

EFFECTS OF OCCUPATIONAL ROLE STRAIN, LIFE CHANGE EVENTS, AND
PRENATAL RISK FACTORS ON OBSTETRICAL OUTCOMES
OF HOSPITAL NURSES

by

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ABSTRACT

The relationships between stress and pregnancy outcomes in hospital nurses were examined retrospectively. Nurses who had singleton pregnancies completed a questionnaire on perceived role strain, life changes, and perinatal complications.

Role strain was significantly correlated to complications during antepartum and marginally related to postpartal problems. Nurses who experienced increased role strain were noted to engender many life changes. If the life changes they experienced were undesirable and only moderately controllable, regardless of role strain, they correlated with intrapartal complications.

If problems were noted antepartally, they correlated highly with adverse intrapartal and postpartal outcomes. Complications, intrapartum to postpartum and intrapartum to newborn, were significantly related. Stress did not correlate significantly to newborn complications; nevertheless, the incidence of birth defects was high.

No significant differences existed between intensive care and transitional care nurses in terms of role strain or pregnancy complications.

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CHAPTER I

INTRODUCTION

The increase in knowledge of physiology and the accompanying advances in technology have required the nurse to become adept in the manipulation of various machines and monitors. With the expansion of medical knowledge, the nurse has begun to assume a greater responsibility for the care of the client. These increased demands may have resulted in greater stress for the nurse.

Many of the nurses who staff hospital units today are women of childbearing age. Liberalization of societal attitudes toward working during pregnancy and increasing financial burdens on the family have caused many women to continue to work well into the third trimester of pregnancy (Jimenez & Newton, 1979).

Nurses are charged with recognizing stress in a client's life and acting to alleviate or modify that stress. However, nurses must also become aware of the stressors they themselves face as well as their bodies' physiological responses to stressors and the possible results of stress.

With pregnancy, physical and psychological changes occur in preparation for the birth of a baby. Unfortunately, the

body's ability to adapt to the pregnancy may be faulty and result in pathophysiological difficulties. Such complications during pregnancy may act as additional stressors. Nurses must also consider that work-related stressors may cause problems during pregnancy. The culmination of stress from work, home, and pregnancy, whether with or without underlying pathophysiological problems, may have negative effects on the maternal and newborn outcomes of pregnancy. The physiology of stress, research of stress in pregnancy and stress in nurses are included in the review of the literature.

Purpose

The purpose of this research was to contribute to the body of knowledge about the relationship between stress and pregnancy in nurses. Hospital nurses are generally considered to be under stress, and as such, provide a large, fairly homogeneous sample. It was hoped that the information gained would improve nurses' obstetrical outcomes through an increased awareness of the level of job-related stress during pregnancy. Because the literature describes intensive care nursing to be more stressful than nonintensive care nursing, the two areas were compared to examine differences in occupational role strain, life changes experienced during pregnancy, and pregnancy outcomes.

Problem Statement

The problem of this investigation was to examine the

effects of perceived role strain, stress outside the workplace, and the physiological risk factors on maternal and newborn outcomes of pregnancy among registered nurses who work in transitional and intensive care hospital settings.

CHAPTER II

REVIEW OF LITERATURE

Animal Research

The maternal environment affects the fetal environment and therefore influences fetal development. The relationship between maternal stress and fetal development is most easily investigated in animals. Manipulation of maternal stress in pregnant rats (Ader & Belfer, 1962; Corson, Heseltine & Smith, 1970; Morra, 1965; Shabanah, Tricomi & Suarez, 1971; Thompson, 1957), rhesus monkeys (Adamsons, Mueller-Heubach & Myers, 1971; Morishima, Pederson & Finster, 1978); Myers, 1975), and ewes (Greiss & Gobble, 1967; Rosenfeld, Barton & Meschia, 1976; Rosenfeld & West, 1977; Shnider, Wright, Levinson, Roizen, Wallis, Rolbin & Craft, 1979) has been well documented.

One form of instrumentation utilized in monkey and ewe research is catheterization of maternal and fetal vessels, along with placement of uterine probes to determine the effects of maternal anxiety on the fetus. After maternal sedation and a venipuncture to provide fluid and medications, an arterial line with a blood pressure transducer attached is placed to allow for blood sampling and blood pressure monitoring. The

effects of medications and stress on the uterus are determined by another pressure transducer in the uterus coupled with a probe to measure flow. The uterine probes are placed in a surgical procedure following which recovery time is allowed prior to the gathering of data.

Investigations involving monkeys or ewes and the catheterization method support the observation that the uteroplacental function is impaired by altering the uterine vasculature through vasoconstrictive effects of norepinephrine and epinephrine (Adamsons et al., 1971; Morishima et al., 1978; Myers, 1975; Rosenfeld et al., 1976; Rosenfeld & West, 1977; Shnider et al., 1979). Planned episodes of maternal stress were instigated after Rhesus monkeys, which had been anesthetized, awoke from the anesthesia of the catheterization procedure (Myers, 1975). The flicking of a light in a previously dark room or negative auditory stimuli were the planned stressors. In 30 out of 37 instances, with seven different monkeys, introduction of maternal stress resulted in a change of vital signs, including bradycardia and hypotension, within a latency period of 50 seconds.

Morishima and associates (1978) documented a significant increase in maternal arterial blood pressures and heart rates along with a decrease in fetal oxygenation and resultant fetal bradycardia in experimentally stressed monkeys. After classifying ewes according to initial acid-base balance, Shnider and

colleagues (1979) found that a decrease in uterine blood flow precipitated a hypoxic spell regardless of the initial acid-base balance. The more acidotic ewes were stricken with profound hypoxia.

In a similar experiment involving ewes, Greiss and Gobble (1967) concluded that the nonexperimental, induced level of stress needed to evoke adverse uterine vasoconstriction is not likely to occur in humans because the endogenous adrenal medullary hormones are not thought to be as extensive in action under normal situations compared to artificial stimulation of the sympathetic nervous system. However, the experiment did reveal vast uterine vasoconstriction, enough to almost completely halt circulation when ewes were artificially stressed.

Avoidance-response training typified the form of emotional trauma in investigations utilizing rats. Control and manipulated groups of pregnant rats were compared. The manipulated rats were subject to conditioned stress throughout pregnancy. At birth, the offspring of the manipulated mothers demonstrated less activity (Ader & Belfer, 1962; Morra, 1965; Thompson, 1957), decrease in learning ability when placed in a shuttle box (Corson et al., 1970), lower birth weight or died (Shabanah et al., 1971).

In summary, maternal uterine vasoconstriction and the resultant decreased uterine blood flow together form the potential to victimize the fetus with possible life threatening vital

sign changes, hypoxia, and lack of adequate blood flow.

Theoretical Basis of Stress

Selye (1956) theorized that the body's reaction to a stressor stimulated a defense mechanism involving hormonal and physical changes designed to re-establish homeostasis. He named the response the stress or General Adaptation Syndrome (G.A.S.). Unfortunately, the initial protective aspects of the general adaptation syndrome may evolve into a disease producing state.

The General Adaptation Syndrome includes all the physiological changes that occur in relation to a stressor. The G.A.S. provides for maintenance of blood pressure, provision of energy for action, nutrients for tissue repair, and continuation of the stress response as necessary (Hopping, 1980). Altered physiological pathways that result from stress may affect the maternal-fetal circulation and thus are a concern to this investigator.

The G.A.S. includes three progressive stages. The first stage, or alarm reaction, stimulates the protective mechanisms of the body into action. The stage of resistance follows and represents the body's full adaptation to the stressor and includes all the nonspecific, systemic adaptive reactions. If the stressor is persistent and inclement, the third stage, exhaustion, may occur. During the stage of exhaustion, the body's energy stores are depleted, leading to a steady deterioration (Selye, 1956).

Maintenance of the body's internal environment is the goal of the autonomic nervous system. Once homeostasis is disturbed, by stress for instance, the parasympathetic and sympathetic divisions of the autonomic nervous system function together to assure bodily needs are met. Sympathetic stimulation partially prepares the body for the alarm reaction phase (Guyton, 1981), as the parasympathetic nervous system begins to conserve energy (Beland, 1970; Ganong, 1979).

The adrenal medulla (central section of the adrenal glands) is affected by emotional stimulation which also triggers the sympathetic nervous system. The catecholamines, epinephrine and norepinephrine, are secreted by the adrenal medulla in response to the stress-stimulated, adrenocorticotrophic hormone. The latter is released by the anterior pituitary in response to a corticotropin-releasing factor from the hypothalamus (Dillon, 1980). The hypothalamus appears to coordinate the actions of the parasympathetic and sympathetic nervous systems (Ganong, 1979; Langley, 1971).

The catecholamines incite targets previously energized by the sympathetic nervous system, thus accelerating circulatory and metabolic actions (Beland, 1970; Ganong, 1979). Epinephrine is a potent pressor agent. Blood pressure increases in response to peripheral vasoconstriction (Ascher, 1978; Hopping, 1980; Langley, 1971). The vasoconstriction and the increased blood pressure are possibly detrimental to the

maternal-fetal circulation. Epinephrine augments the contractility of the heart and increases the rate (thus cardiac output), which aids in maintaining the blood pressure and tissue oxygenation. Arteries of skeletal muscles dilate in conjunction with bronchial dilatation to help with maternal oxygenation (Ascher, 1978; Hopping, 1980; Langley, 1971).

Norepinephrine causes an added volume of blood to be shunted to active, defensive tissues such as brain, heart, and lungs. Concurrently, blood flow is reduced to kidneys, intestines, and uterus. Shunting of blood is secondary to peripheral vasoconstriction. This results in a decreased amount of available oxygen to nonperfused tissues (Ascher, 1978; Guyton, 1981), and hypoxia is dangerous for a developing fetus (Greenhill & Friedman, 1974).

The dispersion of adrenocorticotrophic hormone triggers the release of glucocorticoids and mineralcorticoids from the adrenal cortex (the outer section of the adrenals). Glucocorticoids acts on carbohydrate metabolism; mineral corticoids act upon the metabolism of sodium and potassium (Langley, 1971; Selye, 1965). Together they provide energy and help stabilize the blood pressure. The fetus may be affected by changes in the maternal blood pressure or fluctuations in the maternal glucose. Other hormones are also secreted during stress. An antidiuretic hormone is released from the posterior pituitary. It increases the reabsorption of water in the kidneys, thereby

increasing the circulating fluid volume. As a result, the blood pressure is elevated (Buckley, 1972; Hopping, 1980). As the perfusion to the kidney decreases, the renin and angiotensinogen mechanism is stimulated. Angiotensin II results; as a strong pressor agent, it also serves to elevate the blood pressure. In addition, angiotensin II signals the release of aldosterone from the adrenal cortex (Buckley, 1972; Hopping, 1980; Kopin, 1976; Langley, 1971). Elevated blood pressures during pregnancy are potentially dangerous as maternal-fetal circulation may be impaired.

Prolactin and growth hormone, similar in nature, are also increased with stress (Hopping, 1980). The anterior pituitary secretes both, but the role of prolactin in the stress response is not clear (Ganong, 1979). The growth hormone stimulates erythropoiesis (the production of red blood cells), decreases insulin secretion, increases collagen synthesis, and triggers the release of free fatty acids (Ganong, 1979; Hopping, 1980; Langley, 1971). Erythropoiesis assures the body of adequate oxygen carrying power and facilitates coagulation through increased blood viscosity. Other functions aid in maintaining an adequate level of serum glucose. If these functions are not adequate, maternal hypoxia or hypoglycemia may result, either of which could compromise the fetus.

The metabolic actions of the catecholamines include functions to provide and conserve energy. Needed energy is saved

by inhibiting the functions of the gastrointestinal tract, and in decreasing the activity level of nonimportant organs (Beland, 1970; Guyton, 1981).

Stress provokes the above responses in the pregnant women. The body regards the pregnancy as a luxury--a luxury that could endanger the mother's life; as a result, blood flow to the uterus is decreased (Adamsons, 1974). The decrease in uterine blood flow may impair the transfer of nutrients and oxygen to the fetus and/or delay the excretion of waste products, thus affecting fetal growth (see Figure 1).

Human Research

Investigations involving humans vary in methodology, terminology, and variables controlled. These studies are lacking in the continuity provided by animal research. Nevertheless, inquiries concerning the effects of maternal anxiety upon the fetus have importance in broadening understanding of stress and pregnancy.

The linkage between stress and pregnancy was investigated by Sontag (1941). He reported an association between mothers described as overly nervous during pregnancy and the bearing of infants with "autonomic instability...greater than average heart rate ranges, vasomotor instability or changes in respiratory pattern" (Sontag, 1941, p. 1002).

Grimm (1961) published findings from a prospective investigation involving 235 pregnant women without health problems.

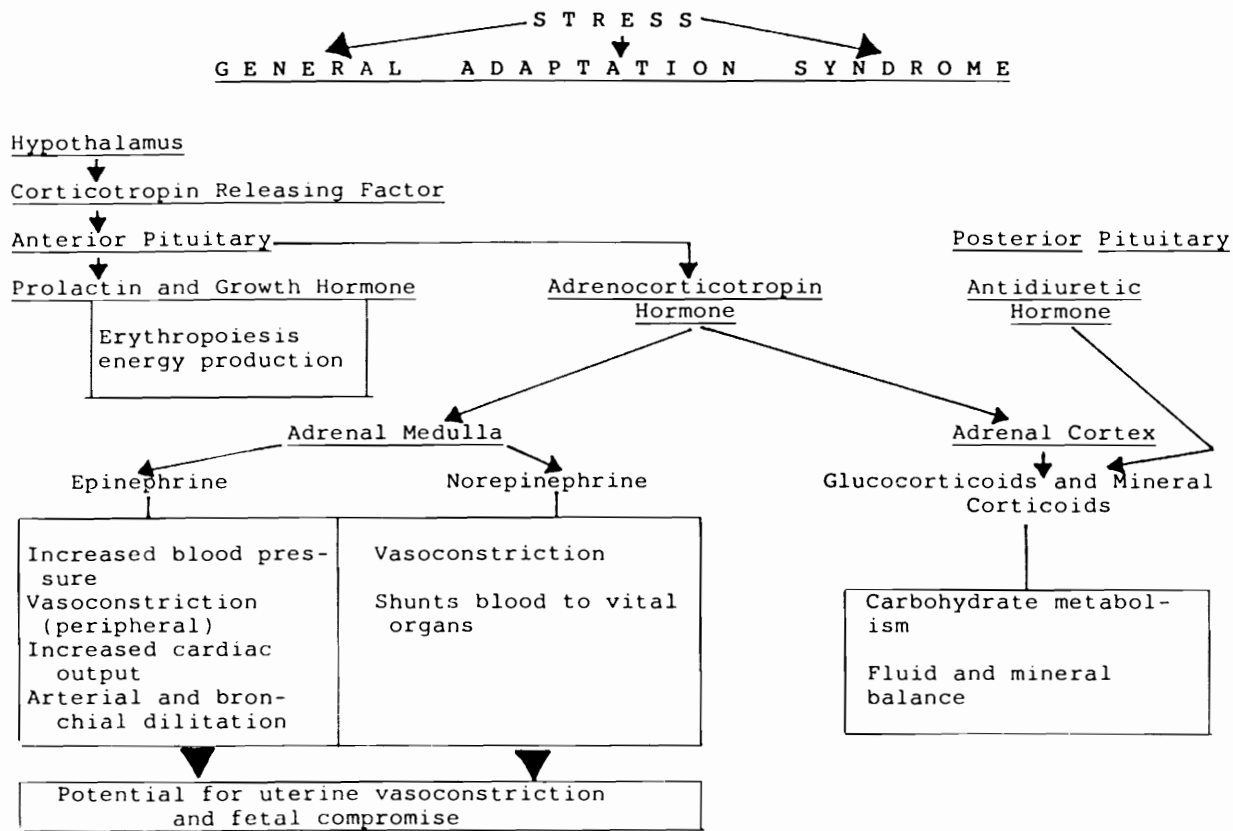


Figure 1. Schematic drawing of the physiology of stress and the potential for uterine vasoconstriction.

She used projective tools to identify different stressors experienced during pregnancy and whether the degree of stress is related to pregnancy outcome. High tension was measured (but not defined) according to test answers during the prenatal period. The results were compiled postpartally. Twenty-seven percent of the high tension group had infants who died within the first 48 hours of life, or had malformations. Only three percent of infants of the women in the low tension group died or were malformed.

Another prospective inquiry involving two interviews which ascertained the level of stress during pregnancy revealed that fetal asphyxia and uterine inertia, considered together, were significantly higher in the stressed groups (Engstrom, Geijerstam, Holmberg & Uhrus, 1964).

Dauids and DeVault (1962) used numerous psychological tests to examine a link between maternal anxiety and delivery room experiences. Fifty pregnant women were examined by clinical psychologists during routine third trimester visits. Postpartally, the data were classified as normal or abnormal. The length of labor was prolonged for women with high anxiety ratings.

Two prospective studies involving clinic patients of a lower socioeconomic standing found anxiety to be positively associated with obstetric complications (Gorsuch & Key, 1974; McDonald, Gynther & Christakos, 1963). Gorsuch and Key's (1974)

longitudinal data demonstrated that increased anxiety during the first trimester was predictive of abnormal changes during the pregnancy, such as polyhydramnios, placenta previa.

McDonald and colleagues (1963), comparing data from the third trimester of pregnancy and hospital delivery records, reported a significant correlation between maternal anxiety scores and the length of labor and the infant's birth weight.

Schwartz (1977) explored the relationship between mothers of premature and full-term infants and the life changes experienced during both antepartum and intrapartum. The mothers of premature newborns had a greater number of moderate and major life changes than did mothers of full-term infants. The greatest difference in life-change units was noted in the year prior to conception for mothers of premature infants having higher life-change unit scores. The mothers of premature infants may have been under more stress and recalled events prior to their delivery more readily than mothers of full-term infants. The study was limited by its small sample size.

In a retrospective report, Blau, Slaff, Gaston, Welkowitz, and Cohen (1963) investigated prematurity by conducting interviews with women who delivered at less than 38 weeks gestation. Standardized intelligence tests and tests designed to elicit feelings toward the pregnancy were administered to women postpartally. Maternal attitudes, evaluated by the tests, illustrated negative feelings toward the pregnancy, which was

usually unplanned. A modified life events inventory was administered three to four days postpartum. A significant number of mothers who delivered between 33 and 36 weeks gestation had experienced more life changes compared with mothers who delivered at 38 to 42 weeks gestation. In the very preterm group who delivered at less than 33 weeks gestation, the difference was higher. The data, though possibly contaminated by the timing of the data collection after the mother delivered prematurely, are interesting because the sample included various socioeconomic levels.

The Taylor Manifest Anxiety Scale, which measures a person's tendency toward anxiety, was the basis for two prospective studies which reported conflicting findings. In a sample of 150 women, Shaw, Wheeler, and Morgan (1970) reported that the more anxious mothers delivered smaller weight babies. In a smaller investigation of 61 pregnant women, Burnstein, Kinch, and Stern (1974) utilized the Taylor Manifest Anxiety Scale in addition to their own pregnancy anxiety scale. No correlation between anxiety and low birthweight or complicated labor was found.

Adamsons (1974) summarized the internal functions of an anxiety-ridden mother as a wide dispersion of epinephrine in the body, which signaled a decrease in uterine blood flow. The decreased blood flow through the uterine vasculature, as well as the direct action of catecholamines on the uterine muscles,

triggered an agitated myometrium into further excitability. The culmination of the physiological occurrences protected the mother, regardless of the fetal needs.

Stress and Nurses

The professional nurse may feel pressured by the intense stimuli in the work area. Not only the environment, but the nurses' contacts with physicians, patients, families, and ancillary hospital personnel can be a source of friction. Unlike the patient, the nurse does not frequently show the subjective feelings of anger, or negativism, but is the recipient of those emotions (Jones, 1962).

The emergence of the intensive care unit and its hectic pace have resulted in publication of articles regarding the stress involved for the nursing staff of those units. The impact from the visual, olfactory, and auditory stimuli in the intensive care unit contribute to a tension charged atmosphere. Whether the anxious climate prevails in nonintensive care units is less well documented. Transitional units (nonintensive care) are generally less inundated with intricate machines, but the nurses who staff the units are not without concerned families, large workloads, unpleasant sights, smells and sounds, or death. The literature is focused mainly on intensive care units (Gardam, 1969; Hay & Oken, 1972; Jackbson, 1978; Jones, 1962) and types of stressors within the intensive care unit categorized. The reports have assumed that intensive care nursing is stressful

and then identified the stressors. Most intensive care nurses choose their unit assignment, implying that the nurses' satisfaction in working in a transitional care unit would be less rewarding and thus a possible stressor (Hay & Oken, 1972; Maloney, 1982).

Maloney (1982) challenged the suggestion that intensive care nursing is more stressful than nonintensive care nursing. He examined occupational stress in 60 registered nurses, 30 intensive care and 30 transitional care nurses. He also measured acute and chronic anxiety, frequency of bodily complaints, job satisfaction and problems within the family.

The interpretation of the data indicated that transitional care nurses recognized a greater number of stressful events, experienced greater discomfort with these events, declared a higher number of interpersonal difficulties, and related an increased number of somatic complaints than intensive care nurses. Maloney suggested the following factors contributed to the findings. Intensive care nurses are highly respected with support being derived from the large staff required by an intensive care unit. The investigator also suggested that the repetitive, acute clinical situations further the obtainment of successful coping mechanisms.

An earlier investigation by Gentry, Foster, and Froehling (1972) compared intensive care nurses to transitional care staff, but derived contrasting results to Maloney's (1982)

findings. The researchers suggested that although no personality types were identified by psychological instruments, the intensive care nurses exhibited more stress and its effects--depression, hostility--than nonintensive care nurses.

Bates and Moore (1975), in an investigation at 20 hospitals, compared stress levels of nurses, hospital administrators, and public service administrators through a questionnaire dealing with role ambiguity, role conflict, and role overload. The stress scores for interns and nurses were significantly higher than those of other groups. Role overload was the highest area of stress for nurses. The scores depicted a staff of interns and nurses who utilized much energy in coping with the level of stress, leaving an insufficient amount of energy to care for clients. No delineation was made between intensive care nurses and nonintensive care nurses.

Situational stressors and coping mechanisms of intensive care nurses were identified by Oskins (1979) employing a questionnaire of 12 narrative situations, and the Rahe Life-Change Event Scale. The 79 nurses who participated represented 38% of the possible sample. The stress level of 57% of the intensive care nurses represented a risk to health as determined by the Rahe Life-Change Event Scale with scores greater than 150. The patient and his care was stated to be the most stressful category perceived by the nurses.

The working environment of the intensive care nurse was

attested to be very stressful by 182 full-time nurses in the Milwaukee area through a study involving a questionnaire (Anderson & Basteyns, 1981). The investigators did not compare intensive care and transitional care nursing, but demarcated key stressors to the nursing staff. Staffing problems and a heavy workload, aspects of role overload, were found to be highly stressful.

Origins of stress have been scrutinized in investigations involving the neonatal intensive care unit (Jacobson, 1978; Strickland, Spector, Hamlin-Cook, Hanna, Moore, Bellig & Fiorato, 1980) and the intensive care unit of the adult (Cassem & Hackett, 1975; Huckabay & Jagla, 1979). Huckabay and Jagla (1979) organized a questionnaire to identify the basis of stress in the intensive care unit. A small sample of 46 registered nurses participated from six hospitals. Three situations were identified as the most stressful: a) excessive workload, b) psychological stress, and c) communication gaps with physicians, nursing administration, or other nurses.

Jacobson's (1978) descriptive survey collated questionnaires of 87 nurses from seven neonatal intensive care units in three different states. Five categories portrayed the most stressful situations: a) nurse-physician conflicts, b) increased workload, c) unexpected deaths, d) the concern for adequate knowledge to care for the patient, and e) the environment itself with its auditory, visual, and olfactory insults. Other

investigators (Cassem & Hackett, 1975; Hay & Okan, 1972; Strickland et al., 1980) have shared similar results as to the most stressful work situations.

Research of stress during pregnancy conducted with animals documented the negative effects of stress on the developing fetus. Selye's conceptual model provided a framework for similar responses to occur in pregnant women. Role strain has been reported to be increased in the nursing profession, especially intensive care nursing. But examinations of the effects of role strain on pregnant nurses have not been reported. If role strain was extensive enough to cause changes in the maternal-fetal circulation, the stress was believed to also cause life changes at home. The hypotheses extended from the relationships between role strain, life changes at home, and the pregnancy outcomes of intensive care and nonintensive care nurses.

Hypotheses

The following hypotheses were tested in this research project.

1. Nurses who have a high perceived occupational role strain during pregnancy, as measured by the modified Job Related Tension Index, will have a higher incidence of complications during pregnancy, labor, delivery, and/or the immediate postpartal period.

2. Newborns of nurses who have a high perceived occu-

pational role strain during pregnancy, as measured by the modified Job Related Tension Index, will have a higher incidence of complications during labor and delivery, and/or the immediate newborn period.

3. Nurses who have an increased number of life changes, as measured by the Social Readjustment Rating Scale (SRRS), will have a higher incidence of complications during pregnancy, labor and delivery, and/or the immediate postpartal period.

4. Newborns of nurses who have an increased number of life changes, as measured by the Social Readjustment Rating Scale (SRRS) will have a higher incidence of complications in the immediate newborn period.

5. Nurses who have an increased number of physiological risk factors during pregnancy, as measured by the Hobel prenatal and intrapartal checklists, will have a higher incidence of complications during labor and delivery, and/or the immediate postpartal period.

6. Newborns of nurses who have an increased number of physiological risk factors during pregnancy, as measured by the Hobel prenatal, intrapartal, and neonatal checklists will have had a higher incidence of complications during labor and delivery and/or in the immediate newborn period.

7. Nurses who have an increased role strain will have an increased number of life changes, as measured by the Social Readjustment Rating Scale (SRRS).

8. Intensive care nurses will perceive their role strain higher than transitional care nurses on a modified Job Related Tension Index.

9. Intensive care nurses will have a greater number of obstetrical problems than transitional care nurses as measured by the Hobel prenatal, intrapartal, and postpartal checklists.

10. Newborns of intensive care nurses will have a greater number of problems than newborns of transitional care nurses as measured by the Hobel intrapartal and neonatal checklists.

11. Intensive care nurses will have more life change units as measured by the Social Readjustment Rating Scale (SRRS) compared to transitional care nurses.

Assumptions

1. The two groups of nurses were comparable in the number of past pregnancies.

2. Nurses answered the questionnaires truthfully with adequate recall.

3. Nurses understood the questions that were based on fundamental nursing knowledge when answering the questionnaire.

Definitions

Antepartum

Antepartum is the time period of pregnancy that extends from conception to the onset of labor.

General Adaptation Syndrome

General Adaptation Syndrome is defined as the defense mechanism of the body which responds to stressors.

Hypoxia

The lack of oxygen to the tissues was defined as hypoxia.

Intensive Care Nurses

Intensive Care Nurses were defined as those nurses who staff critical care units within a hospital and deal with acute medical problems or surgical problems; units known as intensive care or critical care.

Intrapartum

The time period of pregnancy that involves labor and birth of the infant was considered the intrapartum period.

Neonatal

Neonatal was considered the time period involving the first 28 days of the infant's life.

Pathophysiological Events of Pregnancy

Pathophysiological Events of Pregnancy were physical or biochemical changes within the body that place the mother and fetus at an increased level of risk as measured by Hobel's scales.

Perceived Role Strain

The difficulty a person feels in meeting the obligations of his/her role or position as measured by the job related tension index was defined as perceived role strain.

Perinatal

Perinatal was defined as the time period of pregnancy that encompasses life from conception through delivery until the infant is 28 days of age.

Postpartum

Postpartum was considered the time period after labor and delivery while the mother is recuperating.

Stress

The physical or psychological perception of a situation or feeling which requires an adjustment in one's thoughts, actions, or feelings was defined as stress.

Stressor

A stressor was considered the stimulus to initiate the physiological changes of Selye's General Adaptation Syndrome.

Transitional Care Nurses

Transitional Care Nurses were defined as those nurses who staff the units in which patients are cared for after leaving the intensive care unit.

CHAPTER III

METHODOLOGY

Design

An ex post facto design was used to examine the hypothesized relationships between stress and pregnancy outcomes in nurses. The independent and dependent variables had thus occurred prior to the gathering of data. Because the subjects chose their unit of work, the personality differences inherent in such decisions caused a potential threat to the study's internal validity (Polit & Hungler, 1978).

Factors which may have influenced the pregnancy and its outcome among transitional care and intensive care nurses were examined through a questionnaire (Appendix B). Factors examined were role strain, pathophysiological events of pregnancy, and life changes during the last pregnancy. The maternal outcomes included premature rupture of membranes, pregnancy induced hypertension, abruptio placenta or prolonged hospital stay. The newborn outcomes included prematurity, term infant without problems, or illness secondary to an infection or other problem.

Sample

A nonrandom sample of 57 intensive and transitional care nurses was obtained from six hospitals in the Salt Lake area, including both private and university settings. Transitional care nurses were compared to intensive care nurses since the patients for whom they provided care had similar health problems but were no longer in the acutely ill stage. Thus, the environment was hypothesized to be less stressful.

Registered nurses completed the questionnaire with diploma, associate degree, and baccalaureate degree nurses comprising the sample. As licensed practical nurses have different job descriptions from registered nurses, they were excluded.

All of the nurses had delivered singleton pregnancies within a three year time span (1979 - 1982). The singleton delivery was required as multiple gestation pregnancies are at increased risk for problems (Klaus & Fanaroff, 1979; Lubchenco, 1981).

Instruments

The pathophysiological events of the last pregnancy were measured by the modified Hobel (Hobel, Hyvarinen, Okada & Oh, 1973; Hobel, 1982) prenatal, intrapartal, and neonatal checklists. The checklists were scored using the weighting system described by Hobel. The total scores were grouped into a low risk category and a high risk category for each section; prenatal, intrapartal, postpartal, and neonatal. The system

was originally described after a prospective analysis of 738 pregnancies. Prenatal risk scores and intrapartal scores greater than ten were found to be significantly related to increased neonatal scores of greater than or equal to ten (Hobel et al., 1973). This checklist also helped eliminate subjects with predictable causes for abnormal obstetrical outcomes that would not be related to stress from work. Concurrently, it provided an accurate measurement of the obstetrical history of the last pregnancy.

A modified Job-Related Tension Index assessed the role strain a nurse might face during her hospital work. The Job-Related Tension Index (JRT) was designed in the early 1960s, at the University of Michigan (Kahn, Wolfe, Quinn & Snoek, 1964). The reliability for the JRT was reported at +.85 (Indik, Seashore & Slesinger, 1964).

Four categories of role strain were measured with the JRT index: job ambiguity, job overload, role conflict, and the scope or the responsibility of the job. Responses to statements measuring the above factors were marked on a five point scale, expressed from never to most of the time. A few of the items were amended to facilitate the adaptation of the JRT Index to the hospital milieu. Investigators (Anderson & Basteys, 1981; Huckabay & Jagla, 1979; Hay & Oken, 1972; Strickland et al., 1980) of stress in nursing have described areas of stress which were identified in the literature as interpersonal communication

problems, doubt of knowledge base, environmental stressors and philosophical problems. These areas nearly parallel the categories measured by the JRT but were addressed under different headings. The component of role conflict was expanded with additional items on moral conflict, as it was a major source of stress in the nursing reports. See Table 1 for the additional statements.

The modified JRT consists of 21 items. The level of role strain was considered holistically with scores greater than 54 reflecting marked role strain and less than 53 mirroring normal to no perceived role strain.

The SRRS (Holmes & Rahe, 1967; Rahe, Meyer, Smith, Kjaer & Holmes, 1964) was chosen to judge maternal life change events during the six months before birth of the last infant. The instrument related to four global areas of a person's life: family, personal, work, and financial. In each category, the SRRS listed occurrences which consisted of both negative and positive situations. The common link to the SRRS was the need for the individual to adapt, to alter past behavior or routines. The change in behavior which resulted was known as Life-Change Units, or LCUs. Life-Change Units (LCUs) were measured by frequency of occurrence and the person's perception of an event, and whether it takes more or less adaptation than marriage. Marriage was given a preset score of 500. The possible range of points for each event was 0 to 1000.

Table 1
Additional Statements on the JRT

Statements
Feeling you wished you had chosen a different career.
Feeling that death and dying are almost constant and that you can't escape from it.
Feeling unable to tolerate the sights, sounds, or smells of your work environment.
Not knowing what the patient you care for wants or needs.
Being unhappy with the time able to spend with the patient's family for teaching or support.
Feeling you wished you worked in a different unit.

Several research projects, across the United States and in other countries, have used the Schedule of Recent Experience Life Change questionnaires (SRE), which followed the SRRS, and the results "have been strikingly similar" (Rahe, 1972, p. 252 - 253). Even though many of the experiments have been retrospective in nature, recall was found to be adequate on the SRE with people remembering life change events easily (Rahe, 1972).

Rahe (1972), who has conducted extensive research with LCUs and illness prediction (Rahe, 1968; Rahe, 1969; Rahe & Arthur, 1968; Rahe, Gunderson & Arther, 1970; Rahe & Holmes, 1965; Rahe, Lundberg, Bennett & Theorell, 1971; Rahe, Mahan & Arthur, 1970, Rahe et al., 1964), concluded in a review of the reports that a scoring system of LCUs for a risk of near-future illness was possible. The most recent six month period for illness prediction was the most satisfactory. A six month total of 85 LCUs were considered average for people who remained without illness. In this investigation scores of less than 150 were considered low risk for illness or pregnancy complications; scores between 150 - 300 were treated as at moderate risk for illness, and scores greater than 300 were considered at high risk for illness and/or pregnancy complications. Rahe (1972) reported illnesses occurred nearly all the time in people with scores greater than 300.

Life-Change Units helped portray the environment that surrounded the mother at the time of pregnancy. Pregnancy was

a life event measured by the SRRS. It was perceived quite differently among the sample and did not appear to affect the results unless the pregnancy was viewed as exceptionally stressful.

McFarlane, Norman, Streiner, Roy, and Scott (1980) examined the influence of the psychosocial environment upon an individual's health status. They found in preliminary results that life changes which were undesirable in nature evoked a higher degree of stress, whereas, desirable changes only minimally evoked a response. Other findings suggested that an individual who felt the life change was out of his control, experienced a greater degree of stress as did the individual who did not expect the life change to occur. Because of McFarlane and co-workers' findings, those dimensions of life events were tested on the SRRS by an additional three questions on each life event: a) was the event expected? b) did you have control over the event? c) was the event desirable? These were answered by yes and no responses for questions one and three; question two was answered by degree of control.

The SRRS aspect of the questionnaire was not clearly understood by all as it was either left blank or answered incorrectly. Because of this, ten questionnaires were excluded in the SRRS segments of the analysis.

Procedures

After permission from the hospitals involved was obtained,

the head nurses of the intensive care units and transitional care units were contacted and their help solicited. Bulletins were posted to advertise the project. Reminder letters were also mailed to the institutions. Eligible nurses were given the questionnaire to answer. The questionnaire was then mailed to the investigator in stamped envelopes provided. Of approximately 200 questionnaires placed in the area hospitals, only 62 were returned.

Human Subjects Considerations

Permission to extend the questionnaire to the hospital nurses was given by the Director of Nursing at each hospital and/or the individual hospital review board.

Informed consent was obtained by the explanation that this was a thesis project investigating obstetrical outcomes in hospital nurses. The researcher did not emphasize the comparison between intensive care and transitional care nurses. It was felt that that knowledge could have influenced the answers to the Job-Related Tension portion of the questionnaire.

Approximately 35 minutes were required to answer the questionnaire. Only nurses who desired to participate answered the questionnaire with the knowledge that the information was confidential. It was also understood that they could avoid any question in the instrument if desired.

Limitations

The relatively small convenience sample was limiting and prohibits relating the findings to the target population. The ex post facto design had a threat to the internal validity as the researcher is unable to completely define independent variable effects from extraneous variable effects.

The intensive care units generally require a larger nurse to patient ratio meaning more nurses are needed to care for fewer patients. The unequal group sizes reflect this fact. An associated problem was that not all intensive care units transferred their patients to a transitional unit, again depleting the accessible sample.

The questionnaires were made available to the nurses without having contact with the researcher. The total number of eligible nurses was not known making it impossible to expand the findings to other nurses.

Women who recently delivered had not returned to work yet, possibly decreasing the accessible sample. Nurses who experienced an abnormal pregnancy, labor and/or delivery may not have been psychologically ready to answer the questionnaire. This may have affected the results. The investigator was aware of one such case where the pregnancy outcome was quite poor.

As the subjects completed the questionnaire at different times, there was no control over work conditions or recent stressors that may have occurred prior to the answering of the

questionnaire. A possible measurement effect was brought to the investigator's attention when a subject mentioned the Job-Related Tension Index's statements were negatively stated. This was not noted to be a problem in the previous studies in which the JRT was used.

CHAPTER IV

RESULTS AND DISCUSSION

The Statistical Package for the Social Sciences Program (Nie, Hull, Jenkins, Steinbrenner & Bent, 1975) was the basis for statistical analysis. The analysis was performed at the University of Utah Computer Center. The level of statistical confidence was set at 0.05.

Descriptive Statistics

The demographic data, analyzed through basic descriptive statistics, indicated a fairly homogenous sample. All the nurses in the sample were older than 21 years of age and less than 39 years (S.D. = 3.38). The family income averaged \$26,800 annually (S.D. = 0.82). All of the subjects were registered nurses with educational preparation varying from a diploma program to master's degree program. Fifty percent of the participants had earned a Baccalaureate degree.

Five subjects reported mild heart disease. Otherwise, the subjects did not have any documented, underlying pathology which would have affected pregnancy. Only three nurses reported smoking one pack of cigarettes per day. One subject consumed two glasses of alcoholic beverages per day.

The majority of the subjects were multiparous (42 of 57). This was a mean of 2.3 pregnancies for the group with the total number of pregnancies ranging from one to six. A summary of past pregnancies and outcomes are presented in Table 2.

Sixty-two questionnaires were returned, but five were discarded: three pregnancies were not working in the required units at the time of pregnancy; one had diabetes, and one had a multiple pregnancy. Thirty-nine intensive care nurses and eighteen transitional care nurses responded to the questionnaire.

Seventy-five percent of the participating nurses felt intensive care nursing was more stressful than transitional care nursing. Thirty-four of the subjects were full-time employees during the last pregnancy. Nurses who worked full-time were noted to have an increased number of newborn complications ($\chi^2(1df) = 3.98; p < 0.05$).

Inferential Statistics

Many of the variables were not normally distributed, but were skewed. In order to perform parametric tests on the skewed data, logarithmic transformations were done prior to further analysis (Kirk, 1982; Nie et al., 1975).

A basic procedure, the t-test assessed differences between group means along particular variables (Polit & Hungler, 1978). The Pearson r coefficient tested hypotheses dealing with relationships. When the data were ordinal, the Spearman's rho coefficient of correlation was used (Polit & Hungler, 1978).

Table 2
Pregnancy History of Sample
(N=57)

Variable	Mean	Standard Deviation	Range
Total number of pregnancies	2.333	1.272	1-6
Total number of abortions	0.316	0.572	0-2
Total number of miscarriages	0.035	0.018	0-1
Total number of premature	0.105	0.310	0-1
Total number of fullterms	1.842	1.236	0-5

Hypothesis One

Hypothesis one stated:

Nurses who have a high perceived occupational role strain during pregnancy as measured by the modified Job-Related Tension Index, will have a higher incidence of complications during pregnancy, labor, delivery, and/or the immediate postpartal period.

The level of role strain (high vs. low) was determined by median split from the total score on the JRT. The responses to each factor ranged from never (scored one point) to most of the time (scored five points). The highest possible score for the 21 factor index was 105, and the lowest possible score was 21. A score of 53 or greater reflected an individual who perceived a marked degree of role strain.

The mean role strain score for the low stress group was 45.26 and 61.04 for the high stress group. The demographic data depicted basically homogeneous groups as listed in Table 3. There were slight differences in the raw scores on the obstetrical histories; however, no significance was found.

Perceived role strain was also compared with type of nursing education because of differences in program length and non-nursing courses. Nurses who received education in a diploma program appeared to have more perceived role strain ($\chi^2(2df) = 6.75; p < .05$). However, no association was found between type of educational background and perinatal risk factors or life changes.

The nurses varied slightly in regards to work status.

Table 3
Demographic Data and Obstetrical Histories
by Low/High Job Strain

Variable	Low Strain (n=27)		2 Tailed t-test		High Strain (n=28)	
	\bar{X}	S.D.	t	p	\bar{X}	S.D.
Role Strain	45.259 (37 - 53)	4.477			61.036 (54 - 90)	8.108
Age (years)	28 (23 - 35)	3.408	-.28	.784	28.25 (22 - 38)	3.307
Past pregnancies	2.556 (1 - 6)	1.423	1.19	.241	2.143 (1 - 6)	1.147
Past abortions	0.407 (0 - 2)	0.572	1.01	.318	0.250 (0 - 2)	0.585
Past miscarriages	0.074 (0 - 1)	0.267	1.47	.148	0.000 (0)	0.000
Past premature	0.148 (0 - 1)	0.362	.90	.371	0.071 (0 - 1)	0.262
Past fullterm	1.963 (1 - 5)	1.427	.73	.469	1.714 (1 - 5)	1.084

Note. () = range.

There were 13 part-time and 14 full-time employees in the low stress group. The high stress group had 20 full-time nurses and 7 part-time. The difference was not significant ($\chi^2(1df) = 1.99; p < .20$).

Complications during pregnancy were measured by a modified Hobel checklist for prenatal, intrapartal, and postpartal complications. The sections were scored individually; each pathological finding was assigned 0 to 10 points (Hobel et al., 1973). A total score for each section was then given. Appendix C delineates the point values of each factor included in the checklist.

Perinatal complication scores are delineated by low/high job strain in Table 4. The mean raw scores on the perinatal checklists were greater in the high role strain group. When the data were transformed and then analyzed, high role strain scores were found to be significantly related to antepartal complications. In addition, there was a marginally significant association for increased role strain and complications in the postpartal experience. In a conservative study involving women who were at low risk for problems prior to the pregnancy, the association between role strain and pregnancy complications caused concern for the investigator.

The perceived role strain or stress, with the subsequent release of epinephrine and norepinephrine, may have triggered uterine vasoconstriction thus diminishing the ability of the

Table 4
Perinatal Complications by Job Strain and t-Test Values

Perinatal Experience	Low Strain		t-Test		High Strain	
	<u>X</u>	<u>S.D.</u>	<u>2</u> -Tail		<u>X</u>	<u>S.D.</u>
Antepartal score	7.963 (0 - 45)	10.494	-2.01	0.049	11.607 (0 - 40)	9.723
Intrapartal score	10.926 (0 - 50)	13.304	-1.15	0.257	15.357 (0 - 45)	13.398
Postpartal score	3.704 (20 - 50)	10.057	-1.80	0.077	4.821 (0 - 25)	5.850

Note. Range of scores is in ().

uterus and placenta to function as theorized by animal researchers (Adamson et al., 1975; Morishima, 1978; Myers, 1975; Rosenfeld et al., 1976; Rosenfeld & West, 1977; Shnider et al., 1979). The significance between a high level of role strain and antenatal complications may reflect these biochemical and physiological changes.

The association between high job stress and postpartal problems is more difficult to explain. However, the mean intrapartal scores were also elevated, though not significantly. The increased intrapartal scores may have contributed to postpartal problems. It is possible that the job stress or altered uterine vasculature is somehow linked to a failure to progress in labor or a placenta previa, and thus the need for a cesarean childbirth (Jones, 1976). A delivery by cesarean section generally involves a prolonged hospital stay, which is considered a postpartal complication. A cesarean section may have also been necessary because of previous cesarean delivery (Jones, 1976) which included four women in the sample.

Prolonged labor is an indication for a cesarean childbirth (Jones, 1976), and there were seven women with labor lasting longer than 20 hours. Prolonged labor has also been associated with high anxiety levels in women. In Grimm's (1961) report on psychological tension in pregnancy, she noted a significant relationship in length of second stage of labor and a high tension index. Even though Grimm's methodology varied from

this study, the increased incidence of prolonged labor and stress is interesting.

Standley, Soule, and Copan's (1978) findings gave no evidence for anxiety and prolonged labor being associated. However, their anxiety measurement was in regard to feelings towards the pregnancy and childbirth experience, not the overall stress level.

Factors that complicated the subjects' last pregnancy, labor and delivery, and the postpartal period are shown in Tables 5, 6, and 7. Only three nurses did not have any problems with their pregnancy experience, but no significance was found when tested with the t-test at the conventional level of confidence.

As the review of the literature demonstrated, several articles have been written regarding the amount of stress that surrounds nurses, with specific stressors having been identified (Anderson & Basteyns, 1981; Cassem & Hackett, 1975; Gray-Toft & Anderson, 1981; Hay & Oken, 1973; Jacobson, 1978; Jones, 1962; Oskins, 1979). Though work stressors were identified, McMichael (1978) noted the response to a stressor was individual with large variations being recorded. Despite the research on job strain, there have been few studies comparing nursing to other occupations (Bates & Moore, 1975) or transitional care nurses to intensive care nurses (Maloney, 1982).

The subjects in this study could be compared holistically to the women who gave birth in the state of Utah in 1981. During

Table 5
 Antepartal Complications by Job Strain
 (N=55)

Complications	Low Strain	High Strain
Moderate to severe toxemia	0	1
Moderate to severe renal disease	0	1
History of eclampsia	1	0
Mild heart disease	2	3
Mild toxemia	2	1
Acute pyelonephritis	0	1
History of cystitis	0	2
History of toxemia	1	2
Family history of diabetes	3	3
Previous postterm infant	4	0
Previous delivery by C-section	4	3
Habitual abortion	0	1
Rh sensitization only	1	0
Polyhydramnios	1	3
Small pelvis	2	0
Abnormal pap smear	4	4
Previous history of multiple pregnancy	0	2
Age greater than 35 years	0	1
Viral disease	1	2
Severe anemia	1	0
Weight less than 100 lbs. or greater than 200 lbs. before pregnancy	0	2
Severe flu	1	2
Vaginal spotting	1	7
Mild anemia	4	6
Smoking greater than 1 pack per day	1	2
Emotional problem	1	3
Alcohol	0	1

Table 6
 Intrapartal Complications by Job Strain
 (N=55)

Complications	Low Strain	High Strain
Moderate to severe toxemia	1	1
Hydramnios	2	0
Mild toxemia	4	1
Premature rupture of the membranes	2	3
Failure to progress in labor	4	8
Magnesium sulfate because of toxemia	1	1
Labor lasting longer than 20 hours	3	4
Clinically small pelvis for baby	1	2
Medical induction	4	3
Precipitous labor, less than 3 hours	1	5
Need for first C-section	2	1
Repeat C-section	1	3
Uterine tetany	1	0
Pitocin augmentation	7	7
Abruptio placenta	1	0
Postterm, greater than 42 weeks	0	3
Meconium staining, light colored	4	5
Meconium staining, pea soup	0	2
Abnormal presentation of fetus	2	4
Fetal bradycardia, greater than 30"	1	3
Breech delivery	0	1
Fetal weight, less than 5 lbs.	0	1
Fetal tachycardia, greater than 30"	0	1
High forceps or vacuum extraction	0	1
Outlet forceps	7	6

Table 7
 Postpartal Complications by Role Strain
 (N=55)

Complications	Low Strain	High Strain
Damage to pelvic organs or tissues	2	4
Shock, circulatory collapse	1	1
Anemia	2	2
Hospital stay greater than 3 days	4	5
Infection	1	4
Perineal hematoma	0	2
Hemorrhage within the first 24 hours after delivery of the placenta	1	2
Complications with the administration of anesthesia or other sedation (excluding headaches)	3	1

1981, the majority of births were delivered to women between 20 - 24 years of age, and 20,126 births were to women with more than one year of college (Utah Vital Statistics, 1983). The mean age for this sample was higher as was the amount of education.

The most likely factor that possibly decreased the perceived role strain in this sample and thereby diminishing the effects of role strain on pregnancy, was the need for recall. The year of the last pregnancy ranged from 1979 to 1982. The majority of the subjects experienced confinement since 1981 (Table 8). When this information was tested, there was no significant difference noted ($\chi^2(3df) = 2.4; p < .5$).

Hypothesis Two

Hypothesis two stated:

Newborns of nurses who have a high perceived occupational role strain during pregnancy, as measured by the JRT, will have a higher incidence of complications.

When the transformed data were tested, the analysis did not support the hypothesis ($t(53df) = 0.44; p < .70$). Table 9 contains newborn complication scores by maternal role strain scores.

Since the first hypothesis showed a significant relationship between maternal job stress and antepartal complications, but not labor and delivery, it was not surprising that this hypothesis was not supported. The newborn was certainly affected

Table 8
Year of Last Pregnancy by Role Strain
(N=55)

	1979	1980	1981	1982
Low Job Strain	2	9	9	7
High Job Strain	1	7	15	5
Total births	3	16	24	12

Table 9
 Newborn Risk Factors by Job Strain with t-Test Values
 (N=55)

Perinatal Experience	Low Role Strain <u>X̄</u>	S.D.	2-Tail t-Test <u>t</u>	p	High Role Strain <u>X̄</u>	S.D.
Neonatal Score	7.778	16.369	-.44	0.66	7.143	9.272
Range of Scores	(0 - 80)				(0 - 45)	

by the events of the antepartal months; however, the events of labor and delivery are more closely linked to many of the newborn complications such as asphyxia (Hobel et al., 1973).

The newborn scores ranged from 0 to 80. Scores less than or equal to 5 were considered low risk and greater than or equal to 10 were reflective of more serious complications. There were 28 newborns who were delivered to women in the high stress group, but their mean newborn outcome score was considered normal.

The problems experienced by the newborn are listed in Table 10. The total number of complications were not evenly divided. The infant with Trisomy 13 scored the highest number of points. Trisomy 13 is generally caused by nondisjunction, but why the chromosome (13) does not divide during meiosis is not known (Feingold, 1981). Though Trisomy 13 is probably not stress-related, stress cannot be positively ruled out, and thus, the infant was kept in the sample. Some infants had only one problem; other infants had multiple, major problems resulting in very high scores. Forty-two percent of the newborns were without problems. When the newborns without problems were compared to the transformed role strain scores, no significance was noted ($t(53df) = -.58; p < .6$). As there are complications encountered at birth that are not realized until the child is older, the incidence of birth complications could be higher. There are also infants who have difficulties at birth but recover

Table 10
 Neonatal Complications by Job Strain
 (N=55)

Complications	Low Job Strain	High Job Strain
Prematurity and less than 3 lbs.	1	1
Required resuscitation at birth	1	2
Fetal anomalies	3	3
Small for gestational age	2	3
Large for gestational age	2	2
Prematurity and greater than 3 lbs.	1	1
Feeding problem	1	1
Respiratory distress syndrome	1	0
Meconium aspirated	0	1
Other respiratory disease	1	4
Hypoglycemia	1	0
Failure to gain weight	1	0
Jitteriness or hyperactivity with a diagnosed cause	1	0
Major cardiac anomalies	2	1
Congestive heart failure	1	0
Heart murmur	2	1
Hyperbilirubinemia	6	3
Sepsis	1	2
Anemia	1	1
Central nervous system depression for less than 24 hours	1	0
Chromosomal abnormalities	1	0

with minimal, subsequent problems.

Hypothesis Three

Hypothesis three stated:

Nurses who have an increased number of life changes, as measured by the SRRS questionnaire, will have a higher incidence of complications during pregnancy, labor, delivery, and/or the immediate postpartal period.

The score from the Social Readjustment Rating Scale was compared with the modified Hobel checklist score for each aspect of pregnancy. The score from the SRRS was totaled so that a score less than 150 represented a low amount of life changes or stress. A score between 150 - 300 represented an increased amount of stress, but a score greater than 300 depicted an individual who had experienced many life changes and was under stress.

The Pearson r coefficient did not support a correlation between LCUs and pregnancy complications as depicted in Table 11. Thus, the hypothesis was not supported.

Demographic data by categories of low, moderate, or high LCUs are listed in Table 12. The mean age for the three groups decreases as the number of LCUs increases. When further testing was done, no significant difference was noted ($r=1.03$, $p < .4$). It is interesting that the nurses who placed in the low stress group held more part-time positions (9 part-time and 6 full-time) than in the moderate and high stress groups combined (8

Table 11
Pearson Correlation Coefficients for LCUs and Perinatal Scores
(N=47)

Perinatal Experience	<u>r</u>	<u>p</u>
Antepartum period	0.1543	0.150
Intrapartum period	0.1321	0.188
Postpartum period	0.1667	0.131

Table 12
 Age, Obstetrical Histories by Amount of Life Change
 (N=47)

Variable	Low Stress n=15 (less 150)		Medium Stress n=19 (150-300 points)		High Stress n=13 (greater 300)	
	\bar{X}	S.D.	\bar{X}	S.D.	\bar{X}	S.D.
Age in years	29	3.863	28.52	3.204	27.231	3.320
Pregnancies	2.467	1.246	2.474	1.307	2.154	1.519
Abortions	.4	0.623	0.263	0.452	.385	0.768
Miscarriages	0.067	0.258	0	0	0	0
Premature	0.067	0.258	0.105	0.315	0.154	0.376
Full-term	2.000	1.464	1.947	1.129	1.538	1.266
Social score	93.133	44.197	206.053	45.208	563.462	240.767

part-time and 23 full-time). When these findings were subjected to analysis, there appeared to be a marginally significant association between employment status and life changes ($\chi^2(2df) = 5.77; p < .06$).

The obstetrical histories were similar. When the means between the groups were contrasted within the groups, the F -ratios were not significant with p values greater than 0.05.

Rahe (1972) documented an increase in the number of illnesses reported within one year after many life changes. In the moderately stressed group (150 - 300) the illnesses averaged approximately 50% while the illness rate increased to 70% in the high stress group (Rahe, 1972, p. 254). Though the statistical analysis provided no support to the relationship between increased life changes and pregnancy complications, the mean perinatal risk factor scores for the high stress group were greater than the other two groups as listed in Table 13. When the total perinatal score (antepartum plus intrapartum and postpartum periods) was transformed and compared to the number of life changes, no significant differences were noted ($F(2df) = 1.84; p < .17$).

Tables 14, 15, and 16 list the perinatal complications by life change scores.

The SRRS was hampered in the strength of the analysis because of the number of people (10) who failed to complete the questionnaire. The questionnaire was pretested by

Table 13
Perinatal Risk Factors by Degree of Stress in LCUs

Perinatal Experience	Low Stress <u>n=15</u> (less than 150)		Medium Stress <u>n=19</u> (150-300 points)		High Stress <u>n=13</u> (greater than 300)	
	<u>X</u>	<u>S.D.</u>	<u>X</u>	<u>S.D.</u>	<u>X</u>	<u>S.D.</u>
Antepartum Score Range	8.667 (0 - 25)	8.338	10.526 (0 - 45)	11.534	12.308 (0 - 30)	8.807
Intrapartum Score Range	11.667 (0 - 40)	12.630	12.632 (0 - 50)	13.475	19.231 (0 - 45)	14.698
Postpartum Score Range	1.667 (0 - 5)	2.443	5.0 (0 - 50)	11.785	6.154 (0 - 25)	7.403

Table 14
 Antepartal Complications by Life Changes
 (N=47)

Complications	Low Stress	Moderate Stress	High Stress
Moderate to severe toxemia	0	1	0
History of eclampsia	0	1	0
Mild heart disease	0	2	2
Mild toxemia	1	1	1
Acute pyelonephritis	0	0	1
History of cystitis	0	0	1
History of toxemia	0	2	1
Family history of diabetes	2	2	2
Previous postterm, greater than 42 wk	0	3	0
Previous delivery by C-section	2	5	1
Habitual abortion	0	0	1
Polyhydramnios	1	2	1
Small pelvis	1	1	0
Abnormal pap smear	3	1	2
Previous history of multiple pregnancy	1	0	1
Age greater than 35 years	0	1	0
Viral disease	1	1	1
Rh sensitization only	0	1	0
Severe anemia	0	0	1
Weight less than 100 lbs or greater than 200 lbs before pregnancy	0	1	1
Severe flu	2	0	1
Vaginal spotting	2	2	2
Mild anemia	2	6	2
Smoking, greater than 1 pack per day	0	1	2
Emotional problem	0	2	2
Alcohol, less than 2 glasses per day	0	0	1

Table 15
 Intrapartal Complications by Life Changes
 (N=47)

Complications	Low Stress	Moderate Stress	High Stress
Moderate to severe toxemia	1	1	0
Hydramnios	1	1	0
Mild toxemia	1	2	1
Premature rupture of membranes	2	1	0
Failure to progress	1	4	6
Magnesium sulfate because of toxemia	1	0	0
Labor lasting longer than 20 hours	2	4	1
Clinically small pelvis	0	1	2
Medical induction	1	1	3
Precipitous labor, less than 3 hours	2	0	3
Need for first C-section	1	1	1
Repeat C-section	2	2	1
Uterine tetany	0	1	0
Pitocin augmentation	5	4	4
Abruptio placenta	1	0	0
Postterm, greater than 42 weeks	0	0	3
Meconium stained amniotic fluid, light colored	1	5	3
Meconium stained amniotic fluid, pea soup	0	0	2
Abnormal presentation of fetus	2	3	1
Fetal bradycardia, greater than 30"	0	2	2
Breech delivery	1	1	0
Fetal weight less than 5 lbs.	0	0	1
High forceps or vacuum extraction	0	0	1
Outlet forceps	3	4	3

Table 16
 Postpartal Complications by Life Changes
 (N=47)

Complications	Low Stress	Moderate Stress	High Stress
Damage to pelvic organs or tissues	0	2	2
Shock, circulatory collapse	0	1	1
Anemia	0	2	1
Hospital stay greater than 3 days	3	2	4
Infection	1	2	2
Perineal hematoma	0	0	1
Hemorrhage within the first 24 hours after delivery of the placenta	1	3	0
Complications with the administration of anesthesia or other sedation in labor and delivery (excluding headaches)	0	2	1

colleagues (not in the sample) for understanding and time required. No difficulty was noted at that time. However, the SRRS was misunderstood by some nurses who completed every column and others who avoided the section entirely. The author discarded the questionnaires where every event was checked as such occurrences are highly improbable.

Gorsuch and Key (1974) concluded that increased life stress in the last two trimesters were associated with abnormalities, but before the pregnancy, they reported no association with complications. The life change information obtained in this study was not defined by month of gestation, but was concerned with the six months prior to the delivery of the last infant. Rahe (1972) believed the most recent six month interval was most predictive of illnesses compared to one year or two years before pregnancy. However, Schwartz (1977) imparted from her research that the year prior to conception was the important time factor in relation to full term and premature deliveries.

Pregnancy, a common event for all the subjects, was measured by the SRRS. The total scores for pregnancy varied from 100 to 1000 for 47 subjects. Eight of the subjects did not desire the pregnancy. The median pregnancy score was 473; this score reflected a group of subjects who considered pregnancy to require less adaptation than marriage. The author

did not feel pregnancy, as an event, raised the total scores unless it was perceived as a major life change event.

The overall coefficients of correlation (Spearman) between the pregnancy being desired, controlled, or anticipated and the perinatal complications ranged from -0.1645 to 0.0767. No relationship was statistically significant at the 0.05 level of confidence as presented in Table 17.

Hypothesis Four

Hypothesis four stated:

Newborns of nurses who have an increased number of life changes, as measured by the SRRS, will have a higher incidence of complications in the immediate newborn period.

The newborn complications were assessed with the modified Hobel checklist. Only three of the tested 47 subjects were noted to have high newborn scores and high life change unit scores, so when the transformed data were tested, no support of the hypothesis was documented ($r=0.04$, $p<.4$). The mean perinatal risk score for complications with the newborn was higher as stress (in terms of LCUs) increased. Table 18 depicts the findings.

Table 19 presents the neonatal complications by degree of stress resulting from the LCUs. The newborn complications are distributed fairly equally for all of the categories.

The high stress group with scores greater than 300 had a slightly higher mean in regard to past premature deliveries.

Table 17
 Pregnancy Desirability and Perinatal Complications
 (N=47)

Experience of Pregnancy	Desired		Controlled		Anticipated		Values	
	<u>rs</u>	<u>p</u>	<u>rs</u>	<u>p</u>	<u>rs</u>	<u>p</u>	<u>rs</u>	<u>p</u>
Antepartum Periods	.0767	.302	-.0792	.296	-.1201	.208	.0038	.490
Intrapartum Periods	-.1543	.148	-.1645	.132	-.1042	.204	-.0149	.46
Postpartum Periods	-.0392	.396	-.0318	.415	-.0123	.467	-.0524	.360

Table 18
 Newborn Risk Factors by Degree of Stress in LCUs
 (N=47)

Experience	Low Stress n=15 (less than 150)		Medium Stress n=19 (150-300 points)		High Stress n=13 (greater than 300)	
	<u>X</u>	<u>S.D.</u>	<u>X</u>	<u>S.D.</u>	<u>X</u>	<u>S.D.</u>
Newborn Points	6.333	10.431	8.684	17.861	9.615	11.630
Range	(0 - 35)		(0 - 80)		(0 - 45)	

Table 19
 Neonatal Complications by Degree of Stress in LCUs
 (N=47)

Complications	Low Stress	Moderate Stress	High Stress
Prematurity and less than 3 lbs.	1	0	0
Required resuscitation at birth	0	1	2
Fetal anomalies	2	2	2
Small for gestational age	1	2	2
Large for gestational age	1	1	2
Prematurity and greater than 3 lbs.	1	1	0
Respiratory distress syndrome	0	1	0
Meconium aspiration	0	0	1
Other respiratory disease	1	3	0
Hypoglycemia	0	1	0
Failure to gain weight	0	1	0
Jitteriness or hyperactivity with diagnosed causes	0	1	0
Major cardiac anomaly	1	1	1
Congestive heart failure	0	1	0
Heart murmur	1	1	1
Hyperbilirubinemia	2	3	3
Sepsis	1	0	2
Anemia	0	2	0
Central nervous system depression lasting less than 24 hours	0	1	0
Chromosomal abnormality	0	1	0

The means were contrasted, but no significant differences evolved ($F(2df) = .54; p < .6$). Newton, Webster, Binu, Maskrey, and Phillips (1979) cited "significantly more major life events occurred in the preterm than the term group" (Newton et al., 1979, p. 412).

Hypothesis Five

Hypothesis five stated:

Nurses who have an increased number of physiological risk factors during pregnancy, as measured by the modified Hobel prenatal and intrapartal checklist, will have a higher incidence of complications during labor and delivery, and/or the immediate postpartal period.

The statistical analysis was highly significant as noted in Tables 20 and 21. There were 19 women at high risk during the intrapartal experience. Postpartally, only nine subjects who were at risk during pregnancy continued to have problems.

The hypothesis was based partially on Hobel's work (1973 and 1982) where he used the checklists as a screening tool. He found a significant association between complications during labor and the problems experienced by the newborn: the more numerous the intrapartal complications, the higher the risks for the newborn. Hobel spoke in terms of newborn risk factors and not maternal postpartal factors. These findings also supported the belief that prenatal and intrapartal factors were significantly associated with postpartal complications. Newborn problems are closely linked to maternal problems because of the

Table 20
Comparison of Antenatal Factors to Intrapartal and
Postpartal Factors by Pearson Correlation
(N=57)

Experience of Pregnancy	Pearson Correlation Coefficient	Significance Level p Value
Intrapartum	0.3417	0.005
Postpartum	0.4866	0.000

Table 21
Comparison of Intrapartal Factors to Postpartal
Complications by Pearson Correlation
(N=57)

Experience of Pregnancy	Pearson Correlation Coefficient	Significance Level p Value
Postpartum	0.4510	0.0001

physiological basis underlying maternal-fetal circulation. This association of newborn problems with increased postpartal problems possibly reflects difficult deliveries with a longer recovery time being required. The most frequent postpartal factor in nine subjects was a hospital stay greater than three days, but the majority (33) of the nurses reported no postpartal complications.

The demographic and obstetrical data, as presented in Table 22, varied slightly, but no significant difference was documented between the groups. The means of the perinatal complications, when grouped by the individual pregnancy experience as in Table 23, further illustrate the relationships stated in the hypothesis--that increased problems during the antepartum or intrapartum periods will cause more problems to the newborn and to the mother postpartally.

Hypothesis Six

Hypothesis six stated:

Newborns of nurses who had an increased number of physiological risk factors during pregnancy, as measured by the modified Hobel prenatal and intrapartal checklists will have had a higher incidence of complications during labor and delivery, and/or the immediate newborn period.

The hypothesis, when tested after the data were transformed, demonstrated a statistically significant relationship in regard to intrapartal scores with newborn scores ($t(56df) = -3.56; p < .00$), but no association between antepartum and

Table 22

t-Test to Age and Obstetrical History by Experience of Pregnancy

Variable	Low		Antepartum 2-Tail t-Test		High		Low		Intrapartum 2-Tail t-Test		High		Low		Postpartum 2-Tail t-Test		High	
	Mean	Std	t	p	Mean	Std	Mean	Std	t	p	Mean	Std	Mean	Std	t	p	Mean	Std
Age (Range)	27.586 (23 - 33)	2.784	-1.60	.115	29 (22 - 38)	3.820	28.107 (23 - 35)	3.095	-.38	.707	28.448 (22 - 38)	3.680	28.318 (22 - 35)	3.175	.15	.879	28.154 (23 - 38)	4.140
Total # of Pregnancies (Range)	2.138 (1 - 6)	1.187	-1.18	.241	2.536 (1 - 6)	1.347	2.357 (1 - 6)	1.446	.14	.891	2.310 (1 - 5)	1.105	2.250 (1 - 6)	1.366	-.91	.368	2.615 (1 - 4)	0.870
Total # of Abortions (Range)	0.241 (0 - 1)	0.435	-1.000	.322	0.393 (0 - 2)	0.685	0.179 (0 - 1)	0.390	-1.82	.075	0.448 (0 - 2)	0.686	0.273 (0 - 2)	0.499	-1.05	.300	0.462 (0 - 2)	0.776
Total # of Miscarriages (Range)	0.34 (0 - 1)	0.186	-.02	.980	0.036 (0 - 1)	0.189	0.036 (0 - 1)	.189	.02	.980	0.034 (0 - 1)	0.186	0.023 (0 - 1)	0.151	-.92	.360	0.77 (0 - 1)	0.277
Total # of Premature (Range)	0.138 (0 - 1)	0.351	.81	.422	0.071 (0 - 1)	0.262	0.143 (0 - 1)	0.356	.90	.372	0.069 (0 - 1)	0.258	0.114 (0 - 1)	0.321	.37	.711	0.077 (0 - 1)	0.277
Total # of Full-term (Range)	1.724 (0 - 5)	1.222	-.73	.468	1.964 (0 - 5)	1.261	2.000 (1 - 5)	1.277	.95	.348	1.690 (0 - 5)	1.198	1.818 (0 - 5)	1.299	-.27	.791	1.923 (1 - 4)	1.035

Table 23

Means and Standard Deviations of Perinatal Risk Factors by Experience of Pregnancy

(N=57)

	Antepartum				Intrapartum				Postpartum			
	Low		High		Low		High		Low		High	
	<u>X</u>	<u>S.D.</u>	<u>X</u>	<u>S.D.</u>	<u>X</u>	<u>S.D.</u>	<u>X</u>	<u>S.D.</u>	<u>X</u>	<u>S.D.</u>	<u>X</u>	<u>S.D.</u>
Antepartum	2.586 (0 - 5)	2.543	18.036 (10 - 45)	9.061	5.714 (0 - 20)	5.394	14.483 (0 - 45)	11.828	7.273 (0 - 25)	6.943	20.000 (5 - 45)	13.229
Intrapartum	9.655 (0 - 40)	10.851	17.679 (0 - 50)	14.624	2.679 (0 - 5)	2.539	24.138 (10 - 50)	10.779	10.000 (0 - 40)	10.173	25.769 (0 - 50)	15.992
Newborn	5.862 (0 - 35)	8.026	8.929 (0 - 80)	16.519	4.107 (0 - 35)	7.335	10.517 (0 - 80)	16.110	7.159 (0 - 80)	1.994	8.077 (0 - 45)	12.169
Postpartum	2.069 (0 - 10)	3.664	6.607 (0 - 50)	10.369	1.607 (0 - 10)	3.348	6.897 (0 - 50)	10.125	1.250 (0 - 5)	2.190	14.615 (10 - 50)	11.449

newborn complications ($t(55df) = -.80; p < .42$).

Table 24 contains the newborn complication scores as related to the antepartum and intrapartum experiences. The mean newborn scores for the low complication and high score groups are also given.

The social scores by the degree of perceived role strain are listed in Table 25. The mean life change total is much greater in the high role strain category as predicted.

The SRRS contained seven questions involving work-related events out of the instrument's 43 questions. However, the life events on the SRRS (Table 26) differed in context and were not clearly measured on the JRT. The score contributed from the work-related events on the SRRS was not significantly correlated to the degree of perceived role strain ($r = .17; p < .15$) and only one of the work-related factors was in the ten most frequently occurring life events.

The elevated intrapartal score reflects the stress the infant experienced prior to delivery. The subsequent delivery and the newborn complications further support the vulnerability of the fetus to alterations in the maternal-fetal circulation.

The intrapartal and newborn findings supported the work of Hobel and others (1973). They found that women who had problems during pregnancy but not during labor and delivery had lower mortality rates than women who presented with problems throughout pregnancy and delivery. However, women who were

Table 24
 The Relationship of Antepartal and Intrapartal
 Risk Factors to Newborn Risk Factors
 (N=57)

Pregnancy Experience	Low Newborn Score		High Newborn Score	
	<u>X</u>	<u>S.D.</u>	<u>X</u>	<u>S.D.</u>
Antepartum Range	10.526 (0 - 45)	10.053	9.474 (0 - 40)	10.658
Intrapartum Range	11.053 (0 - 50)	12.636	18.684 (0 - 45)	13.682
Newborn Range	1.842 (0 - 5)	2.444	18.421 (10 - 80)	17.642

Table 25
 Degree of Role Strain and Associated Scores from the SRRS
 (N=47)

Variable	Low Score		High Score	
	<u>X</u>	<u>S.D.</u>	<u>X</u>	<u>S.D.</u>
Job strain Range	45.259 (37-53)	4.477	61.036 (54-90)	8.108
SRRS score Range	181.000 (20-530)	132.075	352.917 (30-982)	272.941

Table 26
Work-Related Factors on the SRRS

Factors
Troubles with the boss
Being fired from work
Changing to a different line of work
Major change in responsibilities at work
Major change in work outside the home
Retirement from work-mate
Major business readjustment

without problems until the intrapartal period also had an increased morbidity rate involving their newborns.

The most frequent newborn problem encountered was hyperbilirubinemia in nine subjects. Hyperbilirubinemia was the second most frequent problem according to Hobel (1973). The most frequently occurring problem was a one minute Apgar score of less than five. This researcher did not include Apgar scores since, frequently, the family is not given the information.

Six women had infants with anomalies: one had a cleft lip, cleft palate, and a scalp lesion; one newborn had an atrial-ventricular canal; one infant had hydrocephalus at birth, and the last three subjects were not described. Feingold (1981) reported that "approximately 4% of children are born with some major birth defect." The percentage (10%) in this limited group of nurses was high and needs further exploration. No conclusion can be drawn, however, because of the small sample size. The first infant's anomaly was identified as Trisomy 13, a disorder whose incidence has been reported at 1 in 5000 births (Boue', 1975). The other problems incurred were previously listed in Table 10.

As three anomalies were not described, the investigator suggests caution in interpreting the results. The unknown anomalies may not have been actual congenital anomalies, but a mistake in answering the questionnaire. There were three infants noted to have major cardiac anomalies, but only one

cardiac defect was described. The other two cardiac malformations may account for two of the anomalies not described, leaving one unknown anomaly. The frequency of anomalies was high. Whether these anomalies are attributable from stress or other environmental agents, further investigations are needed.

In the state of Utah for the 1981 year, there were 8,630 infants born with at least one complication out of the 20,126 total births (43%). In this study 58% of the subjects had at least one complication. There were 934 infants that had congenital anomalies or about four percent of the total population (Utah Vital Statistics, 1983).

The importance of the prenatal checklist with its continued use through the antepartum, intrapartum, and postpartum periods was supported by hypotheses five and six.

Hypothesis Seven

Hypothesis seven stated:

Nurses who have an increased role strain will have an increased number of life changes, as measured by the SRRS.

The author felt if role strain was great enough to affect the pregnancy, as stated in the first hypothesis, it would also affect the individual's home life. This hypothesis was supported as the findings on the transformed data were significant ($r = 0.31; p < 0.02$).

Ten subjects had high role strain and high life change unit scores of the 47 subjects tested. This suggested the role

strain may have caused anxiety that extended to the person's nonwork environment. Rahe, Gundersen, and Arthur (1970) reported that dispensary visits on a navy cruiser were closely linked to the sailors' occupation and job satisfaction. If the sailors were not satisfied with their ship duty, they complained of more illnesses.

Role conflict, an aspect of the JRT, has been linked to impaired interpersonal relationships (Cox, 1982; Kahn, 1974). The SRRS assessed interpersonal relationships through events concerning a change in the number of arguments, amount of recreation, or social activities, and/or troubles with the boss. Thus the increased role strain was mirrored by increased life change unit scores.

Theorell (1974), whose findings may be advanced in support of this hypothesis, compared the incidence of myocardial infarctions with life events. He noted that life changes revolving around work (such as increased responsibility, change in position or trouble with the boss) were higher in those who experienced myocardial infarctions than in the control group. Thus, a relationship between role strain, life events, and illness was found. However, no other investigations were found which were based on the same questionnaire.

It is possible that the individuals who scored high on both questionnaires had less ability at managing the stress they felt. Antonovsky (1981) discussed stressors, tension,

and illness. He stated "poor tension management leads to the stress syndrome and movement toward disease on the continuum. Good tension management pushes one toward health ease."

The data supporting this hypothesis may indicate the need to evaluate the nurse-job fit. Man-job fit is a theory which evolves around the assurance that necessary job skills are present but also, that the job meets the individual's psychological needs (French, Rodgers & Cobb, 1974). If the "fit" is poor, the effects of perceived role strain may be increased. Van Harrison (1978) suggested an awareness of person-environment fit theory could be helpful in reducing job stress.

Hypothesis Eight

Hypothesis eight stated:

Intensive care nurses perceived their role strain as higher than transitional care nurses on a modified JRT.

There were two missing cases for the JRT so the analysis involved 55 subjects. The ratio of transitional care nurses to intensive care nurses was fairly equal in both low and high job stress groups. Eight nonintensive care and nineteen intensive care nurses reported low job strain; nine transitional and nineteen intensive care nurses were in the high stress group. However, the differences were not found to be significant ($t(52df) = -.59; p < .60$).

Table 27 presents the most stressful job-related events perceived by both intensive and transitional care nurses. The

Table 27
Rank Order of the JRT Index Factors

Factors
1. Not knowing what your supervisor thinks of you, how he/she evaluates your performance.
2. Feeling that your job interferes with your family life.
3. Feeling that you have to do things on the job that are against your better judgment.
4. Having to decide things that affect the lives of patients.
5. Thinking that the amount of work you have to do may interfere with how well it gets done.
6. Not knowing what people expect of you.
7. Feeling that death and dying are almost constant and that you can't escape from it.
8. Feeling that you have too heavy a workload, one that you can't possibly finish during an ordinary shift.
9. Feeling unable to influence the physicians' decisions and actions that affect your patient's care.
10. Being unhappy with the time able to spend with the patient's family for teaching or support.
11. Feeling you wished you had chosen a different career.
12. Not being able to get information needed to carry out your job.
13. Not knowing what opportunities for advancement or promotion exist for you.
14. Feeling unable to tolerate the sights, sounds, or smells of your work environment.
15. Feeling that you have too little authority to carry out responsibilities assigned to you.

Table 27 Continued

Factors
16. Not knowing what the patient you care for wants or needs.
17. Thinking that you'll not be able to satisfy the conflicting demands of various people over you.
18. Feeling that you're not fully qualified to handle your job.
19. Feeling you wished you worked in a different unit.
20. Being unclear on just what the scope and responsibilities of your job are.
21. Feeling that you may not be liked and accepted by the people you work with.

items were ranked by how often they were marked as a "frequent" or "most of the time" concern. The only job-related event that was different for the two groups was the factor, "Having to decide things that affect the lives of patients." There were 18 intensive care nurses who felt this was a concern either frequently or most of the time compared to one transitional care nurse, a significant difference ($\chi^2(4df) = 12.55; p < 0.02$).

The five most stressful items on the JRT reflect job ambiguity, role overload, role conflict (including moral issues), and unclear job responsibilities. These were similar to the items reported to be most stressful in the nursing reports (Anderson & Basteyns, 1981; Cassem & Hackett, 1975). The first two items on the rank ordered lists are quite nonspecific to nursing and do not reflect the issues which are generally supposed to make intensive care nursing more stressful. The fourth ranked factor is generally felt to be a concern of the intensive care domain, too, as problems are acted upon quickly.

Maloney (1982) reported that nonintensive care nurses perceived work to be more stressful than intensive care nurses. This study and Maloney's were similar in size, but his questionnaire that assessed role strain measured job satisfaction. The differences in the questionnaire probably account for some of the conflicting findings.

A number of possible reasons for rejection of this hypothesis may be advanced. Nurses who felt that their jobs were stressful

would have had the opportunity to change units and have been missed by the questionnaire. In this sample 45 subjects remained in the same area of nursing; 12 nurses reported a unit change. Of this dozen nurses, six had switched from intensive care nursing to nonintensive care nursing. No cause of unit transfer was assessed.

The personality of the nurses who elect to work in the intensive care unit possibly enjoy the high acuity situations and the need for quick action. Perhaps if working elsewhere, the position would be less satisfying and thus more stressful. Probably, the perception of a stressful job is individual and varies tremendously so one position can be considered more stressful or less stressful depending on the person's constitution.

Hypothesis Nine

Hypothesis nine stated:

Intensive care nurses will have a greater number of obstetrical problems than transitional care nurses as measured by the Hobel prenatal, intrapartal, and postpartal checklists.

The hypothesis was not supported. The transformed data showed no significance between unit of work and perinatal complications as illustrated in Table 28. As no other investigations were reported in the literature involving pregnancy outcomes of nurses, comparisons could not be made.

Eight intensive care nurses did not have any problem during their last pregnancies. Mild anemia, a low risk problem, was the

Table 28
t-Test Comparison of Perinatal Risk Factors in
 Intensive Care to Transitional Care Nurses
 (N=56)

Experience of Pregnancy	2-Tail <u>t</u> -Test <u>t</u> -value	Significant level <u>p</u> value
Antepartum Scores	.00	0.997
Intrapartum Scores	1.08	0.285
Postpartum Scores	-.18	0.859

most frequently occurring problem for intensive care nurses.

Vaginal spotting was listed by the transitional care nurses as that group's most frequent problem. Table 29 shows the delineation of complications by the two groups antenatally. Tables 30 and 31 present the same data for the intrapartal and postpartal experiences. No significant differences were noted.

During labor and delivery there were 12 intensive care nurses without abnormal occurrences, but only one transitional care nurse ($\chi^2(1df) = 2.83; p < .10$). Pitocin augmentation was required by nine intensive care nurses; six transitional nurses were aided with outlet forceps. Labor lasting longer than 20 hours was experienced by six intensive care nurses and no transitional care nurses, but there was no significance to the difference. However, prolonged labor has been associated with increased maternal stress (Davids & DeVault, 1962; Grimm, 1961; McDonald et al., 1963).

Hypothesis Ten

Hypothesis ten stated:

Newborns of intensive care nurses will have a greater number of problems than newborns of transitional care nurses as measured by the Hobel neonatal checklist.

Hyperbilirubinemia was the most common newborn problem with seven infants of intensive care nurses and four infants of transitional care nurses experiencing the illness. Table 32 details the diseases of the newborn infants. There were 14 babies

Table 29
Chi-Square Statistic to Antepartal Complications
and Unit of Work
(N=56)

Variable	Transitional Care Nurses	Intensive Care Nurses	Chi- Square χ^2	Significance level p
Mild to moderate toxemia	0	1	.000	1.000
Moderate to severe renal disease	0	1	.000	1.000
History of eclampsia	0	1	.000	1.000
Mild heart disease	3	2	1.00198	0.3168
Mild toxemia	2	2	.10396	0.7471
Acute pyelonephritis	1	0	.18582	0.6664
History of cystitis	0	2	.02815	0.8667
Family history of diabetes	3	4	.10860	.7417
Previous postterm, greater than 42 wks	0	5	1.518	0.2996
Previous delivery by C-section	1	7	.59477	0.4406
Habitual abortion	1	0	.18582	0.664
Polyhydramnios	1	4	.00033	0.9855
Small pelvis	0	2	.02815	0.8667
Abnormal pap smear	1	7	.59477	0.4406
Previous history of multiple pregnancy	1	1	.0000	1.000
Age greater than 35 years	1	0	.18582	0.6664
Viral disease	0	3	.28102	0.5960
Rh sensitization only	0	1	.0000	1.000
Severe anemia	1	0	.18582	0.6664
Weight less than 100 lbs. or greater than 200 lbs. before pregnancy	1	2	.0000	1.000
Severe flu	1	2	.0000	1.000
Vaginal spotting	4	4	.79186	0.3735
Mild anemia	2	9	.37693	0.5392
Smoking greater than 1 pack per day	0	3	.37693	0.5960
Emotional problem	2	2	.10396	0.7471
Alcohol, less than 2 glasses per day	0	1	.0000	0.0001

Table 30
 Chi-Square Statistic to Intrapartal Complications
 and Unit of Work
 (N=56)

Variable	Transitional Care Nurses	Intensive Care Nurses	Chi - Square χ^2	Significance level p
Moderate to severe toxemia	1	2	.000	1.000
Hydramnios	0	2	.02815	0.8667
Mild toxemia	1	3	.000	1.000
Premature rupture of membranes	1	3	.000	1.000
Failure to progress in labor	5	7	.36857	0.5438
Magnesium sulfate due to toxemia	1	2	.000	1.0000
Labor lasting longer than 20 hours	0	6	1.54176	0.2144
Clinically small pelvis for baby	1	2	.000	1.000
Medical induction	3	5	.00352	0.9527
Precipitous labor, less than 3 hours	3	3	.40656	0.5237
Need for your first C-section	1	2	.000	1.000
Repeat C-section	1	4	.0033	0.9855
Uterine tetany	0	1	.000	1.000
Pitocin augmentation	4	10	.000	1.000
Abruptio placenta	0	1	.000	1.000
Postterm, greater than 42 weeks	2	1	.5785	0.4469
Meconium stained amniotic fluid, light colored	4	5	.36921	0.5434
Meconium stained amniotic fluid, pea soup	1	1	.00	1.000
Abnormal presentation of fetus	1	6	.30166	0.5828
Fetal bradycardia, lasting longer than 30"	2	2	.10396	0.7471
Breech delivery	0	2	.02815	0.8667
Fetal weight less than 5 lbs.	0	1	.000	1.000
Fetal tachycardia, lasting longer than 30"	0	1	.000	1.000
High forceps or vacuum extraction	0	1	.000	1.000
Outlet forceps	6	7	1.14367	0.28429

Table 31
 Chi-Square Statistic to Postpartal Complications
 and Unit of Work
 (N=56)

Variable	Transitional Care Nurses	Intensive Care Nurses	Chi-Square χ^2	Significance level <u>p</u>
Damage to pelvic organs/ tissues	0	6	1.54176	0.2144
Shock, circulatory collapse	1	1	.000	1.000
Anemia	2	2	.10396	0.7471
Hospital stay, greater than 3 days	2	7	.03375	0.8542
Infection	4	2	2.48776	0.1147
Perineal hematoma	1	1	.000	1.000
Hemorrhage within 24 hours after delivery of the placenta	1	3	.000	1.000
Complications with the administration of anesthetic or other sedation in labor (excluding headaches)	1	3	.000	1.000

Table 32
Chi-Square Statistic to Neonatal Complications
and Unit of Work
(N=56)

Variable	Transitional Care Nurses	Intensive Care Nurses	Chi- Square χ^2	Significance Level p
Prematurity and less than 3 lbs.	0	1	.000	1.00
Required resuscitation at birth	1	2	.000	1.000
Anomalies	3	2	1.00198	0.3168
Small for gestational age	1	4	.00033	0.9855
Large for gestational age	2	2	.10396	0.7471
Prematurity and greater than 3 lbs.	0	2	.02815	0.8667
Feeding problem	2	0	1.9552	0.1620
Respiratory distress	0	1	.0000	1.00
Meconium aspiration	1	0	.18582	.6664
Other respiratory distress	0	5	1.07618	0.2996
Hypoglycemia	0	1	.000	1.000
Failure to gain weight	0	1	.000	1.000
Jitteriness or hyperactivity with a diagnosed cause	0	1	.000	1.000
Major cardiac anomalies	2	1	.57850	0.4469
Congestive heart failure	0	1	.000	1.000
Heart murmur	2	1	.57850	0.4469
Hyperbilirubinemia	4	7	.01382	0.9064
Sepsis	0	3	.28102	0.5960
Anemia	1	1	.000	1.000
Central nervous system depression less than 24 feet	0	1	.000	1.000
Chromosomal abnormality	0	1	.000	1.000

without problems in the intensive care group and 10 in the transitional care group, but the differences were not significant ($\chi^2(1df) = 0.02; p < .09$).

To speak of the health status of the neonate, one must remember the importance of the antenatal and intrapartal periods. As there was not a significant difference between the two groups of nurses in the number of pregnancy complications, it follows that there would not be differences in the occurrence of neonatal complications. The interplay between the maternal environment and fetal development supports the null hypothesis.

Hypothesis Eleven

Hypothesis eleven stated:

Intensive care nurses will have an increased life change units as measured by the SRRS compared to transitional care nurses.

The analysis was hampered by the three intensive care and seven transitional care nurses who completed the SRRS section inappropriately. When the transformed data were analyzed, a highly significant relationship between transitional care nurses and increased life change units was demonstrated ($t(44df) = 2.23; p < .03$). Originally, the intensive care nurse was hypothesized to experience more role strain with a resultant increase in the number of life changes.

The mean transitional SRRS score was 363.667 (S.D. 269.049)

compared to the mean intensive care score of 231.02 (S.D. 197.62). There were eleven intensive care nurses and four transitional care nurses who were at low risk for illness; however, there were 12 transitional care nurses (16 assessed) and 20 intensive care nurses (31 assessed) in the moderate to high risk groups.

Because of the small sample size, caution should be exercised in data interpretation. The transitional care nurses did not have a greater amount of perceived role strain, but increased role strain was felt to trigger increased life changes at home. Maloney's (1982) work supports the findings. He reported that transitional care nurses had more pronounced personal and family problems than intensive care nurses on the Personal-Family Problem Index. The Personal-Family Problem Index was a 10 item questionnaire designed by Maloney. Unlike the SRRS, the questionnaire was closely job related and more brief in nature. The index did not elicit the variety of life events that were present in the SRRS. Nevertheless, the findings were similar.

The nurses were generally young and without known health problems. Perhaps these qualities helped protect the subjects and fetuses from the stress triggered by increased life changes. Rahe, Mahan, and Arthur (1970) acknowledged the importance of different personality attributes in not succumbing to stress.

The rank order of the experienced life changes is listed

in Table 33. There was no significant difference found between intensive care and transitional care nurses in the frequency or degree of stress of any individual life change. The first five events were possibly related to pregnancy and/or leave of absence granted for recuperation from childbirth.

Additional Findings

The work status, part-time or full-time, was significantly related to newborn complications when the data were analyzed ($\chi^2 = 3.98; p < 0.05$). There were three part-time nurses in the high newborn score group and 15 full-time nurses. No association was noted between work status and role strain, or other perinatal complications. This finding is interesting, but the etiology is not known. It is possible the nurses worked part-time because of illnesses that required bedrest, and the subjects who remained full-time because of financial need, continued to have problems.

McFarlane (1980) found an individual's perception of a life change event colored the amount of stress the event stimulated. The other dimensions that could be ascribed to a life event were those of desirability, degree of control, and predictability. Table 34 was designed to assess the correlation of the life change indices with role strain and perinatal risk factors.

On examination of the table, it can be seen that the unanticipated events were significantly correlated to compli-

Table 33

Rank Order of the Life Events from the SRRS

Life Events
Pregnancy
Major change in responsibilities at work
Revision of personal habits
Major change in the health or behavior of a family member
Major change in sleeping habits
Death of a close family member
Change in residence
Major change in eating habits
Sexual difficulties
Major change in church activities
Major change in number of arguments with mate
Major change in work outside the home
Troubles with the boss
Major change in financial state
Major personal injury or illness
In-law troubles
Vacation
Outstanding personal achievement
Marital separation from mate
Changing to a different line of work
Husband beginning or ceasing work outside the home
Christmas
Major change in living conditions
Taking on a mortgage greater than \$15,000
Major change in social get-togethers
Major change in usual type and/or amount of recreation
Major change in number of family get togethers
Death of a close friend
Major business readjustment
Being fired from work
Minor violations of the law
Divorce
Taking on a mortgage or loan less than \$15,000
Beginning or ceasing of further schooling
Foreclosure on a mortgage or loan
Gaining a new family member (through grandparent moving in)
Son or daughter leaving home during the day for the first time

Table 34

Correlations of Perceptions of Life Change with Role Strain and Perinatal Risk Factors

Life Change	(N=55) Role Strain		(N=57) Antepartum		(N=57) Intrapartum		(N=57) Postpartum		(N=57) Newborn	
	<u>r</u>	<u>p</u>	<u>r</u>	<u>p</u>	<u>r</u>	<u>p</u>	<u>r</u>	<u>p</u>	<u>r</u>	<u>p</u>
Total Value (N=47)	.33 xx	.01	.15	.15	.19	.10	.10	.25	-.02	.46
Anticipated	.29 xx	.02	-.04	.38	.09	.24	.01	.47	.02	.45
Unanticipated	.08	.29	.23 xx	.04	.27 xx	.02	.26 xx	.03	.01	.46
Total Controllable	.03	.42	.10	.23	.12	.18	.17	.10	.02	.44
Moderately Controllable	.24 xx	.04	-.05	.34	.02	.43	.03	.41	-.02	.44
Uncontrollable	.21 x	.06	.19	.08	.29 xx	.01	.08	.27	.08	.27
Desirable	.14	.16	.05	.36	.18	.10	.19	.08	.14	.15
Undesirable	.26 xx	.03	.17	.11	.22 xx	.05	.12	.18	-.02	.43

cations (raw scores) during the antepartum, intrapartum, and postpartum periods. As the questionnaire assessed life changes during pregnancy, it was unexpected for the unanticipated events to be related to antenatal risk factors. The stress from the unanticipated events continued to be related to intrapartal and postpartal complications. Though the stress may have had negative effects on the mother and weakened her slightly, she was able to deliver her infant without problems.

During the intrapartum period the uncontrollable and undesirable life changes also had a substantial influence on the labor and delivery complications. Despite significant relationships between the life change indices and intrapartal complications, the newborn escaped significant complications.

Suls and Mullen (1981) reported the combination of undesirability and lack of control were sufficient to cause psychological distress. The psychological distress could have been the stressor possibly to alter uterine circulation and cause fetal hypoxia, but the individuals (mothers) were evidently able to manage the stress brought about by the undesired life changes; their constitutions provided resiliency to the untoward effects of stress during pregnancy.

The undesirable life event triggered greater stress as did uncontrollable effects in this study as in McFarlane's (1980). Similar findings were also found by McFarlane (1980) in regards to the social value. The social value that expressed

the amount of life change (in comparison to marriage) did not have as much influence on perinatal complications as perception modifiers.

The influence of the numerical value of the life change as well as events being undesirable but anticipated and only moderately controlled, were quite significantly correlated to role strain. McFarlane (1980) also discussed the increased strain that results when a life event is anticipated but only moderately controlled.

CHAPTER V
SUMMARY, CONCLUSIONS, AND
RECOMMENDATIONS

Summary

Literature regarding stress and its adverse effects is extensive as are the reports on role strain (stress) in the nursing profession. Life changes and occupational role strain have been cited as causes of stress. Stress was documented as the basis of perinatal complications in animals because of uterine vasoconstriction and fetal hypoxia. Nonexperimental studies associated stress with premature deliveries and prolonged labor. The purpose of this investigation was to further the understanding of the relationships between stress and pregnancy.

In attempts to clarify the relationships between stress and pregnancy outcomes, role strain was assessed with the Job-Related Tension Index; life changes were identified by the Social Readjustment Rating Scale and the complications of pregnancy by Hobel perinatal checklists. The goal was to help improve future obstetrical outcomes of nurses by increasing the awareness of the effects of job-related stress during pregnancy.

The sample consisted of 57 registered nurses who had had singleton pregnancies in the past three years. Each nurse completed a questionnaire containing questions about demographic data, role strain, life changes, and perinatal complications.

There were eleven hypotheses based on the relationships between the different aspects of the questionnaire. The first hypothesis stated that nurses who had a high role strain during pregnancy would have a higher incidence of complications during pregnancy, labor, delivery, and/or the postpartal period. There was a significant relationship between perceived role strain and antepartal complications. There was also an association between job stress and adverse postpartal outcomes. However, there was no statistical significance with the intrapartum period.

The second hypothesis concerned the newborns of nurses who had high degrees of role strain and the incidence of complications at birth. The analysis found no statistical significance in such a relationship.

The third hypothesis stated that nurses who had an increased number of life changes would have a higher incidence of complications in the perinatal period. No correlation was documented in the antepartal, intrapartal, or postpartal encounters. The complications experienced by the newborns, in relation to the maternal life changes (hypothesis four) were also not significant.

The fifth hypothesis stated that nurses who had an increased number of physiological risk factors during pregnancy would also have a greater incidence of complications during labor and delivery, and/or the postpartum period. The data indicated that there were statistically significant correlations between antepartal complications and intrapartal problems as well as intrapartal and postpartal complications.

The newborns of nurses who had an increased number of physiological risk factors intrapartally, also had a statistically significant increase in problems at delivery, supporting the sixth hypothesis.

The correlation between nurses who had an increased role strain and the appearance of an increased number of life change units was the basis of the seventh hypothesis. The data analysis substantiated that a significant relationship existed between role strain and increased life changes.

The last four hypotheses separated the subjects into two groups: intensive care nurses and transitional care nurses. The eighth hypothesis distinguished between the two nursing groups and perceived role strain. Though differences existed in perceived role strain, with intensive care nurses reporting a greater amount, the differences were not supported statistically.

The delineated groups of nurses were also evaluated in regard to number of obstetrical problems, the ninth hypothesis. There was no statistical significance between unit of work and

perinatal complications. The newborns of the intensive care nurses and transitional care nurses were fairly equal in neonatal complications with no significant differences as suggested by the tenth hypothesis.

The eleventh hypothesis stated that intensive care nurses would have an increased number of life change units compared to transitional care nurses. A significant relationship between the amount of life changes experienced and the transitional care nurses existed.

An additional finding was that nurses who experienced life changes that were not desirable and only moderately controllable, had a greater number of intrapartal complications. The newborn did not suffer any adverse problems from the stress. Events (life) that were unanticipated during the prenatal period also correlated with intrapartal and postpartal complications.

Conclusions

The findings suggest that the role strain experienced by intensive care nurses and transitional care nurses is not important holistically, but the individual nurse's perception of role strain does matter. In the past, authors may have been overly zealous in declaring just intensive care nursing to be extremely stressful. As role strain was related to both adverse antepartal and postpartal outcomes, regardless of type of nursing, the nurse may need to be evaluated for "job-fit" as well as learn methods to diminish role strain.

Nurses who believed they were under a high degree of role strain were associated with an increased number of complications during the antepartal and postpartal periods. The role strain probably did not cause extensive uterine vasoconstriction and hypoxia as the intrapartal and newborn complications would have been greater. Nevertheless, a high degree of role strain apparently affected interpersonal relationships, as the number of life changes experienced increased remarkably in those high stress nurses. Role strain and its relationship to life changes needs further examination.

Life changes that were undesired and only moderately controllable were highly related to intrapartal complications. Life events that were not predicted during pregnancy were associated with intrapartal and postpartal complications. The undesirable and moderately controllable life changes caused stress as did the unpredictable events. However, the mother managed the stress without apparent damage to the newborn. The mother was possibly weakened during intrapartum by the stress load, causing the postpartal complications.

Once abnormal findings are noted in the antepartal period, the mother remains at an increased risk for perinatal problems. If intrapartal problems are experienced by the mother, the newborn is at a statistically significant risk for complications. Hobel's (1973, 1982) observations are supported and the importance of obstetrical management by a licensed care provider is

further advanced. Role strain's link to antepartal and postpartal complications is stimulus enough to evoke concern and the need for further evaluation.

Though newborn complications were not related to role strain, the increased number of birth defects for the nursing population warrants a prospective investigation.

Recommendations

1. A larger sample size would provide for a greater degree of discrimination among role strain, life changes, and perinatal complications. Also, a random sample drawn from all hospital nurses, not just intensive care and transitional care nurses, would allow for generalization to the population of nurses.

2. A control group of women from private practice would allow for a closer comparison of obstetrical and neonatal problems.

3. A prospective and longitudinal study would not suffer from the need for participants to recall important data.

4. The effects of individual hardiness upon the perception of role strain may offer much understanding in this area. In addition, if there are personality traits that lend themselves to successful stress management, they could be utilized in fitting the person to a job.

5. As role strain does cause problems, the management personnel should be instructed in stress alleviation and other areas of humanistic support. Perhaps the hospital psychiatrist

or therapist could direct role strain and provide an avenue for venting concerns.

6. Administration of the questionnaires after the subject has had contact with the researcher would probably promote better understanding of the questionnaire and result in fewer erroneously completed forms.

APPENDIX A

LETTER TO HEALTH CARE PROVIDERS

Dear Health Care Provider:

I am a Graduate Perinatal Nursing student at the University of Utah. I am conducting an investigation regarding pregnancy outcomes in hospital-based nurses. In addition, I am looking at the occupational role strain and life changes encountered during pregnancy.

If you are a registered nurse and have had a singleton pregnancy in the past three years, I invite you to complete a questionnaire. The questionnaire will require approximately 25 to 35 minutes to complete. You are free to leave questions blank if you so desire. Completion of the questionnaire is your agreement to participate. Please mail the questionnaire when it is completed.

The information obtained will remain strictly confidential. No name is required on the questionnaire and a stamped, addressed envelope is provided for mailing the questionnaire directly to me. Upon receiving the questionnaire an identification code will be assigned to your form for use in data analysis.

The only risk in answering the questionnaire is the potential invasion of your privacy, but the steps are being taken to protect your anonymity. There are no direct benefits to you by participating in the project. I hope the data analysis will provide information to contribute to the science of nursing.

If you have any questions, please call! My home phone number is 521-9207, or a message may be left at 363-1221, ext. 400. This topic has excited me since I first helped staff a unit; I hope it will also be of interest to you. An abstract of the research findings will be mailed to your institution once the investigation is completed. This thesis is under the supervision of Carol Kirgis, R.N., Ph.D., Beryl Peters, R.N., Ph.D., and Fred Rhodewalt, Ph.D. If you wish, you may discuss this project with them.

I sincerely appreciate your participation in this investigation.

Sincerely,

Rhonda K. Siebe, R.N.

RKS/r1m

APPENDIX B

QUESTIONNAIRE

PREGNANCY AND NURSES
QUESTIONNAIRE

DIRECTIONS: Please circle the number of the correct answer or fill in the blank to the following questions.
Thank you!!

1. Your age: _____ years
2. Annual family income:
 1. \$10,000-20,000
 2. \$21,000-30,000
 3. \$31,000-40,000
 4. \$41,000-50,000
 5. \$51,000 or up
3. Education (last degree obtained)
 1. Diploma
 2. Associate
 3. Baccalaureate
 4. Masters
 5. Doctorate
4. Year of last pregnancy:
 1. 1982
 2. 1981
 3. 1980
 4. 1979
5. Have you had continuing education classes in?
 1. Crisis intervention
 2. Critical care
 3. Death and dying
 4. Burnout
6. Which do you believe is more stressful?
 1. Nonintensive care nursing
 2. Intensive care nursing
 3. No difference
7. What type of unit do you currently work in? _____
8. Were you working in a different unit during your last pregnancy?
 1. Yes
 2. No
 - If yes, where? _____
9. Were you part-time or full-time during the majority of your last pregnancy?
 1. Part-time
 2. Full-time
10. The number of your total pregnancies _____
11. The number of your spontaneous abortions (less than 20 weeks) _____
12. The number of your miscarriages (greater than 20 weeks) _____
13. The number of your premature deliveries (less than 38 weeks) _____
14. The number of your full-term deliveries _____
15. Do you think your occupation affected your last pregnancy?
 1. Yes
 2. No
16. Are you currently pregnant?
 1. Yes
 2. No

(Please turn the page over)

Page Two

DIRECTIONS: In this section please mark your response to the following items related to your job at the time of your LAST pregnancy. Scale your answers from 1 to 5. Circle the Correct number for each statement.

<u>Job Related Events</u>	Never 1	Rarely 2	Part of the time 3	Frequently 4	Most of the time 5
1. Feeling that you have too little authority to carry out responsibilities assigned to you.	1	2	3	4	5
2. Being unclear on just what the scope and responsibilities of your job are.	1	2	3	4	5
3. No knowing what opportunities for advancement or promotion exist for you.	1	2	3	4	5
4. Feeling that you have too heavy a workload, one that you can't possibly finish during an ordinary shift.	1	2	3	4	5
5. Feeling that you're not fully qualified to handle your job.	1	2	3	4	5
6. Thinking that you'll not be able to satisfy the conflicting demands of various people over you.	1	2	3	4	5
7. Not knowing what your supervisor thinks of you, how he/she evaluates your performance.	1	2	3	4	5
8. The fact you can't get information needed to carry out your job.	1	2	3	4	5
9. Having to decide things that affect the lives of patients.	1	2	3	4	5
10. Feeling unable to influence the physicians' decisions and actions that affect your patient's care.	1	2	3	4	5
11. Feeling that you may not be liked and accepted by the people you work with.	1	2	3	4	5
12. Not knowing what people expect of you.	1	2	3	4	5
13. Thinking that the amount of work you have to do may interfere with how well it gets done.	1	2	3	4	5
14. Feeling that you have to do things on the job that are against your better judgment.	1	2	3	4	5
15. Feeling that your job interferes with your family life.	1	2	3	4	5
16. Feeling you wished you had chosen a different career.	1	2	3	4	5
17. Feeling that death and dying are almost constant and that you can't escape from it.	1	2	3	4	5

**** GO TO THE NEXT PAGE ****

Page Three

Job Related Events continued

	Never 1	Rarely 2	Part of the time 3	Frequently 4	Most of the time 5
18. Feeling unable to tolerate the sights, sounds, or smells of your work environment.	1	2	3	4	5
19. Not knowing what the patient you care for wants or needs.	1	2	3	4	5
20. Being unhappy with the time able to spend with the patient's family for teaching or support.	1	2	3	4	5
21. Feeling you wished you worked in a different unit.	1	2	3	4	5

Directions: In this section, please circle the factors that occurred during your last pregnancy:

- | | | |
|-------------------------------------|--|---|
| 1. Moderate to severe toxemia | 17. Previous fetal exchange transfusion for Rh | 32. Sickle cell disease |
| 2. Chronic hypertension | 18. Previous stillbirth | 33. Age greater than 35 or less than 15 |
| 3. Severe heart disease | 19. Previous post-term, past 42 wks | 34. Viral disease |
| 4. Moderate to severe renal disease | 20. Previous delivery by C-section | 35. Rh sensitization only |
| 5. History of eclampsia | 21. Habitual abortion | 36. Positive serology |
| 6. History of pyelitis | 22. Previous infant with weight greater than 10 pounds | 37. Severe anemia |
| 7. Mild heart disease | 23. Epilepsy | 38. Excessive use of drugs |
| 8. Mild toxemia | 24. History of fetal anomalies | 39. History of tuberculosis |
| 9. Acute pyelonephritis | 25. Uterine malformations | 40. Weight less than 100 lbs or greater than 200 lbs before pregnancy |
| 10. Acute history of cystitis | 26. Incompetent cervix | 41. Pulmonary disease |
| 11. Acute cystitis | 27. Abnormal fetal position | 42. Severe flu |
| 12. History of toxemia | 28. Polyhydramnios | 43. Vaginal spotting |
| 13. Diabetes--Class II or above | 29. Small pelvis | 44. Mild anemia |
| 14. Previous endocrine surgery | 30. Abnormal pap smear | 45. Smoking greater or equal to one pack per day |
| 15. Prediabetes | 31. Previous history of multiple pregnancy | 46. Emotional problem |
| 16. Family history of diabetes | | 47. Alcohol-2 glasses per day |
| | | 48. Alcohol-4 glasses per day |
| | | 49. I do not choose to answer |
| | | 50. No problems encountered |
| | | 51. I do not know the answer |

Directions: In this section, please circle the factors that occurred during your last labor and delivery:

- | | | |
|---|---|--|
| 1. Moderate to severe toxemia | 12. Precipitous labor, less than 3 hours | 23. Abnormal presentation of fetus |
| 2. Hydramnios | 13. Need for your first C-section | 24. Multiple pregnancy |
| 3. Amnionitis | 14. Repeat C-section | 25. Fetal bradycardia, greater than 30 minutes |
| 4. Uterine rupture | 15. Induced labor for personal reasons | 26. Breech delivery |
| 5. Mild toxemia | 16. Uterine tetany | 27. Prolapsed cord |
| 6. Premature rupture of membranes | 17. Pitocin augmentation | 28. Fetal weight less than 5 lbs. |
| 7. Failure to progress in labor | 18. Placenta previa | 29. Fetal tachycardia, greater than 30 mins. |
| 8. Magnesium sulfate because of toxemia | 19. Abruptio placentae | 30. High forceps vacuum extraction |
| 9. Labor lasting longer than 20 hours | 20. Post-term greater than 42 wks | 31. General anesthesia |
| 10. Clinically small pelvis for baby | 21. Meconium stained amniotic fluid (light colored) | 32. Outlet forceps (low forceps) |
| 11. Medical induction | 22. Meconium stained amniotic fluid (pea soup) | 33. Shoulder dystocia |
| | | 34. I do not choose to answer |
| | | 35. No problems encountered |
| | | 36. I do not know the answer |

Page Four

Directions: In this section, please circle the factors that occurred to the infant in your last delivery.

- | | | |
|--|--|---|
| 1. Prematurity & less than 3 lbs. | 11. Anomaly of respiratory system | 23. Heart murmur |
| 2. Required resuscitation at birth. | 12. Apnea | 24. Hyperbilirubinemia |
| 3. Fetal anomalies | 13. Other respiratory distress | 25. Hemolysis of blood |
| | 14. Transient tachypnea of the newborn | 26. Chromosomal abnormalities |
| | 15. Hypoglycemia | 27. Sepsis |
| _____ | 16. Problems with calcium or magnesium | 28. Anemia |
| type | 17. Hypothyroidism | 29. Central nervous system depression greater than 24 hours |
| 4. Small for gestational age | 18. Failure to gain weight | 30. Seizures |
| 5. Large for gestational age | 19. Jitteriness or hyperactivity with diagnosed causes | 31. Central nervous system depression, less than 24 hours |
| 6. Prematurity and greater than 3 lbs. | 20. Major cardiac anomalies | 32. I do not choose to answer |
| 7. Feeding problem | 21. Congestive heart failure | 33. No problems encountered |
| 8. Multiple birth | 22. Persistent cyanosis | 34. I do not know the answer |
| 9. Respiratory distress syndrome | | |
| 10. Meconium aspirated | | |

Directions: In this section, please circle the factors that occurred to you after your last delivery.

- | | | |
|---------------------------------------|---|---|
| 1. Damage to pelvic organs or tissues | 6. Perineal hematoma | 11. Complications with the administration of anesthesia or other sedation in labor and delivery (excluding headaches) |
| 2. Shock--circulatory collapse | 7. Hemorrhage within the first 24 hours following delivery of the placenta. | 12. Acute renal failure following labor and delivery |
| 3. Anemia | 8. Hemorrhage after the first 24 hours following delivery | 13. Deep-vein thrombosis |
| 4. Hospital stay greater than 3 days. | 9. Retained products of conception. | 14. Embolism of any type |
| 5. Infection | 10. Postpartum coagulation defect. | 15. Disruption of caesarian wound. |
| | | 16. I do not choose to answer |
| | | 17. No problems encountered |
| | | 18. I do not know the answer |

Directions: Please read the directions very carefully before answering the following questions.

A. Social readjustment includes the amount and duration of change in one's accustomed pattern of life resulting from various life events. As defined social readjustment measures the intensity and length of time necessary to accommodate to a life event, regardless of the desirability of the event.

B. You are asked to rate a series of life events as to their relative degrees of necessary readjustment. In scoring, mark the experiences that occurred the six months before the birth of your last baby. For each event that occurred please rate as to the social adjustment that it required. Rate as below.

C. The mechanics of rating are these: Event 1, marriage, has been given an arbitrary value of 500. As you complete each of the remaining events, think to yourself, "Is this event indicative of more or less readjustment than marriage?" "Would the readjustment take longer or shorter to accomplish?" If you decide the readjustment is more intense and protracted, then choose a proportionately larger number (up to 1000) and place it in the blank directly opposite the event in the column marked "VALUES". If you decide the event represents less and shorter readjustment than marriage then indicate how much less by placing a proportionately smaller number (to 0) in the blank. If the event is equal in social readjustment to marriage, record the number 500 opposite the event.

D. For each question, check whether the event was desirable or undesirable, controlled or uncontrolled, and whether the event was anticipated.

THE SAMPLE ANSWER SECTION AND THE QUESTIONS FOLLOW ON THE NEXT PAGE

Page Five

Events	Rating						Values	
	Desired	Undesired	Control over event			Anticipated		Non-Anticipated
			total	some	none			
<u>Sample</u>								
1. Marriage							500	
2. Troubles with the boss						✓	300	
3. Detention in jail or other institution			✓			✓	700	
*****Sample ends here*****begin answering questions*****								
1. Marriage								
2. Troubles with the boss								
3. Detention in jail or other institution								
4. Death of spouse								
5. Major change in sleeping habits (a lot less or change in time)								
6. Death of close family member								
7. Major change in eating habits								
8. Foreclosure on a mortgage or loan								
9. Revision of personal habits (dress, manners, associations, etc.)								

(Please turn the page over)

Page Six

Events	Rating						Values	
	Desired	Undesired	Control over event			Anticipated		Non-Anticipated
			total	some	none			
10. Death of a close friend								
11. Minor violations of the law (traffic tickets)								
12. Outstanding personal achievement								
13. Pregnancy								
14. Major change in the health or behavior of a family member								
15. Sexual difficulties								
16. In-law troubles								
17. Major change in number of family get-togethers								
18. Major change in financial state								
19. Gaining a new family member (through grandparent moving in)								
20. Change in residence								
21. Son or daughter leaving home during the day for the first time								

GO TO THE NEXT PAGE

Page Seven

Events	Rating						Values	
	Desired	Undesired	Control over event			Anticipated		Non-Anticipated
			total	some	none			
22. Marital separation from mate								
23. Major change in church activities								
24. Marital reconciliation with mate								
25. Being fired from work								
26. Divorce								
27. Changing to a different line of work								
28. Major change in number of arguments with mate								
29. Major change in responsibilities at work								
30. Husband beginning or ceasing work outside the home								
31. Major change in work outside the home								
32. Major change in usual type and/or amount of recreation								
33. Taking on a mortgage greater than \$15,000 (purchasing a home, car)								
34. Taking on a mortgage or loan less than \$15,000								

(Please turn the page over)

Page Eight

Events	Rating						Values	
	Desired	Undesired	Control over event			Anticipated		Non-Anticipated
			total	some	none			
35. Major personal injury or illness								
36. Major business re-adjustment								
37. Major change in social activities								
38. Major change in living conditions								
39. Retirement from work (mate)								
40. Vacation								
41. Christmas								
42. Changing to a new school								
43. Beginning or ceasing of further schooling								

THANK YOU VERY MUCH FOR YOUR TIME AND COOPERATION!!!!!!!!!!!!

APPENDIX C

PERINATAL CHECKLIST BY EXPERIENCE
OF PREGNANCY AND POINT VALUES
FOR EACH FACTOR

Table 35
Perinatal Risk Factor Point Values
Antepartal Factors

Five Point Value	Ten Point Value
Moderate to severe toxemia	Chronic hypertension
History of eclampsia	Severe heart disease
History of pyelitis	Moderate to severe renal disease
Mild heart disease	Acute pyelonephritis
Mild toxemia	Diabetes--Type II or above
History of cystitis	Prediabetes
History of toxemia	Previous exchange transfusion for Rh
Previous endocrine surgery	Habitual abortion
Family history of diabetes	Previous infant with weight greater than 10 lbs.
Previous stillbirth	Epilepsy
Previous postterm, past 42 wks	Uterine malformations
Previous delivery by C/S	Incompetent cervix
History of fetal anomalies	Previous history of multiple gestation
Abnormal fetal position	Viral disease
Polyhydramnios	Rh sensitization only
Small pelvis	Excessive use of drugs
Abnormal pap smear	Vaginal spotting
Sickle cell disease	Alcohol--greater than or equal to 4 glasses per day
Age greater than 35 or less than 15 yrs.	
Positive serology	
Emotional problem	
Severe anemia	
History of tuberculosis	
Weight less than 100 lbs. or greater than 200 lbs. before pregnancy	
Alcohol - less than or equal to two glasses per day	
Pulmonary disease	
Severe flu	
Mild anemia	
Smoking greater than 1 pack per day	

Table 36
Perinatal Risk Factor Point Values
Intrapartal Factors

Five Point Value	Ten Point Value
Mild toxemia	Moderate to severe toxemia
Premature rupture of membranes	Hydramnios
Failure to progress in labor	Amnionitis
Labor lasting longer than 20°	Uterine rupture
Medical induction	Magnesium sulfate because of toxemia
Precipitous labor, less 3°	Clinically small pelvis for baby
Need for your first C/S	Uterine tetany
Repeat C-section	Placenta previa
Induced labor for personal reasons	Abruptio placenta
Pitocin augmentation	Postterm greater than 42 weeks
Meconium stained amniotic fluid (light colored)	Meconium stained amniotic fluid (pea soup)
General anesthesia	Abnormal presentation of fetus
Outlet forceps	Multiple pregnancy
	Fetal bradycardia, greater than 30 minutes
	Breech delivery
	Prolapsed cord
	Fetal weight less than 5 lbs.
	Fetal tachycardia, greater than 30 minutes
	High forceps or vacuum extraction
	Shoulder dystocia

Table 37
Perinatal Risk Factor Point Values
Postpartal Factors

Five Point Value	Ten Point Value
Anemia	Damage to pelvic organs or tissues
Hospital stay greater than three days	Shock or circulatory collapse
Infection	Hemorrhage after the first 24 hours following delivery
Perineal hematoma	Postpartum coagulation defect
Hemorrhage within the first 24 hours following delivery of the placenta	Complications with the administration of anesthesia or other sedation in labor and delivery (excluding headaches)
Retained products of conception	Acute renal failure following labor and delivery
	Deep vein thrombosis
	Embolism of any type
	Disruption of caesarian wound

Table 38
Perinatal Risk Factor Point Values
Newborn Factors

Five Point Value	Ten Point Value
Small for gestational age	Prematurity and less than 3 lbs.
Large for gestational age	Required resuscitation at birth
Prematurity and greater than or equal to 3 lbs.	Fetal anomalies
Feeding problem	Multiple birth
Apnea	Respiratory distress syndrome
Transient tachypnea of the newborn	Meconium aspiration
Hypoglycemia	Anomaly of the respiratory system
Problems with calcium or magnesium	Other respiratory distress
Jitteriness or hyperactivity	Hypothyroidism
Heart murmur	Failure to gain weight
Hyperbilirubinemia	Major cardiac anomalies
Hemolysis of blood	Congestive heart failure
Anemia	Persistent cyanosis
Central nervous system depression, less than 24°	Sepsis
	Central nervous system depression greater than 24 hours
	Seizures

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