A COMPARISON OF THE EFFECTIVENESS OF CHILDBIRTH PREPARATORY TECHNIQUES

DISSERTATION

Presented to the Graduate Council of the North Texas State University in Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

By

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Stress reduction techniques have been used to assist people in coping with stressful medical procedures and events. Labor and delivery training classes have utilized techniques to assist women with the childbirth process. The classes generally included basic education of labor and delivery, respiration behavior, relaxation of muscles, and participation of a coach. Reducing the amount of pain experienced in labor and delivery has been suggested for facilitating the process and decreasing the amount of medication received. The painful experience changed from an uncontrollable situation into a positive one, allowing women to feel more resourceful, less anxious, and less threatened. To address the appraisal of the labor and delivery process, 36 primiparous women in three groups were studied using anxiety, pain, satisfaction, and difficulty ratings as dependent variables. The results were analyzed by a one-way analysis of variance and correlations. Only one of the four hypothesis reached statistical significance. The imagery assisted relaxation group members were able to increase digital temperatures more than the prepared childbirth group. Correlational
data which included the attitude of the mothers and the nursing staff were reported. The results of this study suggested that the type of training a mother used preparing for labor and delivery differs in its value to her depending on early pregnancy attitudes. Implications for future research were discussed.
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A COMPARISON OF THE EFFECTIVENESS OF CHILDBIRTH
PREPARATORY TECHNIQUES

In Auerbach and Killman's (1977) extensive review of the literature on crisis intervention, there was found a growing body of research which examined the application of stress reduction techniques to better prepare patients for a variety of stressful medical procedures including cholecystectomy, cardiac surgery, and dental procedures. This review failed to refer to the information on childbirth which is clearly pertinent to stress inoculation (Beck & Hall, 1978).

As Beck and Siegel (1980) reported, preparing individuals for stressful medical procedures is important, however, few life experiences are as widespread and have such emotional significance as childbirth. Preparing approximately 50 percent of our population who experience childbirth directly would be a worthwhile pursuit for researchers and clinicians. This preparation would help enable women to change the labor and delivery experience into a more rewarding and pleasant event with a minimum of pain and anxiety. As Morgan, Bulpitt, Clifton, and Lewis (1982) reported, since the advent of "consumer groups" among mothers, demanding home delivery and natural childbirth, more attention must be paid to the emotional satisfaction derived from the childbirth experience. Although the USSR has been active in childbirth alternatives, the
western world has lagged behind. In the 1920's Stalin ordered pregnant women to be tested for susceptibility to hypnosis and then used hypnosis for delivery. This was the beginning of the current training which is called "Lamaze" childbirth training (Werner, Schaubb, and Knudson, 1982). By 1975, only six to seven percent of all pregnant women in the United States were receiving prepared childbirth training; this is in comparison to 90 percent of parturients in the USSR (Declercque, 1977 & Ball, 1960, as cited in Beck & Siegel, 1980).

Labor and delivery techniques can be divided into two major categories: traditional and some type of preparation. Although some overlap may occur, the traditional forms generally involve the use of anesthetics and analgesics. Some of the common obstetric medications include sparine, demerol, pentobarbital, pethidine, and bupivacaine (Proctor, 1980; Brackbill, Kane, Manniello, & Abramson, 1974; Belsey, Rosenblatt, Redshaw, Caldwell, Notarianni, Smith, & Bear, 1981). Hutson and Petrie (1982) reported that drug effects in obstetrics are variable. Some may enhance or inhibit uterine activity while other drugs may enhance or inhibit labor progress. These physicians noted that pharmacology relating to the fetus and uterus is in its infancy and that most studies of drug effects are merely anecdotal in nature. However, the effects of medication on the mothers and neonates
cannot be ignored. Brackbill et al. (1974) suggested that the major obstetric danger may be maternal medications prior to delivery. Belsey et al. (1981) while comparing neonates whose mothers had either received demerol and/or pentobarbital or no medication, found the nonmedicated group habituated faster to nonmeaningful stimuli and performed higher on the Neonatal Behavior Assessment Scale. The longer latency in habituation to nonmeaningful stimuli has been suggested to be a factor in learning disabilities. Belsey et al. (1981) also found pethidine interferes with neonatal breathing. The neonates showed signs of cyanosis, respiratory depression, drowsiness, and generalized CNS depression. These mothers were drowsy and groggy. Similar effects with bupivacaine were noted by Rosenblatt, Belsey, Redshaw, Caldwell, Notarianni, Smith, and Beard, (1981). Furthermore, Robson, and Kumar (1979) reported 25 percent of multiparous and 40 percent of primiparous women reported indifference when first holding their babies. This was more often found if they had experienced a painful labor and delivery or been given more than 125 mgms. of pethidine. The average dosage of pethidine is 100-450 mgms.

The preparatory techniques include "natural" childbirth, introduced by Dick-Read (1944) and "psychoprophylaxis" (Lamaze, 1976) and "prepared" childbirth, which is the term advocated by the American Society for Psychoprophylaxis in Obstetrics (Beck & Siegel, 1980). Although the three programs vary,
four common components are found in each program. First, all include a series of lectures that provide the expectant mother with information about pregnancy, labor, and delivery. Second, most teach a series of respiratory behaviors to be used in different phases of labor. Third, expectant mothers are usually provided with brief training in muscle relaxation. Finally, all encourage the active participation of the husband or coach who gives verbal encouragement and support by timing the length of contractions and massaging muscle groups (Beck & Siegel, 1980). Other techniques that have been incorporated into some preparatory classes are Respiratory Autogenic Training (RAT), which involves adding muscle relaxation and slow respirations between contractions (Zimmerman-Tansella, Dolcetta, Azzini, Zacche, Bertagni, Siani, & Tansella, 1979) and biofeedback (Gregg, 1978) which enables patients to learn to control their level of relaxation and their level of autonomic activity. Hypnosis is again gaining use as a hypoanalgesia in obstetrics (Werner et al., 1982).

Several studies have explored the effectiveness of childbirth training. Studies utilizing the cold pressure task and childbirth preparatory techniques have examined in-vivo emotive imagery and focal-point visualization (Stone, Denchik-Stone, & Horan, 1977), attention focusing and systematic relaxation (Stevens & Heide, 1977), restructuring
the pain experience as pleasant (Barber & Cooper, 1972), and adding cognitive distractors (Mulcahy & Janz, 1973).

To determine pain tolerance and pain perception, the researchers use the cold pressure task, where the nondominant hand is immersed for two minutes in warm water (37 + 2°C) to establish a standard initial hand temperature and then the hand is immersed in ice water (0.5 - 1.0°C). The subjects then rate the pain on a scale from 0 - 10, with "0" being no pain and "10" unendurable pain. If a subject has to remove the hand before four minutes of exposure time, a rating of "10" is given. The two dependent variables are length of immersion time (pain tolerance) and a pain rating (pain perception). Stevens and Heide (1977) found that attention focusing (staring at a blank spot on the wall) with feedback relaxation, which involves alternating tensing and relaxing muscle groups with the experimenter lifting an arm or leg when that muscle group is to be relaxed, was more effective in increasing pain tolerance and decreasing pain perception than either task alone. Stone et al. (1977) in a similar study compared a) in-vivo emotive imagery, where the subjects imagine the cold water as pleasant, b) focal point visualization, where the subjects stare at a white card with a black dot on it, and c) Lamaze respiration techniques. Only the emotive imagery group could marginally increase immersion time. Barber and Cooper (1972) found
subjects who listened to an interesting story or added serial sevens aloud experienced less pain than subjects who were sitting quietly or adding aloud. Mulcahy and Janz (1973) found subjects who were instructed in Lamaze breathing techniques coupled with cognitive distractors were able to increase pain tolerance levels more than subjects who were taught unrelated isometric exercises.

Anxiety and pain have been found to be related. Klusman (1975) observed that pregnant women with high scores on the Manifest Anxiety Scale rated the experience of labor as more painful than those women with low scores. Zuckerman, Nurnberger, Gardine, Vandeveer, Barrett, & den Breeijen (1963) noticed a significant relationship between anxiety ratings on an adjective check list and amount of analgesia used during labor. Kondas and Scetnicka (1972) observed 40 women who scored high on the Manifest Anxiety Scale and instructed half of the group in psychoprophylactic training and half were exposed to systematic desensitization (SD). Both reduced anxiety; however, the SD group exhibited a greater reduction in anxiety. Furthermore, this group had shorter labors for both multiparous and primiparous mothers; they were also rated by their obstetricians as experiencing less pain and manifesting less restlessness. On the Taylor Anxiety Scale (TAS) and State-Trait Anxiety Inventory (STAI) subjects who were exposed to cue-controlled relaxation or attention placebo were able to reduce anxiety more than
the no treatment control group subjects (Counts, Hollandsworth, & Alcorn, 1978). However, Grimm (1980) and Marchetti, McGlynn, and Patterson (1977) did not find cue-controlled relaxation to be any more effective in reducing anxiety than deep breathing. Caution must be exercised with the interpretation of these studies, because trait anxiety was being measured. During labor and delivery Beck and Siegel, 1980, suggested that state anxiety rather than trait anxiety seemed to be the issue involved.

In stressful medical procedures, anxiety has been attenuated by several methods. The effect of pretreatment videotape exposure on patient's reactions to endoscopy was studied by Shipley, Butt, Horwitz, and Fabry (1978). They observed a decrease in heart rate and discomfort after subjects viewed the procedure on film three times. Johnson and Leventhal (1974) noted a combination of sensory descriptions and coping instructions successfully decreased the stress associated with gastrointestinal endoscopy. Kendall, Williams, Pechacek, Graham, Shisslak, and Herzoff (1979) found cognitive-behavioral treatment and educational preparation were more effective in reducing anxiety in cardiac catherization patients than attention placebo or no treatment control groups. Johnson, Rice, Fuller, and Endress (1978) observed that giving coping instructions to cholescectectomy patients was associated with a reduction in post-operative analgesic medication and increased earlier ambulation.
Furthermore, the effect of an accurate description of the procedure was associated with a reduction in hospitalization stay and a shorter length of time remaining indoors after discharge.

Relaxation, coupled with imagery and biofeedback, seem to address the issues related to anxiety, pain, and stress. Benson, Beary, and Carol (1974) stated the relaxation response may result from a hypothalamic response leading to a generalized decrease in sympathetic nervous system activity. The aspects involved include: a) a mental device such as sounds or words which act as a stimulus; b) a passive attitude; c) decreased muscle tone; and d) a quiet environment. Polalck and Zeiner (1979) compared relaxation trained subjects, unstructured relaxation subjects, and quiet-sitting participants on relaxation parameters. The results were non-significant, but were in the intended direction for decreased sympathetic activity with decreased heart rate, decreased skin conductance, decreased respiratory rate, and increased digital pulse amplitude. However, the group that sat quietly had the greatest decrease in heart rate.

Adding imagery to the relaxation process has been found to be helpful in reducing pain, anxiety, and in promoting healing. Paul (1966) observed decreases in the self-report, behavioral and psychological manifestations of anxiety when relaxation training was coupled with imagined feared events.
Achterberg and Lawlis (1980) have noted with cancer, burn, and pain patients that the imagery technique benefitted the healing process. In the area of menstrual pain, Cox and Meyers (1978) and Tasto and Chesney (1974) found systematic desensitization and relaxation decreased menstrual pain.

In a recent study by Lindberg and Lawlis (1983), significantly higher finger temperatures and lower state anxiety were reported by women who were trained in imagery assisted relaxation than by women trained in alternation of tensing and relaxing muscle groups. These differences were found after completion of childbirth classes.

Doyle (1980) reported that biofeedback has been useful in educative-supportive psychotherapy to help subjects utilize stress management skills more effectively. The capacity to learn control is inherent in every human. The biofeedback device simply rationalized and accelerated the learning process. However, biofeedback must be learned and applied through practice and not be a haphazard quest for quick symptom relief during a stressful event (Segal, 1975).

Although only one study (Gregg, 1978) has used biofeedback in childbirth training, biofeedback has been used extensively in the treatment of dysmenorrhea. Dietrorst and Osborne (1978) in a single case study with hand temperature training, found a 64 percent decrease in ratings of symptom severity. Sedlacek and Heczey (1977) noted marked improvement in three cases out of three of dysmenorrhea symptoms when
trained with frontalis EMG, hand, and vaginal temperature biofeedback. Tubbs and Carnahan (1976) reported symptom improvement in four cases out of eight using frontalis EMG and hand temperature training. Heczey, Denmark, and Kerenyi (1975) and Russ (1976) in Denney and Gerrard (1981) found significant differences on biofeedback measures with vaginal and hand temperature levels, but no differences in symptom relief with the training.

French, Leeb, and Boerner (1973) advocated using biofeedback and Lamaze (prepared) childbirth training, however few studies have done so. Gregg (1978) used biofeedback techniques (wrist-to-wrist EMG placement and finger temperature) with women who were pregnant and participating in a Lamaze training program. Sixty subjects were compared with 30 receiving biofeedback training. Those mothers who were multiparous in the biofeedback group had significantly shorter first stage labors; the primiparous group differences were in the same direction, but failed to reach significance. Cervical dilation and fetal descent occurred more rapidly in the biofeedback trained group; they also used less medication. The Apgar scores on the neonates were higher in the group that had biofeedback training.

Melzack, Taenzer, Feldman, and Kinch (1981) utilized the McGill Pain Questionnaire (Melzack, 1975) to examine the qualities of labor pain to determine the effects of prepared childbirth training on intensity and type of pain.
These authors investigated pain felt during contractions by asking women to complete this questionnaire between contractions. The results were analyzed by ranking the pain descriptors and also by reporting the percentage of women using the descriptions. An overall index was also recorded on a "0-5" basis with "0" representing no pain and "5" representing excruciating pain. In that study, multiparous women reported significantly less pain than primiparous women. They also found that age, socioeconomic status, and education were negatively correlated with pain. They further found that women with more severe menstrual pain reported more painful labors.

Lamaze (1976) stated that if a patient can relax, labor was more progressive, required smaller amounts of chemical agents, and afforded a better outcome for the neonate and mother. What seems most important is to identify what helps the mother relax and allows a more efficient labor and delivery. Cogan, Henneborn, and Klopfer (1976) review the aspects that create a positive childbirth. Positive is defined as reduced pain, lowered medication levels, increased relaxation, and control. The four components of a positive experience are a) the husband's participation in both classes and the delivery; b) the couple's feelings of preparedness; c) positive feelings about prepared childbirth on the part of the physician; and d) the level of relaxation the woman felt she had attained.
As Genest (1981) stated, the most notable aspect of the list above centered on what might be called "appraisal" of the childbirth experience. The patient's assessment of the situation as positive and as an experience that she could handle, as well as having support in dealing with the situation, seemed more important than the actual level of relaxation obtained.

What has seemed important in preparing women for labor and delivery is to have training that included the four components of the preparatory classes: a) education; b) breathing techniques; c) relaxation training; and d) participation of a coach. As the Gregg (1978) study pointed out, adding biofeedback parameters to Lamaze training is helpful in improving the labor and delivery process. In addition, as Genest (1981) relates, centering on the "appraisal" of the childbirth process is important to encourage a more positive experience, which involves the women's assessment and judgment about themselves and the context.

This study was designed to address the area of appraisal, to determine if adding imagery assisted relaxation enabled women to feel more control, more resourceful, less anxious, and less threatened. Based on the preceding research, the following hypotheses were made for this study.

1. The women trained in imagery assisted relaxation (IAR) would demonstrate a deeper level of relaxation with higher finger temperatures than the group trained in the prepared childbirth class (PC).
2. It was further hypothesized that the (IAR) group would indicate a greater reduction in state anxiety after training than the group trained in the prepared childbirth class (PC) or the group who received no training (NT).

3. It was also hypothesized that the (IAR) group would experience more satisfaction with the labor and delivery process than the other two groups.

4. Lastly, it was hypothesized the (IAR) group would experience less pain than the other two groups.

Method

Subjects

Thirty-six pregnant primiparous women, who were in their sixth to ninth month of pregnancy, served as subjects in this study. A summary of the results was given to all participants in exchange for their participation. The subjects ranged in age from 18 to 33, their mean age was 23.33, all were married and Caucasian.

Instruments

State-Trait Anxiety Inventory-State. This instrument was developed by Spielberger, Gorsuch, and Lushene in 1970 to detect how a person feels at the moment which assesses state anxiety. The instrument is a list of 20 statements, for example, "I feel calm" or "I feel nervous." The person then responds to each statement by reporting, 1) not at all, 2) somewhat, 3) moderately so, or 4) very much so.
The response is then rated on a scale of 1 to 4; the higher the score the more anxiety the person is feeling at that moment.

**Health Attribution Test.** This instrument was developed by Achterberg and Lawlis in 1980. It is a list of 22 statements which describe the person's perception of their health, for example, "I can usually keep myself healthy by paying close attention to what I eat," or "No matter what I do I will get sick sooner or later." The person then responds to the statements by one of six categories, 1) strongly agree, 2) disagree somewhat, 3) slightly disagree, 4) slightly agree, 5) agree somewhat, or 6) strongly agree. The responses are then broken down into three categories which indicate whether the person attributes her good health to internal resources, the influence of powerful others, or to chance. The response to each statement is rated on a scale of -3 to +3. The raw scores for each category are plotted to determine the STEN into which each score falls. Once the STEN for each category is known, the percentages to which each person attributes her good health, can be calculated by dividing the STEN by the sum of the three STENS. Test retest reliability for internal resources is 0.83, powerful others 0.75, and chance 0.85.

**Dallas Pain Drawing Grid Assessment.** This instrument was developed by Achterberg and Lawlis in 1984 for use at the Dallas Pain Institute. It is a multi-dimensional
scaling of pain location, intensity, and percentage of pain experienced in various body parts. The amount of pain perceived was assessed by counting the number of grids marked where pain was experienced.

**Apgar Infant Rating.** This scaling was developed by Apgar in 1953 to assess the physical status of a newborn. The newborn's heart rate, reflexes, muscle tone, color, and respirations were used to rate the baby's physical well-being. Each aspect was rated on a 0 to 2 basis which yielded a top rating of ten.

**Biotic Band II. A Finger Temperature Indicator for Thermal Biofeedback Training.** This instrument is available from the Bio-Temp Products, Inc. Indianapolis, Indiana. It records temperature to the half degree.

**Procedure**

To determine if imagery assisted relaxation encouraged positive feelings about the women's appraisal of childbirth and reduced pain perceptions during labor, 36 women were studied. Twelve women were trained in imagery assisted relaxation (IAR) techniques. Twelve were trained in the prepared childbirth class (PC) with alternation of tensing and relaxing muscle groups. The other 12 women received no training (NT) in prepared childbirth, they were members of general orientation classes that hospitals offer.

Three Kansas City area hospitals that offered childbirth classes were contacted. The chief nurse of the hospital,
the nursing supervisor of the obstetric unit, and the class instructors were contacted and their cooperation was elicited. Once given permission to attend the classes, the potential participants were read a description of the study; those women choosing to participate then signed a consent form (see Appendix A) and a release of medical information (see Appendix B). The medical care of each participant remained the responsibility of her primary physician regardless of the additional child birth training received. At the first session all women completed a basic data sheet (see Appendix C), the Health Attribution Test (HAT) by Achterberg and Lawlis (1980), and the State-Trait Anxiety Inventory-State (STAI-S) by Spielberger, et al. (1970.)

All aspects of the training of the (IAR) and (PC) groups remained identical except when the (PC) group were taught relaxation by alternating of tension and relaxation of muscle groups by the class instructors, the (IAR) group were taught autogenic relaxation and imagery for the labor and delivery process. The (IAR) group received an audio tape (Lawlis & Lindberg, 1984) for use in home practice (see Appendix D). During the classes when the relaxation was taught, the thermal unit was applied to each participant's non-dominant index finger, fifteen minutes into the relaxation exercise the temperature was read and recorded. The relaxation exercise was taught at the first five segments of a six week course. The (NT) group received no specific relaxation
exercise; they were informed that relaxing the entire body was conducive to more progressive labors. After the last session all participants again completed the HAT and STAI-S forms.

During the labor and delivery, the medication each woman received was recorded, as well as the phase of labor the woman was in which was indicated by the dilation of the cervix. The neonates' one and five minute Apgar ratings were obtained. The nursing staff rated the difficulty of the woman's labor and delivery and post partum experience. Within one week of delivery, preferably while still hospitalized, all participants completed two ratings of the childbirth experience: a) the follow-up interview (see Appendix E) and, b) the Dallas Pain Drawing Grid Assessment (Achterberg & Lawlis, 1984).

Results

Data for the first hypothesis are analyzed by a 1-way analysis of variance to determine which group (IAR) or (PC) is able to attain a higher digital temperature during the relaxation training. The mean temperature of the five recordings for each woman is analyzed. The (IAR) group achieve significantly higher digital temperatures than the (PC) group., \( F(1,22) = 6.99, p < .05 \). A summary of the analysis of variance is reported in Table 1; cell means and standard deviations are reported in Appendix E. The prediction, that women trained in imagery assisted relaxation will
demonstrate a deeper level of relaxation with higher digital
temperature, is supported.

Table 1

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Subjects</td>
<td>35.28</td>
<td>1</td>
<td>35.28</td>
<td>6.99*</td>
</tr>
<tr>
<td>Within Subjects</td>
<td>110.88</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>146.16</td>
<td>23</td>
<td></td>
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*P < .05

The second hypothesis predicts that the (IAR) group
would report a greater reduction in state anxiety at the
end of training from the beginning of the instruction than
the (PC) group or the no-training group (NT). A 1-way analysis
of variance of the difference between pre and post test
scores is performed, F(2,33) = 2.98, p > .05, which indicates
no significant differences between groups. A summary of
the analysis of variance is reported in Table 2; the cell
means and standard deviations are reported in Table 10 (see
Appendix F). Hypothesis number two is not supported.

In further investigation for the second hypothesis
the data collected from the HAT which was also given before
training began and at the completion of training, the attribu-
tion of the mother's good health to internal resources
is significant, $F(2,33) = 3.74, \ p < .05$. The analysis of the other two aspects of attribution of good health are non-significant, the powerful other attribution, $F(2,33) = 2.36, \ p > .05$, and attribution to chance, $F(2,33) = .81, \ p > .05$. Table 3 is a summary of the variance attributed to the three aspects of the HAT; The cell means and standard deviation are reported in Table 10 (see Appendix F).

Table 2

Effect of Training Modality on State Anxiety

<table>
<thead>
<tr>
<th>Source of Variance</th>
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<th>MS</th>
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</tr>
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<tbody>
<tr>
<td>Between Subjects</td>
<td>448.66</td>
<td>2</td>
<td>224.33</td>
<td>2.98</td>
</tr>
<tr>
<td>Within Subjects</td>
<td>2485.23</td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2933.89</td>
<td>35</td>
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</table>

Table 3

Effect of Training Modality on Attribution of Health

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Resources</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Subjects</td>
<td>498.16</td>
<td>2</td>
<td>249.08</td>
<td>3.74*</td>
</tr>
<tr>
<td>Within Subjects</td>
<td>2197.80</td>
<td>33</td>
<td>66.08</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2695.96</td>
<td>35</td>
<td></td>
<td></td>
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</table>
### The third hypothesis predicts that the (IAR) group would experience more satisfaction with the labor and delivery process than the (PC) or (NT) groups. This is non-significant, $F(2,33) = .52, p > .05$. A summary of the analysis of variance for satisfaction ratings is reported in Table 4; the cell means and standard deviations are reported in Table 10 (see Appendix F). Hypothesis number three is not supported.

In further exploring the satisfaction of the labor and delivery process, no significant differences are found when examining the ratings of the nursing staff on the women's difficulty of the labor and delivery process, $F(2,33) = 1.18, p > .05$. Table 5 is a summary of the variance for the
difficulty of the labor and delivery process; the cell means and standard deviations are reported in Table 10 (see Appendix F).

Table 4
Effect of Training Modality on Satisfaction Ratings

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Subjects</td>
<td>7.74</td>
<td>2</td>
<td>2.58</td>
<td>.52</td>
</tr>
<tr>
<td>Within Subjects</td>
<td>163.68</td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>171.42</td>
<td>35</td>
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Table 5
Effect of Treatment Modality on the Perceptions of Nursing Staff Concerning the Difficulty of the Labor and Delivery

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>SS</th>
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<th>F</th>
</tr>
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<tbody>
<tr>
<td>Between Subjects</td>
<td>15.50</td>
<td>2</td>
<td>7.75</td>
<td>1.18</td>
</tr>
<tr>
<td>Within Subjects</td>
<td>216.48</td>
<td>33</td>
<td></td>
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</tr>
<tr>
<td>Total</td>
<td>231.98</td>
<td>35</td>
<td></td>
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</table>

No significant differences are found when analyzing the ratings of the nursing staff of the difficulty of the post-partum period across the groups, F(2,33) = .67, p > .05. Table 6 is a summary of the variance for the post-partum period ratings; the cell means and standard deviations are reported in Table 10 (see Appendix F).
Table 6
Effect of Training Modality on the Perceptions of Nursing Staff Concerning the Difficulty of the Post-Partum Period

<table>
<thead>
<tr>
<th>Source of Variance</th>
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<tbody>
<tr>
<td>Between Subjects</td>
<td>9.72</td>
<td>2</td>
<td>4.86</td>
<td>.67</td>
</tr>
<tr>
<td>Within Subjects</td>
<td>239.25</td>
<td>33</td>
<td>7.25</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>248.97</td>
<td>35</td>
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</table>

Further investigation of the reported satisfaction is assessed by correlating the satisfaction ratings with the rating of the hospital nursing staff of the apparent difficulty of the labor and delivery process and of the post-partum period using a Pearson-product moment correlation. Correlations of the satisfaction rating and the following aspects of the follow-up interview are assessed using the Bi-serial correlation: attitude at the beginning of pregnancy, attitude at end of pregnancy, attitude after delivery, amount of pain, whether the patient's pregnancy was planned, and whether she requests medication. The correlations are reported in Table 11 (see Appendix G). Only in the (NT) group is a correlation found that accounted for more than 25 percent of the variance. For this group, 27 percent of the variance is shared with the ratings of satisfaction and difficulty of the post-partum period. Fifty-six per cent of the variance is shared when the attitude of the mother after delivery
is correlated with the satisfaction ratings; if the attitude is more positive, the satisfaction ratings are higher.

A similar relationship for the (NT) group is noted when satisfaction is correlated with the pregnancy being planned; 32 percent of the variance is shared between these two variables.

The fourth hypothesis predicts that less pain would be experienced by the (IAR) group than the (PC) or (NT) groups. No differences are found in the amount of labor pain experienced by the women, $F(2,33) = .83, \ p > .05$. Table 7 is a summary of the variance for the amount of pain reported; the cell means and standard deviations are reported in Table 10 (see Appendix F).

### Table 7

**Effect of Training Modality on the Amount of Pain Perceived**

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Subjects</td>
<td>13.56</td>
<td>2</td>
<td>6.78</td>
<td>.85</td>
</tr>
<tr>
<td>Within Subjects</td>
<td>263.67</td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>277.23</td>
<td>35</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Although the fourth hypothesis is not supported, several aspects related to the pain in the labor and delivery process are examined. The phase of labor when pain medication is received is analyzed; no significant differences are detected across groups, $F(2,33) = .47, \ p > .05$. Table 8 is a summary
of the variance for the phase of labor when analgesia is received; the cell means and standard deviations are reported in Table 10 (see Appendix F).

Table 8
Effect of Training Modality on the Phase of Labor When Analgesia was Received

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Subjects</td>
<td>716.22</td>
<td>2</td>
<td>358.33</td>
<td>.47</td>
</tr>
<tr>
<td>Within Subjects</td>
<td>25358.19</td>
<td>33</td>
<td>768.43</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26074.85</td>
<td>35</td>
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</table>

Although no differences are found in the amount of pain perceived or the phase of labor when medication was received, the Apgar rating at five minutes indicates a significant difference, \( F(2,33) = 4.35, p < .05 \). Performing the Neuman-Keuls Test indicate the difference is between the (IAR) and (PC) groups, with the (IAR) group having higher five minute Apgar ratings. No significant difference is detected at the one minute Apgar ratings, \( F(2,33) = .77, p > .05 \). A summary of the variances is reported in Table 9; Table 10 (see Appendix F) lists the cell means and standard deviations.

To further explore the pain ratings of the three groups bi-serial correlations correlating the amount of pain perceived with whether the pregnancy is planned, and the women's attitude
at the beginning of pregnancy, at the end of the pregnancy and after delivery. A Pearson-product moment correlation is performed correlating the amount of pain perceived and the stage when medication is received and the nursing staff's ratings of the difficulty of the labor and delivery. The correlations are reported in Table 12 (see Appendix H).

Table 9
Effect of Training Modality on the Apgar Ratings at One and Five Minutes

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Apgar at Five Minutes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Between Subjects            | 5.06| 2  | 2.53| 4.36*
| Within Subjects             | 19.17| 33 | .58 |
| Total                       | 24.23| 35 |     |
| **Apgar at One Minute**     |     |    |     |     |
| Between Subjects            | 2.38| 2  | 1.19| .77 |
| Within Subjects             | 51.53| 33 | 1.55|
| Total                       | 53.53| 35 |     |

*P < .05

Thirty-five per cent of the variance is shared for the (IAR) group with the amount of pain perceived and if the pregnancy is planned. Thirty-two per cent of the variance is shared between the amount of pain perceived with a more
difficult labor. For the (NT) group as the amount of perceived pain increases the attitude of the mother at the beginning of the pregnancy was more negative, with 34 percent of the variance being shared between these two variables.

Discussion

The first hypothesis is clearly supported; the (IAR) group indicates a deeper level of relaxation with higher digital temperatures. As previous research indicates (Gregg, 1978) adding biofeedback to the relaxation exercise enables patients to learn to predictively control their level of relaxation and autonomic activity. In this study both the (IAR) and (PC) groups are exposed to thermal biofeedback. However, the (PC) group women are only exposed to alternating the tending and relaxing of various muscle groups such as the arms, legs, back, chest, or head. Using the autogenic relaxation technique which encourages warming of the hands, relaxing the pelvic and diaphragm muscles, in addition to the arms, legs, back, and head, address the subjective aspects of the aroused sympathetic nervous system that Pelletier (1977) describes, a locked diaphragm, rigid pelvis with numb genitals and a tight anus, tense neck, and cool hands. The (IAR) group are able to achieve with training the relaxation response which is counter to the aroused sympathetic nervous system response. The (PC) group apparently has difficulty utilizing the biofeedback information as an indication of their progress towards the relaxation response.
because their digital temperature readings are not relevant data for them to incorporate and use as a measure of their relaxation. Focusing during relaxation on the subjective aspects of the response seems to promote the achievement of the relaxation response.

The second hypothesis that state anxiety decreases for the (IAR) group after training is not supported. Previous research does indicate that anxiety is reduced when exposed to systematic desentization or psycho-prophylactic training (Kondas & Scetnicka, 1972), cue-controlled relaxation or attention placebo (Counts et al., 1978). In this study all of the groups receive exposure to the four main components of childbirth training that Beck and Siegel (1980) describe including, a) lectures that provide the expectant mother with information about pregnancy, labor, and delivery, b) a series of respiratory techniques to be used during different phases of labor, c) brief training in muscle relaxation, and d) the encouragement of the participation of the husband or coach. Perhaps exposure to these components regardless of the amount or intensity of the exposure affects state anxiety resulting in the finding in this study of no significant differences. The previous studies analyze trait anxiety (Klusman, 1975; Zuckerman et al., 1963; Kondas & Scetnicks, 1972; Counts et al., 1978; and Marchetti et al., 1977) This study investigates only state anxiety which as Beck and Siegel (1980) report seems to be the type of anxiety that
is operating in labor and delivery. In future studies exploring both trait and state anxiety is recommended to further identify any changes after training. In addition, it is possible that as the anticipated due date approaches, state anxiety may increase for some primiparous women regardless of what training or education they receive. With the increasing popularity of lay literature that encourages the use of relaxation or self-hypnosis techniques as well as the use of these techniques in the treatment of various stress related disorders to control anxiety, the possibility of various amounts of exposure to techniques prior to entering the study is a possible threat to the internal validity of this study.

Although the third hypothesis, that the (IAR) group would be more satisfied with the labor and delivery process, is not supported, as Cogan et al. (1976) suggests one aspect of a positive appraisal of the experience relies on the positive attitude of the physician towards prepared childbirth training. All of the women chose a physician prior to the beginning of any classes in this study. Thus, it remains unclear if the physician's attitude about medication and alternative pain coping strategies confound the results of this study. In addition, it is suggested that perhaps the positive attitude of the nursing staff may influence the positive nature of the experience. One father in the (IAR) group reports in an addendum to the follow-up interview
that he noted when the nursing shift changed and the nurse who taught the childbirth class began working with his wife, the situation changed from dealing with painful contractions to a positive coping experience. In this particular case no medication was involved. Although the father is not any more specific than as reported above it appears that if the nursing staff is supportive and encourages positive behaviors of the woman in labor, the woman's appraisal of the experience may be more satisfying. In future studies it is recommended that influence of the physician and nursing staff be controlled.

In further exploring the mother's satisfaction of the process of labor and delivery, all the participants report using the training they had received in classes. Two participants in the (NT) group report that the one aspect that they wished could be changed in the training is more relaxation and breathing practice. As reported earlier the (NT) group is given instruction in the basic breathing techniques and in relaxation, however they are not given the opportunity to practice and refine these techniques during the classes.

This study examines only women who have a vaginal delivery without complications. Perhaps the type of training received may cause differences across groups if women are included that encounter an emergency Caesarean section. One woman who had an emergency section completed the follow-up interview and responded negatively to the experience and to the
training she had received. She had originally been a member of the (PC) group. She reports the training did not prepare her for coping with the intense labor pain, and the relaxation and breathing techniques are ineffective. She rates her satisfaction at the lowest level, "very dissatisfied."

Perhaps once the baby is born and no abnormal difficulties for the infant or mother are encountered, the ratings are artificially inflated. In future studies obtaining a satisfaction rating at various stages of the labor phases, at delivery, and at pre-selected post-partum times would be informative.

For the no-training group whether the pregnancy was planned seems to be related to a more satisfactory experience. For the other two groups (IAR) and (PC) the relationship differs but is small five to six percent. Perhaps for some women if a pregnancy is planned there is the beginning of a more positive set which flows over into the labor and delivery process and this becomes more important when lesser amounts of training are involved. The attitude of the mother after delivery and the rating of the nursing staff concerning the post-partum period are both correlated to the satisfaction ratings for the (NT) group. Perhaps for the women who receive less training the satisfaction is more dependent upon the recovery period being favorable.

Although hypothesis number four is not supported; no significant differences in the amount of pain reported by the women are noted. What may be important in the labor
process is not the amount of pain, but the emotional reaction to the pain (Melzack et al., 1981). In this study five members of the (PC) group, three from the (IAR) group, and four from the (NT) group received no medication. It appears that the influence of the physician or nursing staff interact with the use of medication. Of all the mothers requesting medication only one was denied it; she is a member of the (PC) group. All other women requesting medication received either Demerol or Stadol which are both potent narcotic analgesics similar to morphine (PDR, 1983). Once medication is requested by a woman in labor; the typical response in this study is for the medical staff to prescribe a medication as opposed to encouraging alternative coping strategies.

All participants in each group are given the opportunity to observe a film of a labor and delivery and tour the labor and delivery facility. Perhaps this amount of exposure is effective in controlling anxiety and pain during the actual experience. Johnson and Leventhal (1974), Kendall et al. (1979), Johnson et al. (1978), and Shipley et al. (1978) find in stressful medical procedures that education, coping instruction, and exposure to the anticipated events reduces anxiety, postoperative analgesia, and results in earlier ambulation reducing hospital stays. In future studies, exploring post-partum medication use, length of hospital stay, and difficulties after discharge would be appropriate. One woman who is not included in this study
because of two previous deliveries reports that the (IAR) training is as helpful for her as previous courses in controlling the pain, however she reports the imagery assisted relaxation facilitated her ease in the breastfeeding process which reportedly had been problematic for her in the past. Perhaps the effects of the (IAR) training are also long term and benefit the mother-infant dyad after the labor and delivery process.

As the difficulty of the labor and delivery process increases, the amount of reported pain increases for the (IAR) group. No data are available as to what influenced the ratings of the nursing staff to report a more difficult process. Data that involve physical measurements of the baby and mother's pelvic region may help explain the rationale for a more difficult labor and delivery rating.

Two interesting correlations are noted with the amount of pain perceived. As levels of reported pain increase, the likelihood of an unplanned pregnancy is higher for the (IAR) group. For the (NT) group, as the levels of perceived pain increase, the attitude of the mother early in pregnancy is more negative.

As previous studies indicate, medication given to the mother affect the Apgar ratings of the infant (Proctor, 1980; Brackbill et al., 1974; Belsey et al., 1981). This study fails to find any differences in the one minute Apgar, however at five minutes the Apgar rating of the (IAR) group
is significantly higher than the (PC) group. It appears that other aspects contribute to the Apgar ratings, not just the analgesia. Just what the other aspects are is unclear but provides an opportunity for future investigation.

Inferences drawn from the outcome of this study suggest several additional questions for future research, primarily in the area of satisfaction and pain experienced. The mother's attitudes about the pregnancy and the attitudes of the medical staff seem to influence these two variables. In order to investigate the magnitude of these aspects, a study designed to gather data from the medical staff and the mothers during the entire pregnancy would give a clearer understanding of these attitudinal effects. Further investigation of the childbirth process seems warranted to broaden the body of knowledge currently available to researchers and clinicians.
Appendix A
DESCRIPTION OF STUDY AND CONSENT

This study will examine different types of childbirth training. You will be asked to complete two forms at the beginning and end of the training. You may have hand temperature readings recorded several times during the classes. After completion of the training, your physician and the hospital you are using will be asked to provide some information concerning the progress of your labor and delivery with specific information about the medication you received and your baby's Apgar ratings. After completion of the study a summary of the results will be sent to you, your physician, and your hospital. If at any time you choose to withdraw from the study, you may without jeopardizing any current or future involvement you may have with North Texas State University.

A description of the study has been read to me and any questions I had were answered. I agree to participate in this research project.

Signed ___________________ Date ___________________

Witness ___________________ Date ___________________
Appendix B

CONSENT FOR RELEASE OF INFORMATION

I, ____________________________, give my consent to ____________________________ hospital staff to release medical information concerning my labor and delivery to Cheryl Lindberg, Ph.D. candidate, North Texas State University, Denton, Texas. The following is requested:

1. What medication did I receive? ____________________________

2. At what stage of my labor and delivery did I receive the medication? ____________________________

3. Please rate on a scale of 1 to 10 how difficult was my labor and delivery, with 1 being very easy and 10 very difficult. ____________________________

4. Please rate on a scale from 1 to 10 how my post partum period progressed with 1 being very smooth and 10 very difficult. ____________________________

5. What was my baby's Apgar at one minute? ________________ at five minutes? ________________

Signed ____________________________
Date ____________________________
Witness ____________________________
### Appendix C

#### DATA SHEET

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<td>Phone</td>
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<tr>
<td>Age</td>
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<td>Due Date</td>
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<tr>
<td>Physician</td>
<td></td>
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<tr>
<td>Address</td>
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</tr>
<tr>
<td>Phone</td>
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</table>
This is an exercise designed to teach you how to relax mentally and physically. With practice you will be able to relax in a matter of seconds. Let us begin. You need to make this time, a time when you are unlikely to be disturbed, so close the door and find a position where you are very, very relaxed, either sitting down or lying down. Let us begin by first of all taking a very deep breath and letting it out. Take another deep breath and let it out. While focusing on your breathing, I would like for you to think about your breathing as cleansing your body of any type of tension or any kind of stress. So take another deep breath, as you let this breath out, slowly close your eyes then take another deep breath. This time when you take the breath in say the words, "I am," and as you let the breath out, repeat the word, "Relaxed." So as you breathe in and breathe out you are saying, "I am relaxed." As you do this, you will begin to notice how much more relaxed you are with each breath. "I am relaxed."

As you are breathing this way and becoming more relaxed, I would like for you to become aware of how your eyes are becoming relaxed. Now your eyelids are becoming heavier, and all the little muscles around your eyes and the little muscles behind your eyes are more relaxed. As your eyes relax, become more aware of the radiation of relaxation...
across your nose, your cheekbones, and your mouth. Even your lips and tongue are becoming warmer. As you are breathing in and breathing out, relaxation is spreading across your face into your jaws, ears, across the top of your scalp so that your whole head is becoming warmer, heavier, and more relaxed. "I am relaxed." You are becoming aware of the relaxation as it goes down into your neck, into your throat, and throughout your shoulders. "I am relaxed." Allow any tension to dissolve away and allow relaxation to take over. Feel the relaxation go down into your arms, your elbows, and into your wrists. Your entire arms are heavy and relaxed. The relaxation spreads out into your fingers and your thumbs. As they become very relaxed, you may be aware that the very tips begin to tingle. This is okay. "I am relaxed."

As the relaxation spreads into your chest, you can become aware that it is even easier to breathe. Now the relaxation spreads around your sides to your back, it moves down your back, feel each little vertebrae, each little backbone becoming more relaxed and flexible. Then into your stomach, into your abdomen, warm and heavy. You may even become aware that as you relax your internal organs begin to work more effectively with each other, more rhythmically. Become more aware of your heart beat. Become more aware of your blood flow. Becoming totally aware of your relaxation. "I am relaxed." As the relaxation moves down
into your legs, your thighs, as your upper legs become warmer, more flaccid, more relaxed, you can also feel the relaxation move into your knees and into your calf muscles, spreading into your ankles, your feet, into the ends of your toes. Toes becoming warm and relaxed, each toe, your big toe, your second toe, your third toe, your fourth toe, and even your little toe. Becoming warm and relaxed, warm and relaxed.

As you are lying there or sitting there in a very, very relaxed comfortable position, take a mental journey through your body. Go through your body and see if there are any spots of tension left in your body. Focus on that area of tension and allow it to dissolve away with your breathing. "I am relaxed." Now while you are very relaxed, feeling comfortable and satisfied, I would like to share with you some information about your body's activities during labor and delivery. As we do so, we will do this in a very relaxed way so that you can understand how you can participate in this very wonderful event.

There are several phases in labor. In the first phase, your cervix will begin to dilate. The contractions will be mild and irregular waves lasting 30-60 seconds and probably between 5 and 20 minutes apart. This will be a very happy time. You will feel exhilarated and energetic. During this time you will probably want to become very relaxed, conserving energy and feeling very good about yourself.

As the contractions are becoming stronger and more regular
probably 45-60 seconds apiece coming about 3-5 minutes apart, the cervix will become more thinned out or effaced. It will become more dilated around 3 centimeters. You will be very cheerful and talkative. You will want to talk with somebody and feel companionship with somebody. There may be a sort of anxiety, but through your relaxation, through this sort of relaxation, the anxiety will go away. You will become more attentive to your contractions. You will want to remain relaxed.

In the next phase which is called the accelerated phase, the contractions will become stronger, lasting 50-60 seconds at 2-4 minute intervals. Your cervix will dilate to 3-8 centimeters. You may become more serious. You may even experience some doubts and fears, but through your relaxation and through your knowledge that things will work out, you become more relaxed and these too will go away. The last phase of labor is called transition. During this phase, your contractions will last 30-90 seconds, and occur at 1-2 minute intervals. Your cervix will dilate 8-10 centimeters. Ten centimeters is considered complete dilation. You may feel frustrated and apprehensive. You may even have cramps in your legs. Perhaps you may feel a little nausea. Again, by relaxing and taking control of these feelings, these too will pass. By breathing in and breathing out, breathing in and breathing out, you allow only your uterus to contract.
The next stage is delivery. The cervix is already dilated. The contractions will remain about the same. You may be asked by your physician to push during contractions. To do so, just relax, allow your body to focus on pushing. Pushing primarily onto the perineal area. Allow the perineal to be relaxed. Between contractions you again relax and conserve energy.

The last stage of the total process is the expulsion of the placenta. This is after your baby is born. Remain relaxed and alert, knowing that this is part of the entire experience.

As you practice with this relaxation tape, be aware of your body's cues and sensations so that during labor and delivery you will remain relaxed throughout the entire process. Now, I want you to think back to these phases, picturing yourself going through this process in a very relaxed and calm way. I want you to think about the preliminary phase. The contractions are becoming stronger, you are very relaxed and calm, feeling very good about this process. Now the accelerated phase, when the contractions are coming more frequently, knowing very well that you will be relaxed, calm and alert. Especially during the last phase when your cervix has dilated and you are delivering your baby, feeling the joy, feeling the satisfaction, knowing that after the birth there will be a few more contractions for the expulsion of the placenta.
Now that we have gone through this explanation of the birthing process, I would like you to imagine what is happening inside your body, what is happening with the baby. Imagine your uterus and birth canal as being like a balloon that is filled with water. The top of your uterus, or the top of the balloon, is contracting and pushing air and water or the baby into the neck of the balloon or birth canal. The neck is becoming thin due to the water in the balloon, and your uterus is contracting. The baby is moving along the birth canal, stretching the cervix and thinning the sides. The baby is doing the work as it is moving along. You are allowing the baby's work to proceed with greater ease by relaxing. If you keep your perineal area relaxed, the baby's job of pushing through the birth canal will proceed more readily. The baby will not be pushing against hard tense muscles but instead will be sliding through the fully dilated cervix and relaxed vagina. Again if you imagine the balloon, if you push on the middle or neck of the balloon, some water may escape, however, not as effectively as when you push the water out by pushing on the top of the balloon. Imagine your vagina opening fully in a relaxed manner so that the baby can move along. See in your own mind's eye these relaxed muscles as if they were the sides of a wide water slide. See the baby move along this water slide without resistance, easily, comfortably, and without tension.
With these ideas, with these images in your mind, I would like you to review these processes, knowing that everything will work out for you normally and with great satisfaction. Now, I am going to count from ten to one. As I get closer to one, you will feel more and more alert and more and more refreshed. Ten, nine, eight, feeling energy moving through your body. Seven, six, five, your hands and feet are feeling more like moving. Four, three, two, feeling very refreshed and energetic. One, open your eyes proceed with your activities and have a very, very good day.
Appendix E

FOLLOW-UP INTERVIEW

1. Did you use your training in labor?
2. In delivery
3. How effective was the training?
4. How did you use the training?
5. Did you request medication or did the physician suggest it?
6. Any suggestions for improving the training you received?
7. Was this pregnancy planned? _________
8. What was your attitude about this pregnancy early in the pregnancy?
9. What was your attitude late in the pregnancy?
10. What is your attitude now? ______________________
11. Please rate on a scale from 1 to 10 your feelings during labor and delivery, with 1 being very dissatisfied and 10 being very satisfied. ______________________
APPENDIX F

Table 10

Means and Standard Deviations of Variables Comparing
The Imagery Assisted Relaxation, Prepared Childbirth,
and No-Training Groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Imagery Assisted Relaxation</th>
<th>Prepared Childbirth</th>
<th>No-Training</th>
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<td>X</td>
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<td>Temperature</td>
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<td>HAT-Control</td>
<td>19.58</td>
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<td>HAT-Powerful Others</td>
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### Table 10 - Continued

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<th>No-Training</th>
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</thead>
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<td>S.D.</td>
<td>( \bar{X} )</td>
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<td>3.14</td>
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<td>Apgar Rating at One Minute</td>
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<td>7.08</td>
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<tr>
<td>Apgar Rating at Five Minutes</td>
<td>9.25</td>
<td>0.62</td>
<td>8.33</td>
</tr>
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</table>

*\( p < .05 \)
APPENDIX G

Table 11

Correlations of Ratings by Mothers on Satisfaction of Labor and Delivery Process with Selected Assessed Variables Imagery Assisted

<table>
<thead>
<tr>
<th>Variables</th>
<th>Imagery Assisted Relaxation</th>
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<th>No-Training</th>
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</thead>
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<td>Attitude at Beginning of Pregnancy**(a)</td>
<td>0.10</td>
<td>-0.41</td>
<td>-0.35</td>
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<tr>
<td>Attitude at End of Pregnancy**(a)</td>
<td>0.20</td>
<td>0.09</td>
<td>-0.42</td>
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<tr>
<td>Attitude after Delivery**(a)</td>
<td>0.00</td>
<td>-0.04</td>
<td>-0.75*</td>
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<td>Amount of Pain Perceived(a)</td>
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<td>Pregnancy Planned*** (a)</td>
<td>0.24</td>
<td>-0.26</td>
<td>-0.57*</td>
</tr>
<tr>
<td>Requested Medication*** (a)</td>
<td>0.18</td>
<td>0.24</td>
<td>0.03</td>
</tr>
<tr>
<td>Difficulty of Labor and Delivery****(b)</td>
<td>0.09</td>
<td>-0.15</td>
<td>-0.42</td>
</tr>
<tr>
<td>Difficulty of Post Partum****(b)</td>
<td>0.28</td>
<td>-0.08</td>
<td>-0.52</td>
</tr>
</tbody>
</table>

* p < .05
** Lower number more positive rating
*** Yes = 1
No = 2
**** Lower number less difficulty
(a) Bi-Serial correlation
(b) Pearson-product moment correlation
APPENDIX H

Table 12

Correlations of Amount of Pain Perceived with Selected Assessed Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Imagery Assisted Relaxation</th>
<th>Prepared Childbirth</th>
<th>No-Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy Planned(a)***</td>
<td>0.59*</td>
<td>-0.10</td>
<td>0.34</td>
</tr>
<tr>
<td>Attitude at Beginning of Pregnancy**(a)</td>
<td>0.14</td>
<td>0.21</td>
<td>0.58*</td>
</tr>
<tr>
<td>Attitude at End of Pregnancy**(a)</td>
<td>0.19</td>
<td>-0.08</td>
<td>0.29</td>
</tr>
<tr>
<td>Attitude after Delivery**(a)</td>
<td>0.00</td>
<td>0.05</td>
<td>0.06</td>
</tr>
<tr>
<td>Stage when Medication was Given(b)</td>
<td>0.30</td>
<td>-0.12</td>
<td>-0.07</td>
</tr>
<tr>
<td>Rating of Difficulty of Labor and Delivery(b)****</td>
<td>0.57*</td>
<td>-0.19</td>
<td>0.18</td>
</tr>
</tbody>
</table>

* P < .05
** Lower number more positive rating
*** Yes = 1
No = 2
**** Lower number less difficulty
(a) Bi-Serial correlation
(b) Pearson-product moment correlation
References


