

## CHAPTER 5

### CONCLUSIONS AND RECOMMENDATIONS

A randomized control trial study was conducted to evaluate the effects of using a yoga program during pregnancy on maternal comfort, labor pain, and birth outcomes among primiparous women. In this chapter, the conclusions of the study and recommendations are addressed, and strengths and limitations of the study are also provided.

#### **Conclusions of the Study**

Primiparous women were matched by using a computerized minimization technique controlling for maternal age, education, income, marital status, and trait anxiety scores. Pregnant women in the experimental group received a series of six 60-minute yoga practice sessions at the 26-28th, 30th, 32nd, 34th, 36th, and 37th week of gestation respectively. The results of the experimental group were compared to those of the control group, and VASTC was used to assess changes of comfort over 6 time points, and also MCDP was used to detect these changes at Time 1, Time 4, and Time 6 respectively. A self-report instrument was used to measure the quantity of yoga practice in terms of frequency and duration in minutes. The VASTC, VASPS, and PBOS were used to assess changes in comfort and labor pain during the active phase when the cervical dilatation was 3-4cm and uterine contractions were 30 to 60 seconds, and twice at the end of each two hours. Additionally, MCDL was used at the second hour after the babies were born. The conclusions of the main hypotheses are that:

1. The mean scores of labor pain of the experimental group by VASPS, and PBOS were significant differences lower than those of the control group ( $p < 0.05$ , and  $p < 0.01$  respectively). This supported the hypothesis.

2. The mean scores of maternal comfort during labor of the experimental group by VASTC and MCDL were significant difference higher than those of the control group ( $p < 0.05$ ). This also supported the hypothesis.

3. The mean scores of the experimental group in birth outcomes (length of labor, Apgar score) were better than those of the control group. This was partially supported because:

3.1 The length of labor of the experimental group was significant difference in 1st stage of labor and the total time of labor ( $p < 0.05$ ), but there was no significant difference in the 2nd stage of labor ( $p > 0.05$ ).

3.2 The newborns in the experimental group were not significantly different in terms of being at a higher risk than were those in the control group ( $p > 0.05$ ).

4. The mean scores of maternal comfort during pregnancy of the experimental group by VASTC and MCDP were significant differences higher than those of the control group ( $p < 0.01$ , and  $p < 0.05$  respectively). This supported the hypothesis.

5. Pregnant women who undertook a greater quantity of yoga practice (more frequently and for a longer period of time in minutes) were not significantly different in terms of higher maternal comfort from those who undertook a lesser quantity of yoga practice ( $p > 0.05$ ). Therefore, the hypothesis was not supported.

### ***Recommendations***

The study findings have the potential to contribute to the development of nursing science and knowledge. They have implications for theory, nursing research, nursing practice, and health care policy. These are described below.

#### ***Implications for Theory***

The use of a yoga program in this study resulted in enhancing maternal comfort. This supports a proposition of the theory of holistic comfort that human beings respond holistically to complex stimuli, and that comfort is a desirable outcome of nursing, and human beings strive to have their comforts needs met (Kolcaba, 1994). Yoga is one kind of alternative therapy, which addresses the holistic in its approaches, and pregnancy and childbirth are considered multidimensional experiences. Therefore, the theory of holistic comfort provides an appropriate framework for guiding nursing care for childbearing women.

Ideally, the treatment of pain should decrease distress; at the same time it should maintain or even increase self-awareness. Self-awareness is one of the basic principles of yoga and its related meditative techniques, and increased self-awareness has been successfully used in the treatment of pain (Kabat-Zinn, 1982). The pain alleviating mechanism of the meditating technique is not clear; it might be part of the process that most meditation techniques include, such as partial relaxation, which in itself is often pain relieving. When self-awareness is used as a technique for increasing meditation, practitioners should cultivate the role of an impartial observer and

detached witness in relation to all subjective phenomena including pain. In this way the frame of reference whereby pain is experienced changes. Using meditation to perceive pain may also be considered a paradoxical technique decreasing the fear of pain. Additionally, complete or partial relaxation is also considered an integral component of various yogic practices. This could decrease brain activity due to the decreased input of stimuli from the internal as well as the external environment, as mentioned in the nociceptive pathways. Another controlling mechanism derives from the release of endorphins or endogenous opioid peptides; cultivated by yoga practice this may indirectly influence the central nervous system. In turn, this provides a powerful analgesic effect, and increased pain tolerance and control results (Nespor, 1991). Thus, yoga as a mind-body intervention, emphasizes the interconnectedness of the mind and the body, and connects the power of each to affect the other. This technique attempts to reduce environmental and emotional stress by calming the mind in order to mobilize the body to heal itself.

### ***Implication for Research***

It is known that there is a large research gap relating to complementary and alternative therapies, especially concerning the effects of yoga on both maternal and fetal response in Thai primiparous women. Therefore, the results of this study could be used to address these research gaps or limitations. Moreover, this study provides ideas for future research on integrating the yoga philosophy in caring for pregnant women with other health conditions related to health practices or health behavior.

The study findings are significant to nursing research in relation to holistic comfort, self-care and the use of personal resources to achieve healthy behavior. However, a follow-up period of investigation one to five weeks after the 10-12 weeks of 6 sessions training period would provide further evaluation of the benefits of yoga as a model for promoting health and well-being. This could be extended to assess any long-term changes resulting from the yoga intervention.

This study's findings highlight the need for ongoing evaluation of pain management intervention designed to address the specific needs of pregnant women. Along with the findings of others, this work illustrates the need for inclusion measures of both psychosocial and physiological outcomes. Particular emphasis should be placed on documenting new patterns of physiological response to such intervention among pregnant women or mothers. Future studies should also address the holistic comfort as a nurse-sensitive and institutional outcome. This would further help to measure the impact of yoga measures on overall maternal satisfaction within the experience of pregnancy and childbirth.

Many questions remain regarding the benefits, risks and costs associated with physical activities in yoga programs during pregnancy. Future research should be designed to identify factors that are positively associated with adopting and maintaining such interventions and practices. Increased understanding of the determinants of yoga practice and philosophy should be used to guide the development of appropriate intervention strategies. These could be designed to encourage women from different backgrounds to adopt and adhere to a lifestyle that includes the practice of yoga before pregnancy and through the delivery and postpartum periods. In addition, further investigations are necessary to replicate the beneficial findings of the

yoga program in larger populations and to better elucidate physiological mechanisms underlying pain relief. This would help obtain objective data about pain, and so possibly improve other birth outcomes.

### *Implications for Practice*

Two valuable features of this prenatal program to relieve pain and suffering in labor is that it was inexpensive and relatively easy to use. Such a program may be used with or without pain relief medication. Its components can be combined safely or used sequentially to increase their total effect. It encourages active participation by a woman. She can choose these self-comfort measures and use her own capabilities to follow through. In addition, it maintains or restores a sense of control in the woman who is then confident about using her resources to cope with labor better, or influence the degree of labor pain or discomfort experienced. This all leads to a sense of well-being and mastery, and reduces the likelihood of suffering.

Findings from this study clearly indicate that practicing yoga for 30 minutes at least three times per week for 10 weeks is an effective complementary means for inducing relief from pain during labor. It also shortens the duration of the first stage of labor without undue harm to the mother and the newborn. It was shown to be an effective measure and could be used in clinical practice in order to improve the quality of care in labor and delivery. However, post-hoc pair comparisons revealed that maternal comfort during pregnancy within the experimental group began to be significantly different between Time 1-Time 4 ( $p < 0.01$ ), Time 1-Time 5, and Time 1-Time 6 ( $p < 0.001$ ). Thus a longer duration might have further increased the gains in

the expected psychological outcomes, or might have led to further the cumulative effects of the treatment program.

### *Implications for Health Care Policy*

According, to the 10th Plan Vision, “People-centered Approach and the Philosophy of Sufficiency Economic”, health is seen to be social capital. The health services sector is also considered as a new tool for promoting Thailand’s competitiveness in the global trend towards trade liberalization. “Healthy Thailand” (from 2003 to the present) is a strategic approach for the sustainable health development of individuals, families, communities, and society. Each individual is encouraged to adopt appropriate health behavior, such as exercising at least three times a week. In this study, the size of group differences for maternal comfort ranged from 0.14 of VASTC to 0.05 of MCDP during pregnancy, and was 0.09 of VASTC in the delivery period with the variation of effect size of labor pain 0.09 of VASPS to 0.10 of PBOS. It may be difficult to use these findings to provide substantial information for health care policy makers in Thailand. However, yoga is an alternative option for health care practice. It is an intervention that affects both the physical and psycho-spiritual well-being. Therefore, the findings of this study can be used as supportive data to provide guidelines to improve the health care policy for pregnant Thai women.

### *Strengths and Limitations*

This was the first study to examine the effects of using a yoga program on maternal comfort and labor pain. It featured an experimental design using an intervention, a yoga program, with an experimental group and a control group. The advantages of this design are that it: 1) removes the potential of bias in the allocation of participants to each group; 2) tends to produce comparable groups for both known and unknown prognostic factors and other characteristics of the participants at the time of randomization; and 3) guarantees the validity of statistical tests of significance (Friedman et al., 1998). Randomization with the minimization method helped to ensure a sample balance on five potentially confounding factors. In addition, this study featured good controls because only the researcher provided all the interventions at both hospital sites. Thus, the notable strengths of the study included the randomization procedure and equality in size, using the measures for recommended outcomes, good adherence to processes and follow-up, the use of masked assessors, and the methodical development of yoga protocols. However, several limitations may have affected the results of the study.

Recruitment of subjects was actively performed over a period of 12 months, which resulted in there being only 74 eligible and willing subjects. Factors that may have influenced difficulty in recruitment included strict eligibility criteria and the extensive time commitment required of the participants. Recruitment appears to be a common limitation in clinical interventions that investigate the use of exercise for pregnant women. Without medication, or physical limitations to exercise, many women continue their daily physical activity throughout their pregnancy (ACOG,



1994) and the level and intensity of their exercise regimes tend to decline as pregnancy advances (Collins, Curet, & Mullin, 1983; Clapp & Dickstein, 1984). Ning et al. (2003) reported in their study that approximately 39% of participants (151 of 386) did not engage in regular recreational physical activity during pregnancy. Among the physically active women 44% (104 of 235 of participants) reported that walking (60%) and swimming (16%) were the most frequent recreational physical activities. Other recreational activities common among active women were gardening (15%), jogging (14%), and yoga (6.4% or 15 of 235 participants). This suggests that recruitment for such studies is challenging and may, therefore, require creative recruitment procedures and the firm commitment of clinical personnel to ensure subject participation.

A demographic limitation of this study was that the majority of the subjects were pregnant Thai women, who were married and had achieved grade 12 or lower in education. Replication using a more diverse sample is recommended. Other variables, such as socioeconomic status, education levels, motivation, or lifestyle could be taken into account to replicate or determine the effect of such those factors as they were not considered in this study.

Along with the regular self-practice a yoga cassette tape or compact disk was provided to guide the practicing of yoga at home, and to remind and encourage the participants to follow through the Yoga program. This tape or compact disk might have posed some problems for them. Many of them stated that the tape or compact disk was helpful as a sedative for relaxation as it synchronized body movement with deep breathing techniques and *yoga nidra*. However, a daily schedule of listening to a tape or compact disk for approximately 60 minutes was too long.

Although this study was conducted at two settings, this seemed to offer numerous methodological advantages over single-site trial. These included: (1) enhanced external validity; (2) greater statistical power when studying conditions with a low incidence or prevalence, small event rates in the outcomes, or large variance in outcomes; and (3) rapid distribution to provide health care organizations and policy makers with timely results for rapid dissemination to health care systems, and to impact on the way care is delivered (Weinberger et al., 2001). However, the generalizability of the findings of the study is somewhat limited. For example, the subjects who were selected for this study were free of medical and obstetric complications. It is possible that some of the greatest benefits of yoga exercises might be found when used in pregnancies complicated by disorders such as diabetes and asthma. The results of this study of women with uncomplicated pregnancies provide evidence that this trial could be extended. Health providers may be reassured that a structured and well-supervised yoga program can improve maternal physical work capacity without untoward effects on fetal welfare.