

CHAPTER 1

INTRODUCTION

Background of the Study

During pregnancy, women may experience a wide variety of discomfort, which is often not an isolated problem but a whole range of integrated problems, with one sometimes perpetuating another (Davis, 1996). Recent well-controlled human studies indicate that pregnant women with high stress and anxiety levels are at increased risk of adverse perinatal outcomes (Mulder et al., 2002). During exposure to a stress situation, the whole stress regulating system is activated, causing various hormones including the corticotropin-releasing hormone (CRH), adrenocorticotropin-releasing hormone (ACTH), cortisol, and noradrenaline to be released into the circulation. Pregnant women respond differently to identical stressful stimuli depending on their previous experiences, genetic factors, social support, or personality traits (Narendran, Nagarathna, Narendran, Gunasheera, & Nagendra, 2005). For the primigravid women as the pregnancy progresses, physical changes associated with anxiety regarding labor and fetal outcomes or worries about changes in their personal life due to the pregnancy and childbirth potentially worsen the stress response and lead pregnant women to have greater discomfort (Huizink, Mulder, Robles de Medina, Visser, & Buitelaar, 2004).

Giving birth encompasses many events and experiences for women. Pain, exertion, fatigue, fear, anxiety, doubt, vulnerability, strange surroundings, and unfamiliar people are what women experience during labor (Lowe, 1996; Simkin, 1996). Childbirth may be one of the most significant life change experiences for

woman (Simkin, 1996). There is evidence to support the idea that forty percent of mothers identified pain as the worst part of the labor and delivery experience (Mackey, 1998). The long period of time during uterine contractions represents a crisis of sorts, bringing a woman face to face with the deepest and most intense physical sensations and emotional stress she is ever likely to experience.

Childbirth pain evokes a generalized stress response, which has widespread physiological effects on both a woman's parturient and her fetus. In response to the stress of labor, maternal catecholamine production increases, resulting in an increased cardiac output and peripheral vascular resistance. Changes in maternal physiology include increased oxygen consumption and higher blood pressure, and decreased uterine blood flow (Creehan, 1996). Lederman, Lederman, Work, and McCann (1985) demonstrated that catecholamine influences the labor process by reducing the strength, duration, and coordination of uterine contractions and influences the fetus, as demonstrated by non-reassuring changes in the fetal heart rate pattern. The changes of maternal and fetal physiological effects might lead both to the problems of the length of labor and a decrease in the Apgar score in the newborn (Jimenez, 1988).

Childbirth has become an increasingly medicalised event, characterized by technology and spiraling intervention rates. In many situations women with normal healthy pregnancies are subjected to routine interventions, such as electronic fetal monitoring, epidural analgesia and the use of oxytocics for induction, augmentation of labor, or both. An increasing number of expectant mothers want to avoid the traumatic experiences of birth, and this has led to the wide acceptance of elective caesarean section (Beck, 2004; Cotzias, Peterson-Browns, & Fisk, 2001; Johanson, Newburn, & McFarlane, 2002; Saisto, Kaaja, Helsks, Ylikorkala, & Halmesmaki, 2004). The reason

for this dramatic rise may be related to women's fear of childbirth, and that they demand a caesarean section because it is perceived as a more reasonable option. With this emerging trend, women's expectations have seemingly altered to reflect a process involving medical intervention with less control and choice during the birth process (Fenwick, Hauck, Downie, & Butt, 2005). This process places the burden of pain control in the birth experience solely on the medical professional. Self-confidence in the woman's own resources and capabilities, and a willingness to be an active participant in her own care, are not seen as assets (Simkin & Bolding, 2004).

Pain and suffering in the birth experience lead to the consequences of stress during labor, such as the delayed onset of lactation (Grajeda & Perez-Escamilla, 2002). Primiparous women have been found to be more likely to suffer from severe psychological disorders after birth than multiparous women, although these findings may also be the result of differences in the stress responses of the mothers (Maes, Bosmans, & Ombelet, 2004). Common physical and psychosocial discomfort from labor pain are associated with many factors, such as, the need for pain relief, fear of perceived threat to the body and/or psyche, helplessness and loss of control, distress, insufficient resources for coping with the distressing situation, and even fear of death of the mother or baby (Lowe, 2002). These are not relieved when the affected persons believe that all the elements mentioned are the inevitable consequence of childbirth.

Therefore, pain and suffering are important problems relating to the delivery period (Lowe, 2002), and pain relief in labor is a unique problem (Cunningham et al., 2001). The key to pain relief be seen to be dependent on others, and the goal of the elimination of labor pain is based on the assumption that pain inevitably equals suffering. This requires not only pain medication but also other interventions, complex

technology, and the highly skilled personnel to control accompanying undesirable side effects. The woman becomes more dependent and powerless, not only in managing her pain but in all other aspects of labor and birth, thus the woman's role is one of passive compliance. Various analgesics or anesthesia can be used to relieve pain. According to the Cochrane review, epidural analgesia is an effective way of providing pain relief. However, negative effects of epidural analgesia include prolonging the first and second stage of labor and an increase in oxygen use, malrotation, instrumental delivery, and cesarean section (especially for dystocia) (Howell, 1998). Thus, the side effects of pain medication on women in labor and other multidimensional phenomena indicate that analgesia alone may not manage pain adequately (McCaffery & Beebe, 1989; Mobily, Herr, & Nicholson, 1994).

The connection between the multidimensional factors of pain experience requires multiple convergent approaches (Melzack & Wall, 1988; Melzack, 1993). The non-pharmacological approaches include specific strategies to help the pregnant women to cope with discomfort and pain. The methods used address not only the physical sensations of pain, but also the prevention of suffering by enhancing the psycho-emotional and spiritual components of care. Pain is perceived as a side effect of a normal process, not a sign of damage, injury, or abnormality. The building of self-confidence, and maintaining a sense of mastery and well being, rather than making the pain disappear, are seen to be important in assisting women to cope with labor pain. The woman's perception of her being able to maintain control during labor and delivery; to control pain perception, to control emotions and actions, and to be able to influence decisions while being an active participant, all are central features of a woman's involvement in her childbirth experience (McCrea, Wright, & Stringer, 2000;

Perla, 2002). This requires the kind of care that includes reassurance, guidance, and encouragement in using self-comforting techniques to relieve pain and enhance labor progress. Women who perceive that they coped successfully with the pain and stress of labor state that they were able to transcend their pain and that they experienced a sense of strength and profound psychological and spiritual comfort during labor (Simkin & Bolding, 2004). Thus, alleviation of pain has been identified as a source of comfort and support to women in labor (Hodnett, 1996).

The degree of discomfort a woman experiences during contractions differs according to individual expectations of and preparation for labor, the length of labor, the position of the fetus, and the availability of support people around her (Pillitteri, 2003). The discomfort a woman experiences can become compounded when fear and anxiety are also present (McCrea et al., 2000). Lundgren and Dahlberg (1998) studied women's experience of pain during childbirth using qualitative methods that highlighted the paradox of pain, suffering, and comfort in childbirth. Four themes about the pain of childbirth were identified. First, pain is hard to describe and is contradictory. Second, pain coping strategies include trust in one's body and one's own ability to deal with the pain. Third, the experience of pain is related to the trust in, affirmation, security, support, and encouragement from the people with the woman, particularly her partner and the midwife. Fourth, to go through childbirth and the experience of pain gives meaning to the relationship with the baby, and the woman's transition to motherhood, by helping her gain strength and the power to cope with the new demands of parenthood. Therefore, these themes emphasize the life context of pain in childbirth for the parturient.

The canon of “pain as bad” leaves out the possibility of “pain as protective”. No consideration is given to the fact that comfort may exist despite pain (Schuiling & Sampsel, 1999). Pain and childbirth may be perceived as a strengthening event, a challenge to be met, or as noxious stimuli. A woman’s definition of her labor pain affects her management of it and her perception of the birth event. Mastery of the process can lead to increased self-esteem and personal strength (Lowe, 1996).

Interventions that increase comfort during labor stress the giving of support to a woman in her efforts to be an active participant in the birth, thereby, keeping her connected to her body, emotions, and experience. Non-pharmacological interventions, such as, prenatal preparation, physical exercise manipulation, administration of herbs and nutritive substances, music, backrubs, warm baths, relaxation and the other psychological techniques, and the presence of significant others may provide comfort and promote confidence and strength, empowering laboring women to master the birth process (Gentz, 2001). Regardless of whether or not pain medication is needed in labor, using comforting techniques may strengthen a woman and give her an appreciation of her capabilities (Schuiling & Sampsel, 1999). As a result, when pharmacological and non-pharmacological methods of pain relief are combined, the total dosage of narcotics required for pain relief may be less (Simkin, 1995).

In comparing the non-pharmacological methods during labor, such as, the massaging of muscles and other tissues, it was found that this therapy not relaxes the muscles, but also alleviates pain through distraction (Sakala, 1988). The areas massaged are the neck, back, shoulders, arms, abdomen, and legs. Relief from lower back pain can be achieved when massage has been combined with a menthol “deep heating” preparation. The effect of abdominal massage on the onset of epidural

blockade and relief of pain in laboring women has been investigated. There was no significant difference between the massage and the control group in the visual analogue scale scores. The authors concluded that abdominal massage does not produce a clinically useful alteration in time of onset of epidural analgesia for labor (Parke & Kinsella, 1996). Likewise, Chang, Wang, and Chen (2002) investigated the effects of massage on pain reaction and anxiety during labor. The results revealed that the experimental group had significantly lower pain reactions in the latent, active and transitional phases. Anxiety levels were only significantly different between the two groups in the latent phase. However, this means of intervention requires the skill of a trained person to handle the parturient which is sometimes difficult to arrange because of other duties, or because of the hospital's policy of limiting the persons involved in this experience.

Music therapy during pregnancy, delivery, newborn care, and bedside care has been found to have beneficial effects on body control, enhancing relaxation and concentration, creating a happier environment, improving sensory stimulation for neonates, increasing infant weight gain, and decreasing agitation (Bailey, 1983). A randomized study of using music as a conditioning aid and combining it with Lamaze breathing techniques has been carried out on 30 childbirth couples. The authors found that there was no difference in the frequency of pain medication with the use of music. The subjective sense of satisfaction appeared to be higher in participants who experienced music as a conditioning aid, despite its lack of efficacy in reducing pain requirements (Livingston, 1979). By using the music during labor and delivery, there are several additional requirements that must be met. Women must be advised during childbirth classes of the efficacy of music for analgesia and relaxation. The music must

be prepared in advance so that if labor commences before the expected due date, it is available. The participants must be prepared to bring their own walkman-compact disk, or portable stereo equipment to the hospital. Finally, the hospital personnel and environment must be receptive to the use of music during labor and delivery for it to be effective.

Yoga is a mind-body intervention, which is based on the interconnectedness of the mind and the body and the power of each to affect the other (Nagarathna, Nagendra, & Monro, 1990). This technique strengthens the body so that it can undertake new developments with maximum ease and comfort. The practice of yoga enables people to look within the self and understand bodily mechanisms and helps them to cope with the problem when they confront the actual situation. A pregnant woman who is not aware of the mechanics of labor will be tense and frightened during the laboring period, and this only increases her pain (Balaskas, 2003; Teasdill, 2000). The practice of yoga encompasses a holistic approach in order to establish a sense of awareness and integration within the individual. This corresponds particularly with pregnancy, birth and the period immediately after birth, which are times of change, adjustment and growth at all levels of being (Williamson, 2002). The labor and birth process is viewed as a developmental event in a woman's life, the mastery of which leads to an increased sense of self-esteem and personal strength (Lowe, 1996). Birth makes mothers become strong, competent, and capable people who trust themselves and know their inner strength (Rothman, 1996).

To achieve pain relief in labor, childbirth preparation classes can teach women to maintain control (Mackey, 1998). As the evidence that continues to reveal the synergism of the triad of mind, body, and spirit emerges, it becomes apparent that

childbirth education must provide a holistic approach to the sensory aspects of the birth experience (Jimenez, 2000). Prenatal yoga can help a woman become accustomed to the natural, instinctive yoga-like positions that most women prefer to use during labor and birth. Prenatal yoga also provides an opportunity to explore one's response to pain and to develop relaxation and coping strategies for labor, when the pain of contractions exceeds one's usual pain threshold (Tomlinson, 2003). Therefore, practicing yoga is a particularly effective way to make the most of the transformed potential of pregnancy and, at the same time, to empower women in labor, giving birth and mothering with the attaining and maintaining of optimal functioning (Balaskas, 2003).

To date, there is a limited number of studies of yoga in the area of maternal and child healthcare. Narendran and colleagues have studied the efficacy of yoga on the successful outcome of pregnancies (Narendran et al., 2005). The primary outcomes of that study included gestational age at delivery, mean birth weight, mode of delivery, intrauterine growth retardation, and the obstetric complications such as pregnancy-induced hypertension and intrauterine death. Similarly, Maharana (2006) found that the integrated approach of yoga during pregnancy improved birth weight; decreased labor duration, complications, and the anesthesia requirements, and helped towards a normal delivery. However, the outcomes of maternal comfort and labor pain, which are subjective to individuals and require a holistic approach from antenatal to the delivery period, have not been investigated yet. Thus, the current study was aimed at determining the effects of using a Yoga program during pregnancy on maternal comfort, labor pain, and birth outcomes in primiparous women by comparing an experimental and control group. The quantity of yoga practiced was also examined to

determine the contribution of frequency and duration on maternal comfort during pregnancy.

In summary, enhancement of comfort during pregnancy and delivery is a valued outcome of nursing and midwifery care. Yoga has been selected as an intervention in this study because it increases comfort from the antenatal period through labor and birth, reduces labor pain, improves the birth outcomes and supports a woman's efforts to participate more fully in the birth, thereby keeping her more aware of her body, emotions, and experiences.

Significance of the Study

Nurses have long believed that healing and caring must be approached holistically and that biological, psychological, emotional, and spiritual aspects of health and illness are equally important (Fontaine, 2000). Promoting comfort is strengthening and enables women to identify coping mechanisms allowing for greater participation and mastery of pregnancy adaptation and the birth event. It is also promoting a safe and satisfying birth experience encompassing self-determination and health. Comfort has the potential to assist women to realize the power they possess. Therefore, this study has the following significance for nursing practice, nursing research, nursing administration, and nursing education.

In nursing practice, this program was an evolutionary approach to find enjoyment and success in physical activity, and to provide the tools to develop and enhance the integration of social, physical, mental, emotional health and well being for the pregnant women. In addition, this program would not only inspire pregnant women

to establish and maintain attitudes to achieve a lifetime of wellness in the labor and delivery period, but also to enhance learning and achievement by empowering women when giving birth. Hence, nurses and midwives would be able to use the yoga program as an alternative method to help pregnant women assert their right to choose their own healing journey and influence the quality of their pregnancy and birth experience. As a result, nurses would be able to identify specific nursing interventions to improve maternity care.

Second, this program was to enhance the understanding of human experience through a new holistic perspective. Yoga has the practical aim of finding a deep self-acceptance that is based on self-knowledge, self-validation, and self-empowerment. This means that it acts as a mirror to reveal to us exactly what we are on every level of our being - physical, emotional, psychological, social, cultural, and spiritual. This process of self-awareness through reflected action contributes to increasing the unity of body-mind-spirit with a resulting impact on the state of harmony.

Third, nursing has shifted the focus of its praxis toward a commitment to holistic care; this perspective suggests that each nurse must bring an authentic self as the essential element of therapeutic participation with another human being. The art of the therapeutic use of self in relationships involves an aesthetic process of on-going reflected action, whereby an individual strives toward a sense of harmony and balance within oneself and with the world. This harmony, then, enters into a caring-healing relationship through the authentic and artful use of self. Therefore, this study was intended to gain knowledge in understanding nursing as an art. The artful use of self provides an opportunity for expansion and personal growth and actualizes the potential to expand the good of all.

In conclusion, an evolutionary approach, a holistic view of human experience, and aesthetic knowledge were intended to be the fascinating scientific basis for the main outcomes of this research, which would contribute to the nursing profession. These perspectives were also meant to require nurses to ask questions, seek answers, and look for new ways to handle old problems.

In nursing research, a broader understanding of comfort in labor can cause a shift in the biomedical paradigm of the need for medication during labor. A woman may come to realize that alternative measures can be supportive during the childbirth experience, and may place her and her unborn child at less risk. Thus, research on comfort in labor can give credibility to women's voices expressed through their own experience. Using non-pharmacological interventions can have far-reaching effects. Enhancing comfort during labor and documenting a positive effect can assist women to know their bodies and discover the strength they have within themselves.

In nursing administration, non-pharmacological approaches have become increasingly popular in maternity health care. It appears that in the future the patient may be the ultimate arbitrator, determining whether her needs are being met, as well as whether she will pursue an alternative form of analgesia for the pain of labor and delivery. Providers have the obligation of acting as the patient's advocate, facilitating informed choice through discussion of their own experience and knowledge, identifying authoritative sources or seeking consultation, or all of these. It is important when therapeutic recommendations are given and information is provided to patients that there is some evaluation of the risk-to-benefits ratio and clinical efficacy. To work as a team, there is a need for bilateral, open communication and a willingness to use an evidence-based care plan. Fitch, Gray, Greenberg, Labrecque, and Douglas (1999)

have presented the findings of interviews with 20 nurses regarding their perspectives on unconventional therapies. One of the themes identified was that the nurses in the study were eager to find a way for conventional and unconventional practitioners to work together, despite the current reality of non-collaboration. They believed that there ought to be a way of working unconventional therapies into the system of care. In addition, they perceived the current lack of scientific evidence in this field as a barrier to working together. Thus, the results of this Yoga program are put forward as part of the reliable, valid scientific base of evidence in providing care for childbearing women, as well as providing information as a resource and part of a network.

Nursing education, has incorporated the teaching of complementary healing practices into their programs, and nurses have subsequently used them in their care, such as backrubs, comforting measures, and active listening (Meintz, 1995). However, with the advent of technology and other advances in modern science, high technology has replaced high-touch care (Barnum, 1994). Over time, many essential nursing actions have been omitted. As an increased understanding of the holistic theory emerges, nurses are rediscovering the effectiveness of many of the once abandoned activities, and are reclaiming them as useful nursing interventions. By teaching and learning more about complementary therapy nurses not only add to their repertoire of holistic interventions, but also begin to view themselves as healing facilitators. However, though still limited, the empirical research on complementary therapies has increased tremendously during the past decade (Gates, 1994; Hoekstra, 1994). The results of this study can be used to demonstrate to the students how the alternative healing of yoga therapies can be explored to the group of pregnant women and mothers

in the delivery period. This complementary approach can liberate them for enhanced learning.

Purposes of the Study

1. To evaluate the effects of the yoga program during pregnancy on maternal comfort, labor pain, and birth outcomes of primiparous women in the experimental group compared to those in the control group.

2. To examine whether the variation in the quantity of yoga practice (frequency and duration) contributes to the outcome variable of maternal comfort during pregnancy.

Research Questions

This study asked the following research questions:

1. Does the level of pain during labor of primiparous women who participate in the yoga program during pregnancy differ from those who receive routine care?

2. Does the level of maternal comfort of childbirth experience of primiparous women who participate in the yoga program during pregnancy differ from those who receive routine care?

3. Do the birth outcomes (length of labor, the Apgar score) of mothers who participate in the yoga program during pregnancy differ from those who receive routine care?

4. Does the level of maternal comfort during pregnancy of primiparous women who participate in the yoga program during pregnancy differ from those who receive routine care?

5. What is the linear equation predicting the extent of maternal comfort during pregnancy from the quantity of yoga practice (frequency and duration), and how accurately does this equation predict the extent of maternal comfort?

Research Hypotheses

The research hypotheses are as follows:

1. The mean score of labor pain of the experimental group is lower than that of the control group.

2. The mean score of maternal comfort during labor of the experimental group is higher than that of the control group.

3. The mean score of birth outcomes (length of labor, the Apgar score) of the experimental group is better than that of the control group.

3.1 The length of labor of the experimental group is shorter than that of the control group.

3.2 The newborns in the experimental group are not at higher risk than the newborns in the control group.

4. The mean score of maternal comfort during pregnancy of the experimental group is higher than that of the control group.

5. Pregnant women who undertake a greater quantity of yoga practice (more frequently and for a longer period of time in minutes) have higher maternal comfort than those who undertake a lesser quantity of yoga practice.

Theoretical Framework of the Study

“The Yoga-Sutra of Patanjali” (Fontaine, 2000; Hartranft, 2003), and “Kolcaba’s theory of comfort” (Kolcaba, 1992; 2003) were selected to construct the theoretical framework of this study. In yoga perspective, health is related to the five sheaths of existence *koshas* that are: the physical body (*Anna-maya-kosha*), the energy body (*Prana-maya-kosha*), the mind body (*Mano-maya-kosha*), the higher intellect body (*Vijnana-maya-kosha*), and the bliss body (*Ananda-maya-kosha*). It is believed that imbalance in any of these sheaths can result in illness (Le Page, 2002). All the five sheaths of existence interact with each other; thus something that primarily affects the mind can spread to the body and pranic sheaths (Nagendra, 1997).

Yoga perspectives on health and illness are related to internal and external balance. Although it is recognized that viruses, bacteria, genetics, and accidents cause illness, the insufficient *prana* or life force also brings on disorders, blocked *prana*, unhappiness, pessimism, and negativity (Fontaine, 2000). When there is injury or there is trauma of the body, blood flow is compromised due to tightness of muscles and joints. The body produces hormones to release pain and stress hormones for health. In general, *prana* no longer flows in the *charkas* and *nadis*, and harmony with the internal and external environment is lost.

Based on the yoga perspective, pregnancy has a profound impact on women. It is a time of great physical adaptation and may be causing the discomfort of pregnancy. For example, around 50% of all pregnancies incur pain in the pelvis and/or the lower back, which may persist, or even arise, after delivery (Wu et al., 2002). It is also a time of emotional adaptation, which they will probably find that they have less control over. This bio-psychosocial-spiritual experience needs not only the medical intervention but

also the holistic approach to ease, relieve, or transcend the problem of pregnancy discomfort. The practice of yoga during pregnancy can improve and maintain health and well-being. The synchronized movements that are done slowly and meditatively and combined with breath awareness relieve bad posture, tone the muscles without straining them, promote healthy blood flow and improve poor circulation and sluggishness that can combine to form a build-up of toxins in the body, combat fatigue, balance the neuro-endocrine system, stabilize emotions, and reduce stress. Thus, the physical body is flexed and strengthened in order to achieve the stillness of the body and mind, enabling the pregnant women to explore more deeply and be more successful in liberating their instinctive potential (Balaskas, 2003; Teasdill, 2000). In addition, the practice of yoga during pregnancy aims to allow the expectant mother to connect with her unborn child and also help her to prepare for the birth as she masters the art of relaxation and learns to trust her body's ability to give birth.

Childbirth is a transcendent event and has meaning far beyond the physiological process that occurs on this occasion. Birth is a universal ritual and throughout history it has been a matter of concern for religion, philosophy, and the law (Gennaro, 1988). According to the psychological, physiological, and cultural responses, the individual perceives pain in childbirth differently. Dick-Read (1947, cited in Jimenez, 1988) believed that the ischemia arose from prolonged uterine tension, brought on by "fear-tension-pain syndrome". The body's capacity to produce and maintain endorphins may influence a person's overall pain threshold and the amount of pain perceived at any given time (Pillitteri, 2003). Yoga is one health patterning modality. It is used in labor preparation to promote active and intuitive involvement of the laboring women (Balaskas, 2003).

Guided by the yoga-sutra of Patanjali, a yoga program is chosen as a treatment in this study. This program offers a vision of complete health through five koshas or bodies theory. Each kosha of existence model relates to certain paths of yoga that are especially appropriate to it: - *yama*, *niyama*, and *asana* for the physical body, *pranayama* for the energetic body, *pratyahara* and *yoga-nidra* for the psycho-emotional body, *dharana* or concentration exercises for the wisdom body, and *dhyana* or meditation and *samadhi* for the bliss body. As a healing journey, yoga brings balance and harmony or facilitates optimal health through an experiential understanding and awakening in mind-body awareness. Therefore, yoga is selected, is adapted, or is modified to practice appropriately suited for the individual with respect to age, culture, religion, and specific physical challenges and conditions (Le Page, 2002).

Kolcaba's theory of comfort is provided as an application that is specially suited to nursing practice because patient comfort is a goal in its standard of care and this is an established value for many nurses in their practice. According to the explanation given by Schuiling and Sampelle (1999), the feeling of comfort is the expression of having met present or impending (perceived) needs or desires in the domain of body, mind, and spirit. It provides feelings of relief, ease, security, well-being, hope, and expectation. Thus, comfort is a state of being and a state of mind. The perception of comfort is individual and multidimensional. It is relative to time, space, and magnitude.

In terms of pregnancy and childbirth pain, comfort in the corporeal (body) sense involves having met physical needs if it elicits feelings of relief from physical pain or discomfort and provides a sense of physical ease. In the psychological (mind)

domain, comfort involves peace of mind, a feeling of security, and freedom from anxiety or worry. The person feels a sense of contentedness. Spiritual (soul, spirit) comfort feelings arise from a connected relationship with a higher power or authority by which one's beliefs assist with transcending from physical or emotional pain or infirmity. In this domain, feelings of hope and expectation are most dominant. In conclusion, it allows for theorizing the existence of comfort during pregnancy and the delivery period. Laboring women may be able to sense increases in comfort psychologically and spiritually and this may transcend physical pain and enable them to give birth with need for less medical intervention (Schuiling & Sampelle, 1999). Moreover, this theory is represented as a pattern for providing holistic care to the patients and families in all health care settings. In addition, outstanding needs arise from the stimulus situation and cause negative tension. Negative tension represents an imbalance that exists when obstructive forces (pregnant state or childbirth experience) outweigh the facilitating forces (nursing intervention) at hand. The needs for comfort are identified and interventions are targeted towards those specific needs, moving tensions in a positive direction (Kolcaba, 1994). However, a person may interpret some events in terms of the many interacting forces that influence the outcomes of comfort perception (Murray, 1983). The interacting forces consist of the person's past experience, age, attitude, emotional state, support system, and the totality of elements in the present experience. These parts of persons cannot be separated physically from each other and because they act together, ideally they should all be estimated simultaneously (Murray, 1983).

The theoretical framework of the study is presented in Figure 1. Based on the Kolcaba's guidelines, certain needs arise in the pregnant women or mothers during the

pregnant state or in the stressful situation of childbirth experience as they were defined as the obstructing force. The yoga program during pregnancy was designed to meet the needs that remain after the mother's own reserves are depleted by the pregnant state or labor pain, and they were defined as the facilitating force. The main outcomes were the assessment of the mothers' perception of comfort during pregnancy and during labor, labor pain, and the birth outcomes of the length of labor and the Apgar score at 1 minute and 5 minutes after birth.

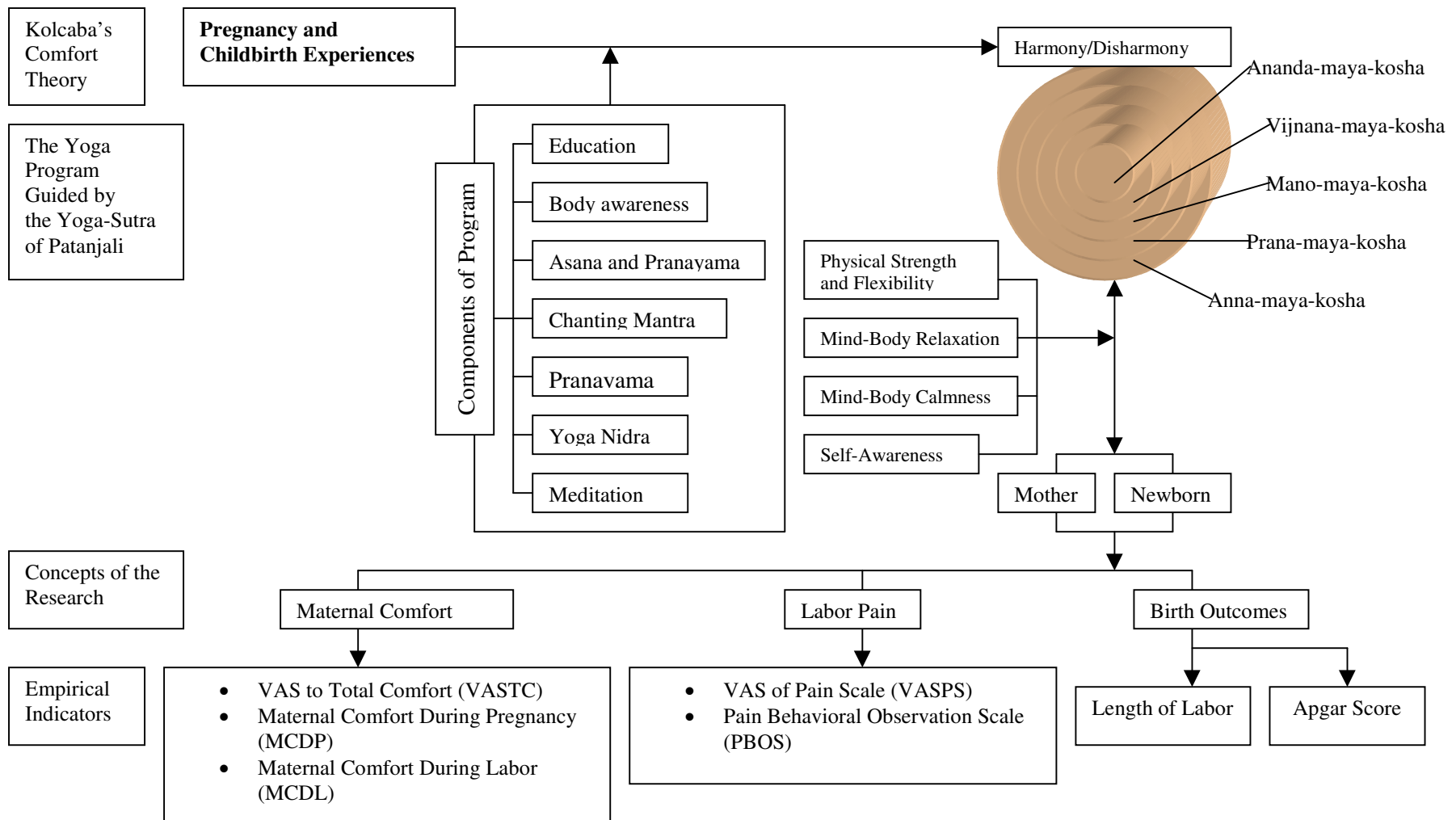


Figure 1 Theoretical Framework of Yoga Program for Enhancing of Maternal Comfort, Reduction of Pain, and Improving of Birth Outcomes

Definition of Terms

Yoga program refers to the program developed for pregnant women based on the yogic principle practices (Balaskas, 2003; Gore, 1997; Kuvalayananda & Vinekar, 1994; Udupa, 1985; Yogendra & Desai, 1994; Yogendra, 1998). It is comprised of: *Asana* for physical exercise combining *Bandha* (a posture in which organs and muscles are contracted and controlled creating a psychomuscular energy lock which redirects the flow of energy or prana in the body and locks it into a specific area) or chanting a mantra (the repetitious use of a word or series of words aloud or silently to invoke spiritual qualities); *Pranayama* (a breathing technique) for channeling energy correctly; *Yoga Nidra* (a deep relaxation technique); and *Dhyana* (meditation) for mental exercise. It evokes the integration of a maternal inner environment and harmonization with the integration of the maternal psyche with its external environment, and the integration of the psyche with the spiritual. This program includes both the 6 sessions with the researcher, and self-practice by the pregnant women at home.

Quantity of yoga practice refers to the quantity of yoga that pregnant women perform within a week. The quantity is measured according to: (1) the duration (how long each session lasts), and (2) the frequency (how often yoga is practiced within a week) (Appendix H). Longer sessions and more frequent of yoga practice would be associated with the greater enhancement of maternal comfort, the reduction of labor pain, and the improvement of birth outcomes.

Maternal comfort refers to the mothers' perception of the state of being strengthened by having the need for relief, ease, and transcendence met in the four context of physical, psychospiritual, sociocultural, and environmental during the

pregnancy and childbirth experience. It can be measured by Maternal Comfort During Pregnancy (MCDP) (Appendix C), Maternal Comfort During Labor (MCDL) (Appendix D), and the Visual Analogue Scale to Total Comfort (VASTC) (Appendix E). Higher mean scores indicate higher manifestation of comfort.

Labor pain refers to mothers' perception of an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described as such during labor. Labor pain can be assessed using the Visual Analogue Sensation of Pain Scale (VASPS) (Appendix F) and the Pain Behavioral Observation Scale (PBOS), developed by Baosoung (1983) (Appendix G). The higher score of VASPS indicates more labor pain, in contrast to the PBOS, in which the lower score indicates more labor pain.

Length of labor refers to the duration time in hours from onset of labor to the time after baby and placenta were delivered. It was taken from the medical record.

Apgar score is a systematic measurement of the neonate's physical condition at 1 minute and 5 minutes after birth, including measuring the heart rate, respiratory effort, muscle tone, reflex irritability, and color of the neonate. The higher score indicates a better condition of the newborn.

Pain medication is defined as the amount of pethidine taken by the mother in intrapartum period.

Trait anxiety refers to an enduring characteristic or the relatively stable difference in proneness to anxiety, that is, the difference between people in their tendency to respond to situations perceived as threatening and causing a state of anxiety, which is unlikely to change easily or in a short period of time. Trait anxiety of

the pregnant women in this study was evaluated by using the State-Trait Anxiety Inventory, Trait Version Scale (Appendix B).