training consisted of the following activities:

a) Physical exercise to enhance muscular strength and functional tolerance, improve elasticity thus reducing pain perception. Physical exercise is composed of three stages; warm-up, exertion, and relaxation with breathing control. The exercises in this program included compressing posture for pelvic and perineal exercise; squatting position for hips, hip joints, pelvic, knees and thigh exercise; butterfly wings expanding position for pelvic, perineum and thigh exercise; Japanese sitting position for abdominal, back, and thigh exercise; cat bending back position for back, abdominal and pelvic exercise; and protruding position for neck, shoulder, arm and thigh exercise. These exercises were applied from the textbook 'Manual for Quality Mother' and research papers that had examined its suitability for women in the third stage of pregnancy (Nobel, 1988; Nichols & Humenick, 1988; Pichai, B.E. 2539; Venus, B.E. 2543; Sukpinush, B.E. 2543; Yuwadee, B.E. 2541; Jeeranao, B.E. 2536).

b) Muscle relaxation technique, performed in 10-15 minutes by focusing on each body part. The women would learn to alternately contract and relax the muscle, and to observe the difference between muscular contraction and relaxation. The relaxation was then spread through the whole muscle group, i.e. leg muscle, pelvic muscle, abdominal muscle, back muscle, thoracic muscle, upper limbs muscle, neck and shoulder muscle, and facial muscle. The best time for relaxation practice is before bedtime every day.

c) Abdominal effleurage, performed by stroking the abdomen lightly with the tips of all fingers but thumbs of both hands, which were slightly bent in hook-shape. The stroking began from pubes upward to the high of fundus while inhaling, and then downward from the high of fundus to the starting point while exhaling.

d) Movement and positioning. The women were instructed about postural changes and movement such as walking, standing, leaning forward while standing, sitting on chair, squatting, leaning forward while sitting, moving on hands and knees, semi-sitting, and lying on the left side. The women might have a posture of their preference but they were recommended to change their position every 30–60 minutes to prevent tiredness.

e) Chest breathing control, of which the breathing pattern changed along with the intensity of labor pain in each stage of labor, as follows:

- In latent phase, the uterine contraction is not intense thus the mothers should have slow chest pattern respiration, starting from one cleansing breath then inhaling slowly while counting 1-2-3-4 and then exhaling slowly through O-shape mouth while counting 1-2-3-4 counting. The breathing should be under controlled in this rhythm until uterine relaxation, when the breathing pattern was finished with one cleansing breath. In each uterine contraction, breathing control should be practiced with rate of approximately 6-8 rounds per minutes.
- In active phase, the uterine contraction is more intense; therefore, the woman should slowly breathe alternately with the shallow accelerated-decelerated breathing pattern. When the uterus starts contracting, the woman would take a cleansing breath first, and then inhale and exhale slowly until the uterine contraction was complete. The breathing then changed to the shallow accelerated-decelerated pattern and back to slowly inhale-exhale during the period of increment and decrement of uterine contraction. In acme stage of uterine contraction the breathing pattern should be in shallow accelerated-decelerated pattern. When uterine relaxation recurs, the woman would finish the breathing control exercise with another cleansing breath.
- In transitional phase, the woman would breathe with the shallow accelerated-decelerated pattern and panted blow pattern to control the urge for

compression effort. During uterine contraction, the woman would take one cleansing, then inhale slowly and lightly with shallow pattern for 6-7 times. Finally, the women would exhale with one blow through mouth. The breathing pattern was carried on until uterine relaxation recurs; and the practice was finished with one cleansing breath gain.

f) Concentration technique. The women were taught to focus on an object thing or picture during uterine contraction and to concentrate on an activity such as relaxation, effleurage, or breathing control, as well as focusing on the rhythm of massage delivered by nurse.

1.4 Massage therapy in active and transitional phase, comprising

1.4.1 Circular hip massage at the end of the contraction. The masseur pressed the palm of the hand on the sacral area and massage firmly. The massage went in a clockwise direction when using the right hand and anticlockwise when using the left hand.

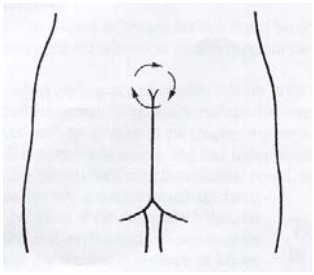


Figure 4: Circular massage

Source: Kimber, L. (1998). Effective techniques for massage in labour. The Practising Midwife, 1(4): 38.

1.4.2 Massage in a figure-of-eight shape. The masseur clenched one hand tightly, leaving the thumb extending out. The clenching hand was then placed firmly on the lower back and moved in the figure-of-eight shape.

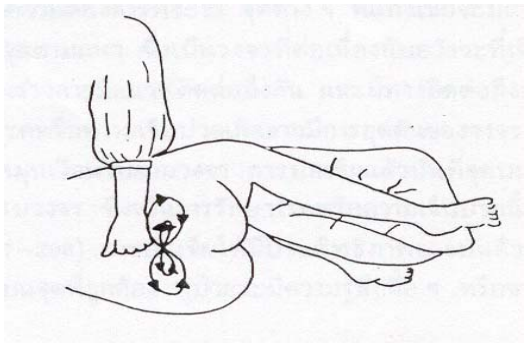


Figure 5: Figure of eight shape massage

Source: Jintana Bangang, (2533). Nursing care for labor pain in pregnant women. Bangkok: Aksornthaipublishing. p. 59.

1.4.3 Waist and buttock massage. While the woman was in haling, the masseur moved both hands upward to the waist level. Then, when the woman started to exhale, the masseur moved both hands downward with the fingers pointing inward and elbows pointing outward. The massage was given across the back to the hips. The hands were then moved smoothly down the sides of the hips until reaching the starting position, like drawing twin circles. (Figure 6-8)

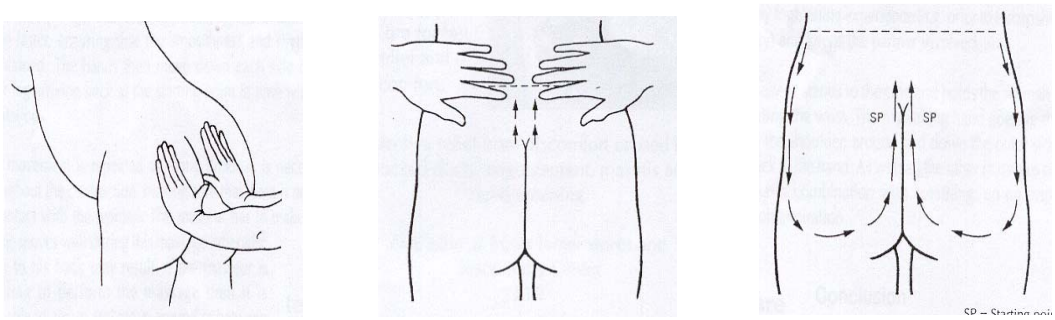


Figure 6-8: Waist and buttock massage

Source: Kimber, L. (1998). Effective techniques for massage in labour. The Practising Midwife, 1(4): 37.

1.4.4 One-hand circular massage. The massage started at the area near the side of one hip and moved across the waist to the opposition hip.

The massaging hand then moved down the side of the hip with the fingers placing around the hip curve, moving down to the buttock before crossing and going slightly upwards to the sacral area with the heel of the hand compressing at the same time. Finally, the hand moved back across to the starting point.

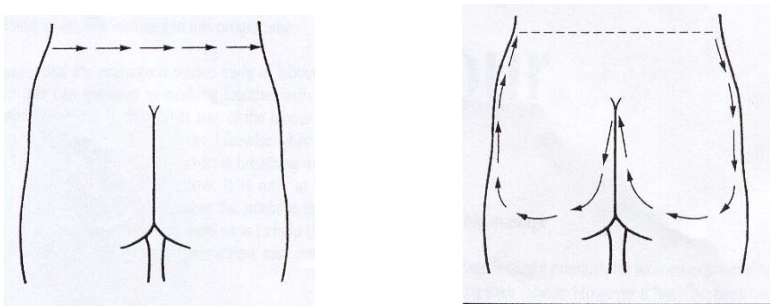
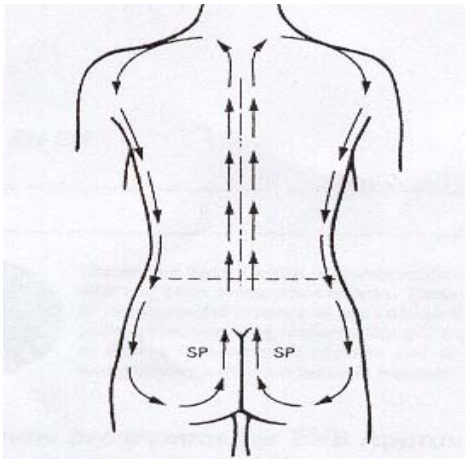


Figure 9-10: Using one hand massage from the side

Source: Kimber, L.(1998). Effective techniques for massage in labour. The Practising Midwife, 1(4): 38.

1.4.5 Whole back massage. The procedure is similar to the waist and buttock massage. Both hands were moved smoothly upward to upper back and down on each side of the body toward the starting point.



SP = Starting Point

Figure 11: Whole back massage

Source: Kimber, L. (1998). Effective techniques for massage in labour. The Practising Midwife, 1(4): 38.

2. Lesson plan for the teaching of laboring and pain management strategies in laboring period.

The plan was developed by the researcher (Appendix C) to be used as guidelines in teaching pregnant women. The lesson plan consisted of behavioral objectives, contents, learning activities, time, teaching materials, and evaluation. The development of plan and quality measurement were conducted in the following manner:

- Set general teaching objectives
- Study textbooks, documents and related research papers to compile the contents of the lessons
- Set behavioral objectives and arrange the content according to the objective
- Determine the study period and evaluation criteria
- Make lesson plan
- Submit the lesson plan to a panel of experts for quality measurement; the panel of experts consisted of one obstetrician, four obstetric nurses and one nurse specialized in laboring care (Appendix A). The experts examined the content validity, suggested amendments for improving the contents and for appropriate use of language, gave advice on teaching materials, lesson times, and learning activities. When the lesson plan receive approval from the panel, it was submitted the research advisor for additional suggestion. Amendments were made according to the suggestion and the lesson plan was completed.

3. Handbook for laboring women and labor pain management strategies (Appendix C). The researcher developed this handbook to use in the childbirth preparation class and for the women to review at home. The handbook, which had contents and pictures associated with the lesson plan, was developed and examined for validity, as described below.

- Study the content of lesson plan and determine the content of the handbook accordingly
- Produce the handbook

- Submit the handbook to a panel of six experts (Appendix A) to examine content validity, correctness and appropriateness, including the use of language, teaching materials, lesson time, and learning activities. After receiving approval from the panel, the handbook was brought to consult with the research advisor. Amendments were then made in response to the advice for its completion.

2. Instrument for Data Collection

This instrument was composed of the following features:

2.1 Demographic data collecting form (Appendix D). It was designed to obtain personal data and pregnancy and delivery history, such as age, educational level, occupation, marital status, family income, family pattern, pregnancy planning, frequency of antenatal visits at the antenatal care unit, history of drug usage either for inducing labor or pain control, duration of labor, complications, and fetal characteristics, i.e. birth weight, gender, and Apgar score at 1 and 5 minutes after birth.

2.2 Labor pain measurement. The Pronnirun Udomthavornsuk's Pain-Color Scale (1985), which was modified from Stewart's Pain- Color Scale and the 11-Point Box Scale (Appendix D), was utilized for measuring labor pain in this research. The scale is an 11- box linear table with right-angle oblique line starting at the second box of the table and finishing at the eleventh box. The triangle under the line was colored with red, of which the shade is increasingly darker as pain perception increasing. The empty box (0) reflects no pain and the darkest red box (10) reflects unbearable pain.

Validity and Reliability

This tool was measured for concurrent validity. The correlation coefficient between Pronnirun Udomthavornsuk's Pain-Color Scale and Stewart's Pain -Color Scale was 0.97 (Pronnirun Udomthavornsuk,1985: 95-97). For this research, the concurrent validity was examined with 30 laboring women whose characteristic met the inclusion criteria. Correlation coefficient was also calculated and the result was 0.87.

2.3 Perception of childbirth experience questionnaire. The questionnaire originally created by Marut and Mercer (1979: 260-266) that enquired laboring women about their feelings and opinions toward labor pain, childbirth, and newborn babies. The 29-item questionnaire was translated into Thai (Yaowalak Sereesathein,B.E. 2530), and was modified into Thai perception of childbirth experience questionnaire (Prakaikeaw Kakum, B.E. 2534; Yuwadee Subprasert, B.E. 2541). The modified questionnaire was composed of 42 items and divided in 6 sections, as follows (Appendix D):

Section 1 Success in self-control during delivery item 1 – 8
(The 1st and 3rd item had negative meaning.)

Section 2 Anxiety about fetal status item 9 –12
(The 11th item had negative meaning)

Section 3 Fear in laboring period item 13-20
(The 14th, 15th, 16th, 19th and 20th item had negative meaning)

Section 4 Expectation of labor experience item 21- 26
(The 21st, 22nd and 26th item had negative meaning)

Section 5 Labor pain throughout the delivery item 27- 33
(The 27th, 30th and 31st item had negative meaning)

Section 6 Satisfaction toward child birth success item 34 – 42

The response is a 4-level Likert scale, ranging from 1 – untrue, to 4 – mostly true. The scores of negative items would be converted before calculating. The possible total score ranged from 42 to 168. Higher score reflected that better perception of childbirth experience.

Validity and Reliability

Marut and Mercer (1979, 260-266) examined content validity from mutual opinion of nine experts. For the modified Thai version, a panel of seven experts comprising one obstetrician examined the content validity of the questionnaire and six nursing instructors specialized in obstetric nursing (Yuwadee Subprasert, B.E. 2541). The approved questionnaire was used in this research without any modification.

For reliability measurement, Marut and Mercer (1979, 260-266) tried out the questionnaire on 30 primiparous mothers undergoing normal labor. The Cronbarch's alpha coefficient was used and yielded coefficient of 0.83. Later Cranley, Hadahl, and Pegg (1983, 10-15) tested this questionnaire on 122 primiparous mothers and got the reliability value from the Cronbarch's alpha coefficient of 0.76. For Thai version, Yuwadee Subprasert (B.E. 2541) tested the modified questionnaire on 30 normal postpartum mothers, and the coefficient of reliability was 0.93. For this research, the tried-out for reliability value also resulted in the Chronbach's alpha coefficient of 0.93.

Protection of the Rights of Human Subjects

The right of the subjects in this study was well protected, as detailed below.

1. The researcher presented the research project to the Committee on Human Rights Related to Human Experimention, Division of Research Administration, Faculty of Graduate Studies, Mahidol University to request for approval and the documentary proof of ethical clearance before experiment.

2. The subjects exercised their right of self-determination, as the researcher approached and informed them about the purpose of this study. They had the right to make decision whether to participate in the study or not. They could also withdraw from the study anytime should they like. Their refusal to participate or withdrawal from the study would have no effect on the medical care they were or would be receiving from the hospital.

3. The subjects had the right of to remain anonymity and all data would be kept confidential by using codes instead of name. No sign was marked on their patient card and the responded questionnaire would be kept in sealed envelope.

4. The researcher gave the subjects information sheets to read and consent letter to sign, confirming their willingness to participate in the study (Appendix B).

Data collection

Procedure of data collection was described below.

Preparation stage

1. Researcher preparation. In addition to studying related literature, the researcher observed childbirth preparation classes at Smithivej Hospital on Sunday from 9.00 to 12.00 p.m. for six times. The researcher also practiced back massage techniques for relieving labor pain with Ms. Melanee Hubprananon, an English midwife who brought the active birth technique to used in Smithivej Hopital and was an instructor at the Childbirth and Breastfeeding Foundation of Thailand. Ms. Hubprananon organized several workshops on non-pharmacological pain management strategies, especially with positioning and movement, and back massage, for a number of organizations and institutes.

2. The researcher studied the process of medical service system for pregnant and parturient women at Mettapracharak (Wat Raiking) Hospital. The obtained information was included in the childbirth preparation lessons in order to diminish the effect of medical service and to avoid disturbing the hospital system during the intervention.

3. An introduction letter was requested from the Faculty of Graduate Studies, Mahidol University and was subsequently submitted to the Director of Mettapracharak (Wat Raiking) Hospital to ask for permission to collect data at the antenatal care unit, Outpatient Department and the postpartum care unit, Obstetric Department.

4. The researcher met the Vice-Director of Nursing Division, Head of Obstetric Nursing, Head of Antenatal Care Unit, Head of Labor Room, and Head of Postpartum Care Unit to give detailed information about the process of the study and to ask for permission and cooperation in conducting the research.

5. The researcher prepared two research assistants, who were registration nurses working in the labor room and the postpartum care unit for ten years; each assistant was assigned to each setting. The assistants had good knowledge and skill in caring for laboring women and postpartum women thus they were able to assist in measuring labor pain level and perception of childbirth experience. The research assistants were prepared as follows:

- receive brief information about the study
- learn about the measure , questionnaire and data collecting method in details.

Intervention stage

The study was firstly carried out with the control group, which received usual nursing care throughout the study process. When data from the control group were completely collected, the integrated pain management program was trailed with the experimental group. The separated period was aimed to prevent cross-contamination between the two groups and to prevent the feeling of biased treatment, which may induce errors in the results. Data were collected in the following orders:

1.Control group

- The sample was composed of 30 full-term pregnant women who received medical care at the antenatal care unit and gave birth at Mettapracharak (Watraiking) Hospital, Nakornpratom.
- The researcher and research assistants introduced themselves to establish good relationship with the subjects. The subjects were informed about the objectives and process of the study and the protection of the rights of human subjects. When the women expressed willingness to participate in the study, they were ask to sign the informed consent. The women were inquired into personal data not included in antenatal report such as family income, pregnancy planning, family characteristics etc. Afterward, a research assistant would explain to the women how to report pain level.
- The research assistants collected data concerning the level of labor pain. They described pain report method to the women and measured pain level with Pronnirun Udomthavonsuk's Pain-Color Scale. Firstly, the research assistant monitored uterine contraction and asked the women to report pain level immediately when the uterus relaxes. The pain was measured when cervical dilatation was 4 centimeters, or when the contraction rate was not less than 3 times in 10 minutes and lasted longer than 40 seconds. The measurement was performed every 10-15 minutes during uterine relaxation and when the labor progressed to 7-cm cervical dilatation with 2-3 minutes of interval and 45-55 seconds of duration, the pain would be

measured every 5-10 minutes. The pain level measurement was carried on until full dilatation or cervical dilatation of 10 centimeters.

- At twenty-four hours after delivery, research assistants asked the subjects to complete the perception of childbirth experience questionnaire in postpartum care unit. The questionnaire could be completely responded in 15-20 minutes and the assistants would be available nearby in case the subjects had any doubts. This will prevent wild guess responses or substituted respondents. When the women finished, the research assistant would check for the completion, and the women would be asked to fill in missing information.

2. Experimental group

- The sample was composed of 30 pregnant women who received antenatal care at the antenatal care unit and gave birth at Mettapracharak (Wat Raiking) Hospital, Nakornpratom.

- The researcher introduced self to establish good relationship with the women and then informed them about the objectives and process of the study and the protection of the rights of human subjects. When the women expressed willingness to participate in the study, they were asked to sign the consent form. The women were then inquired about personal information that was not documented in antenatal report such as family income, pregnancy planning, family characteristics, etc.

- After having a check-up with obstetricians, the women were led to health education room. Their relatives and partners were allowed to sit in this class.

- The researcher gave the women a handbook of labor and labor pain management strategies so that they could review and practice at home. They were requested to bring the handbook along with attending report in every antenatal visit. If the women lose the handbook or forgot to bring it along, the researcher had spare handbooks for borrowing. The researcher then taught the women by following the list of contents of the handbook as detailed below.

- First lessons, at the 32nd week of gestation, the teaching was about laboring knowledge, labor pain, labor pain management strategies and exercise, using 60 minutes.

- Second lesson, at the 34th week of gestation, the teaching was about muscle relaxation and effleurage, using 60 minutes.

- Third lesson, at the 36th week of gestation, the teaching was about positioning and breathing control, using 60 minutes.

- Fourth lesson, at the 38th week of gestation, the teaching was about concentration, back massage, and non-pharmacological pain management strategies during parturition, using 60 minutes.

At the end of each class, researcher gave practice record to the women so that they can note the number of practice done at home. The women were asked to hand this report back when they returned to the next lesson. When subjects in the experimental group were admitted into the labor room, staff nurse would notify the researcher for performing the intervention and collecting data. During the delivery, the researcher functioned as an instructor, supporter and coach to encourage the laboring women to use non-pharmacological laboring pain management strategies as previously learned. The research assistants would explain how to give response to the Pain-Color Scale, and they would measure the women's labor pain. In the active and transitional phase, when cervical dilatation was 4 centimeters, another non-pharmacological approach, back massage, was applied to manage labor pain during delivery. Research assistant measured pain level with the same method as the measure in the control group.

- At twenty-four hours after childbirth, research assistants collected data concerning childbirth experience with the perception of childbirth experience questionnaire in postpartum care unit. The process of measurement, time and method were similar to the measurement of the control group.

2. The researcher calculated the obtained data with statistical analysis method.

The process of data collection was summarized, as shown in figure 12.

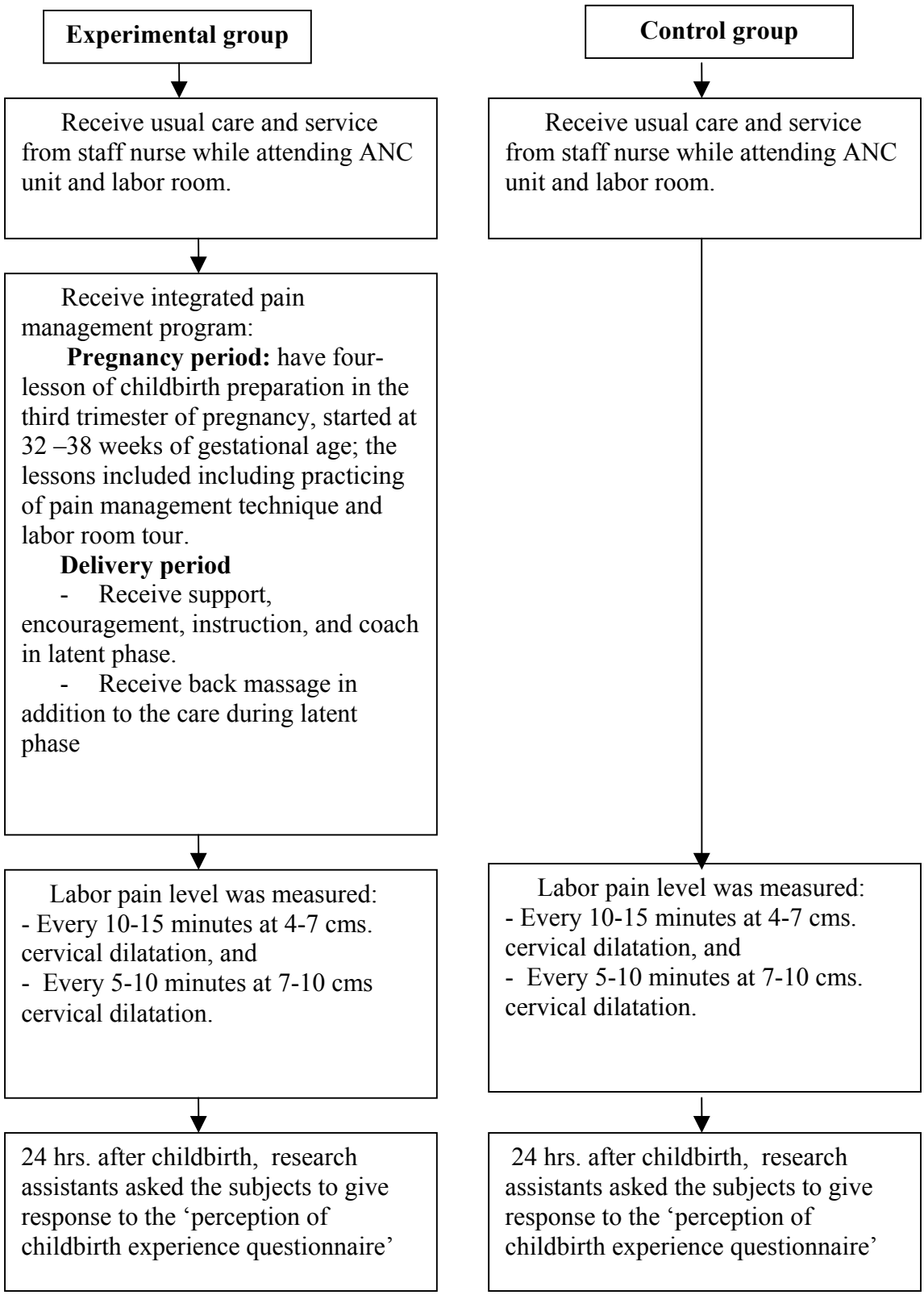


Figure 12: The diagram of data collecting process

Data analysis

The SPSS/PC program for Windows was used to analyze all obtained data. The following statistic methods were applied:

1. The frequency, percentage and mean values were used for demographic description.

2. The test of homogeneity was conducted with Chi-square test to investigation the distribution of data.

3. The scores regarding level of pain at 4-7 cms. and 7-10 cms. cervical dilatation, duration of first stage of labor, and perception of childbirth experience were calculated and expressed in mean values and standard deviation.

4. The mean scores of pain level in active and transitional phase, duration of first stage of labor, and perception of childbirth in the control and the experimental group was compared with the independent t-test.

CHAPTER 4
RESULTS

This research studied the effect of integrated pain management program on labor pain, duration of first stage of labor and childbirth experience in primiparous mothers. The results are presented in two parts. The first part is the comparison of personal characteristics of mothers in the control and the experimental groups. The second part is the comparison of mean scores regarding labor pain, duration of first stage of labor and childbirth experience between the control and the experimental groups.

Comparison of sample's characteristics

The factors expected to be associated with labor pain, duration of the first stage of labor, and perception of childbirth experience of primiparous mothers were analyzed to find the homogeneity between the study groups. The results are shown in Table 1 and Table 2.

Table 1 Comparison of sample's characteristics, using Chi-square test.

Characteristics	Control group (n = 30)		Experimental group (n = 30)		χ^2	p
	No	%	No	%		
Occupation						
Active	10	33.3	11	36.7	.073	.79^{ns}
Sedentary	20	66.7	19	63.3		
Planned pregnancy						
Yes	16	53.3	14	46.7	.27	.61^{ns}
No	14	46.7	17	53.3		
Type of family						
Nuclear	21	70.0	18	60.0	.66	.42^{ns}
Extended	9	30.0	12	40.0		
Infant's gender						
Male	18	60.0	16	53.3	.27	.60^{ns}
Female	12	40.0	14	46.7		
Infant's gender meeting with the expectation						
Yes	21	70.0	19	63.3	.30	.58^{ns}
No	8	30.0	11	36.7		
Medical augmentation						
Received	6	20.0	3	10.0	1.18	.28^{ns}
Did not receive	24	80.0	27	90.0		

ns = $p > .05$

More than half of the sample in both groups had sedentary occupation. There are more mothers in the control group who had planned the pregnancy (53.3%), whereas in the experimental group, less than half of the mothers had planned the pregnancy (46.7%). Most mothers in both groups were members of nuclear family (70% in the control group and 60% in the experimental group) and gave birth to male

infants more than female (60% in the control group and 53.3 % in the experimental group). Most mothers in both groups reported that the infants' genders met their expectations (70% in the control group and 63.3% in the experimental group). Less than a quarter of the sample in both groups had received medical augmentation (20% in the control group and 10% in the experimental group).

Chi-square test was used to compare the difference in characteristics of mothers in the control and the experimental groups. The results showed that occupation, planned pregnancy, type of family, infant's gender, expected infant's gender and medical augmentation of mothers in the control groups were not significantly different from those in the experimental groups ($p > .05$) (Table 1).

Table 2 Comparison of sample's characteristics, using t-test method

Characteristics	Control group (n = 30)			Experimental group (n = 30)			t
	min-max	$\bar{X}$	SD	min-max	$\bar{X}$	SD	
Age	20 – 32	25	3.30	20 – 32	24.57	3.00	.53^{ns}
Family income	5000 – 25,000 (Mode=15,000)	10866.67	5061.57	5000 – 40,000 (Mode=10,000)	12,200.00	8778.50	.72^{ns}
Year of education	6 – 16	11.70	2.82	6 - 16	12.67	2.62	1.38^{ns}

ns = $p > .05$

The mean age of mothers in both groups was approximately equal and the mothers' ages were in the same range of 20 – 32 years old ($\bar{X}$ = 25, SD = 3.30 in the control group and $\bar{X}$ = 24.57, SD = 3.00 in the experimental group). For family income, the control group had higher mode of family income than the experimental group (mode = 15,000 and 10,000, respectively); however, the range of family income in the experimental group was wider than that of the control group (range 5,000 – 40,000 and 5,000 – 25,000, respectively). The number of years of education was in the same range (6-16 years) and the mean values were nearly the same ($\bar{X}$ = 11.70, SD = 2.82 in the control group and $\bar{X}$ = 12.67, SD = 2.62 in the experimental group). The

comparison of the mean values of age, family income, and years of education with t-test showed no statistically significant different between the control and experimental groups regarding personal characteristics ($p > .05$) (Table 2).

The comparison of mean scores for labor pain, duration of first stage of labor and perception of childbirth experience between the experimental and the control group to find the effect of integrated pain management program is presented in Table 3.

Table 3 Comparison of labor pain level, duration of first stage of labor and perception of childbirth experience scores between control and experimental group, using by t-test.

Variables	Control group (n = 30)			Experimental group (n = 30)			t
	min-max	$\bar{X}$	SD	min-max	$\bar{X}$	SD	
Labour pain level							
Active phase (Cx. 4-7 cms)	7.70-9.50	8.50	0.46	6.40-8.00	7.32	0.43	5.66***
Transitional phase (Cx. 7-10 cms)	9.60-10.00	9.93	0.11	9.20-9.90	9.56	0.20	4.41***
Duration of First stage of labor (hour)	9.00-13.00	11.22	0.83	6.50-11.67	9.30	1.40	3.24***
Perception of Childbirth experience	87-135	109.97	10.62	139-162	155.60	4.69	-10.77***

*** = $p < .001$

The results indicated that the mothers in both groups had nearly the same mean scores of labor pain level in active phase ($\bar{X} = 7.32$, SD = .43 in the experimental group and $\bar{X} = 8.50$, SD = .46 in the control group) and transitional phase ($\bar{X} = 9.56$, SD = .20 in the experimental group and $\bar{X} = 9.93$, SD = .11 in the control group). However, when comparing the mean scores of both groups with t-test, the result showed statistically significant lower labor pain level in both active and transitional phase in the experimental group ($t = 5.66$, $p < .001$ and $t = 4.41$, $p < .001$ respectively). For the mean scores of the duration of first stage of labor, mothers in the experimental

group underwent shorter duration than those in the control group ($\overline{X}$ = 9.30 hours, SD = 1.40 and $\overline{X}$ = 11.22 hours, SD = 0.83 respectively). The comparison of the mean scores of both groups revealed that mothers in the experimental group had statistically significant shorter duration of first stage of labor than those in the control group ($t = 3.24$, $p < .001$). For perception of childbirth experience, mothers in the experimental group reported better perception of childbirth experience than those in the control group ($\overline{X}$ = 155.60, SD = 4.69 and $\overline{X}$ = 109.97, SD = 10.62 respectively). This was confirmed with the result of t-test, which revealed that mothers in the experimental group had statistically significant higher mean scores of perception of childbirth experience than those in the control group ($t = -10.77$, $p < .001$). Therefore, the hypotheses of this study were totally supported.

CHAPTER 5
DISCUSSION

This research was designed to study the effect of integrated pain management program on labor pain, duration of first stage of labor and childbirth experience in primiparous mothers. The following discussion is concerned with homogeneity testing and results in relation to the hypotheses of the study.

Homogeneity testing

The literature review revealed that many individual factors have impact on labor pain, duration of first stage of labor and mothers' perception of childbirth experience, e.g. gravidity, age, occupation, family income, etc. Thus, the researcher of this study tried to control these factors with purposive sampling method. The homogeneity of the sample was tested with Chi-square analysis and t-test; and the results show that the characteristics of sample in the control and the experimental groups were not statistically significant different ($p > .05$) (Table1 and 2). Thus, it is very likely that the results of this study were the consequences of the effect of the integrated pain management program.

Hypotheses testing

Hypothesis 1: "The level of labor pain in primiparous mothers who have received the integrated pain management program would be lower than those receiving usual care."

At the end of the study, the mean scores of labor pain level in active and transition phase were 7.32 and 9.56 in the experimental group, and 8.50 and 9.93 in the control group; thus the results of both groups were very close. However, the comparative analysis with t-test revealed that the experimental group had statistically

significantly lower score of labor pain level than the control group ($t = 5.66$, $p < .001$ and $t = 4.41$, $p < .001$ respectively) (9Table 3); therefore, the result of this study supports the hypothesis. This could be explained from the integrated pain management program that the experimental group had attended. The program could reduce labor pain level on account of its major mechanisms that are associated with the gate control theory (Melzack & Wall, 1982), as discussed in details below.

The first mechanism is the cognitive-affective control. Women in the experimental group learned about labor and labor pain management strategies at the 32nd week of their pregnancy and also visited labor room. During delivery, they received mental and emotional support such as being informed about progress of labor, receiving help for some activities, and being empowered and encouraged. The researcher delivered laboring care to these women with pleasant manners – smiling face and polite talk, as well as patiently coaching. These treatments contribute to the mothers' perception of warmth and support. In addition, non-pharmacological techniques such as concentration, distraction from pain, and muscle relaxation could reduce emotional stimuli to the central nervous system. Also, good knowledge increases understanding and confidence in dealing with situations during delivery and decreases anxiety and fear of the unknown factors caused by misunderstanding (Bask & Gold, 1982: 242). The reduction of anxiety and fear leads to pain relief because it inhibits impulses from the cerebral cortex and the thalamus. While concentration, distraction and muscle relaxation inhibit sensory input to the limbic system, resulting in the gate control closing for pain impulse (Reeder, Martin & Koniak, 1997: 500) thus reducing the mother's perception of labor pain.

Secondly, the impulses from small fibers decreased because the mothers practiced not only exercises but also positioning and movements to promote labor. After returned demonstration, they were encouraged to practice at home everyday in order to use these techniques to manage labor pain during delivery. Exercises increase muscles' strength and tolerance, while appropriate positions and movements contribute to both comfort and rapid labor progress. Maintained upright positions, such as walking, standing, standing and leaning forward, sitting and leaning forward with support, in the first stage of labor permits the abdominal wall to relax; therefore, the pressure is relived from the fundus, the back and the buttock. In addition, the

chest breathing control technique was used to release pressure from the diaphragm, which compresses the fundus. All above techniques reduce the mother's labor pain.

The last one is increased impulses from large fibers with effleurage technique and back massage given in active and transitional phase. The increased impulses from large fibers will close the gate control of pain sensation. This finding was supported by previous studies conducted by Field and associates (1997: 286 – 291), Chang, Wang & Chen (2002: 68 – 73), and Linda Kimber (2003: 77-82). They found that mothers who received back massage in the first stage of labor had significant lower pain score than the mothers who did not.

Hypothesis 2: "the primiparous mothers who received the integrated pain management program would have shorter length of labor than those receiving usual care."

The mean score of the duration of the first stage of labor in the experimental group was 9.30 hours, while the corresponding result in the control group was 11.22 hours. However, when they were compared to find out the effect of the integrated pain management program, the result indicated that the duration of the first stage of labor of the experimental group was significantly shorter than the control group ($t = 3.24$, $p < .001$) (Table 3), thus supporting the hypothesis of this study. This is because during the first stage of labor, mothers in the experimental group were encouraged to use appropriate positions and movements to promote labor. The upright position permits abdominal wall to relax, which helps the fundus to fall forward through the force of gravity. This forward position of the fundus directs the fetal head to well engage into the cervical cavity. It is postulated that cervical stimulus feeds back stimuli that increase the intensity and regularity of uterine contractions (Reeder, Martin & Koniak, 1997: 554; Pilitteri, 1995: 531). Effective uterine contraction leads to cervical change affecting labor process (Dickason, Silverman & Kaplan, 1998: 282). Then the process of labor speeds up (Sweency cited by Shaver, 1993: 58). In Aderhold and Roberts's study on pregnant women in an upright position (1991 cited by Dickason, Silverman & Kaplan, 1998: 296), the results showed that the position was effective for uterine contraction. In addition, using upright position during active phase could lead to a short phase of maximum slope (Dickason, Silverman & Kaplan, 1998: 295). In

Andrews and Chrzanowski's study on upright positions in normal primigravidas (1990: 7 – 13), it was discovered that the mothers who maintained upright positions had a significantly shorter phase of maximum slope (cervical dilatation 4 – 9 centimeters in diameter) than the mothers who maintained horizontal position.

During uterine contractions, the mothers relaxed muscles and concentrated on breathing or abdomen effleurage. Relaxation can help reducing tension, conserving energy, and increasing the effectiveness of uterine contractions, resulting in more efficient labor (Kaner & MacLaren, 1993: 1030). Breathing technique can promote relaxation of abdominal muscles and thereby increase the size of the abdominal cavity. Therefore, it lessens friction between the uterus and the abdominal wall because the muscles of the genital area is more relaxed. Consequently, discomfort in the abdomen is lowered, and descent of the fetus is easier (Bobak & Jensen, 1993: 455), which can accelerate the progress of labor thus shortening the duration of labor. Besides that, in this study, the researcher had delivered back massage to the mothers in active and transitional phase. The mothers had to be in the upright position as it was an appropriate position for back massage. The mechanical effect of massage was not only the stimulation on large fibers, which inhibited pain impulses at the spinal level and consequently closes the gate, but the massage also increased endorphin release to inhibit substance P, which is associated with the transmission of pain impulse; as a result, the mothers experienced more physical comfort. Furthermore, physical contact and continual communication during massage could minimized the sensory overload, and eventually shortened the duration of labor. Simkin (1995: 169) who stated that the mothers whose physical and psychological comfort was well promoted would have rapid progress of labor and a short duration of labor supports this.

The result of this study is consistent with that of the studies conducted by Flynn and associates (1978: 591– 593), Diaz and associates (1980: 1 – 7), Liu (1989: 14-18), and Yotsathien (1999: 54 – 63). These studies found that the mothers who used upright position such as standing, walking, etc. in the first stage of labor had statistically significant shorter duration of first stage of labor than those who did not do so. However, this result is inconsistent with the studies conducted by Subprasert (1998: 98) and Sankasuwan (2000: 4), which found no statistically significant difference in first stage of labor between primiparous mothers who were promoted to

use the upright positions and the mothers who were not. This inconsistency of results may be explained from the possibility that not only upright position can promote the progress of labor but other factors are also associated with the progress of labor, such as favorable position of cervix, effective uterine contraction, anatomy of the pelvis, and fetal size.

Hypothesis 3: "The primiparous mothers who received the integrated pain management program would have better perception of childbirth experience than those receiving usual care".

The results show that the mean score of the perception of childbirth experience of mothers in the experimental group was 155.60, whereas the mean score of the control group was 109.97. The comparative analysis with t-test revealed that the perception of childbirth experience of mothers in the experimental group was significantly better than that of those in the control group ($t = 21.53$, $p < .001$) (Table 3).

In the integrated pain management program, the mothers attended four lessons of childbirth preparation since the 32nd week of pregnancy. They learned about labor and labor pain management strategies, expressed their feelings about labor, practiced exercise for childbirth, positions and other techniques, including having labor room tour. The knowledge and familiarity with the environment decrease anxiety and fear of the unknown factors caused by misunderstanding (Bask & Gold, 1982: 242), leading to increased self-confidence in dealing with labor and labor pain.

During the first stage of labor, the researcher provided mothers in the experimental group with both physical and emotional support in order to make them feel more comfortable. When the mothers could cope with pain, they would not view the infants or childbirth as causes of extreme distress and they would have good perception of childbirth experience as a consequence. As Gorrie and associates (1994: 362) stated, "*the mothers who can control their labor pain will have a good perception of childbirth experience*".

The result of this study is consistent with the study of Athaseri, Chatpothong & Serisathien (1990) who found that mothers who received psychological nursing support had better perception of childbirth experience than those receiving usual

nursing care. Similarly, Subprasert (1999: 47) revealed that the perception of childbirth experience in primiparous mothers who used non-pharmacological technique to relieve pain in the first stage of labor was significantly more positive than the perception of those who did not use the techniques. In addition, the study conducted by Sankasuwan (2000) also found that the mothers who participated in the childbirth preparation program had better perception of childbirth experience than the those receiving usual care at statistically significant level ($F = 11.25$, $p < .05$).

CHAPTER 6
CONCLUSION

This quasi-experimental research design aimed to determine the effect of integrated pain management program on labor pain, duration of first stage of labor and perception of childbirth experience in primiparous mothers who had prenatal care and gave birth at Mettapracharak (Wat Raiking) Hospital. The purposive sampling technique was used to obtain 60 of samples in each group based on the similarity of individual characteristics. The control group was received usual care by the staff nurse, while the experimental group was received usual care plus the integrated pain management program by the staff nurse and the researcher. Data were collected from the control group first and the experimental group later.

Research instruments was divided into two parts; instruments for intervention and for data collection. Instruments for intervention were the integrated pain management program, handbook for the mothers and the lesson plan about labor and labor pain management strategies. Instruments for collecting data consisted of the Demographic Data Form and two instruments for measuring labor pain level and assessing perception of childbirth experience.

The primiparous mothers were asked to complete the Demographic Data Form at the first met, follow by Pain – Color Scale in the labor room and then the perception of childbirth experience Questionnaire at least 24 hours after birth. Data were analyzed with the SPSS/FW program by using descriptive and t-test.

Results of this study revealed that the mothers in the experimental group had statistically significantly lower labor pain level both in active and transition phase than and shorter duration of first stage of labor ($t = 5.66$, $p < .001$, $t = 4.41$, $p < .001$ and $t = 3.24$, $p < .001$ respectively) than those in the control group. For the perception of childbirth experience the experimental group had statistically significant higher scores than those in control group ($t = 10.77$, $p < .001$).

Recommendation

Nursing practice

1. The integrated pain management program should be combined with routine teaching of the Antenatal Care Unit and nursing intervention of the Labor Room. However, in case of the hospital has problem of staff nurses retention, partial or some selected contents about labor and labor pain management strategies can be applied into the instruction program. Hospital should provide workshop or refresh course of non-pharmacological labor pain management strategies for staff nurses both in Antenatal Care Unit and labor room, thus they will coordinate together to teach the mothers at Antenatal Care Unit by rotation. This can also make the mothers be familiar with the Labor Room's staff nurses since in antenatal period.

2. Because the integrated pain management program is one – to - one support in labor. So to use it effectively, the job assignment for staff nurses should be adjust in the primary nursing system.

3. Should be allowed significant others such as husbands, pregnancy's mothers, family's member or someone who always accompanies to hospital with the pregnant to participate in class because they will be the one who can coaching and back massaging for the mothers at home.

4. Labor Room should provide the place or corner which the husbands or relatives can visit by let the mothers walk out. It not only can promote mothers to walk but also make them stay close. So the mothers will be received more emotional support, at that time nurses who function as care giver can becomes a facilitator for family-centered care to help the mothers cope with labor pain by enhancing the family members to give touch, coach and empower the mothers. It is a positive way of giving them an active role in the process of labor. They will be closer and feel better in relation.

5. A handbook for mothers, related to labor and labor pain management strategies should be provided for basic knowledge of primiparous mothers.

Nursing education

The integrated pain management program workshop should be provided for nurse students in order to enhance their knowledge about the non-pharmacological

pain management techniques. It will help them response to mothers' need appropriately, and will give them more confidence in their role in providing care for the mothers because they can perform independently.

Nursing research

Based on the finding of the present study, the following implications for further studies are recommended:

1. Study of the effect of integrated pain management program on labor pain, length of labor and perception of childbirth experience, in other risk groups of mothers, such as adolescent mothers or elderly primigravidous mothers.
2. Study of long-term effect of integrated pain management program on maternal attachment, role satisfaction and competency in maternal role at 3 or 6 months postpartum.
3. Study of the effect of integrated pain management program by the others supporter such as husbands, pregnancy's mothers, family's members, or friends on satisfaction in labor and childbirth experience.

Limitation of the study

1. In this study, the researcher could not know whether the sample mothers practiced the labor pain management strategies such as exercise as they reported in the practice document sheet or not, since it was the activities at her home.
2. Sample size was not large (30 cases per each group) and purposively selected, so the result can not refer to the generalization population.
3. Since all of intrapartum pain control strategies did not apply to all mothers equally. Therefore this study had the problem of threaten to construct validity.

BIBLIOGRAPHY

Albers, L.L. et al., (1996). Factors related to perineal trauma in childbirth. Journal of Nurse-Midwifery, 41(4): 269-276.

Andrews, C.M.& Chrzanowski, M. (1990). Maternal position, Labour, and Comfort. Applied Nursing Research, 3 (1) : 7-13.

Auvenshine, M.A. & Enriques, M.G. (1990). Comprehensive Maternity Nursing : Prenatal and Women;s Health. 2nd ed. Boston: Jones and Bartlett.

Barbara, S. (1984). Control of pain in labor. Nursing Mirror, 7 (March) : 31-33.

Bask, D.B.&Gold, W.A. (1982). The nurse and the childbearing family. New York: John Wiley&Son.

Birch, E.R. (1986). The experience of touch received during labor : Postpartum Perceptions of Therapeutic Value. Journal of Nurse-Midwifery, 31(6) : 270-276.

Bobak, I.M., Lowdermilk, D.L.& Perry, S.E.(1995). Maternity nursing. 4th ed. St. Louis : Mosby.

Bobak, I.M. &Jensen, M.D.(1993). Maternity & Gynecologic Care: The nurse and the family. 5th ed. St. Louis : Mosby.

Bonica, J.J. (1994). Textbook of Pain. 3rd ed. NewYork : Churchill Livingstone.

_____(1996). The nature of pain in parturition. In Zundert, A.V. and Ostheimer, G.W. (Eds) Pain relief and anesthesia in obstetrics. New York : Churchill Livingstone.

Bonnel, A.M. & Boureau, F. (1985). Labor Pain Assessment: Validity of a Behavioral Index. Pain, 22(1) : 81-90.

Bonica, J.J. & McDonald, J.S. (Eds). (1995). Principles and practice of obstetric analgesia and anesthesia. 2nd ed. Baltimore : Williams & Wilkins.

Breen,T.W. et al., (1994). Factors associated with back pain after childbirth. Anesthesiology, 81(1) : 29-34.

Browning, C.A. (2000). Using Music During Childbirth. Birth,27(4):272-276.

Buxton, B.P. (1990). The Relationship between Personality characteristic and pain response. CINHAL (1982 to September 1994) ANN ARROR : University of Microfilms.

Camann, W.R. et al., (1991). Maternal temperature regulation during extradural analgesia for labor. British Journal Anaesthiology, 67(2) : 565-568.

Carpenito, L.J. (1993). Nursing diagnosis application to clinical practice. 5th ed. Philadelphia : J.B. Lippincott.

Chang, M.Y., Wang, B.G. & Chen, C.H. (2002). Effect of massage on pain and anxiety during labour : a randomized in Taiwan. Journal of Advanced Nursing, 38(1) : 68-73.

Clark, A., Affonso, D.D. & Harris, T.R. (1993). Childbearing : A nursing perspective. 4th ed. Philadelphia : R.A. Davis.

Cranley, M.S., Hedahl, K.J. & Pegg, S.H.(1983). Women's perceptions of vaginal and cesarean deliveries. Nursing Research, 32(1) : 10-15.

Diaz, A.G., et al. (1980). Vertical position during the frist stage of the course of labour and neonatal outcome. European Journal of Obstetrics Gynecology and Reproductive Biology, 1(1): 1-7.

Dickason, E.J., Silverman, B.L. & Kaplan, J.A.(1998). Maternal-Infant Nursing Care. 3rd ed. St. Louis : Mosby.

Dick-Read, G.(1984). Childbirth without fear. New York : Harper & Row.

Elizabeth Noble, P.T. (1988). Essencial Exercises for the Childbearing Year : A Guide to Health and Comfort Before and After Your Baby Is Born. 3rd ed. Boston : Houghton Mifflin.

Feldman, H.R. (1991). Pain. In Patrick, et al. (Eds.) Medical-Surgical Nursing Path of Physiological Concept. Philadelphia : J.B. Lippincott. p. 100-105.

Field,T.,Hernandez-Reif,M.,Taylor,S.,Quintino,O.&Burman,I.(1997). Labor pain is reduced massage therapy. Journal Psycosomatic of Obstetrics Gynecology,18 (4):286-291.

Fridh, G. et al. (1988). Factors associated with more intense labor pain. Research in Nursing & Health, 11(2) : 117-124.

Flynn, A.M., et al. (1978). Ambulation in labour. British Medical Journal, 26: 591-593.

Gaston – Johanson, F. et al., (1988). Progression of labor pain in primiparas and multiparas. Nursing Research, 37(1) : 86-89.

Gorrie,T.M., McKinney,E.S. & Murry,S.S. (1994). Foundations of Maternal-Newborn Nursing. Philadelphia : W.B. Sanders Company.

Jimenez, S.M. (1988). Supportive pain management strategies. In Nichols, F.H. & Humenick, S.S. (Eds.) Childbirth education : Practice, Research and Theory. Philadelphia : W.B. Saunders company.

Joanne, W. (1990). Pain control in labour. Nursing, 4(2) : 14-16.

Kaminski, H.M, Stafl, A. & Aiman, J.(1987). The effect of epidural analgesia on the frequency of instrumental obstetric delivery. Obstetrics & Gynecology, 69 (5) : 770-773.

Kamp, V.H. & Hatmaker, D.D. (1989). Stress and Social Support in High-Risk Pregnancy. Research in Nursing & Health, 12(3) : 331-336.

Kaner, C.A.& MacLaren, A. (1993). Essentials of Maternal and neonatal Nursing. Pensylvania: Springhouse Corporation.

King, T. (1997). Epidural anesthesia in labor : Benefits versus Risks. Journal of Nurse- Midwifery, 42(5) : 377-388.

Larson, P.J. et al. (1994). A model for symptom management. IMAGE : Journal of Nursing Scholarship, 26(4) : 272-276.

Lauretti, G.R. (1999). Mechanisms of Labor Pain. In Norris, M.C. (Eds). Obstetric Anesthesia. 2nd ed. Philadelphia : Lippincott Williams & Wilkins.

Lederman, R.P. et al. (1978). The relationship of maternal anxiety, plasma catecholamine and plasma cortisol to progress in labor. American Journal of Obstetric and Gynecology, 132 (64) : 495-500.

_____ (1979). Relationship of psychological factors in pregnancy to progress in labor. Nursing Research, 28 (1) : 94-97.

Lieberman, E. et al.(1996). Association of epidural Analgesia with cesarean delivery in nulliparas. Obstetrics & Gynecology, 88(6) : 993-1000.

_____ (1997). Epidural analgesia, Intrapartum fever and Neonatal sepsis evaluation. Pediatrics, 99(3) : 415-419.

Kimber, L. (1998). Effective techniques for massage in labour. The Practising Midwifery, 1(4) : 36-39.

_____ (2003). The effect of massage on labour. Journal of Nurse-Midwifery, 48(2) : 77-82.

Liu, Y.C. (1989). The Effects of the Upright Position During Childbirth. IMAGE: Journal of Nursing Scolarship, 21(1), 14-18.

Lowe, N.K. (1987). Parity and pain during paturition. Journal of Obstetric Gynecology and Neonatal Nursing , 16 (3) : 340-346.

_____(1989). Explaining the pain of active labor : The importance of maternal confidence. Research in Nursing &7 Health, 12(2) : 237-240.

_____(1991). Confidence in coping with labor : A self-Efficacy concept. Journal of Obstetric Gynecology and Neonatal Nursing , 20(4) : 457-463.

_____(1996). The pain and discomfort of labor and birth. Journal of Obstetric Gynecology and Neonatal Nursing , 25(1) : 82-92.

MaCaffery, M. (1979). Nursing management of the patient with pain. NewYork : J.B. Lippincott.

MacArthur, C., Lewis, M. & Knox, E.G.(1992). Investigation of long term problems after obstetric epidural anaesthesia. British Medical Journal, 304(16 May) : 1279-1282.

Macaulay, J.H., Bond, K. & Steer, P.J. (1992). Epidural analgesia in labor and fetal hyperthermia. Obstetrics & Gynecology, 80(4) : 665-669.

Magni, G., et al. (1986). Psychosocial stress and obstetric complication. ACTA Obstetric and Gynecologic Scandinavia, 65(3) : 273-276.

Manning, M.M. & Wright, T.L. (1983). Self-efficacies expectancies, outcome expectancies and the persistwnce of pain control in childbirth. Journal of Personality and Social Psychology, 45(4) : 421-431.

Martin, L.L. & Reeder, S.J.(1991). Essentials of Maternity Nursing : family-centered care. Philadelphia : J.B. Lippincott.

Marut, L.S. & Mercer, R.T.(1979). Comparison of primipara's perception of vaginal and cesarean birth. Nursing Research, 28(5) : 260-266.

May, K.A. & Mahlmeister, L.R.(1994). Maternal and Neonatal nursing : Family-centered care. 3rd ed. Philadelphia : J.B. Lippincott.

McDonald, J.S. (2001). Pain of childbirth. In Loeser, J.D., Butler, S.H., Chapman, C.R. & Turk, D.C. (Eds) Bonica's Management of Pain. 3rd ed. Philadelphia : Lippincott Williams & Wilkins.

McGuire, D.B. (1992). Comprehensive and Multidimensional Assessment and Measurment of Pain. Journal of Pain and Symptom Management, 5 (July) : 314-315.

McGuire, D.B. (1992). Measurment Pain. In Frank-Stromborg, M. & Pender, J.N. (Eds) Instrument for clinial Nursing Research. Boston : Jones & Bartlett Publisher. p. 333-356.

McKinney, E.S. et al.(2000). Maternal-Child Nursing. Philadelphia : W.B. Saunders Company.

Melzack, R. & Schaffelberg (1987). Low- back pain during labor. American Journal Obstetrics and Gynecology, 156(6) : 901-905.

Melzack, R. (1993). Labour pain as a model of acute pain. Pain, 53 (2) : 117-120.

Mercer, R.T. (1985). Relationship of the birth experience to the late mothering behavior. Journal of Nurse-Midwifery, 30(4) : 204-211.

Morgan, B.S. & Barden, M.E. (1985). Unwed and pregnant : Nurses' attitudes toward unmarried mothers. Maternal and Child Nursing, 10(2) : 114-118.

Myles, M.F. (1989). Textbook for Midwives. 11th ed. Edinburgh : Churchill Livingstone.

Newton, E.R. et al., (1995). Epidural analgesia and uterine function. Obstetric & Gynecology, 85 (5 part 1) : 749-755.

Nichols, F.H. & Humenick, S.S.(1988). Childbirth education : Practice, Research and Theory. Philadelphia : W.B. Saunders company.

Niven, C.A. & Murphy-Black, T. (2000). Memory for labor pain : A review of the literature. Birth, 27(4) : 244-255.

Nolan, M. (1998). Antenatal Education : A Dynamic Approach. London : Bailliere Tindall.

Norr, K.L. et al. (1977). Explain pain and enjoyment in childbirth. Journal of Health and Social Behavior, 10(1) : 260-275.

Nunnally, D.M., & Aguiar, M.B. (1974). Patient's evaluation of their prenatal and delivery care. Nursing Research,23(4) : 469-474.

Olds, S.B., London, M.L. & Ladewig, P.W.(1996). Maternal-Newborn nursing : A family-centerd approach. 5th ed. California : Addison-Wesley Nursing.

Penny Simkin, P.T. (1991). Just another day in a woman's life? Women's long-term perceptions of their first birth experience.Part I.Birth,18(4):203-210.

_____ (1992). Just another day in a woman's life? Part II : Nature and consistency of women's long-term memories of their first birth experience. Birth,19(2) : 64-81.

_____ (1995). Reducing pain and enhancing progress in labor: A guide to nonpharmacologic methods for maternity cargivers. Birth, 22(3): 161-171.

Pilitteri, A. (1995). Marternity and Child health nursing : Care of the childbearing and child family. 2nd ed. Philadelphia : J.B. Lippincott

Ploeckinger, B. et al., (1995). Epidural anaesthesia in labor : Influence on surgical delivery rate, intrapartum fever and blood loss. Gynecology & Obstetric Investigation, 39(3) : 24-27.

Polit, D.F. & Hungler, B.P. (1983). Nursing Research. Philadelphia : J.B. Lippincott Company

Ransjo-Arvidson, A. et al., (2001). Maternal analgesia during labor disturbs newborn behavior : Effect on breastfeeding, temperature and crying. Birth, 28(1) : 5-12.

Reeder, S.J., Martin, L.L. & Koniak, D. (1997). Maternity nursing family, newborn and women's health care. 18th ed. Philadelphia : J.B. Lippincott

Rowlingson, J.C. (1994). The Assessment of Pain. In Hamill, R.T. & Rowlingson, J.C. (Eds.) Handbook of Critical care Pain Management. NewYork : McGraw-Hill.

Russell, R. et al., (1993). Assessing long term backache after childbirth. British Medical Journal, 306(1 January) : 1299-1303.

Scanlon, J.W., Brown, W.U. & Weiss, J.B. (1974). Neurobehavioral responses of newborn infants after maternal epidural anesthesia. Anesthesiology, 40(2) : 121-128.

Shaver, D.C. (1993). Clinical Manual of Obstetrics. 2nd ed. Singapore: McGraw-Hill.

Sherwen, L.N., Scoloveno, M.A. & Weingarten, C.T. (1995). Nursing care of the childbearing family. Norwalk : Appleton & Lange.

Simpson, K.R. & Creehan, P.A.(1996). AWHONN : Perinatal Nursing. Philadellphia : Lippincott-Ravern.

Thompson, E.D.(1995). Introduction to Maternity and Pediatric nursing. 2nd ed. Philadelphia : W.B. Saunders Company.

Thorp, J.A. et al., (1993). The effect of intrapartum epidural analgesia on nulliparous labor : A randomized, controlled, prospective trial. American Journal of Obstetric and Gynecology, 169 (4) : 851-858.

Thorp, J.A. & Breedlove, G.(1996). Epidural analgsia in labor : An evaluation of risks and benefits. Birth, 23(2) : 63-83.

Walker, L.O. (1992). Parent-Infant Nursing Science: Paradigms, Phenomena, Methods. Philadelphia : F.A. Davis company.

Willmuth, L.R. (1975). Prepared Childbirth and The Concept of Control. Journal of Obstetric Gynecology and Neonatal Nursing, 4(1) : 38-41.

จีรเนาว์ ทัศศรี. (Jeeranao Tudsri) (2536). การบริหารร่างกายสำหรับผู้รับบริการสูติกรรม. กรุงเทพ : โอ. เอส. พริ้นติ้งเฮาส์.

จตุพล ศรีสมบูรณ์. (Jatupon Srisomboon) (2540). Painless Labor. ภาควิชาสูติศาสตร์-นรีเวชวิทยา คณะแพทยศาสตร์มหาวิทยาลัยเชียงใหม่.

จารุวรรณ รังสิยานนท์. (Jaruwan Rungsiyanon) (2540). ผลของการเตรียมหญิงครรภ์แรกเพื่อการคลอดต่อการรับรู้ความสามารถของตนเองและความคาดหวังผลลัพธ์ในการเผชิญกับภาวะความเจ็บครรภ์. วิทยานิพนธ์พยาบาลศาสตรมหาบัณฑิต, สาขาวิชาการพยาบาลแม่และเด็ก บัณฑิตวิทยาลัย มหาวิทยาลัยเชียงใหม่.

จินตนา บ้านแก่ง. (Jintana Bangang) (2533). การพยาบาลสตรีตั้งครรภ์ที่มีความเจ็บปวดในระยะคลอด.กรุงเทพ : โรงพิมพ์อักษรไทย.

จุฬาภรณ์ ตรีโอษฐ์. (Juraporn Triode) (2531). ประสิทธิผลของโครงการสุขศึกษาเพื่อเตรียมมารดาให้มีความพร้อมในการคลอด ศูนย์ส่งเสริมสุขภาพเขต 4 ขอนแก่น. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต(สาธารณสุขศาสตร์), สาขาวิชาเอกสุขศึกษา บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

เจียรนัย โพธิ์ไทรย์. (Jearanai Phosai) (2539). การคลอดอย่างมีคุณภาพ : มิติใหม่สำหรับพยาบาล. วารสารพยาบาลศาสตร์, 23(4) : 1-5.

ฉวี เบาทรวง. (Chawee Baosuang) (2526). ผลของการให้คำแนะนำในการปฏิบัติตัวอย่างมีแบบแผนและการสัมผัสต่อการลดความวิตกกังวลและพฤติกรรมการเผชิญภาวะเครียดในระยะคลอด. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต, สาขาพยาบาลศาสตร์ บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ฉวีวรรณ อยู่สำราญ.(Chaweewan Yusamran) (2533). ผลการจัดท่าคลอดต่อระยะเวลาของการคลอด ความพึงพอใจของผู้คลอดต่อท่าคลอดและสภาวะของทารกแรกเกิด. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต, สาขาการพยาบาลศาสตร์ บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ชญาภรณ์ ไวยเนตตา. (Chayapron Vainatetra) (2542). ประสบการณ์ความปวด และการจัดการกับความปวดในหญิงหลังผ่าตัดคลอดทางหน้าท้อง. วิทยานิพนธ์พยาบาลศาสตรมหาบัณฑิต, สาขาการพยาบาลมารดาและทารกแรกเกิด บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ดรรชนี ลิ้มประเสริฐ. (Datchanee Limprasert) (2539). ผลของดนตรีต่อการเผชิญความเจ็บปวดในระยะคลอดของผู้คลอดครรภ์แรก. วิทยานิพนธ์พยาบาลศาสตรมหาบัณฑิต, สาขาการพยาบาลแม่และเด็กบัณฑิตวิทยาลัย มหาวิทยาลัยเชียงใหม่.

เทียมศร ทองสวัสดิ์. (Teaumsron Tongsawat) (2531). การเตรียมตัวเพื่อการคลอด. (พิมพ์ครั้งที่ 2). เชียงใหม่ : ศูนย์ส่งเสริมวิชาการมหาวิทยาลัยเชียงใหม่.

นิพรรณพร วรมงคล. (Nipanpron Woramongkol, N.) (2543). ลูกเกิดรอด แม่ปลอดภัย : การดำเนินการในประเทศไทย. วารสารการศึกษาพยาบาล, 10(3) : 2-5.

บุญสืบ โสโสม. (Boonserab Sosome) (2539). ความสัมพันธ์ระหว่างการรับรู้สมรรถนะในการเผชิญความเจ็บปวดในระยะคลอด. วิทยานิพนธ์พยาบาลศาสตรมหาบัณฑิต, สาขาการพยาบาลแม่และเด็ก บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ประกายแก้ว กำคำ. (Prakaikeaw Kakam) (2534). ผลของการช่วยเหลือของสามีต่อผู้คลอดครรภ์แรกในระยะเจ็บครรภ์ต่อการควบคุมตนเอง ความต้องการยาระงับปวด ระยะเวลาในการคลอดและการรับรู้ประสบการณ์คลอด. วิทยานิพนธ์ครุศาสตรมหาบัณฑิต, สาขาการบริหารการพยาบาล บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย.

ปราณี แสงรุ่งนภาพรรณ. (Pranee Sangrungnapapan) (2531). การมีส่วนร่วมของสามีในระยะเจ็บครรภ์ต่อความวิตกกังวลและพฤติกรรมการเผชิญภาวะเครียดของผู้คลอดครรภ์แรก ณ โรงพยาบาลศรีนครินทร์จังหวัดขอนแก่น. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต, สาขาอนามัยครอบครัว บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ปิยะรัตน์ ตาตินิจ. (Piyarat Tatinit) (2524). ความเจ็บปวดในการคลอด. วารสารคณะพยาบาลศาสตร์, 4(กรกฎาคม-กันยายน) : 32-41.

พรนิรันดร์ อุดมถาวรสุข. (Proniran Udomthavornsuk) (2528). การพยาบาลอย่างมีแบบแผนต่อการลดความเจ็บปวดจากการฉีดยาเข้ากล้ามเนื้อสะโพก.วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต, สาขาวิชาพยาบาลศาสตร์ บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

พรรณิภา รักษ์กุศล. (Pannipa Ragguson.) (2537). ผลของการเตรียมคลอดอย่างมีแบบแผนต่อพฤติกรรมการเผชิญความเจ็บปวดในระยะคลอด และเจตคติที่มีต่อการคลอด. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต, สาขาวิชาพยาบาลศาสตร์ บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

พรรณพิไล ศรีอาภรณ์. (Panpilai Sriarpron) (2540). การพยาบาลเพื่อช่วยประคับประคองสตรีในระยะคลอด. พยาบาลสาร, 2 (เมษายน- มิถุนายน) : 1-7.

พิชัย เจริญพานิช. (Pichi Chareonpanith) (2539). การออกกำลังกายและเพศสัมพันธ์ระหว่างตั้งครรภ์. กรุงเทพ : 21 เซนจูรี่ จำกัด.

พิริยา ศุภศรี. (Piriya Supprasri.) (2540). การพยาบาลในระยะคลอด. (พิมพ์ครั้งที่ 2) กรุงเทพ : ศูนย์สื่อเสริมกรุงเทพ.

มัณฑนา กัลยา. (Mantana Kanlaya.) (2540). ผลของดนตรีต่อความเจ็บปวดและพฤติกรรมการเผชิญความเจ็บปวดของหญิงครรภ์แรกในระยะที่ 1 ของการคลอด. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต(สาธารณสุขศาสตร์), สาขาวิชาเอกพยาบาลสาธารณสุข บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

มาลินี ปัญญาคำเลิศ. (Malinee Panyakamlerd) (2539). ผลการให้สุขศึกษาแก่หญิงตั้งครรภ์ในการเตรียมตัวเพื่อการคลอดปกติโดยวิธีของดิกรีดกับวิธีของลามาซที่โรงพยาบาลตำรวจ. วิทยานิพนธ์การศึกษามหาบัณฑิต, สาขาวิชาเอกสุขศึกษา บัณฑิตวิทยาลัย มหาวิทยาลัยศรีนครินทรวิโรฒ.

ยุวดี ทรัพย์ประเสริฐ. (Yuwadee Subprasert.) (2541). ผลของการพยาบาลโดยใช้เทคนิคการบรรเทาความเจ็บปวดโดยไม่ใช้ยา ต่อพฤติกรรมการเผชิญความเจ็บปวดในระยะคลอด ระยะเวลาคลอด และการรับรู้ประสบการณ์การคลอดของผู้คลอดครรภ์แรก. วิทยานิพนธ์พยาบาลศาสตรมหาบัณฑิต, สาขาการพยาบาลศึกษา บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย.

ยุวดี วัฒนานนท์ และคณะ. (Yuwadee Wattananon and others) (2526). ผลการสำรวจความวิตกกังวลของมารดาที่มีต่อกระบวนการคลอด. ภาควิชาการพยาบาลสูติ-นรีเวชวิทยา คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล.

ยุวดี ฦาชา และคณะ. (Yuwadee Luecha and others) (2540). วิจัยทางการพยาบาล.(พิมพ์ครั้งที่ 6) กรุงเทพ : สยามศิลป์การพิมพ์.

เยาวลักษณ์ เสรีเสถียร. (Yaowalak Serisathien.) (2530). ความสัมพันธ์ระหว่างการรับรู้เกี่ยวกับประสบการณ์การคลอด อัตมโนทัศน์ กับสัมพันธภาพระหว่างมารดาและบุตรในมารดาที่มีภาวะเสี่ยง. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต, สาขาพยาบาลศาสตร์ บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

รสสุคนธ์ ลิ้มทะวงศ์.(Rodsukon Limtawong.) (2530). ผลการเตรียมคลอดด้วยวิธีของลามาซต่อพฤติกรรมการเผชิญความเจ็บปวดของมารดาในระยะคลอดและสัมพันธภาพระหว่างมารดาและทารก. วิทยานิพนธ์วิทยาศาสตร์มหาบัณฑิต, สาขาวิชาพยาบาลศาสตร์ บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ละมัย วีระกุล และคณะ. (Lamai Welakul and others) (2534). เปรียบเทียบความแตกต่างของพฤติกรรมการเผชิญความเจ็บปวดในระยะคลอดระหว่างมารดาที่ได้รับการฝึกเตรียมคลอดกับมารดาที่ไม่ได้รับการเตรียมคลอด.สำนักงานปลัดกระทรวงสาธารณสุข กรุงเทพมหานคร.

ลัดดาวัลย์ จิตรขาว. (Ladawan Jitkao.)(2542). ผลของการได้รับยาระงับความเจ็บปวดของแม่ขณะเจ็บครรภ์ในระยะที่หนึ่งของการคลอดต่อพฤติกรรมและระยะเวลาที่ทารกเริ่มดูดนมแม่ได้เป็นผลสำเร็จครั้งแรกในระยะหลังคลอด. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต(สาธารณสุขศาสตร์), สาขาวิชาเอกพยาบาลสาธารณสุข บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

วัสสิกา เผือกโสมณ. (Watsika Pearksomon.) (2539). ประสิทธิผลของการเตรียมคลอดตามรูปแบบที่กำหนดเพื่อพัฒนาความสามารถตนเองในการเผชิญความเจ็บปวดระยะคลอดของหญิงครรภ์แรกในโรงพยาบาลจุฬาลงกรณ์. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต(สาธารณสุขศาสตร์), สาขาวิชาเอกอนามัยครอบครัว บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

วาริศา วิเศษสรรพ์. (Warisa Wisedsun.) (2542). การส่งเสริมการคลอดโดยธรรมชาติ. วิทยาสารพยาบาล วิทยาลัยพยาบาลสภากาชาดไทย, 24(2) : 110.

วาสนา แหวนหล่อ. (Wasana Wanlo.) (2540). ผลของการเตรียมมารดาเพื่อการคลอด ต่อการรับรู้ประสบการณ์การคลอดและสัมพันธภาพระหว่างมารดาและทารกในมารดาวัยรุ่น. วิทยานิพนธ์พยาบาลศาสตรมหาบัณฑิต, สาขาการพยาบาลแม่และเด็ก บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

วิมลลักษณ์ สนั่นศิลป์. (Wimonlak Sanansilp.) (2543). ระบบประสาทและอิทธิพลของความปวด ใน ชูศรี พิศลยบุตรและพงษ์ธารา วิจิตรเวชไพศาล (บรรณาธิการ). ตำราวิสัญญีวิทยาทางสูติกรรม. กรุงเทพ : พี.เอ.ลิฟวิ่ง จำกัด.

วิโรจน์ ตั้งเจริญเสถียร และคณะ. (Wirote Tangjareonsathien and others) (2541). แบบแผนการคลอดบุตรในโรงพยาบาลของสตรีไทยในปี2533-2539. สถาบันวิจัยระบบสาธารณสุข กรุงเทพ : สำนักพิมพ์หมอชาวบ้าน.

วีนัส ฉัตรชลอลักษณ์. (Venus Chatchalawlak.) (2543). ผลของการมีส่วนร่วมในโปรแกรมเตรียมคลอดต่อทักษะการควบคุมตนเองในระยะคลอดของสตรีคลอดครรภ์แรก สถานส่งเสริมอนามัยแม่และเด็กศูนย์ส่งเสิมสุขภาพเขต 4 ราชบุรี. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต(สาธารณสุขศาสตร์), สาขาวิชาเอกพยาบาลสาธารณสุข บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

ศิรินารถ ศรีกาญจนเพริศ. (Sirinad Sriganjanaperd.) (2542). ความเป็นห่วงเกี่ยวกับการคลอดบุตรและการปฏิบัติตนของสตรีตั้งครรภ์ในระยะใกล้คลอด. วิทยานิพนธ์พยาบาลศาสตรมหาบัณฑิต, สาขาการพยาบาลแม่และเด็ก บัณฑิตวิทยาลัย มหาวิทยาลัยขอนแก่น.

สมปอง ใช้ไหวพริบ. (Sonpong Chaiwaiprip.) (2543). การลดความเจ็บปวดในระยะคลอดโดยไม่ใช้ยา. วารสารพยาบาลศาสตร์, 18(3) : 25-32.

สมศิริ นนทสวัสดิ์ศรี. (Somsiri Nontasawatsri.) (2542). ผลของการเตรียมก่อนคลอดร่วมกับการฝึกฝนผ่อนคลายกล้ามเนื้อต่อความเครียดและการเผชิญความเจ็บปวดในหญิงตั้งครรภ์. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต (สาธารณสุขศาสตร์), สาขาวิชาเอกพยาบาลสาธารณสุข บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

สุขภินุช สังฆสุวรรณ. (Sukpinush Sankasuwan.) (2543). ผลของการใช้โปรแกรมการเตรียมหญิงครรภ์แรกเพื่อการคลอดต่อพฤติกรรมการเผชิญภาวะเจ็บครรภ์, ระยะเวลาในระยะที่หนึ่งของการคลอด และการรับรู้ประสบการณ์การคลอด. วิทยานิพนธ์พยาบาลศาสตรมหาบัณฑิต, สาขาการพยาบาลแม่และเด็ก บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

สุธิต คุณประดิษฐ์. (Sutit Kunpradith.) (2543). งานอนามัยแม่และเด็ก : วิธีคิด ปฏิบัติ และผลลัพธ์. ลำพูน : โรงพยาบาลลำพูน.

สุปราณี อัทธเสรี และเยาวลักษณ์ เสรีเสถียร. (Supranee Athaseri & Yaowalak Serisathien.) (2531). การศึกษาความสัมพันธ์ระหว่างปัจจัยบางประการกับการรับรู้เกี่ยวกับประสบการณ์การคลอด. รายงานการวิจัยภาควิชาสูติศาสตร์นรีเวชวิทยา คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล.

สุปราณี อัทธเสรี, ศิริพร ฉัตรโพธิ์ทอง และเยาวลักษณ์ เสรีเสถียร. (Supranee Athaseri, Siripron Chatpothong, & Yaowalak Serisathien.) (2531). การศึกษาผลของการพยาบาลด้านจิตใจต่อพฤตีกรรมการเผชิญความเจ็บปวดของสตรีมีครรภ์ในระยะคลอดและการรับรู้เกี่ยวกับประสบการณ์การคลอด. รายงานผลการวิจัยภาควิชาการพยาบาลสูติศาสตร์และนรีเวชวิทยา คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล.

สุลัณฑา ยิ้มแย้ม. (Sulanta Yimyam.) (2528). การศึกษาความสัมพันธ์ระหว่างเอกลักษณ์บทบาททางเพศกับการปรับตัวต่อการเป็นมารดาของหญิงตั้งครรภ์ครรภ์แรก. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต, สาขาวิชาพยาบาลศาสตร์ บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

สำนักงานโครงการปฏิรูประบบบริการสาธารณสุข สำนักงานปลัดกระทรวงสาธารณสุข. (2544). 30 บาทรักษาทุกโรค สู่หลักประกันสุขภาพถ้วนหน้า. กรุงเทพ : โรงพิมพ์องค์การรับส่งสินค้าและพัสดุภัณฑ์ (ร.ส.พ.).

อุษา เชื้อหอม. (Usa Chauhom.) (2534). ผลของการเตรียมตัวคลอดต่อความวิตกกังวล ความเจ็บปวด ระยะเวลาคลอดและการรับรู้ประสบการณ์การคลอด. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต, สาขาวิชาพยาบาลศาสตร์ บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

เอกสารวิชาการกรมประชาสงเคราะห์ กระทรวงแรงงานและสวัสดิการสังคม. (2543). รายงานผลการสำรวจข้อมูลโครงการส่งเสริมสวัสดิการสังคมระดับครัวเรือนทั่วประเทศ พ.ศ. 2538-2542. กรุงเทพ (เอกสารอัดสำเนา).

APPENDIX A
LIST OF EXPERTS

LIST OF EXPERTS

There are six experts, who have validated the content of research instrument including the Handbook and Lesson Plan of Labour and Labour pain management strategies. They are :

1. Associate Professor Areena Phanusopone
   Department of Nursing, Faculty of Medicine,
   Ramathibodi Hospital, Mahidol University

2. Lecturer Thasanee Preuksacheewa
   Department of Nursing, Faculty of Medicine,
   Ramathibodi Hospital, Mahidol University

3. Assistant Professor Dr. Nittaya Sinsuksai
   Department of Obstetric and Gynecology
   Faculty of Nursing, Mahidol University

4. Assistant Professor Dr.Somjai Puttapitukpol
   School of Nursing, Sukhothai Thummathirat Open University

5. Miss Raungthip Jinapan
   Head nurse of Labor room, Mettapracharak (Wat Raiking) Hospital

6. Doctor Sunsern Sukawatcharin (M.D.)
   Chief of Obstetric & Gynecology Department,
   Mettapracharak (Wat Raiking) Hospital

APEENDIX B
CONSENT FORM FOR THE PARTICIPANTS

ใบยินยอมให้ทำการวิจัย

การวิจัยเรื่อง "ผลของโปรแกรมการจัดการกับความเจ็บปวดแบบผสมผสานต่อความเจ็บปวด ระยะเวลาในระยะที่หนึ่งของการคลอด และประสบการณ์การคลอดของมารดาครรภ์แรก"

วันให้คำยินยอม วันที่……..เดือน…….พ.ศ……

ก่อนที่จะลงนามในใบยินยอมให้ทำการวิจัยนี้ ข้าพเจ้าได้รับการอธิบายจากผู้วิจัยถึงวัตถุประสงค์ของการวิจัย วิธีการวิจัย อันตราย หรืออาการที่อาจเกิดขึ้นจากการวิจัย รวมทั้งประโยชน์ที่จะเกิดขึ้นจากการวิจัยอย่างละเอียดจนมีความเข้าใจดีแล้ว ผู้วิจัยรับรองว่าจะตอบคำถามต่างๆที่ข้าพเจ้าสงสัยด้วยความเต็มใจ ไม่ปิดบังซ่อนเร้นจนข้าพเจ้าพอใจ อีกทั้งข้าพเจ้ามีสิทธิที่จะบอกเลิกการเข้าร่วมในโครงการวิจัยนี้เมื่อใดก็ได้ โดยการบอกเลิกการเข้าร่วมการวิจัยนี้จะไม่มีผลต่อการดูแลรักษาที่ข้าพเจ้าพึงจะได้รับต่อไป ในกรณีเกิดอันตรายใดๆกับข้าพเจ้าอันเป็นผลเนื่องมาจากการวิจัย ข้าพเจ้าจะได้รับการรักษาพยาบาลโดยไม่คิดมูลค่าตามมาตรฐานวิชาชีพและจะได้รับการชดเชย รายได้ที่สูญเสียไประหว่างการรักษาพยาบาลดังกล่าว ตลอดจนเงินทดแทนความพิการที่อาจเกิดขึ้น และหากมีข้อมูลเพิ่มเติมที่ส่งผลกระทบต่อการวิจัย ข้าพเจ้าจะได้รับการแจ้งให้ทราบโดยไม่ปิดบัง

ผู้วิจัยรับรองว่าจะเก็บข้อมูลเกี่ยวกับตัวข้าพเจ้าเป็นความลับและจะเปิดเผยเฉพาะในรูปที่เป็นผลสรุปการวิจัย การเปิดเผยข้อมูลเกี่ยวกับตัวข้าพเจ้าต่อหน่วยงานที่เกี่ยวข้อง กระทำได้ในกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้น

ข้าพเจ้าได้อ่านข้อความข้างต้นแล้ว และมีความเข้าใจดีทุกประการ จึงได้ลงนามในใบยินยอมนี้ด้วยความเต็มใจ

ลงนาม…….ผู้ยินยอม

ลงนาม……..พยาน

ลงนาม……..พยาน

คำอธิบายโครงการวิจัย

1. หัวข้อเรื่องการวิจัย ผลของโปรแกรมการจัดการกับความเจ็บปวดแบบผสมผสานต่อความเจ็บปวด ระยะเวลาในระยะที่หนึ่งของการคลอด และประสบการณ์การคลอดของมารดาครรภ์แรก

2. วัตถุประสงค์และวิธีการวิจัย การวิจัยครั้งนี้มีวัตถุประสงค์ คือ หาวิธีการลดความเจ็บปวดในระยะคลอดแบบไม่ใช้ยาที่เหมาะสมเพื่อให้เป็นทางเลือกหนึ่งของมารดาในระยะคลอดนอกเหนือจากการใช้ยาระงับปวดและการใช้ยาระงับความรู้สึกเข้าทางไขสันหลัง โดยวิธีดังกล่าวคาดว่าจะสามารถช่วยให้ระยะของการคลอดสั้นลงและมารดาเกิดความรู้สึกประทับใจต่อการคลอด วิธีการวิจัยประกอบด้วย การเตรียมคลอดด้วยการสอนเรื่อง การคลอดและกลวิธีการจัดการกับความเจ็บปวดในระยะคลอดตั้งแต่ในระยะตั้งครรภ์ โดยเริ่มสอนเมื่อมารดามีอายุครรภ์ได้ 32 สัปดาห์ ครั้งละ 1 ชั่วโมง นัดสอนห่างกันทุก 2 สัปดาห์จนถึง อายุครรภ์ 38 สัปดาห์ รวม 4 ครั้ง นอกจากมารดาจะได้เรียนเนื้อหาเกี่ยวกับการคลอดแล้วยังได้ฝึกปฏิบัติในเรื่อง การบริหารร่างกาย การผ่อนคลายกล้ามเนื้อ การลูบหน้าท้อง การเคลื่อนไหวและท่าที่ส่งเสริมการคลอด การเพ่งจุดสนใจและการควบคุมการหายใจ ซึ่งผู้วิจัยจะมีคู่มือแจกให้กับมารดาเพื่อนำกลับไปทบทวนและฝึกปฏิบัติต่อที่บ้าน รวมทั้งพาเยี่ยมชมห้องคลอด เมื่อมารดาเข้าสู่ระยะคลอดในช่วงรอคลอดระยะแรกที่ความเจ็บปวดยังไม่มากผู้วิจัยจะช่วยแนะนำและสนับสนุนให้มารดาใช้ความสามารถของตนเองด้วยการนำเทคนิคการจัดการกับความเจ็บปวดแบบต่างๆที่ได้เรียนและฝึกปฏิบัติมาใช้ ส่วนในช่วงรอคลอดระยะท้ายที่ความเจ็บปวดมีมากขึ้น ผู้วิจัยจะช่วยนวดหลังให้กับมารดาเพิ่มขึ้นอีก 1 วิธี โดยมารดายังมีสิทธิ์ในการขอยาแก้ปวดได้ จากนั้นทำการวัดระดับความเจ็บปวดในระยะคลอด และหลังคลอดแล้ว 24 ชั่วโมงจึงให้มารดาตอบแบบสอบถามการรับรู้ประสบการณ์การคลอดที่ตึกหลังคลอด

3. เหตุผลที่เชิญมารดาเข้าร่วมโครงการวิจัย เพราะเป็นโครงการที่มีประโยชน์และไม่ก่อให้เกิดอันตรายใดๆต่อทั้งมารดาและทารก

4. ระยะเวลาในการเข้าร่วมโครงการวิจัย ตั้งแต่อายุครรภ์ 32 สัปดาห์ จนถึงหลังคลอดแล้ว 24 ชั่วโมง

5. ประโยชน์ที่คาดว่าจะเกิดกับผู้เข้าร่วมโครงการวิจัยและผู้อื่น ประโยชน์ที่คาดว่าจะเกิดขึ้นสำหรับมารดาที่เข้าร่วมการวิจัย ได้แก่ มีความพร้อมทั้งทางร่างกายและจิตใจต่อการคลอด ได้ใช้ความสามารถของตนเองในการจัดการกับความเจ็บปวดในระยะคลอดให้ความเจ็บปวดลดลงโดยไม่ต้องรีบร้อนใช้ยา อีกทั้งไม่ต้องทนกับความเจ็บปวดนานเพราะมีระยะเวลาคลอดสั้นลง เกิดความ

ภาคภูมิใจที่ได้มีส่วนร่วมในการคลอดและให้กำเนิดบุตรซึ่งเป็นประสบการณ์การคลอดที่เป็นไปในทางดี ซึ่งจะได้นำโปรแกรมนี้ไปใช้เป็นแนวทางในการให้บริการกับมารดารายอื่นๆต่อไป

6. ความเสี่ยงหรือความไม่สบายที่คาดว่าจะเกิดจากการเข้าร่วมโครงการวิจัย คาดว่าไม่มี เนื่องจากวิธีการต่างๆที่นำมาผสมผสานกันเป็นโปรแกรมการวิจัยครั้งนี้ได้ผ่านการตรวจสอบจากผู้เชี่ยวชาญทั้งสูติแพทย์ อาจารย์พยาบาลสูติกรรม และพยาบาลผู้เชี่ยวชาญด้านสูติกรรม รวม 6 ท่าน มีความเห็นว่าเป็นโปรแกรมที่เหมาะสมที่จะใช้สอนให้กับมารดาได้โดยไม่ก่อให้เกิดอันตราย อีกทั้งวิธีการต่างๆได้เคยถูกนำไปใช้ในทางปฏิบัติจริงกับมารดาตั้งครรภ์มาแล้วหลายร้อยรายทั้งในหลักสูตรการอบรมมารดาก่อนคลอดและในงานวิจัยทั้งในและต่างประเทศหลายงานวิจัย ไม่พบว่ามีความเสี่ยงหรือความไม่สบายใดๆเกิดขึ้น

7. การดูแลรักษาความลับของข้อมูลต่างๆของผู้เข้าร่วมโครงการวิจัย ผู้วิจัยจะเก็บข้อมูลของมารดาเป็นความลับด้วยการไม่เขียนชื่อ-นามสกุลของมารดาลงในใบบันทึกหรือแบบสอบสอบถาม แต่จะใช้เป็นรหัสแทน และมีซองเอกสารใส่มิดชิดเพื่อมิให้ผู้อื่นเห็นข้อมูลที่มารดาให้ไว้

8. สิทธิของมารดาในการถอนตัวจากโครงการวิจัย มารดามีสิทธิในการตัดสินใจเข้าร่วมโครงการวิจัยด้วยตนเอง และสามารถถอนตัวจากโครงการวิจัยได้ตลอดเวลาและในทุกขั้นตอนที่มารดาต้องการ โดยจะไม่มีผลกระทบใดๆต่อการดูแลรักษาที่พึงได้รับตามปกติต่อไป

9. ชื่อ ที่อยู่ และเบอร์โทรศัพท์ของแพทย์ที่มารดาสามารถติดต่อได้โดยสะดวก **ในกรณีที่มีเหตุจำเป็นหรือฉุกเฉินทั้งในและนอกเวลาราชการ มารดาสามารถติดต่อกับผู้วิจัยได้ที่เบอร์โทรศัพท์ 01-5050548 และ 09-5427849 และแพทย์หญิง สรรเสริญ สุขะวัชรินทร์ ซึ่งเป็นสูตินรีแพทย์หัวหน้างานห้องคลอดโรงพยาบาลเมตตาประชารักษ์(วัดไร่ขิง)ได้ที่เบอร์034- 225417-20 ต่อ ห้องคลอด และ 01-8906063**

APEENDIX C
INSTRUMENTS FOR INTERVENTION

* Labour and labour pain management Strategies Lesson plan
* Labour and labour pain management Strategies Handbook

แผนการสอน

เรื่อง การคลอดและกลวิธีการจัดการกับความเจ็บปวดในระยะคลอด

ผู้สอน นางเพลินพิศ พรหมรักษ์

ผู้เรียน มารดาครรภ์แรกที่มีอายุครรภ์ 32 สัปดาห์ เมื่อเริ่มสอน ถึง 38 สัปดาห์ เมื่อสิ้นสุดการสอน ซึ่งมาฝากครรภ์และตั้งใจจะคลอดที่โรงพยาบาลเมตตาประชารักษ์ (วัดไร่ขิง) และสมัครใจเข้าร่วมในการศึกษาวิจัย จำนวน 30 ราย

สถานที่ ห้องสอนสุขศึกษาแผนกรับฝากครรภ์ โรงพยาบาลเมตตาประชารักษ์ (วัดไร่ขิง)

วิธีการสอน บรรยาย สาธิต สาธิตกลับ และฝึกปฏิบัติ

วัตถุประสงค์ เมื่อจบการเรียนการสอน มารดาครรภ์แรก

1. มีความพร้อมทั้งทางด้านร่างกายและจิตใจต่อการคลอด
2. มีความรู้ความเข้าใจในเรื่องการคลอด ความเจ็บปวดจากการคลอดและกลวิธีการจัดการกับความเจ็บปวดในระยะคลอด
3. มีความสามารถในการปฏิบัติเกี่ยวกับวิธีจัดการกับความเจ็บปวดจากการคลอดโดยไม่ใช้ยาทั้งการบริหารร่างกาย การผ่อนคลายกล้ามเนื้อ การลูบหน้าท้อง การเคลื่อนไหวและท่าที่ส่งเสริมการคลอด การควบคุมการหายใจ และการเพ่งจุดสนใจ รวมทั้งนำไปปฏิบัติไปอย่างถูกต้องและมี ประสิทธิภาพเมื่ออยู่ในระยะคลอด

หัวข้อและระยะเวลาที่ใช้สอน : แบ่งออกเป็น 4 ครั้ง ดังนี้

ครั้งที่ 1. เมื่อมารดาครรภ์แรกมีอายุครรภ์ 32 สัปดาห์ หัวข้อที่สอนได้แก่ ความรู้เกี่ยวกับการคลอด ความเจ็บปวดจากการคลอดกลวิธีการจัดการกับความเจ็บปวดในระยะคลอดและการบริหารร่างกาย ใช้เวลา 60 นาที

ครั้งที่ 2. เมื่อมารดาครรภ์แรกมีอายุครรภ์ 34 สัปดาห์ หัวข้อที่สอนได้แก่ การผ่อนคลายกล้ามเนื้อและการลูบหน้าท้อง ใช้เวลา 60 นาที

ครั้งที่ 3. เมื่อมารดาครรภ์แรกมีอายุครรภ์ 36 สัปดาห์ หัวข้อที่สอนได้แก่ การเคลื่อนไหวและท่าที่ส่งเสริมการคลอดและการควบคุมการหายใจ ใช้เวลา 60 นาที

ครั้งที่ 4. เมื่อมารดาครรภ์แรกมีอายุครรภ์ 38 สัปดาห์ หัวข้อที่สอนได้แก่ การเพ่งจุดสนใจ การนวดหลังการนำกลวิธีการจัดการกับความเจ็บปวดแบบไม่ใช้ยาไปใช้เมื่อเข้าสู่ระยะคลอด และพาเยี่ยมชมห้องคลอด ใช้เวลา 60 นาที

คู่มือมารดา

เรื่อง

การคลอดและกลวิธีการจัดการกับความเจ็บปวดในระยะคลอด

จัดทำโดย

นาง เพลินพิศ พรหมรักษ์

อาจารย์ที่ปรึกษา

อาจารย์ ดร. ศรีสมร ภูมนสกุล

รศ. อรพินธ์ เจริญผล

คู่มือนี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาพยาบาลศาสตร
มหาบัณฑิต สาขาการพยาบาลมารดาและทารกแรกเกิด
คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี
บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล

APEENDIX D
INSTRUMENTS FOR DATA COLLECTION

* Demographic Data Form
* Udomthawornsuk's Pain – Color Scale
* Perception of childbirth experience questionnaire

แบบบันทึกหมายเลข……

แบบบันทึกข้อมูลส่วนตัวของผู้คลอด

ข้อมูลทั่วไป

หมายเลขประจำตัว …….. วันที่…….. อายุ …….. ปี

ระดับการศึกษา ( ) ประถมศึกษาหรือต่ำกว่า ( ) มัธยมศึกษา หรือ ปวช.

( ) ปริญญาตรี ( ) ปริญญาโท หรือ สูงกว่า

ลักษณะอาชีพ ( ) แม่บ้าน ( ) รับราชการ ( ) รับจ้าง

( ) ทำสวน ( ) ค้าขาย ( ) รัฐวิสาหกิจ

( ) อื่นๆ ระบุ …….

( ) ใช้แรงงาน ( ) ไม่ใช้แรงงาน

รายได้ของครอบครัว / เดือน ……. บาท

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ข้อมูลเกี่ยวกับการตั้งครรภ์และการคลอด

การวางแผนการตั้งครรภ์ ( ) มีการวางแผน ( ) ไม่มีการวางแผน

ความต้องการบุตร ( ) ต้องการ ( ) ไม่ต้องการ

อายุครรภ์เมื่อคลอด ……. สัปดาห์ จำนวนครั้งของการฝากครรภ์ …… ครั้ง

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ลักษณะของทารก

น้ำหนัก …… กรัม Apgar Score 1 นาที = …… 5นาที = ……

เพศ …… ( ) ตรงความคาดหวัง ( ) ไม่ตรงความคาดหวัง

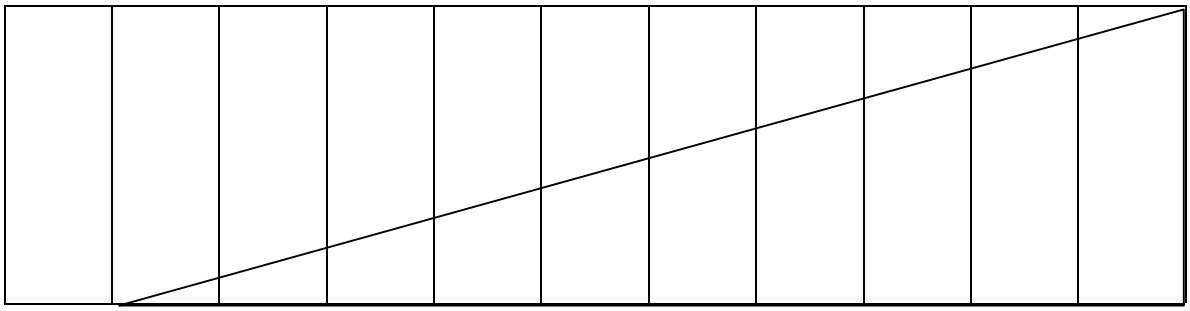
อาการเมื่อแรกคลอด ( ) ปกติ ( ) ไม่ปกติ ระบุ …….

T = …… ^{o}C RR = …… / min HR = ……/ min

รวมระยะเวลาที่อยู่ในโรงพยาบาล……วัน

แบบวัดหมายเลข……..

แบบวัดระดับความเจ็บปวดในระยะคลอด



0 1 2 3 4 5 6 7 8 9 10

ไม่ปวด ปวดมากที่สุด
จนทนไม่ได้

ระยะปากมดลูกเปิด 4 – 7 ซม.			ระยะปากมดลูกเปิด 7 – 10 ซม.		
บันทึกครั้งที่	เวลา	คะแนน	บันทึกครั้งที่	เวลา	คะแนน

แบบสอบถามการรับรู้ประสบการณ์การคลอด

คำชี้แจงในการใช้แบบสอบถาม

แบบสอบถามนี้ต้องการทราบความรู้สึกและความคาดหวังของมารดา เกี่ยวกับเหตุการณ์ที่ตนเองได้ประสบมาแล้วในระยะคลอด โดยจะมีข้อความให้มารดาได้พิจารณาว่าตนมีความรู้สึกหรือความคิดเห็นตรงกับข้อใดในแต่ละข้อมากน้อยเพียงใด ดังนั้นจึงไม่มีคำตอบใดถูกหรือผิด ขอให้มารดาตอบให้ตรงกับความรู้สึกและความเห็นตามความเป็นจริงมากที่สุด คำตอบที่ได้ครั้งนี้จะถือเป็นความลับ และนำไปใช้ในการวิจัยครั้งนี้เท่านั้น เพื่อให้เกิดประโยชน์ต่อการพัฒนาและปรับปรุงบริการงานการพยาบาลด้านสูติกรรมต่อไป

โปรดอ่านข้อความแต่ละข้อ แล้วทำเครื่องหมายถูก (✓) ในช่องตารางที่มีตัวเลขให้ตรงกับความรู้สึกและความคิดเห็นที่แท้จริงของมารดาที่มากที่สุดเพียงข้อเดียว **<u>กรุณาตอบทุกข้อ</u>** โดยในการเลือกตอบให้ถือเกณฑ์ดังนี้

หมายเลข 1 หมายถึง ไม่เป็นความจริงเลย คือ เมื่อมารดาเห็นว่าข้อความนั้นไม่ตรงกับความรู้สึกและความคิดเห็นของมารดาเลย

หมายเลข 2 หมายถึง เป็นความจริงบางส่วน คือ เมื่อมารดาเห็นว่า ข้อความนั้นตรงกับความรู้สึกและความคิดเห็นของมารดาเป็นบางส่วน

หมายเลข 3 หมายถึง เป็นความจริงเป็นส่วนมาก คือ เมื่อมารดาเห็นว่า ข้อความนั้นตรงกับความรู้สึกและความคิดเห็นของมารดาเป็นส่วนมากแต่ไม่ทั้งหมด

หมายเลข 4 หมายถึง เป็นความจริงมากที่สุด คือ เมื่อมารดาเห็นว่า ข้อความนั้นตรงกับความรู้สึกและความคิดเห็นของมารดามากที่สุดหรือทั้งหมด

ประสบการณ์การคลอดของมารดา	(1) ไม่เป็นความจริงเลย	(2) เป็นความจริงบางส่วน	(3) เป็นความจริงเป็นส่วนมาก	(4) เป็นความจริง มากที่สุด	สำหรับผู้วิจัย
<u>หมวดที่ 1</u> ความสำเร็จในการควบคุม ตนเองในระยะคลอด					
1. ในระยะเจ็บครรภ์ท่านสามารถปฏิบัติวิธีต่างๆเพื่อบรรเทาความเจ็บปวดที่เกิดขึ้น	…….	…….	……...	……...	( )
2. วิธีบรรเทาความเจ็บปวดที่ท่านปฏิบัติสามารถบรรเทาความเจ็บปวดได้ผลดี	……...	……...	……...	……...	( )
3. เมื่อมดลูกหดรัดตัวท่านมักจะดิ้น และ / หรือร้องเสียงดัง	……...	……...	……...	……...	( )
. . . .					
41. ท่านรู้สึกพึงพอใจกับบรรยากาศในการคลอดครั้งนี้	……...	……...	……	……...	( )
42. ท่านรู้สึกพึงพอในและเป็นสุขเมื่อนึกถึงการคลอดครั้งนี้	……...	……...	……	……...	( )

BIOGRAPHY

NAME	Mrs. Plernpit Promrak
DATE OF BIRTH	6 January, 1968
PLACE OF BIRTH	Srisaket province, Thailand
INSTITUTIONS ATTEND	Nakornrajsima Nursing College 1986 – 1990: Diploma in Nursing Science Mahidol University, 2000 – 2004 Master of Nursing Science (Maternity and Newborn Nursing)
SCHOLARSHIP	Rajavithi Hospital, Medical Department, Ministry of Public Health
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