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THE EFFECTS OF PREPARED CHILDBIRTH ON LENGTH OF LABOR IN LOW-RISK PRIMIPARAE

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THE EFFECTS OF PREPARED CHILDBIRTH ON LENGTH OF LABOR IN LOW-RISK PRIMIPARAE

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Chapter 1

INTRODUCTION

Background Rationale for the Study

Prepared childbirth has become an increasingly popular method of childbearing in the United States during recent years. Its public popularity has stimulated professional interest and widespread acceptance by many obstetrical health care professionals. There are many possible explanations for this trend. Some parents find the enhancement of personal satisfaction and the opportunity for active participation in their child's birth most attractive. Published reports of physiologic benefits for the mother's labor process and for improved fetal/neonatal well-being have also contributed to the enthusiasm for prepared childbirth. In some instances, however, the trend has resulted more from public demand than from scientific documentation of the principles involved.

As early as the 1930's Grantly Dick-Read proposed that fear, tension and pain inhibited labor and caused prolonged, dysfunctional labors (Dick-Read, 1959). Dick-Read developed a prepared childbirth technique which was based on a desire to view childbirth as a natural phenomenon. Natural childbirth, as practiced by Dick-Read's patients, was based on educational preparation and physical conditioning. Dick-Read provided a positive, humane supportiveness that was apparently very pleasing to his patients, however, this technique has been described as mystical (Ewy, 1976) and lacked a true technical format.

Today, prepared childbirth is based on the psychoprophylactic method (PPM) which was introduced by a French obstetrician, Ferdnand Lamaze, in the 1950's (Vellay, 1960). The Lamaze method provided some definitive techniques in addition to physical and educational preparation. This technique was based on the Russian concept of psychoprophylaxis, meaning mind-prevention, which stemmed from the Pavlovian experiments with conditioned response. Pavlovian theory distinguished two types of central nervous system response sets: unconditioned, or inborn reflex response, controlled unconsciously by subcortical areas of the brain, and conditioned, or learned reactions, controlled consciously by the cerebral cortex. The use of positive conditioned responses, i.e., breathing and relaxation techniques, in childbearing replaced the socially acquired negative reactions of fear and pain to uterine contractions. Lamaze added the rapid accelerated breathing technique and established his modification of PPM.

Sasmor (1979:45) refers to the childbirth education offered in the United States today as "eclectic approaches" which feature a combination of the Dick-Read and Lamaze methods and are based on three components: knowledge, relaxation, and breathing techniques. The inclusion of the husband as a supportive agent has been an American addition to the European techniques which only saw specially trained health care professionals, i.e., doctors, midwives, or monitrices, as appropriate coaches for trained women in labor. Bradley (1974:13), an American obstetrician and childbirth educator, facilitated movement toward "husband-coached" natural births with his book Husband-Coached Childbirth (Bradley, 1974). He felt that husbands were pushed aside from their wives and were "deprived by isolation from the most meaningful

emotional experience of their lives together" (Bradley, 1974:34). He wondered why husbands should not be present to witness the joyous, rich emotional birth experiences which prepared mothers displayed in the delivery room instead of anxiously, fearfully, uselessly sitting in the waiting room. He began to include them as a member of the childbirth team and found this change to be a very satisfactory one for all involved.

Prepared childbirth has been accepted as a useful coping mechanism for laboring couples. As Sasmor (1979) believes, childbirth education is properly placed within the practice of nursing. A major principle of PPM is the support which is basic to the art of nursing (Hommel, 1969). Nurses supporting PPM couples can provide technical direction on the use of appropriate relaxation and breathing techniques as well as psychological encouragement. Despite the importance of knowledge of PPM to obstetrical nursing practice the physiologic effects of the method have been largely uninvestigated by the nursing profession.

Prepared childbirth has evolved from early mystical theories to knowledge of physiologic factors influencing pain perception and control. Recently it has been shown that the human body is capable of producing endorphins (Chretien, Seidah, Benjannet, Dragon, Routhier, Motomatsu, Cline & Lis, 1977; Vale, Rivier, Yang, Minick & Guillemin, 1978) which reduce pain perception as well as catecholamines which may increase in the presence of anxiety (Lederman, Lederman, Work & McCann, 1978). Levinson, Gershon & Shnider (1979) reported that anxious women had higher circulating catecholamine levels, weaker uterine contractions and longer labors. Thus, Dick-Read's theory of role of fear in labor appears to have been scientifically substantiated.

Both the Dick-Read and the Lamaze methods recognized the benefits of relaxation to efficient labor courses. The duration of labor is of concern because it affects both maternal and fetal/neonatal well-being. It has been said that "Time is the greatest enemy of good labor. Fatigue, both physical and emotional is very detrimental." (Hommel, 1979:363) If relaxation and physical conditioning do promote more efficient labor, the question arises as to whether women practicing prepared childbirth techniques may tend to have shorter labors than those who do not have the benefit of such preparation.

The work of Emanuel Friedman (1978) has provided baselines for normal labor progression to which labors of the study groups were compared. His work was based on observations of 58,831 women over 25 years of data collection. His sample consisted of 10,293

> ...gravidas who did not have fetopelvic disproportion, any form of fetal malposition or malpresentation or multiple pregnancy and who were not subjected to heavy sedation, conduction anesthesia uterotonic stimulation or operative intervention. The group consisted of gravidas at term, all with adequate pelvis, vertex presentation and well-flexed occiput anterior position whose labors progressed normally without interferences and who delivered average-size infants spontaneously or by outlet forceps....(Friedman, 1978:52).

Analysis of these data revealed a typical sigmoid-shaped curve (Figure 1) of normal labor progress which has provided obstetrical personnel with helpful definitions and boundaries for normalcy as well as a means of evaluating a patient's progress in labor.

Friedman Labor Curve

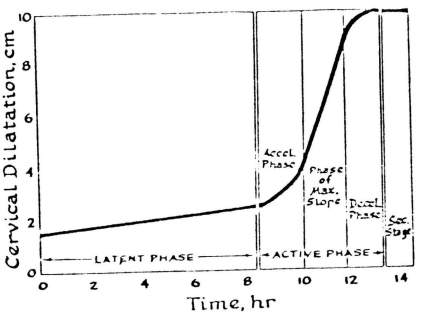

Figure 1

Source Emanuel A. Friedman, Labor: Clinical Evaluation and Management, 2d. ed., (New York: Appleton-Century-Crofts, 1978), p. 33 (reproduced by permission).

The purpose of the study was to compare the duration of the first and second stages of labor of women using prepared childbirth to unprepared women. Both groups were limited to married primiparae between the ages of 18 and 35 years old experiencing low-risk full term pregnancies who had spontaneous labors and deliveries.

Sample Selection Criteria

The selection of these criteria for the target population was based on some widely accepted premises.

Marital Status

The choice of married women only is intended to eliminate risks which may occur when a pregnancy is out of wedlock. Tankson (1979:212) wrote:

> Single parenthood can create many problems that may place both the parent and children

> at risk...difficulties may be directly related to the cause of single parenthood, such as divorce, unwed pregnancy or the death of a spouse.

Another reason for specifying that only married women be included was that it seemed that among the participants available a high proportion of unmarried women would fall into the unprepared group and a high proportion of the married women would be in the prepared group. The groups would be more difficult to compare if marital status was also a variable.

Parity

The use of data on primiparae in the study was made in order to reduce the multiple variables associated with multiparity such as influences of past pregnancy experiences, time interval since last pregnancy, and number of previous pregnancies.

The study was limited to nulliparous women who may have had previous pregnancies which were terminated by spontaneous or induced abortions. All participants therefore were either primigravid nulliparae or multigravid nulliparae. The inclusion of the latter group was supported by Friedman's findings in a study of randomly selected nulliparae that "the labor data for nulliparae who had had prior abortions were essentially identical with those of primigravid nulliparae" (Friedman, 1978:157).

Age

The age group selection was made on the basis of Friedman's (1978) identification of the 18-35 year-old range for his study of low-risk pregnancies. He found that 95% of normal pregnancies occur during those years. A general consensus of opinion (Cram-Elsberry & Malley-

Corrinet, 1979; Friedman, 1978) appears to be that maternal age is a high-risk factor in very young teenagers or of advanced aged primiparae. Although the high-risk screening method used in the project suggests ages below 15 and above 35 are most at risk, Friedman's specifications of 18 to 35 years were followed since the labor curve used was modeled after his work (Friedman, 1978).

Risk

The low-risk designation was intended to reduce the many variables associated with complications of pregnancy and birth. A high-risk status threatens both the mother and her fetus as well as increasing the stress of the pregnancy on the family's development. Some of the factors associated with high-risk status are directly related to the quality as well as the progress of labor, the variable which the study scrutinized.

Gestational Age

Full term pregnancies are less affected by risks which may beset pre- or postterm births. The onset of labor in a preterm pregnancy imposes psychological trauma in addition to possible affects on length of labor which may result from either incomplete fetal growth or an unprepared or "unripe" cervix (Friedman, 1978). Postdatism can pose problems associated with uteroplacental insufficiency and feto-pelvic disproportion (Clark & Affonso, 1979).

Onset of Labor

The labors of eligible subjects were spontaneous, that is, without artificial induction techniques by way of oxytocic drugs which may stimulate and shorten labor. Amniotomy, on the other hand, if

performed once labor has begun, is essentially uninfluential to the course of labor. In fact, Friedman's work refutes the belief that amniotomy stimulates labor. It was found to be "ineffectual as a therapeutic procedure in consistently abbreviating any of the phases of labor" (Friedman, 1978:216). Therefore, labors which were "induced" or "augmented" by amniotomy were still considered spontaneous and were eligible for the study.

Prepared Childbirth Group

The Prepared Childbirth (PC) group consisted of 30 women who had participated in prepared childbirth classes taught by American Society for Psychoprophylaxis in Obstetrics (ASPO) Certified Childbirth Educators in the Peninsula area of Virginia. The classes offered by this group of instructors consisted of a six-lesson series of weekly two-hour classes. The classes typically consisted of an hour of practice and instruction on breathing and relaxation techniques, a short break and approximately an hour of theoretical information about pregnancy, labor and birth. A typical class outline followed the sequence shown below:

Class I	What is prepared childbirth, Relaxation, Body Toning, Kegal's Exercises, Breastfeeding, Introduction to literature available, Options in birthing
Class II	Fetal development, Labor process, Breathing - Slow chest, Shallow chest, Hospital procedures - Admission, Preps, Enemas
Class III	Details of first stage through active labor, Fetal monitoring, Breathing - Double time, Combination, Accelerated-decelerated, Shallow
Class IV	Back labor, Transition, Premature urge to push, Inductions, Breathing - Choo-choo, Blowing

Class V	Second stage, Medications, Forceps, Cesareans, Breathing - Pushing: Holding breath and exhalational
Class VI	Visit from delivered couple, Delivery room procedures, Delivery, Third and fourth stages, Emergency childbirth, Postpartum in hospital and at home, Exercises

Classes cost $30.00 per couple, however, a sliding scale of fees ranging from as low as $5.00 was available for low income women who wished to attend classes. Postcards for class registration were available in all obstetrician's offices serving the study hospital and were included in the information package given to all new obstetrical clients in the City Health Center's prenatal clinics.

Unprepared Group

This group was defined as those participants who had not participated in the ASPO prepared childbirth classes. The unprepared (UP) group consisted of 20 participants. Some women, particularly those who attended the prenatal clinic, received prenatal classes which mentioned, but did not focus on, prepared childbirth techniques. These were group discussions offered in the clinic waiting room on clinic days which addressed many topics relating to pregnancy, labor, birth, parenting, etc.

Problem Statement

Do prepared childbirth techniques affect the length of the first and second stages of labor in low-risk primiparae?

Hypothesis

The length of the first and second stages of labor will be shorter for low-risk prepared primiparae than for low-risk unprepared primiparae.

Variables

The independent variable in this study was the presence or absence of prepared childbirth classes. Women in the study who participated in the six-lesson ASPO program during this pregnancy were considered the prepared childbirth (PC) group. Other participants were designated the unprepared (UP) group.

The dependent variables were the duration of the first and second stages of labor. The first stage was defined according to Clark and Affonso (1979) as the length of time from the onset of regular uterine contractions until complete cervical dilatation (10 cm) and effacement (100%) was achieved. It was subdivided into three phases:

a. the latent phase (0-3 cm)

b. the active phase (4-7 cm)

c. the transitional phase (8-10 cm)

The second stage was defined as the period of time from complete dilatation and effacement until the birth of the infant (Clark & Affonso, 1979).

Operational Definitions of Other Key Terms[1]

1. Fourth stage - immediate recovery period, begins after the expulsion of the placenta and lasts for at least one hour.
2. Full term - births occurring between 38 and 42 weeks of gestation.
3. Gravida - a pregnant woman.
4. High-risk - a group of women and their [fetuses or[2]] infants who may be in jeopardy.
5. Labor - the physiologic process by which the fetus and associated placenta and membranes are expelled from the body.
6. Low-risk - pregnancies which have progressed in an uneventful, uncomplicated manner in that neither maternal nor fetal health has been seriously jeopardized;[2] having achieved a score of less than ten on Hobel's screening system (Hobel, 1973).
7. Parous - having given birth, vaginally or abdominally at or beyond 20 weeks gestation.
8. Primipara - a woman who has given birth or is giving birth to her first child.
9. Prepared childbirth (psychoprophylactic method or PPM) - mental and physical education of the parents in preparation for childbirth, with the goal of minimizing the fear of pain and promoting positive family relationships (Jensen, Benson & Bobak, 1977).

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[1] Definitions are according to Clark and Affonso (1979) except where indicated.

[2] Author's definition.

10. Prolonged latent phase - dysfunctional labor pattern defined by abnormal duration of the latent phase beyond 20 hours in primiparae (Friedman, 1978).
11. Third stage - placental stage, begins after the complete birth of the baby and ends with the delivery of the placenta.
12. Toxemia of pregnancy (preeclampsia) - a specific complication of pregnancy characterized by a sustained rise in blood pressure and often by edema and albuminuria.

Assumptions

1. The women in the prepared childbirth (PC) group received approximately equivalent preparation since each of them completed a six-lesson (12 hour) program of instruction which consists of very similar content. No attempts were made to control for missed classes. Instructors for these classes were ASPO-certified childbirth educators. Individual instructor differences in teaching techniques may have accounted for some differences in preparation as could individual couple motivation and practice time.
2. All women delivered in the hospital and received similar care by personnel with similar skills during labor and delivery.
3. Classification of high-risk status (Hobel, Hyvarinen, Okada & Oh, 1973) can potentially cause deviations from normal progress in labor and therefore disqualified these women from participation in the study.

4. Forcep deliveries alter the second stage and these deliveries were not considered spontaneous.
5. Oxytocin artificially affects uterine contractions and progress in the first stage. Women who received oxytocics in their first or second stages of labor were eliminated from consideration.
6. A mother's decision to give her baby up for adoption undoubtedly creates a difficult and stressful situation so these women were not asked to participate in the study.

Limitations

1. Although all the prepared women were assumed to be equally trained, individual differences such as practice time and fatigue may have altered ability to use the prepared childbirth techniques effectively.
2. Prepared childbirth classes were taught by several different instructors which may have accounted for some variance in degree of preparation.
3. Unprepared women may not have been as "unprepared" as the prepared group were "prepared". That is, the two may not have been truly opposite in degree of preparation, as many unprepared women were taught breathing techniques during labor by nursing personnel. Nursing care was not manipulated to deprive them of this source of support during their labors.
4. Instruments developed for the study by the researcher have not been tested for validity and reliability.

5. Length of labor may have been affected by extraneous factors other than those identified by the screening device. Factors such as occiput posterior position may have existed undetected and affected length of labor.
6. Mental attitudes were not within the scope of the study and were not assessed. In an effort to limit the scope of the project, it was essentially excluded from study.
7. The length of labor in the first stage was difficult to assess accurately. To assure consistency of conditions, the onset of the first stage was based on the admitting physician's notation on the chart.
8. Data collection was limited by time factors which prohibited a very large sample size.

Summary

In recent years as childbearing has become a safer process, both maternity nursing and obstetrical practice have become more sensitive to the psychological needs of the childbearing family. Obstetrical care has been adapted to incorporate a more holistic, family-centered philosophy. Prepared childbirth has evolved into one way of helping to satisfy the desire of couples to be more involved in the birth process and to foster family attachment. It is desirable to gain a better understanding of the physical effects of childbirth preparation through empirical testing and documentation. Previous research has shown mixed results as to actual physiologic benefits of the use of "prepared" or "natural" childbirth techniques. The data which have accumulated to date are inadequate and inconclusive as the following review of literature reveals. The study

contributes a more controlled and better defined data collection in order to help overcome some of the deficiencies of previous research and provides clearer insights into the effects of childbirth preparation on length of labor. The study provides nurses, other health care professionals, parents, and childbirth educators with greater knowledge and understanding of the value of prepared childbirth and its effects on the length of the labor process. The information provided by the study broadens our professional knowledge of the effects of prepared childbirth and increases the ability of health care team members to foster satisfying, efficient labors for their clients.

Chapter 2

REVIEW OF THE LITERATURE

Introduction

There have been few studies aimed at evaluating the effects of childbirth preparation on length of labor. The literature available begins with the use of the Dick-Read method of natural childbirth and evolves to the Lamaze techniques which are the basis for the psychoprophylactic method in use today. In order to establish a framework for the present study, a review of this evolution follows.

In 1933, an Englishman, Grantly Dick-Read, proposed that the pain of childbirth was due to psychologic interference with that natural phenomenon. He theorized that the cyclic syndrome of fear, tension and pain could be interrupted by knowledge and good physical conditioning. The expectant mother would then experience labor without pain (Dick-Read, 1959). His method was practiced to some extent in the United States by a Yale physician, Herbert Thoms, in the late 1940's (Thoms, 1954), but did not gain widespread acceptance and support in this country.

During the mid-1940's in Russia, the Pavlovian theories of conditioned responses were applied to childbirth preparation. It was on this basis that a French obstetrician, Ferdnand Lamaze, began to teach psychoprophylaxis to his patients in Paris in 1951 (Vellay, 1960). The Lamaze method, the psychoprophylactic method, or "PPM" are terms which are used synonomously in the literature.

One of Lamaze's patients, an American in Paris during the 1950's, was Marjorie Karmel. She delivered by this method and became so enthused that in 1959 she introduced the psychoprophylactic method (PPM) to the United States by writing her now well-known book, Thank You, Dr. Lamaze (Karmel, 1959). Together with Elisabeth Bing, a physical therapist, and author of Six Practical Lessons for an Easier Childbirth (1977), Ms. Karmel founded the American Society for Psychoprophylaxis in Obstetrics (ASPO) in 1960. The advent of PPM was an important advance in obstetrical care due to its focus on producing a positive childbirth experience. It helped move obstetrics out of a dark era by advocating parental knowledge and conscious participation in birth. Childbirth was no longer a fearful event clouded in mystery. Bradley's (1974) support of husband-coached childbirth helped to make birthing a more family-centered experience. Other benefits of PPM were still uninvestigated and have remained rather obscure even to the present.

Prepared childbirth classes have since spread throughout the United States. At present, the results of PPM training may be seen daily in practice yet little is known about its effects from a scientific viewpoint. Research primarily undertaken by medical professionals to evaluate its effects has returned mixed results while nursing studies of this subject are almost non-existent.

Studies on Other Factors Affecting Length of Labor

Friedman (1978) identified many other factors which affected the progress and outcomes of labor. Among these were parity, age, the size and position of the fetus, character of uterine contractions, size and shape of the maternal pelvis, and status of membranes. The location of

the placenta was a factor identified by Alvarez (Caldeyro-Barcia, 1961). Maternal position during labor can affect progress as well (Caldeyro-Barcia, 1960, 1979). Attempts to measure all of these factors would prove formidable and were not within the scope of the study. The present study focused on a single physical aspect of labor, its duration, and whether preparation may have any affect on it.

Psychological Elements

Many people who practice in the field of obstetrics have acknowledged the effects of stress, fear and anxiety on labor. It is believed by some that these elements may affect progress in labor. Dick-Read identified the role of fear in pain perception and developed his concept of the fear-tension-pain syndrome (Dick-Read, 1959). He believed that women had been socialized to respond negatively to childbirth and that a cyclic snowball effect of these three elements interferes with labor. Others have used psychological assessments of mothers to determine effects of anxiety states and concluded that mothers with high levels of anxiety antepartum experience more difficult labors (Davids & DeVault, 1962; Kapp, Hornstein & Graham, 1963; McDonald, Gynther & Christakos, 1963). Luschinsky (1978) noted that 10% of the cases of uterine inertia among his well-trained Lamaze patients occurred where no logical anatomic, physiological or mechanical reason could be found. He suggested that these patients were "filled with subconscious fear" (Luschinsky, 1978:194).

On the effects of preparation for childbirth, Friedman wrote:

> The basic problem is our inability to be truly objective in determining the degree of psychologic preparation achieved by any particular patient. Classes in

> psychophysical preparation may attract many individuals who possess underlying anxieties and deep-seated fears. If the psychologic state of the gravida does influence the course of labor - then those gravidas with disturbed attitudes should have disturbed labors. Including such patients in prepared groups will necessarily alter the outcome data adversely. They will effectively erase any potentially beneficial effect on the labor that preparation might have had in more normal individuals...Since psychologic testing at this time is still imperfect, the question of the relationship between formal preparation and the subsequent course of labor remains unanswered... (Friedman, 1978:246,7).

Pharmacologic Factors

Little can be said with certainty about the effects of pharmacologic agents on the progress of labor although many studies of various agents and their effects have been conducted. The results have been highly variable and often contradictory. Friedman (1978) devoted an entire chapter to discussion of potential effects of various drugs on labor and it seemed to be an important variable to address in the present study since very few of the participants were completely unmedicated.

Narcotics. The effects of narcotics varies depending on the phase of labor during which they were given. Narcotics administered during the latent phase may result in "major inhibition of uterine contractility" whereas no effect at all may be discernable from the same dosage of medication given later in the first stage or in the second stage of labor (Friedman, 1978:249). THe amount of medication given is also important as significant differences were found when groups of

lightly medicated and groups of heavily medicated patients were compared to moderately sedated women (Friedman, 1978:250).

Tranquilizers. Promethazine (Phenergan) was shown to reduce the amount of narcotics necessary to achieve analgesia and had less depressant action on uterine contractility than larger doses of narcotics did but still "inhibits both the amplitude and frequency of uterine contractions" (Friedman, 1978:255). It has been reported to diminish uterine activity proportionately to the concentration of the drug given. Zourlas (1964) reported that nine of 13 women induced by oxytocin who were given 50 mg of Phenergan intravenously experienced a decrease in frequency and amplitude of contractions as measured by Montevideo units.

Promazine (Sparine) has shown varied effects in different studies. Zourlas (1964) reported that 50 mg of Sparine given intramuscularly during elective oxytocin inductions in 15 full term gravidas caused an average decline of 80 Montevideo units from the initial values in 13 of the women studied.

Inhalational Anesthetics. Nitrous Oxide does not affect uterine contractility (Caldeyro-Barcia, 1958) but halothane (Fluothane) is a strong inhibitor of uterine contractility (Munson, Maier & Caton, 1969). Methoxyflurane (Penthrane), another halogenated ether compound, also depresses myometrial contractility (Munson, 1974).

Regional Anesthetics. The effects of local anesthetic agents used varies with the site and time in labor of injection; generally, spinal and epidural routes do not alter the course of labor, although there is some disagreement that arrested labor is especially common with

epidural anesthesia (Potter & MacDonald, 1971). Friedman reported that conduction anesthesia "readily inhibited progress and prolonged the latent phase" (Friedman, 1978:263). An increased incidence of forcep applications has been shown in women who received conduction anesthesia (Johnson, Winter, Eng, Bonica & Hunter, 1972).

Pudendal block does not affect myometrial function (Greenhill, 1962) but may retard second stage progress (Lee, 1959). Local infiltration of an anesthetic in the perineal body apparently does not affect myometrial activity although evidence of its presence in fetal scalp blood samples taken seconds after its administration into any maternal spaces (Bradley, 1974) would suggest that even anesthetics given by this method are rapidly absorbed by maternal and fetal tissue and effects cannot be ruled out.

Studies Reporting the Length of Labor of Prepared Women

The results of previous studies of length of labor in prepared versus unprepared women are summarized in Table 1. The findings are mixed with the earlier studies reporting the shorter labors for prepared women.

A very early study of women who attended a four-class training based on the Dick-Read method found that labors averaged 13.4 hours for trained women and 15.5 hours for their untrained group (VanAuken & Tomlinson, 1953). Of 200 trained women only 45 progressed through labor without medication such as meperidine hydrochloride (Demerol) or alphaprodine hydrochloride (Nisentil). Among the trained women, 89 received inhalation analgesia and 84 had complete general anesthesia for delivery.

Table 1

Summary of Previous Samples and Findings
of Studies on Prepared Childbirth and Length of Labor

Authors	Year	Number of Subjects	Parity of Subjects[a]	Do Results Show Prepared Group to Have Shorter Labors?
VanAuken & Tomlinson	1953	200 Prepared 200 Control	P	Yes
Thoms & Karlovsky	1954	2000 Prepared	P,M	No comparison possible
Laird & Hogan	1956	283 Prepared 227 Unprepared	P,M	No difference
Flowers et al.	1960	33 Natural 22 Hypnotized 55 Natural & Hypnosis 92 Hypnosis & Analgesia 201 Analgesia 186 Scopolamine & Analgesia	P,M	Yes
Davis & Morrone	1962	355 Prepared 108 Unprepared	P	No difference
Yahia & Ulin	1965	166 Prepared	P,M	No comparison possible
Davis & Curi	1968	50 Control 50 Prepared	P	No difference
Sharley	1970	600 Trained 600 Untrained	P,M	Yes
Shapiro & Schmitt	1973	100 Lamaze 100 Unprepared	P	Yes
Zax et al.	1975	41 Unprepared 128 Unprepared	P,M	No difference
Scott & Rose	1976	129 Lamaze 129 Control	P	No difference
Charles et al.	1978	95 Prepared 154 Unprepared	P,M	No difference
Hughey et al.	1978	500 Lamaze 500 Unprepared	P,M	No difference
Herrera	1979	99 Prepared 100 Unprepared	P,M	No difference

[a] P = Primiparae; M = Multiparae

Among the untrained women, 198 had complete general anesthesia for their deliveries. These figures indicated a frequent use of major analgesia and anesthesia, a variable which must be considered when evaluating length of labor.

Thoms and Karlovsky (1954) studied 2000 prepared mothers to collect data on their labor durations, use of medication, and types of delivery. The preparation given to these women consisted of instruction on basic reproductive anatomy and physiology, relaxation techniques and muscle control exercises. They reported that the primipara's labors averaged 14.3 hours and multiparae averaged 8.0 hours of labor. Their results are difficult to interpret, however, due to lack of controls for comparison of their findings on the duration of labor.

Laird and Hogan (1956) compared 283 women who were trained by attending six 1-1/2 hour conferences which emphasized natural childbirth and the role of the parents in the childbearing process to 227 women who did not attend the conferences. Their data on length of labor were presented in terms of the shortest single labor in each group rather than by group averages. The shortest labor among primiparae was 9 hours, 50 minutes for a trained mother compared to 11 hours, 33 minutes for an untrained mother. Among multiparae the shortest duration was a prepared woman's 7 hour, 37 minute labor compared to an unprepared mother's 8 hour, 25 minute labor. Thus, in each group the trained mothers had the shortest labors, but this cannot be generalized to other groups since single labors are not representative of the group. It was concluded that length of labor was approximately the same in all groups.

Flowers, Littlejohn, and Wells (1960) compared women using natural childbirth and/or hypnosis to those given other analgesics for

labor and delivery. Their study of 442 primiparae and multiparae revealed longer labors among medicated patients. The shortest labors in their groups were the 11 primiparae (natural) and 13 multiparae (hypnotized). Their study reported mean first stages of 4.3 hours and second stages of 0.33 hours in women using natural childbirth and hypnosis compared to a mean total labor of 7 hours in groups using heavier sedation. The use of hypnosis invalidates these results for purposes of comparing natural versus medicated births. Some patients received oxytocin and some received alcoholic beverages during labor in this study making the findings difficult to compare to other studies.

Davis and Morrone (1962) compared 355 mothers who were prepared by attending five or more classes on pregnancy and antenatal exercises to 108 who were unprepared. These groups were further divided into 405 mothers who were given support by a nurse researcher during labor and 58 non-supported women. There were 320 prepared, supported women, 35 prepared, non-supported women; 85 non-prepared, supported women, and 23 with neither preparation nor support. These authors defined support as "...an attempt to create an environment in which the patient may feel secure, comfortable, informed and happy throughout labor and delivery without an undue amount of analgesia or anesthesia" (Davis & Morrone, 1962:1197). They found the support group had longer three to ten centimeter active phases than the non-support group but that the difference was not statistically significant. There was generally no difference between prepared and unprepared groups, although the prepared group tended to have shorter active phases than those who did not attend classes. The second stage was not altered by either support or preparation in their study. No comparison was made between prepared women and unprepared,

supported women. It was concluded that the

> ...type of person who elects preparation is more important in determining its effects than the preparation itself. (Davis & Morrone, 1962:1200).

Yahia and Ulin (1965) prepared their study group of 169 women by teaching five two-hour sessions for couples which emphasized Lamaze's principles and knowledge of the childbirth process. Their results included women who were given oxytocin (Pitocin) and sedation during labor. The average duration of the first stage was 9 hours, 56 minutes for their primiparae and 5 hours, 48 minutes for their multiparae. This study did not use a control group for comparison and drew no conclusions about the effect of preparation on length of labor.

Davis and Curi (1968) reported findings on duration of labor in 50 primiparae who had no formal prenatal preparation to 50 primiparae participating in an extensive training program including exercises, anatomy and physiology, labor and delivery, baby care and the postpartum period. They found no significant differences between the prepared and control groups in terms of the length of the various stages of labor or in the use of analgesics during labor. Average total labor for the prepared group was 11 hours, 7 minutes compared to 11 hours, 1 minute for the control group.

In Australia during the years 1965 to 1968, Sharley (1970) compared 600 Lamaze-trained to 600 untrained women in labor and found that labors were shorter among the trained women. Overall, her trained women averaged approximately 9 hours, 45 minutes for three stages of labor and the untrained mothers averaged 14 hours, 46 minutes for the same process. The numbers of primiparae and multiparae were nearly

equivalent in each group. This study reported means for the groups with no conclusions on statistical significance of the differences shown.

Later, in a study by Shapiro and Schmitt (1973), 100 Lamaze-prepared women were compared to 100 unprepared controls. This study revealed that the Lamaze-prepared group tended to spend less time during their first stages in the hospital, that is, they stayed home longer after the onset of labor, and had shorter total first stage durations (426 minutes) than the control group (508 minutes). Trained women averaged 69 minutes in second stage compared to a mean of 70.6 minutes spent in second stage by the control participants. This study was composed of women with uncomplicated, vertex presentations. The researchers also reported less use of analgesia by the prepared group and concluded that findings supported Friedman's (1968) report that narcotics inhibit cervical dilation. From this data it is impossible to distinguish which factor affected length of labor: reduced medication or Lamaze techniques?

Zax, Sameroff and Farnum (1975) studied 70 prepared primiparae, 48 prepared multiparae, and 41 unprepared multiparae. Control primiparae were not available for study due to the popularity of the classes in the study area. The authors reviewed charts of 1015 previously delivered untrained primiparae. The findings did not support the expectation of shorter total labors among prepared mothers. In fact, they found the opposite in their data. The trained primiparae averaged 9.04 hours compared to 7.85 hours in the previously delivered group. The trained multiparae averaged 5.51 hours compared to 4.70 hours in the untrained controls. Thus, the labors of the trained primiparae and multiparae appeared to average an hour longer than the controls but the

difference was not statistically significant. Zax et al. then questioned whether Lamaze trained participants were sensitized to the time of labors onset which may have explained the seemingly longer first stages among those women.

Scott and Rose (1976) studied 129 Lamaze-prepared and 129 unprepared primiparae and found no significant difference in length of labor between their two groups. Their groups included many medicated women as well as oxytocin augmentations. Mean first stage duration was 8.98 hours in the Lamaze group and 8.83 hours in the control group. Mean second stage was 51.90 minutes in the Lamaze group compared to 56.89 minutes in the control group.

Charles, Norr, Block, Meyering, and Myers (1978) evaluated many aspects of Lamaze preparation and also found few differences either overall or by stages in length of labor for the 95 prepared and 154 control women in their study. They noted the incidence of forcep deliveries was greater in the unprepared than in the prepared group. This raised the question of whether the effect of forcep deliveries skewed the results toward shorter labors for unprepared mothers. Among primigravidae their results showed mean first stages of 13.65 hours in the prepared group compared to 12.71 hours in the unprepared group. Multiparae in the prepared group averaged 7.55 hour first stages compared to 8.62 hours in the unprepared group. Second stage data revealed a mean of 67.5 minutes for the prepared primiparae, 57.9 minutes for the unprepared primiparae, 33.1 minutes for the prepared multiparae and 21.9 minutes for the unprepared multiparae. The latter was the only figure which was statistically significant with the difference being opposite of the predicted direction.

The largest and best controlled study of Lamaze techniques was reported by Hughey, McElin and Young (1978). They found no significant difference in length of labor between 500 Lamaze-prepared women and 500 unprepared controls. The Lamaze group averaged 7.6 hours in first stage, 31 minutes in second stage. The control group averaged 7.3 hour first stages and 30 minute second stages. Primigravidae were grouped together with multiparae and matched for age, parity, race, and educational level. The researchers noted only a small difference in overall use of pain medication and reported a balancing effect between better bearing down by prepared women and the higher incidence of forcep applications in the unprepared group. They did not exclude from their study those labors which were eventually terminated by cesarean birth, some of the longer of which were prepared women. They suggested that efforts to avoid cesarean deliveries for the prepared women may have delayed the decision to deliver by cesarean birth.

Summary

In summary, the review of literature reveals that previous studies do not resolve the question of whether prepared childbirth techniques affect the length of labor and that this question has not been addressed to any extent by the nursing profession. A summary of previous research is provided in Tables 1 (p. 22) and 2. Table 2 illustrates that many high-risk factors which may affect length of labor were not adequately controlled. Many of the studies cited, including some of the most recent ones, have not controlled for the use of oxytocin, analgesia, anesthesia, episiotomy, forcep application, and cesarean birth which obviously biased the data available on duration of labor.

Table 2

Critique of Previous Research Studies
In Studies on Prepared Childbirth and Length of Labor

The results of the literature search corroborated the need for further study comparing the labors of groups of uncomplicated prepared women to unprepared women from a nursing perspective.

Chapter 3

METHODS

Design

The study was an ex post facto analysis design (Campbell & Stanley, 1963). Experimental and control groups were retrospectively evaluated to test the study hypothesis that low-risk prepared childbirth participants would have shorter labors than low-risk unprepared participants.

Participants

The target population consisted of married primiparae between the ages of 18 and 35 years who experienced spontaneous labor and uncomplicated vaginal birth of full term neonates. The participants were selected using a convenience sampling technique wherein all qualified, consenting women admitted and delivered at the study hospital between the dates of April 1 and July 5, 1980, inclusive, were studied. A total of 50 women participated in the study.

Setting

The study hospital is a 641-bed private, non-sectarian, general hospital in a southeastern Virginia city. The area served had a population of 317,000 based on 1978 figures. It is a teaching institution which offers an Obstetrics and Gynecology residency program for physicians, a family practice internship and obstetrical experience for

first year medical students and for nursing students. The hospital has an active obstetrical service serving both private and staff patients. They averaged 239 deliveries per month in 1979. The nursing staff in Labor and Delivery consisted of Registered Nurses and Licensed Practical Nurses who assisted in some of the preliminary data collection. The labor and delivery unit has eight private labor rooms including one birthing room, four delivery rooms and a recovery room, although most patients were returned to their labor rooms for recovery care.

Instruments

High-Risk Screening

The high-risk screening system (see Appendix C-3) designed by Hobel and associates (1973) was used to eliminate high-risk candidates. This system was designed for antepartal and intrapartal evaluation of risk status in pregnant women.

The scoring system consisted of three parts. There were 51 prenatal items, 40 intrapartal items, and 35 neonatal factors. Values of one, five or ten points were assigned to each factor, "...depending on the assumed value of each factor in predicting neonatal morbidity or mortality" (Hobel, et al., 1973:3). Scores were tabulated for each section. Scores of ten or greater were identified as high risk. Four groups of patients were defined:

> The first group had negative prenatal and intrapartum scores (low/low risk). The second group had positive prenatal and negative intrapartum scores (high/low risk). The third group had negative prenatal but positive intrapartum scores (low/high risk), while the last group had positive scores for

both the prenatal and intrapartum period (high/high risk). (Hobel, et al. 1973:3)

The low/low-risk group consisted of 46% of the studied patients. Only 6.5% of their infants were found to be at risk during the neonatal period, a figure which was lower than the low/high-risk group and significantly lower than either the high/low-risk group or the high/high-risk group. The authors concluded that these women had the lowest risk for neonatal morbidity and mortality.

Originally, this instrument was tested on 738 pregnancies. Those which received a score of ten or higher on either of the first two parts, but especially on the intrapartum factors, were most highly correlated with neonatal scores of ten or higher ($r = 0.818$, $p < 0.01$) (Hobel et al., 1973:7). Neonatal scores of ten or greater were most highly associated with neonatal morbidity and mortality. Further testing of this instrument on 1275 gravid women has validated its risk-predictive capacity. Although specific correlations were not presented, it was concluded that this method of risk scoring was an effective, valuable clinical technique (Sokol, Rosen, Stojkov & Chik, 1977).

Recently, analysis of 1417 subjects (including the original study group) using an unvalidated modification of the instrument has allowed computer analysis of each individual risk factor (Hobel, Yonkeles & Forsythe, 1979). This method was not used in the present study. Instead, the instrument was used as it was originally described except that the neonatal factors were omitted from the screening process since these were not important for the present study. Only women who were low/low risk, that is, low risk by evaluation of both the prenatal and intrapartum factors, were included in the study sample.

Gestational Age

The Dubowitz Clinical Assessment for Gestational Age in the Newborn (Dubowitz, Dubowitz & Goldberg, 1970) was designed to determine both physical and neurological development in the neonate. It was first presented in England in 1970 and has since gained widespread acceptance as a valid measure of gestational age. It was found to have a correlation coefficient of 0.93 against gestation when administered during the first five days of life (Dubowitz et al., 1970).

This criteria was incorporated into the screening only where the duration of the pregnancy was questionable and the 38-42 week specification could not be answered with certainty. This system of neonatal appraisal was routinely administered to all newborns by trained nursing personnel in the study hospital's nursery. Their appraisals were assumed to be accurate and this provided a final estimate of gestational age where it was prenatally obscure.

Data Collection Form

Two other forms were used in the data collection process. Both were designed for the study by the investigator. The first, the Preliminary Screening Instrument (see Appendix C-1) contained a checklist of target population characteristics, a space to indicate any individual's refusal to participate, and a space for the labor and delivery nurse to check if the individual appeared to be a likely candidate but was too actively laboring to interview for the study. This form had the seven questions needed for background data which could not be obtained from the chart: whether ASPO-prepared childbirth classes had been taken, practice time, number of classes attended, relationship of

coach, whether any other prenatal classes were attended, annual income and educational level.

The second original instrument, the Data Collection Form (see Appendix C-2), was used to accumulate all necessary information on each participant prior to transfer of data to computer cards. This form identified the participant, whose name was changed to a number, and indicated whether she was classified as "prepared" or "unprepared". Her age, gravida, delivery date and time were noted here. Spaces for answers to the seven questions on the Preliminary Screening Instrument were provided. Time of rupture of membranes as well as the woman's cervical status and station, and whether the membranes ruptured artificially or spontaneously, were included. Spaces were provided to note the time of onset of labor and to compute the time in each phase of the first stage, total first stage, onset of second stage, duration of second stage and duration of total labor. Spaces were provided to note any medications given to the woman during labor or delivery. The type of delivery was noted as either spontaneous or low forcep. The position of the fetal head at birth was noted. The type of episiotomy was recorded as were lacerations and their degree. A series of spaces was provided to note deviations in any of the stages of labor, the delivery, the neonate, and in the postpartum period for high-risk screening purposes. The infant's one- and five-minute Apgar scores and weight were noted. A space was provided to record the score on the High-Risk Screen.

Procedure

Permission to conduct an ex post facto research study on maternity patients was obtained by submitting a copy of the proposal and

a letter requesting approval to the Director of Maternal and Child Nursing, the Vice President, and the Executive Vice President of the hospital utilized in this study (see Appendix A-1). Permission was formally granted by letter from the institution (see Appendix A-2). The proposal was presented to the Obstetrics and Gynecology Medical Staff at their monthly business meeting and permission of the medical staff was granted by the Director of Obstetrics/Gynecology (see Appendix A-3).

A pilot study was conducted to evaluate the appropriateness of the consent, screening, data collection forms. Minor revisions were made after testing the material on five pilot subjects.

A survey of the delivery room log book for the months of April, May, June and December, 1979, January and February, 1980, showed the number of primiparae between 18 and 35 years of age inclusive, who had uncomplicated spontaneous vaginal deliveries of full term neonates. Low forcep deliveries by women fitting the same description were also tallied. Each delivery was categorized as "prepared" or "unprepared" based on the notation on whether the woman had taken prepared childbirth classes. This survey did not reveal which of these patients were unmarried or if they had received oxytocin during their labor. Based on the numbers of potentially eligible candidates in these months, the projected sample size of 20 to 25 spontaneously delivered women in each group during the two-month study period was established.

A letter was sent to Calvin Hobel requesting permission for use of his High-Risk Screening system (see Appendix A-4). Consent was granted by a return letter from one of his associates (see Appendix A-5).

A letter was sent to Appleton-Century-Crofts, Publishers, requesting permission to illustrate the Friedman Labor Curve in the study (see Appendix A-6).

The research proposal was submitted to the Committee for the Conduct of Human Research, Virginia Commonwealth University, and was approved at their March, 1980 meeting (see Appendix A-7).

Copies of the preliminary screening instruments (see Appendix C-1) were placed in the Labor and Delivery nurse's station along with a wooden box with a padlock for storage of completed preliminary screening forms. The majority of the nursing staff of Labor and Delivery met with the investigator in a unit meeting. The project was explained, their role defined, and their cooperation solicited. An opportunity for questions was provided at this time. Frequent conferences with the Head Nurse and members of the nursing staff were conducted throughout the study period to maintain communication and cooperation in the data collection process.

Protocol

Study participants were identified by a preliminary screening method (see Appendix C-1) implemented by staff nurses in Labor and Delivery or postpartally by the researcher. The checklist was completed, which identified the characteristics of the target population (see Appendix C-1). Women who were found to fit the desired description were then asked to sign the informed consent form (see Appendix B). Their signatures were witnessed by the screening nurse. Where laboring women were being screened, the nurses used their judgement on when to refrain from asking for consent due to the nature of the woman's labor or due to

departmental activity. When apparently eligible candidates for the study were not interviewed on admission, blank forms stamped with their names were placed in the box for later interview and data collection by the researcher.

Participants answered questions two through eight as they appeared on the screening form (see Appendix C-1). Forms completed in labor and delivery were deposited in the locked wooden box placed in the nurse's station. Periodically the forms in the box were collected and the delivery log book was checked to identify possible candidates who may have been overlooked by the nurses. These clients were later screened and interviewed by the researcher.

While the women were still inpatients at the hospital, they were further screened to eliminate any who exhibited high-risk characteristics as described in the Hobel (1973) high-risk assessment method (see Appendix C-3). Any candidate who scored ten or greater either prenatally or intrapartally was automatically disqualified. Charts were re-evaluated to validate the preliminary screening criteria and to ascertain that labors were all completed by either spontaneous or low forcep delivery without oxytocin augmentation. Where questionable gestational ages occurred, the final decision was based on results of the routinely-performed Dubowitz assessment of gestational age on the neonate by nursery personnel. Provided the criteria for the study were still met by the participant, data on her labor and delivery were collected and recorded along with information from the preliminary screening form (see Appendix C-1). The time of onset of the first stage was based on the physician's notation on the delivery summary. Findings of each charted vaginal examination, the time of amniotomy or spontaneous rupture of membranes, medications, type

of delivery, episiotomy, lacerations, fetal position, infant's Apgar scores and weight were noted along with any abnormalities of labor, the neonate, third stage or fourth stage of labor. A total risk score was noted on each participant. The duration of each phase of the first stage and the second stage were calculated based on vaginal exams. In some instances an estimate was made where a large change occurred between any two consecutive exams or no value for that particular phase was included in the data. Women who were admitted in advanced labor were not included. Interestingly, when Friedman was faced with this same problem, he justified the elimination of these women by saying that the absence of data on rapid labors was probably balanced by the exclusion of those delivered by cesarean birth (Friedman, 1978).

Data Analysis

The data were analyzed using the SAS computer system available at the investigator's university. Statistical analysis consisted of identification of means, analysis of variance (ANOVA), and correlations.

Summary

All married, low-risk, primiparae experiencing full term, spontaneous, labor and delivery between the ages of 18 and 35 years, inclusive, who delivered at the study hospital during the study period were screened during their hospitalization. Informed consent was obtained from the participant or her husband. Background data were collected. High-risk screening methods were carried out. Data on the

labor and delivery of the study participants were gathered and statistical comparisons were made between unprepared and prepared childbirth groups.

Chapter 4

RESULTS

Introduction

An ex post facto study to test the hypothesis that low risk primiparae who have taken prepared childbirth classes would have shorter labors than similar unprepared primiparae was conducted. All women in both groups had spontaneous labors and deliveries. Data on the participants were obtained by interview and survey of labor and delivery records on their hospital charts. The method of selection of eligible participants utilized a preliminary screen and high-risk screening system. Randomization techniques were not employed as all eligible women who delivered during the study period were included. None of the eligible women interviewed declined to participate.

Description of the Sample Population

The study included a total of 50 primiparae; 30 prepared childbirth (PC) mothers and 20 unprepared (UP) mothers all of whom experienced uncomplicated spontaneous vaginal deliveries. Data were also collected on ten prepared women and four unprepared women who were delivered by low forcep applications, however, they were not included in the sample analyzed since the intention of this study was to examine data on spontaneously delivered women. The data on the forcep deliveries have been included in Appendix D.

Analysis of the Data

A composite of background characteristics of the participants in each group is presented in Table 3. Statistical procedures used included controls for differences in group sizes. Data collected which pertained to rupture of membranes was not considered useful and was not included in the discussion which follows.

Age

The prepared mothers consisted of a group of women ranging from 18 to 35 years with a mean age of 24.23 years. The unprepared mother's ages ranged from 18 to 27 years with a mean value of 20.70 years. The mean values were significantly different for the two groups; $F(1,48) = 9.57$, $p < .05$; however, analysis of covariance controlling for age as the covariate on variables such as length of labor stages and phases as well as other factors revealed no significant differences. Age factors correlated significantly with education ($p = 0.0002$) and income ($p = 0.0001$).

Gravida

The prepared mothers' group consisted of 24 primigravidae and six nulliparous multigravidae. Their mean gravida was 1.23; whereas, the unprepared mothers' group consisted of 16 primigravidae and four multigravidae whose mean gravida was 1.20. There was no significant difference on this factor, $F(1,48) < 1$. This coincidently provides an even distribution as each group consisted of 75% primigravidae and 25% nulliparous multigravidae, although differences on this factor are not critical as Friedman (1978) found.

Table 3

Summary of Demographic Characteristics of the Participants

	Prepared Childbirth (N=30)		Unprepared (N=30)	
	Mean	S.D.	Mean	S.D.
Age*	24.23	4.75	20.70	2.27
Gravida	1.23	0.50	1.20	0.41
Number of ASPO Classes Attended*	5.70	0.60	0.15	0.49
Hours Practice/Week*	4.03	3.33	0	0
Income (Thousands)*	22.07	18.07	9.76	5.21
Education (Years)*	13.31	2.12	11.85	0.67
Risk Score	2.13	2.49	2.40	2.48

*$p < .05$

Classes

The mean number of prepared childbirth classes for the PC group was 5.70 and 0.15 for the UP group. The difference here was significant $F(1,48) = 1184.76$, $p < .05$, signifying that all prepared mothers did attend prepared childbirth classes while only two of the unprepared mothers attended any prepared childbirth classes at all.

Socioeconomic Status

The PC group averaged 13.31 years of education and mean annual income of $22,100 compared to 11.85 years education and $9,800 annual income in the UP group. The two groups showed significant differences on both of these factors [income: $F(1,42) = 7.44$, $p < 0.05$; for education: $F(1,47) = 8.80$, $p < 0.05$]. These two factors showed a significant positive correlation to each other [$r(42) = 0.478$, $p < 0.001$]. Analysis of covariance procedures, with income and education as covariates, analyzed length of phases and stages of labor. No differences in the two groups were detected.

Risk

The PC group had a mean score of 2.13 on the high-risk screening instrument and the UP group's mean was 2.40. These differences were not significant $F(1,48) < 1$.

Negative correlations existed between the risk score and both one minute Apgar scores [$r(48) = -0.459$, $p < 0.001$] and five minute Apgar scores [$r(48) = -0.318$, $p < 0.05$].

Length of Labor

The duration of labor was compared by analyzing values for the various phases and stages of labor and for some combinations of these (see Table 4). Prepared and unprepared mothers did not differ on any variable. The hypothesis that prepared mothers would have shorter labors than the unprepared controls was not supported.

The latent phase lasted a mean of 5.5 hours in PC participants and 7.0 hours in UP participants $F(1,45) = 1.45$, $p > .10$. The active phase lasted 3.6 hours in the PC group and 3.4 hours in the UP group $F(1,45) < 1$. Transition took an average of 1.1 hours for the PC women and 1.3 hours for the UP women $F(1,46) < 1$. The mean duration of the total first stage of labor was 9.9 hours for the PC group and 11.5 hours for the UP group $F(1,48) = 1.33$, n.s. The mean duration of the second stage was 1.1 hours for the prepared women and 0.7 hours for the unprepared women $F(1,48) = 1.91$, n.s. The mean total length of labor for the prepared group was 10.8 hours and 12.2 hours for the unprepared group $F(1,48) = 1.02$, n.s. The groups were compared on a value for the total labor minus the latent phase figure. The mean figure for this combination was 5.6 hours for the PC group and 5.3 hours for the UP group $F(1,45) < 1$.

Mean values for labor phases and stages were graphed on a Friedman-style graph of labor progress (see Figure 2).

Medications

The use of pharmacologic agents for participants in each group was evaluated by comparing the number of injections (intravenous or intramuscular) received during labor, the presence or absence of anesthesia in the second stage, and whether anesthetics used were

Table 4

Comparison of Duration of Labor Phases and Stages

	Prepared Childbirth			Unprepared		
	Mean	S.D.	N	Mean	S.D.	N
Latent Phase (Hr)	5.45	4.22	29	6.95	4.01	18
Active Phase (Hr)	3.55	2.08	29	3.40	1.93	18
Transition Phase (Hr)	1.15	0.68	29	1.35	1.25	19
Total 1st Stage (Hr)[a]	9.87	4.77	30	11.49	4.99	20
Total 2nd Stage (Hr)	1.09	1.29	30	0.68	0.44	20
Total Labor (Hr)[a,b]	10.75	4.73	30	12.17	5.06	20
ACTRAN 2 (Hr)[c]	5.58	2.75	29	5.33	2.52	18

[a] The total mean values for stage one and for total labor are not equal to the sum of the means for the earlier phases due to some missing values in those phases on participants who were included in the total length of labor analysis.

[b] Third stage not included.

[c] ACTRAN 2 = Active phase + Transition + Second stage

Graph of Labor Progress, Spontaneous Deliveries

——— Prepared, Spontaneous

· · · · · Unprepared, Spontaneous

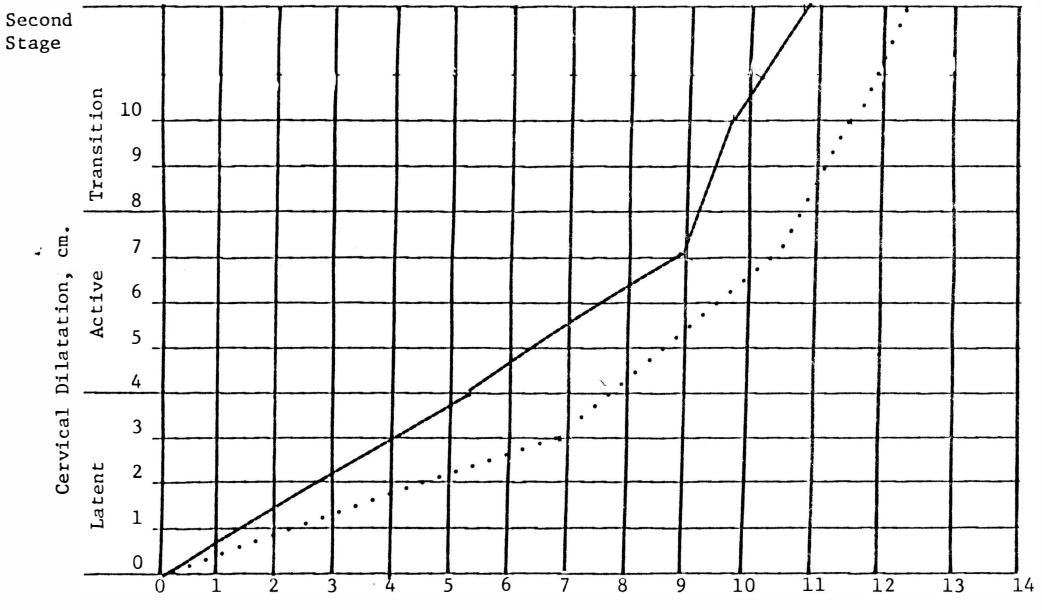


Figure 2

classified as minor (local, pudendal) or major (spinal, general). Agents used during labor consisted of primarily meperidine (Demerol) and often a combination of meperidine and promazine (Sparine) or promethazine (Phenergan) for analgesia or sedation and either one or two percent solutions of lidocaine (Xylocaine) for local or pudendal anesthesia. The prepared mothers' mean number of analgesic injections was 0.7 compared to the unprepared mothers' mean of 1.1, although this difference was not significant at the .05 level, $F(1,48) = 3.02$, $p < .09$. The use of anesthetics was not significantly different as all the participants with the exception of one unprepared woman had either local or pudendal anesthesia $F(1,48) = 1.52$, n.s., and none of the women in either group received major anesthesia for their deliveries. A summary of use of anesthetic techniques is provided in Table 5.

Delivery

The groups were likewise consistent with respect to the use of episiotomy procedures. All participants except one unprepared woman, who delivered over an intact perineum, received median episiotomies. The groups were not significantly different on this factor either $F(1,48) = 1.52$, n.s.

The mean degree of laceration showed no significant differences also with the values of 1.37^{o} for the PC group and 1.9^{o} for the UP group $F(1,48) = 1.25$, n.s. Table 5 also illustrates the frequencies of various degrees of lacerations.

Table 5

Comparison of Anesthetic Methods and Incidence of Lacerations

	Prepared Childbirth (N=30)		Unprepared (N=20)	
	Frequency	Percent	Frequency	Percent
No Anesthesia	0	0	1	5
Local/Pudendal	30	100	19	95
Major Anesthesia	0	0	0	0
No Episiotomy	0	0	1	5
Median Episiotomy	30	100	19	95
Lacerations				
None	17	56.66	7	35
1^{o}	0	0	2	10
2^{o}	2	6.66	1	5
3^{o}	7	23.33	6	30
4^{o}	4	13.33	4	20

Infant Outcomes

Table 6 presents a summary of fetal outcomes for the study groups by Apgar scores and birth weights. The infants all delivered occiput anteriorly with the exception of one in the UP group who was born occiput posteriorly (see Table 7). Therefore, there was no significant difference on fetal position between the two groups, $F(1,48) = 1.52$, n.s.

The Apgar scores for all infants were likewise consistent. The mean Apgar score at one minute of age was 8.6 among infants of prepared mothers and 8.7 for infants of unprepared mothers $F(1,48) < 1$. At five minutes of age, the mean Apgar score for the PC group was 9.03 compared to 9.0 for the UP group, $F(1,48) < 1$.

Positive correlations existed between income level and five minute Apgar scores ($p < 0.005$).

Significant negative correlations occurred between the factors of risk and both one and five minute Apgar scores ($p < 0.001$ and $p < 0.03$, respectively) which indicated that the risk assessment system utilized in the study was an accurate predictor of lower Apgar scores, especially at one minute after birth.

Birth weights for infants in the PC group were not significantly different than for infants in the UP group with mean values of 7.56 pounds and 7.29 pounds respectively, $F(1,48) = 1.01$, n.s.

Summary

Data were collected on 50 low-risk primiparae, 30 of whom were classified as prepared and 20 of whom were classified as unprepared.

Table 6

Summary of Infant Outcomes

	Prepared Childbirth (N=30)		Unprepared (N=20)	
	Mean	S.D.	Mean	S.D.
Apgar (1 Minute)	8.60	0.56	8.65	0.59
Apgar (5 Minute)	9.03	0.32	9.00	0.32
Weight (Pounds)	7.56	1.03	7.29	0.82

Table 7

Summary of Fetal Positions at Birth

	Prepared Childbirth (N=30)		Unprepared (N=20)	
	Frequency	Percent	Frequency	Percent
Occiput Anterior	30	100	19	95
Occiput Posterior	0	0	1	5

All 50 women experienced spontaneous vaginal deliveries of full term neonates. Data were also collected on 14 forcep-delivered women (four unprepared, ten prepared) but were not included in the primary data analysis. The data were analyzed to determine whether prepared childbirth techniques resulted in shorter labors for prepared women.

Chapter 5

DISCUSSION

Summary of Results

The data collected on groups of prepared and unprepared full term spontaneously delivered low-risk primiparae all of whom were married and between the ages of 18 and 35 years revealed that there were no significant differences in the duration of any of the phases (latent, active, transition) of labor, in the first or second stages or in the total labor (first and second stages combined). The groups were different in three respects: the age, income and educational levels were significantly higher in the prepared women as compared to the unprepared women. All other factors evaluated revealed no significant differences between the groups. These included gravida, number of analgesic injections received, anesthesia used, degrees of lacerations sustained, type of episiotomy, maternal risk score, infant's position at birth, weight and Apgar scores at one and five minutes of age. These data do not support the hypothesis that low-risk prepared women would experience shorter labors than low-risk unprepared women in the groups studied.

Comparison of Findings to Previous Studies on Prepared Childbirth and Length of Labor

The results of the present study validate findings of researchers who have reported that prepared childbirth training has no

effect on the duration of labor (Charles et al., 1978; Davis & Curi, 1968; Davis & Morrone, 1962; Herrera, 1979; Hughey et al., 1978; Laird & Hogan, 1956; Scott & Rose, 1976; Yahia & Ulin, 1965; Zax et al., 1975) and conflicts with the findings of those researchers who reported shorter labors for prepared women (Flowers et al., 1960; Shapiro & Schmitt, 1973; Sharley, 1970; VanAuken & Tomlinson, 1953). None of the more recent studies have shown shorter labors for prepared women. The present study attempted to introduce greater control over some variables which were thought to possibly influence the data collected in these previous studies, such as limiting the study to married women experiencing low-risk spontaneous labors and deliveries of full term neonates. It appears that these factors do not cause enough alterations to significantly influence the outcomes toward shorter labors for prepared women.

The present study also echoes the findings of previous studies that the women who chose prepared childbirth were older, more educated and wealthier than non-choosers (Cave, 1978; Davis & Morrone, 1962; Leonard, 1973; Tanzer, 1972). As previously noted, the classes are available to all women and income limitations should not interfere since sliding scales of fees for the classes are available. Cave (1978) reported on social characteristics of natural childbirth users and non-users. She studied records of 2,302 patients from 11 New York hospitals and validated reports that natural childbirth users tend to have the characteristics stated above. In addition, she identified some other interesting characteristics. For example, she stated that the adopters of prepared childbirth were "more cosmopolitan", had greater

knowledge of their health, were more innovative than non-adopters. She also reported that prepared childbirth users consisted of proportionately higher numbers of Jewish women than Protestants or Catholics (Cave, 1978:898,9).

What Are The Real Benefits?

If, as these reports indicate, preparation for childbirth does not cause a briefer labor, perhaps its true benefit is psychological.

Personal accounts of the satisfaction with the experience of prepared childbirth are plentiful. Most of the books on the subject include testimonials of mothers who have delivered by this method (Bradley, 1973; Ewy, 1976; Karmel, 1960; Tanzer, 1972, to name a few). Research on satisfaction and locus of control has supported these ideas. Tanzer (1972) found that women who practiced prepared childbirth had improved general views of themselves. This was not limited to those who had chosen to take prepared childbirth. In fact, the non-choosers (women who accepted the program but had not sought it out and were not especially dedicated to it) also had higher perceptions of themselves postpartally. Charles et al. (1978) found that women who selected prepared childbirth experienced "higher levels of enjoyment during childbirth" and also that they were somewhat more likely to have a high positive self-concept and feelings of personal competence than women who did not select prepared childbirth. Herrera (1979) stated that parents in his study's prepared childbirth group described their birthing experiences as "joyful".

Recommendations for Further Study

Although the end result of the study suggests that preparation for childbirth probably does not have an effect on the length of time a primipara will spend laboring, some questions still remain unanswered and a few new ones can be raised.

Sample Size

The groups of 20 and 30 participants are small and perhaps the same study on a larger population would have more positive results.

Marital Status

It is uncertain whether this variable truly does effect physiologic outcomes. Certainly inclusion of unmarried women who met the criteria for the study in other respects would have added to the numbers available for study; it could be beneficial to do the same study and include unwed women, then compare their data with those of married women.

Parity

The present study was limited to primiparae. Many of the studies cited in the literature review included multiparae in their data, and the effects of the inclusion of these women on these data are still unknown.

Medication

Since pharmacolocic agents used in labor are known to effect length and efficiency of labor (Friedman, 1978) and the neonate (Brazelton, 1973), it is fortunate that the groups did not differ on

this variable; however, some authors have reported improved outcomes where less medication was used by prepared women which may have accounted for differences in data favoring PPM (Shapiro & Schmitt, 1973). An ideal situation would be to obtain data on unmedicated women, however, in the obstetrical practices at the location where the study was conducted, few women deliver without some medication.

Infant Outcomes

The significant correlations between Apgar scores and income levels raises the question of whether the wealthier women are producing healthier babies at birth. Since the present study indicates no correlation in terms of the income and first Apgar score but a significant correlation between income and the five minute Apgar, it might appear that infants of these mothers recover more quickly from general birth trauma. A study of prenatal care aspects other than childbirth preparation may be interesting to conduct.

Self-Selection of Groups

The fact that the groups are self-selected has been a point of interest for many years. Factors which influence a woman's decision to enroll or not to enroll in prepared childbirth classes are unknown, yet may account for some differences in the groups. How, then, can we make these classes appealing for women other than the "innovative" types that Cave (1978) identified or the higher socioeconomic statuses revealed in the present study as well as others? Why does this occur and how can nurses help to solicit participation in prepared childbirth by a broader, more general segment of the pregnant population in order to spread the benefits of PPM among a larger group of childbearing women?

Presence of a Supportive Other

Since the sample population in the present study consisted of married women the presence of husbands was frequent. All of the PC women had husbands present for labor and delivery and 14 of 20 unprepared women had their husbands with them in delivery. Information on presence of the husbands of unprepared women during labor was not available. Presumably, those who were present for delivery were also present for labor; some of those absent for delivery may have been present for some or all of the time in labor. The institution did not prohibit unprepared fathers from attending births and did not limit attendance to married couples. In the absence of the father, a woman was permitted to have other significant individuals with her in labor and one could accompany her into delivery. Perhaps the value of this individual's presence as well as coaching by nursing personnel may make up for some of the differences between being "prepared" or "unprepared" for childbirth. Although a complex approach, the Davis & Morrone (1962) study which further divided groups into supported and non-supported women may have had a good point by looking at support in labor as a variable. Further investigation of this aspect may prove interesting.

Summary

The hypothesis that prepared low-risk primiparae would experience shorter labors than unprepared low-risk primiparae was not upheld in the findings of the present study. The findings of the present study did appear to validate the findings of several other similar studies which

reported no differences in length of labor between prepared and unprepared women. Suggestions for further study of some questions raised by the present study have been made.

BIBLIOGRAPHY

BIBLIOGRAPHY

Bing, Elisabeth
1967 Six Practical Lessons for an Easier Childbirth. New York: Grosset and Dunlap.

Bradley, Robert A.
1974 Husband-Coached Childbirth. New York: Harper and Row Publishers.

Brazelton, T. Berry
1973 Neonatal Behavioral Assessment Scale. Philadelphia: J. B. Lippincott Company.

Brewer, Mary Jones
1979 "The High Risk Pregnancy" in High Risk Parenting: Nursing Assessment and Strategies for the Family at Risk. Suzanne Hall Johnson ed., New York: J. B. Lippincott Company.

Burstein, Irving, Robert A. H. Kinch and Leo Stern
1974 "Anxiety, Pregnancy, Labor and the Neonate." American Journal of Obstetrics and Gynecology 118 (January 15) :195-199.

Buxton, C. Lee
1963 "Psychophysical Training in Preparation for Childbirth." Clinical Obstetrics and Gynecology 6 (September) :669-84.

Caldeyro-Barcia, Roberto
1960 "Effects of Position Changes and the Intensity and Frequency of Uterine Contractions During Labor." American Journal of Obstetrics and Gynecology 80 (August) :284.

_____
1961 Oxytocin. New York: The Pergammon Press.

_____
1979 "The Influence of Maternal Position on Time of Spontaneous Rupture of the Membranes, Progress of Labor and Fetal Head Compression." Birth and Family Journal 6(1):7-15.

_____
1958 "Uterine Contractility in Obstetrics." Deux Congress International Gynecologists and Obstetricians 1:65.

Campbell, Donald T. and Julian C. Stanley
1963 Experimental and Quasi-Experimental Designs for Research. Chicago: Rand McNally College Publishing Company.

Castallo, Mario A.
1958 "Preparing Parents for Parenthood." Journal of the American Medical Association 166:1970-1973.

Cave, Carolyn
1978 "Social Characteristics of Natural Childbirth Users and Nonusers." American Journal of Public Health 68 (September) :898-901.

Chabon, Irwin
1966 Awake and Aware. New York: Delacorte Press.

Charles, Allen G., Kathleen L. Norr, Carolyn Block, Suzanne Meyering and Ellen Meyers
1978 "Obstetric and Psychological Effects of Psychoprophylactic Preparation for Childbirth." American Journal of Obstetrics and Gynecology 131 (May 1) :44-52.

Chertok, Leon
1967 "Psychosomatic Methods of Preparation of Childbirth." American Journal of Obstetrics and Gynecology 98 (July 1) :698.

Chretien, N., N. S. Seidah, S. Benjannet, N. Dragon, R. Routhier, T. Motomatsu, P. Cline and N. Lis
1977 "A Beta LPH Precursor Model: Recent Developments Concerning Morphine-Like Substances." Annals of New York Academy of Sciences 297 (28 October) :84-107.

Clark, Ann L. and Dyanne D. Affonso
1979 Childbearing: A Nursing Perspective. 2d. ed., Philadelphia: F. A. Davis Company.

Cram-Elsberry, Charlotte and Ann Malley-Corrinet
1979 "The Adolescent Parent" in High-Risk Parenting: Nursing Assessment and Strategies for Families at Risk. Suzanne Hall Johnson ed., New York: J. B. Lippincott Company.

Davids, Anthony and Spencer DeVault
1962 "Maternal Anxiety During Pregnancy and Childbirth Abnormalities." Psychosomatic Medicine 24(5):464-70.

Davis, Clarence D. and Joseph F. J. Curi
1968 "A Comparative Study of a Prepared Childbirth Program." Connecticut Medicine 32 (February) :113-121.

Davis, Clarence D. and Frank A. Morrone
1962 "An Objective Evaluation of a Prepared Childbirth Program." American Journal of Obstetrics and Gynecology 84 (*November* 1) : 1196-1201.

Deering, Susan G. and Doris R. Entwisle
1975 "Preparation During Pregnancy and Ability to Cope With Labor and Delivery." American Journal of Orthopsychiatry 45 (October) :825-837.

Dick-Read, Grantly
1959 Childbirth Without Fear. Second Revised Edition. New York: Harper and Brothers Publishers.

Dubowitz, Victor, Lilly Dubowitz and Cissie Goldberg
1970 "Clinical Assessment of Gestational Age in the Newborn Infant." Journal of Pediatrics 77 (July) :1-10.

Enkin, M. W., S. L. Smith, S. W. Dermer and J. O. Emmett
1972 "An Adequately Controlled Study of the Effectiveness of P.P.M. Training." Psychosomatic Medicine in Obstetrics and Gynecology. London: S. Karger.

Ewy, Rodger and Donna Ewy
1976 Preparation for Childbirth. 2d. ed., New York: Signet Books.

Felton, Gary S. and Florrie B. Segelman
1978 "Lamaze Childbirth Training and Changes in Beliefs About Personal Control." Birth and Family Journal 5 (Fall) :141-150.

Flowers, Charles E., Jr., Thomas W. Littlejohn and H. Bradley Wells
1960 "Pharmacologic and Hypnoid Analgesia." Obstetrics and Gynecology 16:210-221.

Friedman, Emanuel A.
1978 Labor: Clinical Evaluation and Management. 2d. ed., New York: Appleton-Century-Crofts.

Greenhill, J. P.
1962 Analgesia and Anesthesia in Obstetrics. Springfield: Charles G. Thomas.

Henneborn, William James and Rosemary Cogan
1975 "The Effect of Husband Participation on Reported Pain and Probability of Medication During Labor and Birth." Journal of Psychosomatic Research 19:215-222.

Hobel, Calvin J., Marcia A. Hyvarinen, Donald M. Okada and William Oh
1973 "Prenatal and Intrapartum High-Risk Screening." American Journal of Obstetrics and Gynecology 117 (September 1) :1-9.

_____, Lee Yonkeles and Alan Forsythe
1979 "Prenatal and Intrapartum High-Risk Screening II. Risk Factors Reassessed." American Journal of Obstetrics and Gynecology 135 (December 15) :1051-1056.

Hommel, Flora
1979 "Monitricing." in Childbearing: A Nursing Perspective. Ann L. Clark and Dyanne D. Affonso, eds., Philadelphia: F. A. Davis Company.

Hommel, Flora
1969 "Natural Childbirth - Nurses in Private Practice as Monitrices." American Journal of Nursing 69:1446-1450.

Hughey, Michael J., Thomas W. McElin and Todd Young
1978 "Maternal-Fetal Outcomes of Lamaze Prepared Patients." Obstetrics and Gynecology 51 (June) :643-647.

Jensen, Margaret Duncan, Ralph C. Benson and Irene M. Bobak
1977 Maternity Care: The Nurse and the Family. Saint Louis: C. V. Mosby Company.

Johnson, Wayne L., William W. Winter, Marlene Eng, John J. Bonica and Charles A. Hunter
1972 "Effect of Pudendal Spinal and Peridural Block Anesthesia on the Second Stage of Labor." American Journal of Obstetrics and Gynecology 113 (April 15) :166-173.

Kapp, Frederic T., Stephen Hronstein and Virginia T. Graham
1963 "Some Psychological Factors in Prolonged Labor Due to Inefficient Uterine Action." Comprehensive Psychiatry 4(1):9-18.

Karmel, Majorie
1959 Thank You, Dr. Lamaze. New York: Doubleday and Company.

Kirgis, Carol A., Donna B. Woolsey, and John J. Sullivan
1977 "Predicting Infant Apgar Scores." Nursing Research 26 (November-December) :439-442.

Klopfer, Frederick J., Rosemary Cogan and William J. Henneborn
1975 "Second Stage Medical Intervention and Pain During Childbirth." Journal of Psychosomatic Research 19:289-293.

Laird, Marion D. and Margaret Hogan
1956 "An Elective Program on Preparation for Childbirth at the Sloane Hospital for Women, May 1951 to June 1953." American Journal of Obstetrics and Gynecology 72 (September) :641-647.

Lederman, Regina P., Edward Lederman, Bruce A. Work, Jr., and Daisy S. McCann
1979 "The Relationship of Psychological Factors in Pregnancy to Progress in Labor." Nursing Research 28 (March-April) :94-97.

_____
1978 "The Relationship of Maternal Anxiety, Plasma Catecholamines and Plasma Cortisol to Progress in Labor." American Journal of Obstetrics and Gynecology 132 (1 November) :495-500.

Lee, James G.
1959 "Transvaginal Pudendal Nerve Block: A New Technique." American Journal of Obstetrics and Gynecology 77 (February) : 419-423.

Leonard, Roger F.
1973 "Evaluation of Selection Tendencies of Patients Preferring Prepared Childbirth." Obstetrics and Gynecology 42 (September) :371-377.

Levinson, Gershon and Sol M. Shnider
1979 "Catecholamines: The Effects of Maternal Fear and Its Treatment on Uterine Function and Circulation." Birth and Family Journal 6:167-174.

Luschinsky, Heinz
1978 Psychological Aspects of Gynecology and Obstetrics. Benjamin B. Wolman ed. Oradell, New Jersey: Medical Economics Company, Book Division.

McDonald, R. L., M. D. Gynther and A. C. Christakos
1963 "Relations Between Maternal Anxiety and Obstetric Complications." Psychosomatic Medicine 25(4):357.

Moir, Donald
1978 Pain Relief in Labor. 3d. ed., New York: Churchill Livingstone.

Munson, E. S.
1974 "Effects of Anesthetics on the Uterus and Labor." in S. M. Schnider and F. Moya eds., The Anesthesiologist, Mother and Newborn. Baltimore: Williams and Wilkins.

_____, W. R. Maier and D. Caton
1969 "Effects of Halothane, Cyclopropane and Nitrous Oxide on Isolated Human Uterine Muscle." Journal of Obstetrics and Gynecology - British Commonwealth 76:27.

Potter, N. and R. D. MacDonald
1971 "Obstetrical Consequences of Epidural Analgesia in Nulliparous Patients." Lancet 1 (Saturday, May 22) :1031-1034.

Sasmor, Jeanette
1979 Childbirth Education: A Nursing Perspective. New York: John Wiley and Sons.

Sawyer, Blackwell
1946 "Experience With the Labor Procedures of Grantly Dick-Read." American Journal of Obstetrics and Gynecology 51:952-8.

Scott, James R. and Nancy B. Rose
1976 "Effect of Psychoprophylaxis (Lamaze Preparation) on Labor and Delivery in Primiparas." New England Journal of Medicine 294 (May 27) :1205-1207.

Shapiro, Howard I. and Lenore G. Schmitt
1973 "Evaluation of the Psychoprophylactic Method of Childbirth in the Primigravida." Connecticut Medicine 37 (July) :341-343.

Sharley, Colleen B.
1970 "The Value of Physiotherapy in Obstetrics." Medical Journal of Australia 6 (June 6) :1159-1162.

Sokol, Robert J., Mortimer G. Rosen, Jean Stojkov and Lawrence Chik
1977 "Clinical Application of High-Risk Scoring on an Obstetric Service." American Journal of Obstetrics and Gynecology 128 (July 15) :652-656.

Tankson, Edith
1979 "The Single Parent" in High-Risk Parenting: Nursing Assessment and Strategies for Families at Risk. Suzanne Hall Johnson ed., New York: J. B. Lippincott Company.

Tanzer, Deborah with Jean Libman Block
1972 Why Natural Childbirth? New York: Shocken Books.

Thoms, Herbert and Emil D. Karlovsky
1954 "Two Thousand Deliveries Under Training for Childbirth Program." American Journal of Obstetrics and Gynecology 68 (July) : 279-284.

Vale, Wylie, Catherine Rivier, Lana Yang, Scott Minick and Roger Guillemin
1978 "Effects of Purified Hypothalamic Corticotropin-Releasing Factor and Other Substances on the Secretion of Adrenocorticotropin and Beta-Endorphin-Like Immunoactivities in Vitro." Endocrinology 103 (November) :1910-1915.

VanAuken, William B. D. and David R. Tomlinson
1953 "An Appraisal of Patient Training for Childbirth." American Journal of Obstetrics and Gynecology 66 (July) :100-105.

Vellay, Pierre
1960 Childbirth Without Pain. New York: E. P. Dutton and Company, Inc.

Yahia, Clement and Priscilla R. Ulin
1965 "Preliminary Experience With a Psychophysical Program of Preparation for Childbirth." American Journal of Obstetrics and Gynecology 93 (December 1) :942-949.

Zax, Melvin, Arnold J. Sameroff and Janet E. Farnum
1975 "Childbirth Education, Maternal Attitudes and Delivery." American Journal of Obstetrics and Gynecology 123 (September 15) : 185-190.

Zourlas, Pantelis
1964 "In Vitro and In Vivo Effects of Sparine (Promazine Hydro-Chloride) on Human Uterine Contractility." American Journal of Obstetrics and Gynecology 88 (March 15) :770-773.

APPENDIX A

LETTERS OF PERMISSION

APPENDIX A-1

LETTER TO ADMINISTRATION OF
STUDY INSTITUTION

RIVERSIDE HOSPITAL/SCHOOL OF PROFESSIONAL NURSING
J. Clyde Morris Boulevard
Newport News, Virginia 23601
Telephone 599-2700

December 4, 1979

Mr. Gerald R. Brink, Executive Vice President
Mrs. M. Caroline Martin, Vice President
and Mrs. Mary K. Thompson, R.N.,
Coordinator of Ob-Gyn Nursing
Riverside Hospital
Newport News, Virginia 23601

Dear Administrators:

I would like to request your permission to conduct a study in partial fulfillment of requirements for the degree of Master of Science in Nursing in Nursing from the Medical College of Virginia - Virginia Commonwealth University at Riverside Hospital.

The research project is designed to evaluate the effects of Lamaze preparation for childbirth on the length of labor experienced by low risk parturients.

I plan to teach the nursing staff on labor and delivery to screen patients admitted to their unit for risk factors in order to identify subjects who qualify for participation in the study. With the permission of these individuals, I plan to review their labor records to obtain data on the progress of their labors. Comparison will be made of the labors of Lamaze prepared versus unprepared subjects.

I would like to conduct this data collection during the winter and spring of 1980 or until I am able to obtain a sample size of at least one hundred subjects for each group.

Your cooperation in this endeavor will be greatly appreciated.

Sincerely,

[redacted]

(Mrs.) Beth S. Mollick, R.N.

APPENDIX A-2

PERMISSION FROM STUDY INSTITUTION -
DIRECTOR OF MATERNAL CHILD HEALTH

RIVERSIDE HOSPITAL

J. Clyde Morris Boulevard
Newport News, Virginia 23601
Telephone 599-2000

December 15, 1979

Mrs. Beth S. Mollick, R.N.
[redacted]

Dear Beth:

This letter is in response to your request to conduct a research project designed to evaluate the effects of Lamaze preparation for childbirth on the length of labor experience.

I have discussed your request with Mrs. Caroline Martin, Vice President, and we both are very comfortable with you doing your study here at Riverside Hospital. It is our understanding that patient's names will be necessary for your data collection, but the names will not be included in your final study.

If I can be of assistance to you while you are doing your study, do not hesitate to let me know. I appreciate your contributions to our OB service, both as an instructor and as a staff member in our Labor Pool.

Best wishes with your study, and we will all look forward to knowing the outcome of your research project.

Sincerely,

[redacted]

Mary M. Thompson, R.N.
Director
Maternal Child Health Nursing
Riverside Hospital

MMT/lp

APPENDIX A-3

PERMISSION FROM OBSTETRICS/
GYNECOLOGY MEDICAL DIRECTOR

RIVERSIDE HOSPITAL
J. Clyde Morris Boulevard
Newport News, Virginia 23601
Telephone 599-2000

January 8, 1980

Mrs. Beth S. Mollick, R.N.
Riverside Hospital
School of Professional Nursing
J. Clyde Morris Blvd.
Newport News, Virginia 23601

Dear Mrs. Mollick:

Your letter of December 4, 1979 was read and discussed at the OB/GYN Department business meeting on January 4, 1980. The Department had no objection to this study but requested that the patients not be identified by name.

Sincerely,

[redacted]

C. W. Nickerson, M.D.
Director of OB/GYN

/cw

APPENDIX A-4

LETTER TO DR. HOBEL

Beth S. Mollick
[redacted]

Dr. Calvin J. Hobel
[redacted]

February 21, 1980

Dear Dr. Hobel,

I am writing in reference to your high-risk screening tool which was reproduced in the 1979 edition of Childbearing: A Nursing Perspective by Clark and Affonso.

This tool would be useful to me in my Master's Degree thesis project where I need to screen out high risk subjects from my sample population. My study will involve observing the differences in length of labor among low risk primiparas who are using prepared childbirth as compared to those who are unprepared. May I please have your permission to use your screening tool in this project? If possible, I would appreciate any information on validity and reliability determinations which you may have made since your original publication of the instrument in 1973. Also, have you done any further work or made any modifications of the tool?

Thank you very much.

Sincerely,

(Mrs.) Beth Mollick, R.N.

LETTER FROM HOBEL'S ASSOCIATE

SOUTH BAY REGIONAL PERINATAL PROJECT
1124 West Carson Street
Torrance, CA 90502
(213) 533-3651

April 2, 1980

Mrs. Beth Mollick, R.N.
[redacted]

Dear Mrs. Mollick:

This is in response to your letter of February 21st to Dr. Calvin J. Hobel. I must apologize for the delay in replying; Dr. Hobel is on sabbatical leave in Australia and your letter made an extended "round trip."

Dr. Hobel has stated that you can use his screening tool in your thesis project.

He has also asked that I send you a copy of our current POPRAS forms, as well as a reprint of his most recent article updating the risk factor determinations.

Please advise if we can be of further help.

Sincerely,

[redacted]

Milton Cohen

MC:jp

Supported by the Robert Wood Johnson Foundation

APPENDIX A-6

LETTER TO APPLETON-CENTURY-CROFTS, PUBLISHERS

RIVERSIDE HOSPITAL/SCHOOL OF PROFESSIONAL NURSING
J. Clyde Morris Boulevard
Newport News, Virginia 23601
Telephone 599-2700

August 7, 1980

Appleton-Century- Crofts Publishers
292 Madison Avenue
New York, New York, 10017

Dear Sirs:

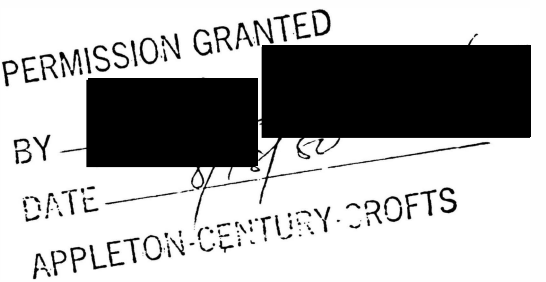
I would like to request permission to reproduce the Friedman Labor Curve as illustrated on page 33 of Friedman, E.A: Labor: Clinical Evaluation and Management 2d ed., published by Appleton - Century - Crofts, 1978 in my Master's Thesis for Virginia Commonwealth University.

Thank-you

[redacted]

Beth S. Mollick

BM/vss



COMMITTEE ON THE CONDUCT OF HUMAN RESEARCH APPROVAL FORMS

TO: Ms. Beth S. Mollick (Dr. JoAnne Kirk Henry, Advisor) Principal Investigator

Dr. Margaret Spaulding Chairman of Department Concerned

Dr. Martha B. Conway Administrator of Research Grants & Contracts

TITLE OF INVESTIGATION: The Effects of Prepared Childbirth on Length of Labor in Low Risk Primiparas.

VCU ASSIGNED NUMBER: 3/31/80

The Committee on the Conduct of Human Research of Virginia Commonwealth University met on March 26, 1980, and the above investigation was reviewed and approved.

You are cautioned to note that:

1. Informed, written consent is required of each human subject or his legally qualified guardian or next-of-kin, unless specifically excluded.

2. Any deviation from the above named protocol, or the identification of unanticipated problems which may involve risk to subjects, must be reported to this committee for review and approval.

3. Your study is subject to continued surveillance by this committee, and it will be reviewed periodically. The next review is scheduled for March 1981. At that time you must make available to the committee a roster of all subjects, a file of the completed permission slips and a summary of the results obtained, especially any adverse or unexpected effects.

4. All requests for information related to this investigation must include the exact title, the investigator, and the VCU Study Number as noted above.

5. This investigation has been indentified as being submitted to the Department of Health, Education and Welfare, and will be certified to H. E. W.
Yes _____ NO X

6. In some instances approval is contingent upon compliance with changes designated by the committee. If such are imposed, they are listed on an attached sheet, one copy of which must be signed and returned to the committee to indicate the investigator's acceptance of the changes. Where there is no attachment, the study was accepted.

[redacted]

Donald L. Brummer, M.D., Chairman,
Committee On The Conduct of Human Research

DLB/ad

(Revised Form Dated 5/1/76)

APPENDIX B

PARTICIPANT CONSENT FORM

PARTICIPANT CONSENT FORM

The study in which you are being asked to participate is designed to compare the labor and delivery periods of women who have taken ASPO prepared childbirth classes to women who have not. Only those patients whose labor and delivery courses are completely uncomplicated will actually be included in the final data analysis.

Your consent gives permission for the researcher, Beth Mollick, RN, a graduate student in the Department of Maternal and Child Nursing at the Medical College of Virginia, to collect information on the progress of your labor and delivery from your records and to use this information in compiling statistics about women like yourself for her Master's Degree Thesis.

Participation in this study will not alter your treatment in any way. There will be nothing of any experimental nature done to, or withheld from your care. There will be no risk to either you or your baby. Your cooperation will help add to our understanding of human labor and birth.

You may choose not to participate or you may withdraw from participation at any time without fear of penalty if you should so desire. Your doctor and the administration of Riverside Hospital have both approved this project. You can be assured that the information collected will be handled confidentially and that your name will not appear in any reports of this data.

Your signature below indicates that you understand and are willing to participate in this study. If you have any questions please ask your nurse. If you wish to discuss any aspect of this with me, your nurse can help you contact me.

Results of this study will be available on request.

_____

Patient Signature

_____

Date

I _____(Nurse) have explained the study to this prospective subject and have witnessed her signature.

Thank you,

APPENDIX C

INSTRUMENTS

APPENDIX C-1

PRELIMINARY SCREENING INSTRUMENT

(To be completed by nursing assessment on admission to labor and delivery.)

1. Preliminary Screen for Target Population

	Yes	No
Primipara	_____	_____
Age 18-35	_____	_____
Gestation between 38 and 42 weeks	_____	_____
Married	_____	_____
Single, Vertex Presentation	_____	_____
Spontaneous Labor	_____	_____

If answer is Yes to all of above, obtain consent for participation in study. If any of the above is No, the patient will not qualify and further screening is not necessary. (Please save all forms whether patients qualify or not.)

Please ask the following questions.

2. "Did you take prepared childbirth ("Lamaze") classes taught by Peninsula ASPO certified childbirth educators with this pregnancy?"

Yes	No
_____	_____

3. "If number two is 'Yes', on the average how much time in hours or minutes per week did you practice?" _____hr. _____min.

4. "How many of the six classes did you attend?" _____

5. "Who is your coach?" _____(i.e. husband, sister, friend, etc.) (relationship)

6. "Did you attend any prenatal classes other than 'Lamaze' classes?" _____

7. "What is the approximate total annual income in your household?" $_____

8. "What is the highest grade or level of education you have completed?" _____

APPENDIX C-2

DATA COLLECTION FORM

Patient _____ Prepared _____(Yes) _____(No)

Delivery Date _____ Time _____ a.m. p.m.

Age _____ Gravida _____ Para _____

If prepared, relationship of coach _____

How many classes attended _____ Other classes _____

Weekly practice time _____hrs. _____min.

Annual income for household $_____

Educational background _____(Highest grade or level completed)

Time of rupture of membranes _____ a.m. p.m. _____cm, _____%_____station

(_____artificial, _____spontaneous)

First Stage - Time Onset: _____	Vaginal Exams	Medications
Length of latent phase _____hr _____min	_____	_____
Length of active phase _____hr _____min	_____	_____
Length of transition _____hr _____min	_____	_____
TOTAL 1st Stage duration _____hr _____min	_____	_____
Second Stage - Time Onset: _____		
TOTAL duration _____hr _____min	_____	_____

TOTAL 1 and 2 _____hr _____min

DELIVERY

_____spontaneous; _____low forcep Position of infant _____
(0=OA,ROA,LOA; 1=OP,ROP,LOP; 2=OTHER)

Episiotomy _____(0=none, 1=midline/median, 2=RML, 3=LML)

Lacerations _____(0=none, 1=1°, 2=2°, 3=3°, 4=4°)

Abnormalities of labor _____

delivery _____

neonate _____

Third stage _____

Fourth stage _____

Postpartum _____

Infant Apgar Scores: _____1 min.; _____5 min.

Infant weight: _____lb _____oz

High-Risk Screening Score _____

APPENDIX C-3

HIGH-RISK SCREENING INSTRUMENT

	Maternal Factors	Score
I.	Cardiovascular and renal	
1.	Moderate to severe toxemia	10
2.	Chronic hypertension	10
3.	Moderate to severe renal disease	10
4.	Severe heart disease, Class II-IV	10
5.	History of eclampsia	5
6.	History of pyelitis	5
7.	Class I heart disease	5
8.	Mild toxemia	5
9.	Acute pyelonephritis	5
10.	History of cystitis	1
11.	Acute cystitis	1
12.	History of toxemia	1
II.	Metabolic	
1.	Diabetes $\geq$ Class A-II	10
2.	Previous endocrine ablation	10
3.	Thyroid disease	5
4.	Prediabetes (A-I)	5
5.	Family history of diabetes	1
II.	Previous histories	
1.	Previous fetal exchange transfusion for Rh	10
2.	Previous stillbirth	10
3.	Post-term > 42 weeks	10
4.	Previous premature infant	10
5.	Previous neonatal death	10
6.	Previous cesarean section	5
7.	Habitual abortion	5
8.	Infant > 10 pounds	5
9.	Multiparity > 5	5
10.	Epilepsy	5
11.	Fetal anomalies	1
IV.	Anatomic abnormalities	
1.	Uterine malformation	10
2.	Incompetent cervix	10

	Maternal Factors	Score
3.	Abnormal fetal position	10
4.	Polyhydramnios	10
5.	Small pelvis	5
V.	Miscellaneous	
1.	Abnormal cervical cytology	10
2.	Multiple pregnancy	10
3.	Sickle cell disease	10
4.	Age $\geq$ 35 or $\leq$ 15	5
5.	Viral disease	5
6.	Rh sensitization only	5
7.	Positive serology	5
8.	Severe anemia ($<$ 9 gm. hgb.)	5
9.	Excessive use of drugs	5
10.	History of TB or PPD $\geq$ 10 mm.	5
11.	Weight $<$ 100 or $>$ 200 pounds	5
12.	Pulmonary disease	5
13.	Flu syndrome (severe)	5
14.	Vaginal spotting	5
15.	Mild anemia (9-10.9 gm. hgb.)	1
16.	Smoking $\geq$ 1 pack day	1
17.	Alcohol (moderate)	1
18.	Emotional problem	1

	Intrapartal Factors	Score
I.	Maternal factors	
1.	Moderate-severe toxemia	10
2.	Hydramnios or oligohydramnios	10
3.	Amnionitis	10
4.	Uterine rupture	10
5.	Mild toxemia	5
6.	Premature rupture of membrane $>$ 12 hr.	5
7.	Primary dysfunctional labor	5
8.	Secondary arrest of dilation	5
9.	Demerol $>$ 300 mg.	5
10.	MgSO $>$ 25 gm.	5
11.	Labor $>$ 20 hrs.	5
12.	Second stage $>$ 2-1/2 hrs.	5
13.	Clinical small pelvis	5
14.	Medical induction	5
15.	Precipitous labor $<$ 3 hrs.	5
16.	Primary cesarean section	5
17.	Repeat cesarean section	5
18.	Elective induction	1
19.	Prolonged latent phase	1
20.	Uterine tetany	1
21.	Pitocin augmentation	1

Intrapartal Factors		Score
II.	Placental factors	
1.	Placenta previa	10
2.	Abruptio placentae	10
3.	Post-term > 42 weeks	10
4.	Meconium-stained amniotic fluid (dark)	10
5.	Meconium-stained amniotic fluid (light)	5
6.	Marginal separation	1
III.	Fetal factors	
1.	Abnormal presentation	10
2.	Multiple pregnancy	10
3.	Fetal bradycardia > 30 min.	10
4.	Breech delivery total extraction	10
5.	Prolapsed cord	10
6.	Fetal weight < 2,500 gm.	10
7.	Fetal acidosis pH $\geq$ 7.25 (Stage I)	10
8.	Fetal tachycardia > 30 min.	10
9.	Operative forceps or vacuum extraction	5
10.	Breech delivery, spontaneous or assisted	5
11.	General amesthesia	5
12.	Outlet forceps	1
13.	Shoulder dystocia	1

Neonatal Factors		Score
I.	General	
1.	Prematurity < 2,000 gm.	10
2.	Apgar at 5 minutes < 5	10
3.	Resuscitation at birth	10
4.	Fetal anomalies	10
5.	Dysmaturity	5
6.	Prematurity 2,000-2,500 gm.	5
7.	Apgar at 1 minute < 5	5
8.	Feeding problem	1
9.	Multiple birth	1
II.	Respiratory	
1.	RDS	10
2.	Meconium aspiration syndrome	10
3.	Congenital pneumonia	10
4.	Anomalies of respiratory system	10
5.	Apnea	10
6.	Other respiratory distress	10
7.	Transient tachypnea	5

Neonatal Factors		Score
III.	Metabolic disorders	
1.	Hypoglycemia	10
2.	Hypocalcemia	10
3.	Hypomagnesemia or hypermagnesemia	5
4.	Hypoparathyroidism	5
5.	Failure to gain weight	1
6.	Jitteriness or hyperactivity with specific causes	1
IV.	Cardiac	
1.	Major cardiac anomalies which require immediate catheterization	10
2.	CHF	10
3.	Persistent cyanosis	5
4.	Cardiac anomalies not requiring immediate catheterization	5
5.	Murmur	5
V.	Hematologic problems	
1.	Hyperbilirubinemia	10
2.	Hemorrhagic diathesis	10
3.	Chromosomal anomalies	10
4.	Sepsis	10
5.	Anemia	5
VI.	CNS	
1.	CNS depression > 24 hrs.	10
2.	Seizures	10
3.	CNS depression < 24 hrs.	5

Source: Calvin J. Hobel, Prenatal and Intrapartum High-Risk Screening. American Journal of Obstetrics and Gynecology. 117:1, 1973, by permission.

APPENDIX D

DATA ON FORCEP-DELIVERED PARTICIPANTS

APPENDIX D-1

Table 8. Statistical Data on Forcep Delivered Participants

	Prepared N=10		Unprepared N=4	
	Mean	S.D.	Mean	S.D.
Age	25.7	2.75	19.75	1.26
Gravida	1.60	1.58	1.00	0
Number of Prepared Childbirth Classes Attended	4.90	1.85	0	0
Practice Time Hr/Wk	3.23	2.68	0	0
Income (Thousands)	23.1	10.85	11.25	2.22
Education (Years)	14.6	3.05	11.75	0.50
Risk Score	3.10	2.73	2.50	1.73
Latent Phase (Hr)	5.75	6.67	5.65	1.47
Active Phase (Hr)	2.64	1.21	4.08	2.20
Transition (Hr)	1.52	1.14	0.40	0.21
Total First Stage (Hr)	9.95	6.32	10.13	3.90
Total Second Stage (Hr)	1.13	0.79	0.78	0.38
Total Labor (Hr) (First and Second Stage)	11.1	6.53	10.91	3.66
ACTRAN 2 (Active + Transition + Second Stage)	5.44	2.28	5.23	2.24
Medications (Number of Injections)	0.50	0.70	0.50	0.58
Mean Degree of Laceration	0.90	1.28	0.25	0.50
Apgar (1 Min.)	8.50	0.70	8.00	0.81
Apgar (5 Min.)	9.20	0.42	9.00	0
Weight (Lbs)	8.07	1.11	7.80	0.50

APPENDIX D-2

Graph of Labor Progress, Forcep Deliveries

———————— Prepared, Forcep

. . . . . Unprepared, Forcep

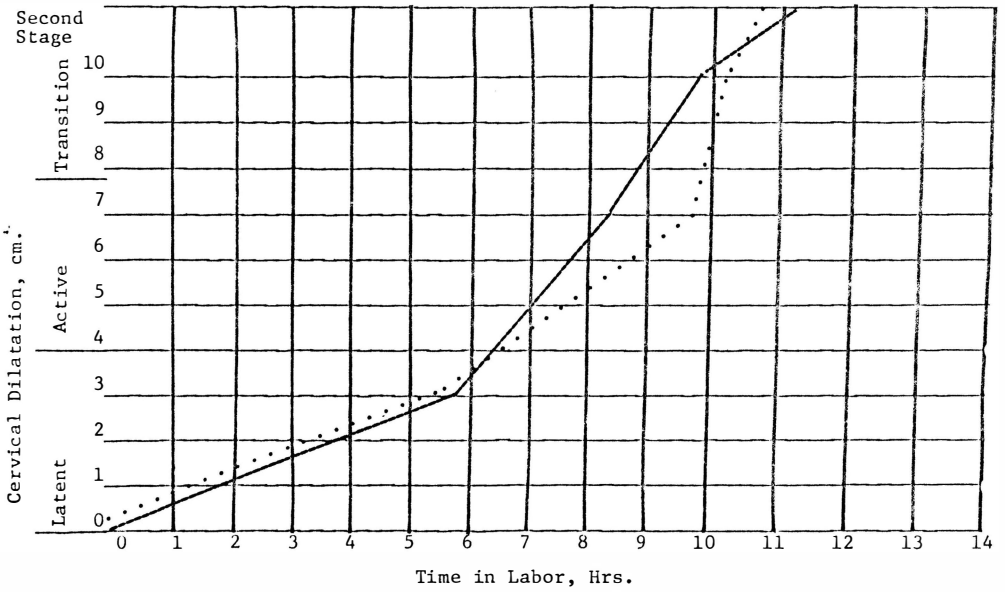


Figure 3

APPENDIX D-3

Table 9. Frequency Data on Forcep-Delivered Participants

	Prepared N=10	Unprepared N=4
Anesthesia		
None	0 (0%)	1 (25%)
Minor Anesthesia	9 (90%)	3 (75%)
Major Anesthesia	1 (10%)	0 (0%)
Episiotomy		
None	0 (0%)	0 (0%)
Median	10 (100%)	4 (100%)
Lacerations		
0	6 (60%)	2 (50%)
1^o	1 (10%)	0 (0%)
2^o	1 (10%)	0 (0%)
3^o	2 (20%)	2 (50%)
4^o	0 (0%)	0 (0%)
Fetal Position		
O.A.	10 (100%)	4 (100%)
O.P.	0 (0%)	0 (0%)

VITA